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INFORMAL TEACHER LEADERSHIP FOR TECHNOLOGY INTEGRATION: A MULTI-SITE CASE STUDY OF DISTRIBUTED LEADERSHIP

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INFORMAL TEACHER LEADERSHIP FOR TECHNOLOGY INTEGRATION: A
MULTI-SITE CASE STUDY OF DISTRIBUTED LEADERSHIP

DISSERTATION

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the
College of Education
at the University of Kentucky

By

Taylor John Clements
Wilmore, Kentucky

Co-Directors: Dr. Tricia Browne-Ferrigno, Professor of Educational Leadership Studies
and Dr. Jayson W. Richardson, Associate Professor of Educational Leadership Studies

Lexington, Kentucky

2018

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ABSTRACT OF DISSERTATION

INFORMAL TEACHER LEADERSHIP FOR TECHNOLOGY INTEGRATION: A MULTI-SITE CASE STUDY OF DISTRIBUTED LEADERSHIP

The goal of this study was to understand how a secondary principal uses a distributed perspective of leadership to support informal teacher leaders (ITLs) to improve classroom technology integration. Using a phenomenological lens, I employed a multi-site case study to inform the research goals. A conceptual framework based on Bandura’s (1977) social learning theory and Wenger’s (1998) communities of practice theory was used to guide the study’s methods and data collection.

Data were collected in three phases. At each site, the first phase consisted of a digital survey with only closed-ended questions that was administered to all classroom teachers. The survey was analyzed using social network analysis to identify the ITLs at each school. During the second phase, individual interviews with the ITLs and the principal as well as a follow-up focus group interview with ITLs at each school were conducted. During the final phase of data collection, I observed the ITLs at work to understand how they embodied informal teacher leadership.

Analyses of diverse data revealed how a principal influences the nature of informal teacher leadership in a school. Findings revealed that principals establish cultural expectations using teacher voice in leadership decisions, modeling the effective use of education technology, providing in-school and out-of-school leadership opportunities for ITLs, and establishing expectations for all teachers to assume roles of instructional leadership. It was clear in this study that although principals are not directly connected to the informal leading and learning network that occurs in a school, they indirectly influence the informal network by establishing school-wide cultural expectations for informal teacher leadership and by personally interacting with the ITLs.

KEYWORDS: Informal Teacher Leadership, Distributed Leadership, Social Network Analysis, School Technology Leadership, Mixed-Methods Research
Taylor J Clements

04/24/18

Date
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04/24/18
This dissertation is dedicated to the teacher leaders working across Kentucky and the organizations who have dedicated money and time to helping empower teacher voice in educational change.
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CHAPTER 1

INTRODUCTION

Education technology spending across the world is substantial and increasing. According to a report by Futuresource Consulting (2016), the global K-12 spending on education technology was at $15 billion in 2015, which was a 7% increase from 2014. In the United States alone, roughly $4.7 billion was spent on education technology in 2015, with roughly $522 million of that spent on mobile tablets (McCarthy, 2015). A report by EdNet Insight (2015) estimated that 90% of school districts in the United States are expected to continue or increase current technology budgets in the 2016 school year. This pattern of increasing allocation to digital technology will likely remain a nationwide push for using digital technologies in the classroom and granting ubiquitous access to teachers and students.

The hardware devices and software that connect users to the Internet, referred to as digital technologies (Ku, 2002), are integral to the daily lives of most people today. Digital technology devices are cheap, take up little space, and are extremely mobile. Along with the high accessibility of the digital technology hardware, accessibility to the Internet and its resources has increased. The Internet provides individuals with a wealth of information that is growing constantly (McCarthy, 2015). Using digital technologies and resources provided by the Internet in the classroom can be powerful for learning.

When utilized effectively, digital technologies can lead to powerful opportunities for teaching and learning (Larson, Miller, & Ribble, 2009). With digital technology, teachers and students have new ways to collaborate, communicate, and differentiate instruction (Bebell & Kay, 2010; Zucker & Light, 2009). For example, cloud-based
resources and social media applications can instantly connect students to each other from anywhere and store seemingly unlimited data. In another example, teachers can use digital tools for a multi-directional flow of information to improve how students experience curriculum and engage in instruction. It is clear that effectively integrating digital technologies can have transformational impacts on how teachers approach learning in the classroom (Frank, Zhao, & Borman, 2004).

In an effort to implement the powerful ways that digital technology can strengthen learning and teaching, many district leaders implement various digital device programs. A popular approach for implementing devices across a learning institution is known as a 1:1 program (Howell, 2012; Penuel, 2006). The term 1:1 describes a ratio of one device for every one student. Through a 1:1 program, every student can access a personal digital device throughout the course of a school day (Bebell & Kay, 2010).

School leaders implement 1:1 programs through bring your own device (BYOD) policies supplemented with school-purchased devices or by providing school-purchased devices for all students. Thus, the push for 1:1 programs in schools is channeling a large amount of funds into education technology. With the many dollars school districts are funneling into education technology, it is important to understand how educational leaders are supporting teachers in the move to technology-rich learning and teaching environments. Educational leaders are called to be purposeful with how classroom instruction adapts to digital technology in response to the changing landscape of digital technologies (Sauers, Richardson, & McLeod, 2014).

Numerous examples of how formal educational leaders are crucial to leading schools with technology integration exist. For example, Sauers, Richardson, and
McLeeod (2014) found that a shared vision for technology integration, infrastructure, communication, and professional development were important for superintendents in leading schools with digital-technology integration. In another study that highlights the role of formal school leaders, Anderson and Dexter (2005) determined the overwhelming importance of principals in leading school-technology integration. Compared to technology infrastructure, school leadership is absolutely “necessary for effective utilization of technology in schooling” (Anderson & Dexter, 2005, p. 49). Additionally, other researchers have indicated the important role of teacher leaders in facilitating technology integration in schools (Erekson, 2005; Riel & Becker, 2008).

Teacher leaders are expert teachers who work to improve their own classroom instruction and the instructional practices of others through professional development and professional collaboration (Silva, Gimbert, & Nolan, 2000; Snell & Swanson, 2000). However, teacher leaders can take on formal and informal leadership roles in schools (York-Barr & Duke, 2004). For example, formal teacher-leader roles include hybrid-teacher leaders who spend their days split between classroom teaching and leading other teachers in an instructional capacity (Margolis & Huggins, 2012). Teacher leaders play an important role in facilitating instructional guidance to other teachers in topics such as literacy (Stoelinga, 2008) and technology integration (Stevenson, 2004). Researchers have discovered that teachers require more learning opportunities for technology integration than formal school leaders can provide (Jones & Dexter, 2014; Stevenson, 2004). According to Jones and Dexter (2014), teachers need more informal and personalized-learning opportunities for technology integration. Informal teacher leaders can provide more one-on-one learning opportunities for teachers with technology
integration. However, little is known about how informal teacher leaders facilitate digital-technology integration in schools.

Unlike formal teacher leaders, informal teacher leaders have no title or no required instructional-leadership responsibilities in a school (Moller & Pankake, 2006; Pitts & Spillane, 2009; Whitaker, 1995). Informal teacher leaders are classroom teachers who are considered sources of instructional guidance and support by the other teachers in their school (Pitts & Spillane, 2009; Spillane, Hunt, & Healey, 2009b). Little research has been conducted to provide a universal definition for these informal leadership roles. However, some researchers have indicated that informal leadership can be more powerful than formal leadership roles (Donaldson, 2007; Margolis & Huggins, 2012).

Informal teacher leaders play a unique role in a school-leadership structure. As informal leaders, these teachers do not have a hierarchical position over other teachers. Lacking a formal leadership title allows these teachers to develop unique relationships to support their peers, which can be a strength for informal teacher leaders. Strengths in this instance are the interpersonal ties that teacher leaders develop through working informally with colleagues; the informal nature of this leadership relationship allows the ties to develop and strengthen into a network of leaders and learners. Additionally, because too much power is often placed on those officially titled as leaders in schools, informal leaders can be transformative in their efforts to build instructional leadership within their schools (Donaldson, 2007). By formalizing roles for teacher leaders, the hierarchical power structure in a school is replicated, and the informal teacher leader may be less effective (Margolis & Huggins, 2012). Both formal and informal teacher leaders
provide instructional leadership, but the relationships between principals and informal teacher leaders is unknown.

One of the common themes from research on formal teacher leaders is the role played by the school principal (York-Barr & Duke, 2004). An effective principal supports and builds relationships with formal teacher leaders to improve instructional leadership and increase student learning (Angelle, 2010). Principals are aware of formal teacher leaders, whereas principals may not be aware of those serving as informal teacher leaders in a school. Because informal teacher leaders do impact a school’s instructional leadership environment, it is important to understand the relationships between a principal and the faculty’s informal teacher leaders. By supporting and developing teacher leadership in schools, principals embrace a distributed perspective of leadership (Spillane, Halverson, & Diamond, 2004).

A distributed perspective of leadership reframes the traditional-hierarchical structure of leadership and allows researchers to examine how organizational-leadership activities are performed by individuals around the formal leader (Gronn, 2002; Spillane, 2005). In a distributed perspective of leadership, the focus of leadership shifts from the actions of the principal to the role of teacher leaders in espousing instructional leadership. These teacher leaders that help facilitate instructional leadership may undertake these instructional-leadership roles formally or informally. Researchers have provided empirical examples of how a distributed perspective of leadership can provide a deeper analysis of how schools are led.

For example, a distributed perspective of leadership was used as a framework to analyze how three Irish post-primary schools were led (Donovan, 2015). The author
revealed that too much focus is generally put on the actions of the principal instead of how the principal engages others in leading schools. In another example of how a distributed perspective of leadership supports a deeper analysis of school leadership, Spillane and his colleagues (2009b) examined a mid-sized urban school district in the United States. By examining the informal and formal leaders in the individual schools, they determined that the principal’s reliance on other leaders to carry out school leadership activities varied greatly based on the school and its principal. Using a distributed perspective of leadership allows researchers to analyze school leadership at a deeper level and examine how a principal activates peripheral leaders in a school-leadership structure.

Researchers have indicated that a distributed perspective of leadership should be applied to leading school-technology integration because the rapid change in technology and uneven distribution of expertise make technology integration particularly difficult (Anderson & Dexter, 2005). When using a distributed perspective of leadership, the role of teacher leaders in facilitating technology integration become more apparent (Levin & Schrum, 2013; Riel & Becker, 2008). In this study, a distributed perspective of leadership was used to frame the relationships between the principal and the informal teacher leaders that lead classroom technology integration.

**Purpose and Significance**

The purpose of this study was to understand how a secondary school principal uses a distributed perspective of leadership to support informal teacher leaders (ITLs) to improve classroom technology integration. While researchers have indicated that a distributed perspective of leadership should be used in leading technology integration
(Anderson & Dexter, 2005; Levin & Schrum, 2013), more research is needed on how principals are doing this. I used a distributed perspective of leadership to analyze how principals lead technology integration through ITLs. Through this framework of leadership, the findings can be used to inform how principals engage others in the leadership process of integrating technology for classroom learning. Additionally, findings from the study can be used to explore the nature of ITLs in technology integration. Although both informal and formal teacher leaders are important influences on school culture and instructional leadership in schools (Nappi, 2014; Silva et al., 2000), more research is needed on the roles of ITLs in schools (Margolis & Huggins, 2012).

**Research Questions**

The goal of the study was to answer the umbrella question: *How does a secondary school principal support ITLs to strengthen classroom technology integration?* The specific research questions that will help answer the overarching question are:

1. Who are the ITLs in the school as identified by the classroom teachers in the building?
2. How does an ITL perceive the support provided by the principal?
3. What leadership opportunities do principals provide for ITLs?
4. What systems do principals establish to strengthen informal teacher leadership?

A multi-site case study design was used with a phenomenological approach to answer the research questions. Three secondary schools in Kentucky were used as the sites as for this study.

Social network analysis (SNA) was used to inform the qualitative methods for this study. The data collection included a seven-item closed-ended survey, individual and
focus-group interviews, and observations. The qualitative data analysis used the constant comparative method to identify emergent themes. A conceptual framework based on Bandura’s (1977) social learning theory and Wenger’s (1998) communities of practice (COP) guided the study.

**Summary**

An overview of this multi-site case study of what principals do to support ITLs in support technology integration was provided in this chapter. In three purposefully selected school, I identified ITLs using SNA and then collected qualitative data from the identified ITLs and the principal. The study’s findings can be contributed to the literature on how school leaders can use informal teacher leadership as a way to help integrate instructional technology in the classroom. A conceptual framework, centered on social learning theory, was used to guide the data analysis. Additionally, the multi-site case study findings can be used to provide more understanding on how ITLs are connected to and supported by the school principal. The important terms for the study have also been provided.

Supporting literature for this study is provided in the following chapter. The literature topics include organizational leadership, the role of principals in leading technology integration, and the importance of ITLs in leading a school. Attention is also given to the role of the formal and informal collaborative structures, such as professional learning communities (PLCs), and how they relate to ITLs.
Table 1.1

**Definition of Terms**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>For this study, the term <em>technology</em> specifically refers to digital technologies, which includes the hardware and software components of digital tools that teachers and students are currently using in classrooms.</td>
<td>Levin and Schrum (2013)</td>
</tr>
<tr>
<td>Informal teacher leader (ITL)</td>
<td>A classroom teacher that holds no formal instructional leadership title and is <em>identified by peers</em> as a source instructional guidance and advice.</td>
<td>Pitts and Spillane (2009); Nordengren (2015)</td>
</tr>
<tr>
<td>Professional learning community (PLC)</td>
<td>A community designed to promote and sustain the learning of all professionals in the school community in order to enhance student learning.</td>
<td>Bolam, McMahon, Stoll, Thomas, and Wallace (2005)</td>
</tr>
<tr>
<td>Community of practice (COP)</td>
<td>A group of like-minded practitioners that meet to develop professionally and improve practices.</td>
<td>Wenger (1998)</td>
</tr>
<tr>
<td>Instructional technology</td>
<td>The design, development, utilization, and management of resources for learning.</td>
<td>Seels and Richey (1994)</td>
</tr>
<tr>
<td>1:1</td>
<td>A digital device program in which every individual student can access a personal digital device throughout the course of a school day (Bebell &amp; Kay, 2010). The 1:1 means a ratio of one device per each individual student.</td>
<td>Bebell and Kay (2010)</td>
</tr>
<tr>
<td>Node</td>
<td>The individual actors within a network or organization are referred to as nodes. In the graphical representation, nodes are the individual points that are connected, usually represented with small circles, squares, or triangles.</td>
<td>Borgatti, Everett, and Johnson (2013)</td>
</tr>
<tr>
<td>Hub</td>
<td>A hub is a node with multiple connections to other nodes. Although this term was recently applied to research, it is not commonly found in SNA research.</td>
<td>Reeves (2006); Rook (2015)</td>
</tr>
<tr>
<td><strong>Ties</strong></td>
<td>The term tie is used to describe the <em>connection</em> between hubs. Graphically, ties are represented with lines connecting two hubs. Ties can be used to represent the flow of information, influence, and resources.</td>
<td>Burt (1992)</td>
</tr>
<tr>
<td><strong>Centrality</strong></td>
<td>Centrality conceptualizes a node’s position in a network. The more central an actor is to a network, the greater the access of resources, opportunities, and influence.</td>
<td>Borgatti, Everett, and Johnson (2013)</td>
</tr>
<tr>
<td><strong>Summit Learning</strong></td>
<td>A commercial personalized learning platform. Summit Learning focuses on student success through developing individualized projects and a personalized approach to curriculum.</td>
<td>Jacobs (2017)</td>
</tr>
<tr>
<td><strong>G-Suite</strong></td>
<td>G-Suite (formerly called Google Apps for Education) is a collection of cloud-based tools that are used by schools for teaching and learning. G-Suite tools for education is a commercial product that every school in this study used. Products in G-Suite include Google Docs, Google Slides, Google Forms, Google Sheets, and Google Drawing</td>
<td>Lawrence (2017)</td>
</tr>
</tbody>
</table>
CHAPTER 2:

LITERATURE REVIEW

The goal of the study was to answer the question: *How does a secondary school principal support ITLs to strengthen classroom technology integration?* Three cases of distributed leadership were examined to inform knowledge on ITLs and how principals support them. In the first chapter, I provided an overview of the research problem, the context, and the guiding questions for this study. The relevant theoretical and empirical literature relating to the study are provided in this chapter.

Teacher leaders are not only key factors to school culture (Kilinic, 2014), instructional leadership (Marks & Printy, 2003), and professional learning communities (PLCs) (Vescio, Ross, & Adams, 2007), but are also important to effective technology integration (Jones & Dexter, 2014; Levin & Schrum, 2013; Stevenson, 2004). However, without effective principal support and relationships with principals, teacher leaders do not develop into the leaders that schools need for successful classroom technology integration (Angelle, 2010; Mangin, 2007). Examining how principals support ITLs deepens understanding on how school leaders develop effective technology integration for learning and teaching.

I begin this review of literature by examining school leadership and situate the principal’s role as the primary organizational leader of a school. Next, the role of the principal in school technology leadership is described and connected to distributed leadership, the phenomenon that was examined in this case study. A final section is provided in which I outline teacher leadership, describe a proposed model of informal
teacher leaders (ITLs), and examine how communities of practice (COPs) can provide a space for teacher leadership.

**School Technology Leadership and Organizational Change**

Organizational leaders act in an influence relationship to provide organizational change (Rost, 1991). Researchers generally agree that the role of the principal is influential, substantial, and critical (Hallinger & Leithwood, 1994; Leithwood & Montgomery, 1984; Murphy, Elliott, Goldring, & Porter, 2006; Waters, Marzano, & McNulty, 2003). As a school’s primary leader, principals exercise their influence to provide two primary functions: set vision and develop school culture (Louis, Leithwood, Wahlstrom, & Anderson, 2010). The vision must be “uplifting, pointing to new directions, calling for progress from where we are to where we want to be, and describing how we will get there” (Owens, 2004, p. 271). To implement a vision for the organization, employees must understand the change process that must take place to move to where the organization needs to go (Fullan, 2009).

A culture of change is necessary for school principals to effectively lead schools with a vision (Fullan, 2001). However, the change process was described by Fullan (2001) as messy and unintuitive. In outlining conditions needed for a culture of change, Patterson and Rolheiser (2004) stated that school principals should guide teachers in “learning about change” (p. 2). Principals must work with stakeholders to communicate how change is necessary to improve instructional experience for students. In challenging leaders to accept a change culture, Fullan (1993) admitted the hierarchical structure of schools results in “a system that is more likely to retain the status quo than to change” (p. 3).
The role of change in school improvement is supported by empirical studies. For example, Louis and Miles (1990) used multiple site case study methods to examine the role of the principal in urban high schools that were attempting school-wide reforms. The researchers determined that the change process was not directly anticipated by the principal, but rather facilitated by the principal and developed by teachers in the school.

In another set of case studies featuring restructured high schools, Louis and Smith (1991) found that teachers were crucial to the process of change. Teachers embraced risk-taking in a culture of change to develop new solutions to issues that improved the educational setting (Louis & Smith, 1991). These researchers help provide examples of both principals and teachers leading to change schools. Principals must also use their influence in order to lead education technology integration in schools (MacNiel & Delafield, 1998; Richardson, Flora, & Bathon, 2013).

Education technology are the tools that help advance student learning (Levin & Schrum, 2009) and principals must include advancing education technology in their vision for school success (Richardson, et al., 2013). Focusing on education technology integration is key for principals to develop “future-ready citizens who are technologically savvy, globally competent, and prepared to engage in a 21st century knowledge-based economy” (Flanagan & Jacobsen, 2003, p. 216). Because of this study’s connection to effective technology integration for learning, the next section will provide an overview of school technology leadership and the principal’s role in school technology leadership.

As digital technologies have assimilated into schools across the world (Levin & Schrum, 2009; Lim, Zhao, Tondeur, Chai, & Tsai, 2013), principals are called to navigate the new digital learning environment (Richardson et al., 2013). However, there are a lack
of data collected on how current principals successfully support technology integration in their schools (Levin & Schrum, 2013; McLeod & Lehmann, 2011; Richardson, Bathon, Flora, & Lewis, 2012). Numerous researchers and practitioners identify tools and strategies for school leaders to embrace school technology leadership (Levin & Schrum, 2009; McLeod & Lehmann, 2011; Sheninger, 2014), but as Sauers et al. (2014) pointed out, “These tips and tools are timely and needed, but they do not fulfill our need for research on how technology efforts are implemented” (p. 118). Not enough research has been done on how “school administrators learn about or even navigate effective school technology leadership” (Richardson et al., 2013, p. 148). While authors assert the need for more research on how school systems develop technology-rich learning spaces (Anderson & Dexter, 2005; Levin & Schrum, 2009; McLeod & Lehmann, 2011; Richardson et al., 2012; Sauers et al., 2014), there is a widely held consensus of the large responsibility of school principals in establishing effective technology integration practices in schools.

In order to be successful in leading technology integration for teaching and learning, principals must become involved in “discovering, evaluating, installing, and operating new technologies of all kinds” (Creighton, 2003, p. 3). The school principal helps set the tone for educational technology and leads the school culture in technology integration, which includes how digital tools are used to enhance learning, teaching, and leadership (Richardson et al., 2013). Although more research is needed on how principals are implementing effective school technology leadership, there are empirical studies that describe the pivotal role of principals in school technology leadership (e.g., Anderson & Dexter, 2005; Levin & Schrum, 2013).
In a seminal study on school technology leadership, Anderson and Dexter (2005) used survey data from 898 public, private, and parochial schools to examine “leadership characteristics and their effect on indicators of technology outcomes” (p. 49). The results provided that technology leadership had greater leverage on technology outcomes than technology infrastructure and expenditures. In their implications from the study, Anderson and Dexter (2005) described the need for applying a framework of distributed leadership to technology integration citing the “rapid technical change and highly uneven distribution of expertise” (p. 73) that makes technology integration more challenging.

In another example that outlines the importance of technology leadership, Levin and Schrum (2013) studied the school leaders of eight technology-rich schools. Across their separate cases, the authors affirmed the essential role of principals in developing school-wide technology integration. Notably, principals were driven by having a clear vision of how they wanted technology to be used in their high schools. The principals of these schools then worked to make sure their visions were understood by the teachers to help strengthen the use of technology for learning.

These empirical studies on school technology leadership affirm that if a school principal does not adequately understand the trends in educational technology, then the principal is not prepared to lead with modern digital technologies (Richardson et al., 2013). However, the focus of the present study is specifically on how principals support the ITLs who are working to strengthen technology integration. The phenomenon of distributed leadership allows for an in-depth analysis of how leadership activities are carried out through individuals alongside the formal leader, in this case the principal.
(Spillane, 2005). The next section will provide an overview of a distributed perspective of leadership.

**Distributed Perspective of Leadership Activity**

Although it is clear that principals are primary factors of determining school success and student learning (Fullan, 2001; Hallinger & Heck, 1996; Leithwood & Riehl, 2003; Louis, 1994), it is easy to overlook the roles of others in the school leadership process. Researchers agree that principals require additional individuals and support to lead schools effectively (Glazer, Hannafin, & Song, 2005; Riel & Becker, 2008; Spillane, 2005), but less is understood about how leadership activities are spread throughout an organization. Examining the interactions between principals and other leaders in a school will develop a better understanding of how effective school leadership is enacted. A distributed perspective of leadership, as described by Spillane (2009), provides a lens for analyzing the leadership practice of principals through “the interactions of leaders, followers, and aspects of the context” (Spillane, 2009, p. 70).

Distributed leadership is a broad term in leadership research. Shared leadership (Angelle & Teague, 2014), collective leadership (Louis et al., 2010), and collaborative leadership (Shepard, Hurley, & Dibbon, 2010) have all been used to define a similar phenomenon of distributing leadership (Harris, 2008). According to Harris (2011), distributed leadership has become a “catch-all” (p. 11) expression that can apply to other leadership frameworks centered on dispersing leadership activities. This study will use the framework of distributed leadership as outlined by Spillane et al. (2004).

A distributed perspective of leadership challenges the normative hierarchical structure of leadership in schools. The traditional view of school leadership places the
principal at the center as the romanticized “solo or stand-alone leader” (Gronn, 2002, p. 423). The traditional view of leadership, as described by Gronn, focuses on traits of the leader and leaves questions concerning how the principal’s interactions with subordinates can lead to student success and initiative implementation in schools. To address these questions, a distributed leadership model recognizes the importance of other individuals in a school that work with the principal. A distributed perspective of leadership “de-romanticizes” (Elmore, 2000, p. 13) the principal’s role and focuses on the interactions between a principal and the other individuals in the school that help perform leadership activities (Harris, 2013). Shifting the focus towards the role of the peripheral actors surrounding the principal and how these roles are engaged will provide an effective analysis of how principals perform school leadership activities. A distributed perspective of leadership examines who principals interact with and how principals connect with others to lead a school. A distributed perspective of leadership also frames leadership in such a way that the role of the principal is not diminished but rather emphasizes the supporting characters in the leadership process. While school principals are vital to student success and organizational change, how principals connect with teachers and other roles to lead schools is critical to understanding the practice of school leadership (Heller & Firestone, 1995; Spillane et al., 2004).

Spillane et al. (2004) determined two primary components of a distributed perspective of leadership to be the *principal-plus* and *practice*. Principal-plus addresses the individuals that help decision-making and leadership in the school, which might include individuals who focus on instructional technology, literacy skills, or social media. The practice aspect of distributed leadership examines the specific actions of a principal
in distributing leadership and decision-making (Spillane et al., 2004). Examples of the practice aspect of distributed leadership include a principal cultivating effective PLC practices (Spillane, 2005) or developing teacher leaders for school-wide decision-making (Bolivar, 2009). These two components of a distributed perspective, principal-plus and practice, help researchers analyze how principals lead organizational change and adopt innovation (e.g., Bolivar, 2009; Levin & Schrum, 2013).

In a year-long dissertation case study, Bolivar (2009) used distributed leadership as a framework for how a Venezuelan middle school implemented an International Baccalaureate (IB) program. Similar to this study, Bolivar utilized SNA to analyze the interpersonal network connections throughout the school faculty. To understand how distributed leadership was utilized in a new program implementation, observations and interviews were conducted with school teachers and administrators. The findings of this exploratory study suggested the importance of social networks, teacher collaboration, and teacher support tasks in school-wide implementation of a new school-wide program. The use of SNA was important for showing how formal leaders, such as coordinators and administrators, were connected to teachers and used these connections to enact school leadership.

In another example of using a distributed perspective of leadership in research, Levin and Schrum (2013) used a cross-case analysis of descriptive case studies to examine how principals were leading classroom technology integration efforts in their schools. In their cases, Levin and Schrum found that seven of the eight school principals explicitly described the use of distributed leadership to develop technology integration. These actions included encouraging teachers to lead from their strengths, working in
teams, and engaging in valuable relationships with teachers. Based on the case study data, the researchers also determined the importance of supporting teachers considered to be early adopters in their efforts to integrate technology.

When principals approach leadership with a distributed perspective, the results are readily felt and appreciated by teachers and teacher leaders (Angelle, 2010; Cruickshank, 2013). A distributed perspective of leadership puts the spotlight on teachers as leaders and the roles they play in leadership activities. How principals support or connect with teacher leaders in their buildings is an important piece of school culture and instructional leadership (York-Barr & Duke, 2004). Now that a distributed perspective of leadership has been described, attention turns to what teacher leaders do as leaders in the school. The next section will outline teacher leadership literature, provide a definition for teacher leadership, and examine a gap in the current understanding of teacher leader roles.

**Teacher Leadership**

The historical development of teacher leadership has been classified into three waves. Berry and Ginsberg (1990) described how the first wave of teacher leadership included teachers taking on positions such as department head and union representative. These early teacher leader roles were designed to be managerial in nature and were considered to be primarily an extension of the administration (Berry & Ginsberg, 1990). Teacher involvement in school leadership, evidenced through more meaningful roles in administrative tasks, continued to develop and mature into the second wave (Silva et al., 2000).

In support of a national movement to professionalize teaching and empower teachers, Darling-Hammond and Berry (1988) described how the second wave of teacher
leadership focused on teachers as instructional leaders in schools. Referred to as lead teachers by Berry and Ginsberg (1990), teacher leaders in the second wave were meant to focus on “professionalizing and decentralizing educational decision-making” (Berry & Ginsberg, 1990, p. 617). Teacher leader roles in the second wave were broadly defined as teachers who participated in professional development, maintained classroom teaching roles, and worked with other classroom teachers to improve instructional practices (Berry & Ginsberg, 1990; Darling-Hammond & Berry, 1988; Smylie & Denny, 1990). Though a universal understanding of teacher leadership had not entirely materialized in this wave, formal teacher leader roles became common in practice of teacher leadership (see Hart, 1990; Smylie & Denny, 1990). Empirical studies on teacher leadership began to appear in the second wave of teacher leadership (e.g., Berry & Ginsberg, 1990; Whitaker, 1995).

The third wave of teacher leadership, considered by Silva et al. (2000) to be emerging presently, situates teachers at the pinnacle of school culture and organizational problem solving. As investigated by Cooper (1993) and Sergiovanni and Starratt (1998), teacher leaders of the third wave directly challenge the hierarchical conception of school leadership to combine classroom teaching with school leadership on a regular basis. In this third wave, experts tend to agree that the power of teacher leadership in schools is a crucial catalyst to student learning (Danielson, 2005; Katzenmeyer & Moller, 2001, Reeves, 2009). Particularly with regards to instructional leadership, the role of teacher leaders in the third and current wave of teacher leadership is essential to school leadership and student learning (Silva et al., 2000; Stoelinga, 2008; York-Barr & Duke, 2004). Based on the existing teacher leadership literature, the following section will
provide a definition of teacher leadership for this study and examine a gap in the current understanding of teacher leadership roles.

**Defining Teacher Leadership**

Experts have outlined numerous definitions of teacher leadership throughout the years (York-Barr & Duke, 2004). Despite a universal definition of teacher leadership, a synthesis of the available literature leads to several common traits for defining teacher leadership. Teacher leaders do the following:

- commit to improved teaching and learning (Birky, 2002; Riel & Becker, 2008);
- possess instructional expertise (Marks & Printy, 2003; Nappi, 2014);
- establish strong relationships with administrators (Angelle & DeHart, 2011; Snell & Swanson, 2000; Whitaker, 1995); and

These four characteristics, grounded in the empirical and theoretical literature on teacher leadership, are contributed to a definition of informal teacher leadership for the current study. These characteristics are explored next in the context of supporting literature.

**Commit to improved teaching and learning**. Teacher leaders believe that their instructional capacity must constantly improve (Birky, 2002; Fullan, 1994; Thacker, 2014). For example, using teacher-provided results from the Teaching, Learning, and Computing: 1998 National Survey, Riel and Becker (2008) categorized teachers according to their leadership characteristics. In the data analysis, the authors determined that respondents in the teacher-leader category (2% of the sample) were far more interested in professional development than other teachers that were not in the teacher-
leader category. Using the survey responses, professional development was represented through attending workshops, leading workshops, and partaking in collaborative projects with other teachers.

The continued instructional development of teacher leaders through professional development was indicated by another study by the Aspen Institute (2014) that examined a teacher leadership initiative from the Tennessee Department of Education. The program supported roughly 700 teacher leaders from across the state to develop instructional skills through workshops during the summer of 2012. After the sessions, the teacher leaders returned to their own schools to specifically share content and strategies. While the researchers only gathered specific follow-up data from one participant, the program was successful in supporting teacher leaders in extending their professional skills in the classroom. Although there is no universal definition of teacher leaders, it is clear that teacher leaders continue to learn more about teaching as a practice. Teacher leaders embody a spirit of continued commitment to improving mastery of teaching and learning (Fullan, 1994; York-Barr & Duke, 2004).

**Possess instructional expertise.** There is a consistent theme of teaching expertise in the teacher leadership research (Nappi, 2014). For example, after identifying and interviewing 10 middle school teacher leaders, Snell and Swanson (2000) used qualitative data to detail their Five Dimensions of Teacher Leadership. In one of the five dimensions, expertise, Snell and Swanson described that teacher leaders seek out opportunities to “enhance and refine their craft” (p. 7).

In another example of teacher leadership expertise, Marks and Printy (2003) identified 24 elementary, middle, and high schools across the country that had
experienced a restructured school leadership with high staff turnover and a new principal. The goal of the study was to examine how principals were using distributed leadership for school improvement. The researchers determined that principals identified teacher leaders based on teacher expertise and then identified them as instructional leaders for the schools. The principals of these restructuring schools were utilizing the teaching expertise of teacher leaders to improve learning and teaching in their schools. As determined from empirical studies, teacher leaders are often identified based on their teaching expertise and their passion to continue improving that classroom teaching quality.

Establish strong relationships with administrators. Particularly in a distributed leadership framework, which places focus on the connections with individuals surrounding the formal school leader, relationships are critical to effective school leadership (Lattimer, 2007; Snell & Swanson, 2000; York-Barr & Duke, 2004). Using a one-way ANOVA across 43 schools in 7 states, Angelle and DeHart (2011) examined the relationship between self-perceptions of teacher leadership and the impact of teacher leadership in schools. The authors concluded that for teacher leaders to be effective, “special relationships must exist between the principal and the teacher leaders” (Angelle & DeHart, 2011, p. 155). Researchers found that many teacher leaders rely on these relationships to enact successful teacher leadership. For instance, in an exploratory comparative case study, Mangin (2007) collected data from 33 participants spanning classroom teachers, principals, and district administrators to determine principal knowledge, principal support, and district communication structures to enhance teacher leadership. While the researcher suggested a link between district communication and teacher leadership support, relationships between principals and teacher leaders was
provided as being crucial to successful teacher leadership. In one of the cases, the “principal support was insufficient” (Mangin, 2007, p. 347), which left the respondent frustrated and unfulfilled as a teacher leader. Without principal connections and support, teacher leaders cannot develop into the instructional leaders that would improve instruction in schools.

**Participate in teacher networks.** A common characteristic of teacher leadership involves connecting to other teacher leaders (Angelle, 2007; Riel & Becker, 2008). While a PLC is usually the center of collaboration and communication between teachers, Riel and Becker (2008) were particular in including the role of teacher networking outside of the building-level PLC. Using data from the Teaching, Learning, and Computing: 1998 National Survey, the authors specifically identified data regarding teacher professional engagement to inform their study. Riel and Becker determined that teacher leaders stay connected to other teacher leaders in general. These networks consist of teacher leaders in the building and outside of the building. These connections to other teachers are not limited to specific boundaries, such as K-12 or higher-education, but include all types of interactions that allow for the sharing of resources and ideas. Considering the role of digital tools and social media in forming networks of connected teachers, the scope of networking has broadened to account for the extensive reach of social media tools in forming these networks (Riel & Becker, 2008). Now that the supporting literature has been examined to provide a definition of teacher leadership, attention turns to the roles of teacher leaders.
Roles of Teacher Leaders

Another theme from the literature is that teacher leadership is not confined to formal organizational roles or titles (Angelle & Teague, 2014; York-Barr & Duke, 2004). In reference to the second wave of teacher leadership (Silva et al., 2000), teachers began assuming formal roles that outlined the necessity for collective leadership in schools. However, teacher leadership is not restricted to these formal titles or roles (Katzenmayer & Moller, 2001). While formal teacher leaders are an important piece of school culture, this study only looked at principal support for ITLs.

While few empirical studies have focused explicitly on teacher leadership roles, some research has been done on how ITLs play a role in facilitating instructional leadership. In one of the early examples of research on the role of ITLs, Whitaker (1995) examined the relationship between middle school principals and their schools’ informal teacher leaders. Using the results of the Audit of Principal Effectiveness, a national assessment of principal skills, Whitaker identified eight middle school principals: four above one standard deviation of the national norm and four below one standard deviation. Interviews with groups of teachers were used to identify the ITLs. The principals who were considered more effective based on the results of the audit were able to accurately identify the ITLs in their schools. These principals continued to seek their input for school leadership decisions. In addition to outlining the importance of ITLs, Whitaker also hinted at the importance of gathering input from peers in identifying ITLs. SNA was used in this study, which helped provide me a way to identify ITLs by gathering input from teachers in a school.
In another example of investigating teacher-leader roles, Angelle and Teague (2014) examined teacher perceptions of teacher leadership and the “extent of collective efficacy” (p. 738). Angelle and Teague gathered quantitative data from teachers, building administrators, and district administrators in three school districts. After performing descriptive statistics and an ANOVA, the authors determined that those in formal teacher leader roles were *not* necessarily as effective as ITLs. Despite having no formal titles or responsibilities, ITLs were regarded by some teachers as having more influence than some with formal leadership roles. Angelle and Teague found that some respondents described department heads and grade level chairs as having less teacher leadership than some others in the building.

While it is clear that these ITLs play an important role to the teachers in a school, few researchers have explicitly differentiated between informal and formal teacher leader roles in empirical studies. As outlined above, the term teacher leadership literature refers to both formal and informal teacher-leader roles in schools. This study focused exclusively on the support for ITLs, so the next section defines informal and formal teacher leaders for the case study.

**Formal and Informal Teacher Leadership**

Formal teacher leaders, as described by Nordengren (2015), include teachers in the school building who have an official title or formal responsibility for providing instructional guidance to other teachers. An example of a formal teacher leader might include a teacher formally tasked with helping assist other teachers with education technology questions and needs. Hybrid roles, as discussed by Berry (2015) and Margolis and Huggins (2012), have grown in popularity and provide a way for schools to support
formal teacher leader roles in schools. Hybrid teacher leaders spend part of their day teaching in the classroom and part of their day as instructional leaders in their school or district. Formal teacher leader roles allow teachers to continue their vital role of impacting student learning directly while providing instructional leadership to others in their buildings (Berry, 2015; Jones, Lefoe, Harvey, & Ryland, 2015).

Contrary to formal teacher leaders, ITLs have no formal title or list of responsibilities but provide instructional guidance and advice to other teachers (Donaldson, 2007; Moller & Pankake, 2006; Pitts & Spillane, 2009; Whitaker, 1995). These are classroom teachers who are considered sources of instructional guidance and support by their school colleagues but have no official title for instructional leadership in the school. A formal teacher leader holds a responsibility and administrative awareness to

*Figure 2.1* The roles of formal and informal teacher leaders.

Contrary to formal teacher leaders, ITLs have no formal title or list of responsibilities but provide instructional guidance and advice to other teachers (Donaldson, 2007; Moller & Pankake, 2006; Pitts & Spillane, 2009; Whitaker, 1995). These are classroom teachers who are considered sources of instructional guidance and support by their school colleagues but have no official title for instructional leadership in the school. A formal teacher leader holds a responsibility and administrative awareness to
provide instructional guidance, whereas an ITL may be only known as an instructional leader by other teachers. Similar to formal teacher leaders, ITLs still provide instructional guidance, advice, and influence on other teachers (Moller & Pankake, 2006). An illustration of how formal teacher leaders and ITLs were defined in this study is provided in Figure 2.1. While researchers have predominantly studied teacher leadership without specifying between formal and informal roles (Stoelinga, 2008), I examined only some of the ITLs in a school.

No universal definition of informal teacher leadership exists in theoretical or empirical literature (Moller & Pankake, 2006). What little empirical data that exists on informal teacher leadership was used to define ITLs in this study. The gap between informal and formal teacher leader roles is clear in Spillane et al. (2009b), who used data from 23 elementary schools in a mid-sized urban school district. In their examination of school leadership roles, Spillane and colleagues included teachers with “formal leadership assignments” (p. 11) in their analysis. In addition to these formal teacher leaders, Spillane et al. used SNA to include informal leaders to be identified using centrality scores. Using a distributed perspective of leadership and SNA, the researchers effectively examined the role of formal leaders in the organization as well as highlighted the importance of informal leaders. In the conclusion, Spillane et al. discussed the wide variety found between roles of informal leaders across the elementary schools. While some schools reported informal leaders being vital to the flow of school functions, others described a school-wide lack of reliance on informal leaders for the day-to-day operations. Though this study did not find more details on the roles of ITLs, the authors modeled a method for identifying ITLs and highlighting their importance in schools.
In another example of informal teacher leadership, Stoelinga (2008) investigated teachers leading literacy instruction informally in three elementary schools using a multi-site case study analysis. In addition to SNA, the author used document analysis, interviews, and observations to situate teacher leadership in the informal leadership of the organization. In the findings of the study, Stoelinga determined that ITLs can be powerful and play a crucial role in “school improvement efforts” (p. 117). In the study analysis, the author described the influential impact of ITLs in school-wide initiatives such as improved classroom technology integration.

In a dissertation, Nordengren (2015) used a case study to investigate an elementary school’s instructional teacher leaders. Nordengren determined that teachers who provide instructional guidance are not necessarily teacher leaders. SNA was used to identify teachers who provided instructional advice or guidance and the researcher followed up with interviews to see if these individuals exercised informal leadership. Based on the qualitative data provided by the interviewees, Nordengren established that ITLs must have a vision for improving their personal instruction, variations of their own instructional practice, and an invitation from a colleague to offer advice, information, or support on an instructional topic. Similar to my study, Nordengren’s findings emphasized the role of peers in determining informal leadership. Without a formal title to direct the leadership responsibilities, peers in the building are important for identifying ITLs.

More empirical studies of informal teacher leader roles in schools are needed. Few researchers have explicitly differentiated between the formal and informal roles of teacher leadership, which has resulted in a lack of a research-informed definition of informal teacher leadership. Recently, a number of doctoral dissertations (e.g., Addis,
2015; Conery, 2012; Nordengren, 2015) specifically focused attention on how informal teacher-leader roles are working to impact school change. These dissertations also utilized SNA and a distributed perspective of leadership to frame informal teacher leadership. While these dissertations will likely result in more peer-reviewed articles and publications on informal teacher leadership, there is currently a gap of understanding in informal teacher leadership, the roles these individuals play in school improvement, and how they are connected with the principal. A proposed model of ITLs for this study is provided in the next section.

**Proposed Model of ITLs**

As discussed above, a universal conception of informal teacher leadership has not been developed by researchers. Using the research-based definition of teacher leadership already provided, a proposed model for ITLs is presented in Figure 2.2. Unlike formal teacher leaders in a school, ITLs *must* be identified by their colleagues (Stoelinga, 2008; Whitaker, 1995). The informal teacher-leader role is directly perceived by the teachers in the building. Because ITLs have no formal title or authority, their connections to principals is unclear. For this reason, the proposed model of the ITL (see Figure 2.2) does not necessarily include a relationship with administrators. This theme, taken from the definition of teacher leadership, is shaded-in for the proposed model of ITLs. A modified model for the ITL is provided in Chapter 6 to clarify the nature of the relationship between the principal and an ITL that I found in this study.
Figure 2.2 Proposed model of ITLs.

Because the identity of ITLs may not be known to the school principal, researchers cannot rely on the principals to identify the informal teacher leaders. SNA allows researchers to accurately identify ITLs exclusively using input from the teachers in the building. The results of SNA allow researchers to identify ITLs without relying on the formal school leaders that may be unaware of the ITLs. While the principal may be aware of these individuals, ITLs must be identified by their own colleagues in the building. The next section provides more details into the nature of the ITL.

Defining ITLs

Based on the relevant literature discussed and the proposed model for informal teacher leadership laid out above, a formal definition of an ITL can be given. For this study, ITLs were teachers who:

- are identified by their peers (Pitts & Spillane, 2009; Spillane et al., 2009b; Whitaker, 1995); and
• hold no formal title(s) or responsibilities of teacher leadership in the school (Conery, 2012; Nordengren, 2015).

These defining characteristics are now detailed using supporting empirical studies.

**Identified by their peers.** Because no formal title or role exists for ITLs, their instructional leadership may only be known by other teachers. ITLs are recognized by their peers as being sources of instructional guidance and advice to other teachers. Recognizing the possible bias or unawareness of ITLs by principals, Whitaker (1995) used focus groups with teachers in each case to identify ITLs. The findings presented by Whitaker (1995) showed that while some principals were aware of their school’s ITLs, other principals were unaware. In order to identify ITLs in elementary schools, Spillane et al., (2009b) found centrality degrees using SNA. The researchers analyzed input from the teachers in the building to determine which teachers were considered to be ITLs. Spillane et al., (2009b) determined that while some school facilities relied heavily on informal leaders, others did not. Findings from these studies highlight the importance of collecting input from teachers to determine informal teacher leaders.

**Hold no formal title(s).** When examining the power of SNA in school leadership, Pitts and Spillane (2009) defined informal math teacher leaders as “teachers who were not formally designated leaders but had more people go to them for math advice relative to other people in their school” (p. 11). These individuals, identified through SNA, were considered important to math instruction and leadership in their respective schools. Notably, the informal math teacher leaders did not have formal leadership roles attached to them. In her dissertation, Conery (2012) analyzed teacher perceptions of school leadership practice in an elementary school using a distributed perspective of leadership.
and SNA. To account for all of the school leaders, the researcher included ITLs in her analysis along with formal school leaders. Using a centrality score, Conery (2012) found that at least nine teachers were “key advice-givers” (p. 161) and had no formal leadership roles. These teachers, identified by having the highest centrality scores, were deemed ITLs. These researchers suggested that ITLs, identified using SNA, play important roles in providing instructional guidance and advice in the school.

![Definition of Informal Teacher Leaders](image)

*Figure 2.3 Defining the ITL.*

The definition of ITL is provided in Figure 2.3. This definition is supported by the principal-plus component of a distributed perspective of leadership. The principal-plus component highlights the importance of individuals other than the principal to carry out instructional leadership. Included in a distributed perspective of leadership is the practice component, which focuses on how principals connect with and utilize these peripheral formal and informal leaders in the organization (Spillane et al., 2004). Since the principal may not know who the ITLs are in the building, it is currently unclear how the practice component of a distributed perspective of leadership will be seen in the study. This definition of the ITL is easily connected to the use of SNA in this study. SNA allows researchers to see personal connections across organizations that may be informal or formal in nature (Daly, Liou, Tran, Cornelissen, & Park, 2014). SNA has been used
repeatedly to identify ITLs in faculty networks (e.g., Pitts & Spillane, 2009; Spillane et al., 2009b).

**ITLs and Technology Integration**

Empirical findings on classroom instructional technology integration (Jones & Dexter, 2014; Riel & Becker, 2008; Stevenson, 2004) have been used to direct researchers to the importance of ITLs in classroom technology integration. These informal leaders work with other teachers to develop digital tools and strategies that support learning (Riel & Becker, 2008). In a qualitative study of 13 middle and high school social studies teachers in Georgia, Zhao, and Bryant (2006) examined the impact of technology integration training over the course of a semester. After conducting interviews, observing classrooms, and analyzing documents, the researchers determined that teachers found the most positive impact from the instructional technology leaders working individually with specialists. These interactions, which were one-on-one and informal, were described as being the most impactful to classroom technology integration by the participants.

In a dissertation study, Thacker (2014) examined informal learning in a high school social studies PLC. In the case study, Thacker found one teacher in particular to be a crucial teacher leader with instructional technology. This teacher leader did not have a formal leadership position but was important for modeling instructional technology resources to his peers. This teacher leader was “known for both his strong history content knowledge and his technological prowess” (p. 108) that set him apart as a leader in his school and social studies PLC. This case study especially helped show how important an ITL can be to the instructional development of a content-specific PLC.
Now that teacher leadership has been examined using empirical examples, attention is given to the social structures in schools that support teacher leadership. These groups are important for understanding how teachers may fulfill leadership roles in schools and connect with one another. In keeping with the nature of teacher leadership studies, the next section will refer to both informal and formal teacher leader roles when using the term teacher leadership.

**Communities of Practice**

COPs were formally defined by Wenger (1998) as groups of like-minded practitioners that meet to develop professionally and improve practices. Developing COPs and a school-wide culture of collaborative learning has been identified as one of the most effective ways that schools can connect teachers to each other, develop teacher leadership, and improve student learning (Cooper, 2009; Fullan, 1994; Hord, 1997b; Little, 2002; Martin, 2013). Although this study did not formally examine COPs in a school, their role is important when considering networks within a school faculty.

When outlining effective COPs, Wenger (1998) stated that COPs are ideally informal and self-led. However, researchers have established the important role that principals play in implementing formal COPs (Coburn, Mata, & Choi, 2013; Printy, 2007). These formal COPs, implemented or required by principals, have been referred to as PLCs by researchers (Jones & Dexter, 2014; Vescio et al., 2008). PLCs consist of teachers meeting to help facilitate changes meant to improve instructional quality, develop a collaborative atmosphere, and improve student learning outcomes (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006). PLCs can also strengthen teacher
leadership and peer-instruction between within school departments and faculty members (Cooper, 2009; McLaughlin & Talbert, 2006; Sullivan & Glanz, 2006).

My study refers to formal COPs as PLCs, as suggested by Jones and Dexter (2014). PLCs might include semi-regular meetings of a content-specific department, such as Mathematics (e.g., Thacker, 2014; Wiley, 2001), or meetings designed to attack problems in a school (e.g., Berry, Johnson, & Montgomery, 2005). PLCs play an important role in faculty networks by connecting teachers and providing opportunities for teacher leadership (Jones & Dexter, 2014; Thacker, 2014). However, researchers have determined that PLCs do not necessarily meet all of the collaborative learning needs of teachers (Jones & Dexter, 2014; Sesky, 2014; Stevenson, 2004).

Informal groups of teachers who choose to come together, share information, and work together on problems of practice have been labeled as informal COPs by Jones and Dexter (2014). These informal COPs, unlike PLCs, are formed by teachers and more closely fit the model described by Wenger (1998) for authentic COPs. However, it is unclear if principals are aware of these informal COPs. In a dissertation that examined the use of distributed leadership in a turnaround high school, Sesky (2014) used case study methods to identify the principal support for an informal PLC. In the case study, five teachers gathered and formed an informal COP before sharing their vision of methods to help improve the school with the principal. In this example, the principal was unaware of the informal COP before they formally presented themselves to the principal. This dissertation provided insight into the development and nature of an informal COP. While there are empirical examples of the impact of informal COPs in schools (Jones & Dexter, 2014; Stevenson, 2004), these studies are focused on teacher learning and do not
examine the extent to which principals know about or interact with these informally-developed groups. Although the nature of informal COPs was not a focus of this study, their existence is important to understanding teacher networks and opportunities for informal teacher leadership. The next section is used to examine what principals must do to effectively lead a PLC culture in their schools.

The Leadership Paradox in Teacher Leadership

In order for PLCs and teacher leadership to be successful, principals must provide visionary leadership (Lieberman, 2009). As the primary factors in determining school culture (McCombs, 2010), principals are crucial for embracing a leadership approach that encourages the strength in faculty members for improving instruction (Hord, 1997a). As principals develop a culture of teacher learning, teacher leadership, and PLCs, they cannot be overbearing in the process. COPs are most effective when self-organized and self-led (Wenger & Snyder, 2000), but school principals will often direct the process of forming and requiring formal PLC meetings.

An appropriate analogy was provided to frame the role of the principal in developing formal PLCs and teacher leadership (Wenger & Snyder, 2000). The gardener (principal) cannot rush the process of growing plants by pulling on a cornstalk or pulling out a plant to examine its roots, but the garden can be maintained by tilling the soil, pulling out weeds, and supplementing water supply in droughts. These nurturing actions help provide a healthy crop, in the same way that a principal can cultivate teacher leaders through COPs but cannot force successful teacher leadership in their schools. By being purposeful in identifying potential COPs, providing the best infrastructure, and using nontraditional methods of evaluating these groups, principals can be effective in
developing teacher leadership through PLCs and informal COPs (Wenger & Snyder, 2000). Just as principals are important to supporting teacher leaders, principals are important to supporting collaborative learning through COPs and PLCs. These formal and informal groups that connect teachers are important for providing teacher leadership opportunities and supporting a distributed perspective of leadership in a school.

A theory for COPs, provided by Wenger (1998), is used to support the use of SNA in this study. While teacher connections in PLCs might be formal and more evident, COPs can exist informally across a faculty network. Using SNA can provide a method for identifying and analyzing the informal connections between teachers that develop in a school network. Determining and analyzing the informal connections between teachers helped inform how ITLs are connected to other teachers in the building. Wenger’s conceptualization of COPs is used in the conceptual framework for the study, which will now be described.

**Conceptual Framework**

To frame the study’s focus on a distributed perspective of leadership, two theoretical frameworks were used to build a conceptual framework. These include social learning theory (Bandura, 1977) and COPs (Wenger, 1998). These theories heavily pull from sociocultural learning in order to outline a socially-constructed leadership lens. Using the lens of distributed leadership, the roles of formal leaders and undesignated informal leadership can be examined (Spillane, 2005). As illustrated in Figure 2.4, COPs (Wenger, 1998) is framed within Bandura’s (1977) social learning theory.
Figure 2.4 The conceptual framework. Bandura’s (1977) social learning theory surrounds Wenger’s (1998) COPs theory to frame the formal and informal interactions that teachers share to develop a common culture and shared understanding.

**Social Learning Theory**

Also referred to as social cognitive theory (Bandura, 1993, 2001, 2002, 2009), Bandura’s (1977) social learning theory allows researchers to focus on individual processing that results from cognitive stimuli through modeling in a social context. Psychological processing is “explained in terms of a continuous reciprocal interaction of personal and environmental determinants” (p. 11). Instead of assuming that a person and their environmental factors function as independent determinants, Bandura uses his theory of social learning to postulate that they determine each other. As with each variation of sociocultural learning, Bandura's model has a specific approach to framing the learning that takes place within groups. Social learning theory relies on external stimuli, focusing on the role of modeling in social learning. Without modeling, learning would be “exceedingly laborious, not to mention hazardous” (p. 22). Examining these external stimuli, Bandura presented observational modeling, verbal instruction, and symbolic modeling for the social learning process.
Observational modeling, or live modeling, is considered to be an original source of learning most is often associated with children seeing constant modeling from their parents. A learner physically sees, internally processes, and decides to act upon the modeling. Verbal instruction, while still internalized by an individual, is processed differently and often requires a set of reinforcement. Verbal modeling is powerful because “one can convey with words an almost infinite variety of behaviors that would be inconvenient and time consuming to portray behaviorally” (Bandura, 1977, p. 39).

Symbolic modeling, while it uses some type of communication medium such as television, digital videos, or other visual media, is significant due to the widespread impact it can have. While the basic modeling process is the same regardless of the style (i.e., live, verbal, symbolic), Bandura holds that the effectiveness of each varies.

While teachers do not have frequent opportunities to witness live modeling from their peers, the capacity for verbal modeling and symbolic modeling is high (Glover, 2012). Bandura’s (1977) theory offers a way to synthesize the learning that takes place between teachers and teacher leaders in a faculty network, as seen in Stevenson (2004). PLCs provide a time and social setting for various types of modeling to take place. When teachers are digitally savvy, PLC members may utilize a strong digital environment (Riel & Becker, 2008). These groups use technology to learn collaboratively and thus support Bandura’s theory for symbolic modeling. While Bandura’s social learning theory reflects the importance of social groups for developing and learning, the conceptual framework for this study includes a lens for the interpersonal structures that exist in the organization. The formal and informal networks of teachers, which support the use of SNA and a
distributive perspective of leadership, are framed by social learning theory and exemplified by shared learning among members of COPs (Wenger, 1998).

Communities of Practice

Building on sociocultural learning theory, Wenger (1998) stressed the role of “shared historical and social resources” (p. 98) in social learning that assumes learning is based on an individual’s social setting. His contribution to social learning theory developed into what is referred to as a COP. In contrast to other social learning theories, COPs are focused on the social participation formed by a common goal of collective learning. COPs are self-forming “groups of people informally bound together by shared expertise and passion for a joint enterprise” (Wenger & Snyder, 2000, p. 139). Wenger noted that it is important to identify the characteristics that separate a COP from simply a network of individuals.

A COP has an identity defined by a shared domain of interest (Wenger & Snyder, 2000). A shared domain of interest refers to an internal interest or passion that spans the members of a community. COP members participate in joint activities, share knowledge, engage in discussions, and interact on at least a semi-regular basis. Wenger (1998) identified communities as being more than having a one-time connection, but rather members are consistently engaged in interactions.

Unlike a community built purely on a common interest, members of a COP are practitioners. Members actively develop a shared repertoire of experiences, stories, tools, and ways of addressing problems (Wenger & Snyder, 2000). COPs in organizations: (a) help drive strategy, (b) start new lines of business, (c) solve problems quickly, (d) develop professional skills, (e) transfer best practices, and (f) help companies recruit and
retain talent (Wenger & Snyder, 2000). COPs is an approach to social learning that stresses belonging in a social group or network as a predecessor to individual understanding.

While COPs are “fundamentally informal and self-organizing” (Wenger & Snyder, 2000, p. 143), action from leadership is still required. In order to help sustain effective COPs, leaders can help by:

- identifying potential COPs that will enhance the company’s strategic capabilities;
- providing the infrastructure that will support such communities and enable them to apply their expertise effectively; and
- using nontraditional methods to assess the value of the company’s COPs (Wenger & Snyder, 2000, p. 144).

Without developing the culture to nurture a COP, sustainability and efficacy of the community will suffer (Wenger & Snyder, 2000). Leaders must be willing to invest time and money in helping communities reach their full potential. Leaders can also help sustain these communities by nominating official sponsors or leaders to support community members with resources and coordination. To adequately assess the value of a community, Wenger and Snyder recommended that managers listen to “members’ stories in a systematic way” (p. 145). By embracing a vision that supports effective COPs, organizational leaders are providing a culture of social belonging, which supports Wenger’s (1998) definition of COPs. As Thacker (2014) summarized it, “knowledge, then, is not a set of facts to be memorized by individuals but is constantly shifting; it is interpreted and constructed socially” (p. 43).
The conceptual framework for this study is drawn from Bandura’s (1977) social learning theory and Wenger’s (1998) COPs. These theories, combined into a conceptual framework, provided a guide for the data collection, data analysis, and discussion of the results. This case study examined how principals in three Kentucky secondary schools promoted distributed leadership through ITLs. The methodological details of the case study are provided in the following chapter.

**Summary**

In this study, I examined how principals support ITLs to strengthen instructional technology integration. In this chapter, I discussed the relevant literature regarding school leadership and organizational change, a distributed perspective of leadership, and teacher leadership. Also included in this chapter was a proposed model for the ITL (see Figure 2.2), a formal definition for ITLs (see Figure 2.3), and the conceptual framework for the study (see Figure 2.4). Chapter 3 is used to describe the methodology for this study.
CHAPTER 3

METHODOLOGY

The support provided by a school principal for informal teacher leaders (ITLs) who help strengthen classroom technology integration was examined in this study. I used qualitative methods to answer the overarching research question during the three phases of the study. The first phase consisted of collecting survey data from all faculty members at each site using the ITL Identification Survey (see Appendix E). The survey responses were analyzed using social network analysis (SNA) to identify the ITLs. The second phase involved initially conducting individual interviews with the ITLs and the principal at each school followed by a focus-group with the ITLs in each school. During the third phase, the identified ITLs at each school were observed while facilitating teacher-leadership activities that strengthen education technology. An overview of the study’s three phases is provided in Figure 3.1.

Figure 3.1 Three phases of data collection used in this study. All three phases took place in each site, independent of the other sites.

The overarching question was, *How does a secondary school principal support informal teacher leaders (ITLs) to strengthen classroom technology integration?* The four guiding research questions that assisted in answering the overarching question were:
1. Who are the ITLs in the school as identified by the classroom teachers in the building?

2. How does an ITL perceive the support provided by the principal?

3. What leadership opportunities does the principal provide for ITLs?

4. What systems does the principal establish to strengthen informal teacher leadership?

In the following sections, I provide the methodological details of the study including the case study methods, a short description of each study site, data collection techniques, data analysis strategies, potential limitations, and quality assurances.

This exploration used case-study methods that allow an investigator to answer research questions by contextualizing a contemporary phenomenon within a specific boundary (Hatch, 2002; Merriam, 1988). A case study examines “a program, an event, a person, a process, an institution, or a social group” (Merriam, 1988, p. 13) during a specific time frame. As such, using case-study methodology allowed me to explore in-depth how a principal supports and interacts with the ITL(s) in a school. Data were gathered at three research sites to generate opportunity for greater understanding about how ITLs are supported by the school principal.

The three sites for the study were selected based on purposeful sampling (Patton, 1980). Because I focused on ITLs that strengthen classroom technology integration, only secondary schools that provide one device for each student and teacher were considered as potential sites. In schools where all students and teachers are provided an infrastructure for digital devices, it is more likely that teachers work together to support classroom
technology integration by helping their colleagues use the devices appropriately for learning.

**Study Sites**

Schools that provide individual devices for use by students throughout the day are referred to as *1:1 schools* (Dunleavy, Dexter, & Heinecke, 2007). With more individual devices in a school, a principal must be diligent to assure teachers are well-trained and supported with the requisite knowledge about using technology effectively in the classroom. However, the devices in the classroom must be leveraged by other digital tools to support student learning.

**Population**

The schools used in this study were identified using a combination of purposeful and criterion-based selection. Only secondary schools with 1:1 programs were considered for the study. The sites were identified in 2016, during which about 126 of the 420 secondary schools in Kentucky were operating in a 1:1 environment (Kentucky Department of Education, 2016).

To identify principals, I contacted an individual at the Kentucky Department of Education and received a list of school districts that had begun 1:1 programs. I began by emailing roughly ten principals from the list that were within a three-hour drive of where I lived at the time. While eight principals did not respond, two responded to decline the invitation. Both principals that responded to decline quoted time as the primary obstacle to hosting the study. The first principal to accept was Principal Adrian on behalf of Armstrong High. The second site was identified when I emailed a superintendent that I worked with in a previous school and he recommended a principal. I contacted this
principal, and he agreed to participate on behalf of Bressman High. The third site was identified when a principal, who I had met via Twitter, showed interested in hosting my study in Carter Middle. It is worth noting that the principals who accepted the invitation to participate in the study already stood out as possibly being more innovative and transparent principals. The energy and enthusiasm surrounding their interest in participation reflected their passion for developing more research on teacher leadership, highlighting what their schools are doing well, and improving education in general through research. While it was not necessarily a criterion for selection, all of the secondary schools selected for the study were G-Suite schools.

The schools that participated in this study had access to the G-Suite, a set of cloud-based digital tools produced by Google that can be leveraged for teaching and learning. The tools available through G-Suite can also be used to strengthen communication and collaboration between teachers. For example, using Google Drive to share documents quickly and efficiently helps strengthen collaboration between teachers. By providing teachers with these tools, school leaders lay the groundwork for a potentially rich network of teacher sharing and connections between colleagues. The communication between teachers regarding classroom technology integration is important to this study; the G-Suite tools along with individual devices are crucial components to a school-wide focus on teacher collaboration.

Only pseudonyms are used to protect the anonymity of the study sites and participants (e.g., names of schools, principals, and teachers). The following sections provide preliminary details about the schools and principals that participated in the study.
Table 3.1 displays preliminary demographics about each school; more details about the individual schools are presented in Chapter 4.

Table 3.1

*Site Information Matrix*

<table>
<thead>
<tr>
<th>School Name</th>
<th>Number of Teachers</th>
<th>Approximate Number of Students</th>
<th>Number of ITLs Identified using SNA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armstrong High</td>
<td>35</td>
<td>700</td>
<td>2</td>
</tr>
<tr>
<td>Bressman High</td>
<td>18</td>
<td>200</td>
<td>1</td>
</tr>
<tr>
<td>Carter Middle</td>
<td>28</td>
<td>700</td>
<td>3</td>
</tr>
</tbody>
</table>

**Armstrong High**

Armstrong High is one of three public schools located in a central-Kentucky community. Situated in a county with a population around 45,000 residents, Armstrong High has 35 teachers who serve approximately 700 students from both suburban and rural areas. The principal, who is referred to as Principal Adrian, is the school’s founding principal and was in his sixth year of service when data collection began. After teaching high school English for five years, he spent a year as a principal intern, another year as an assistant principal, and then began his tenure at Armstrong High. Additionally, Principal Adrian was earning his Doctor of Education (EdD) from a Kentucky university during the time of data collection.

**Bressman High**

Bressman High is located in a central-Kentucky community that has two other public high schools. Operating in a county with about 50,000 residents, Bressman High serves roughly 200 students, all of whom are from urban areas. The faculty includes 18 teachers. Principal Bain was in his second year as the principal of Bressman High when
data collection started. Before this role, he was an assistant principal at another Kentucky high school. He began his education career as a middle school teacher in Georgia before moving to Kentucky and transitioning to high school mathematics and social studies. During the time of data collection, Principal Bain was completing an EdD from a private university in Kentucky.

**Carter Middle**

Carter Middle is one of two middle schools located in its central-Kentucky district with approximately 40,000 residents. The roughly 700 students that attend Carter Middle are from suburban and rural areas and are served by 28 teachers. Principal Cortes was in her first year as the school’s principal when data collection began; before accepting the position, she served two years as an assistant principal at Carter Middle. Prior to becoming an assistant principal, she worked as a middle school social studies teacher and then a formal teacher leader. During the data collection, Principal Cortes was also working toward completing an EdD at a university in Kentucky.

**Data Sources**

The study participants at each site consisted of three groups. The first group was composed of all faculty members at each school who completed the survey use to identify the ITLs. The second group included all ITLs identified by the school faculty; recall that ITLs are classroom teachers who do not hold formal leadership titles for education-technology integration. The principals at each participating school constituted the third group.
Phase 1: ITL Identification

The first step in the research process at each site was to identify the ITLs, which was done by administering the ITL Identification Survey (see Appendix E). All classroom teachers in the school were invited to respond to the ITL identification survey, which is a seven-item closed-ended digital survey. The survey was analyzed using SNA to identify the school’s ITLs.

Survey development. SNA was conducted to determine the flow of instructional-technology leadership in the faculty at each school. The ITL Identification Survey used a roster approach (Marsden, 1990), which helps ensure that respondents do not forget their colleagues’ names (Borgatti et al., 2013), and is a common method for obtaining social network data in education research (Anderson, 2010; Daly & Finnigan, 2010; Ellwardt, Labianca, & Wittek, 2012; Penuel, Riel, Krause, & Frank, 2009). A roster approach means that each question on the survey consists of a list of names from which survey respondents select certain names based on a criterion (Marsden, 1990). The seven components of the technological pedagogical and content knowledge (TPACK) framework were used to frame the ITL Identification Survey. Using a roster approach in this study means that for each of the seven TPACK framework sections listed below, the survey provided a checklist of all classroom teachers’ names who work in the high school. By using the TPACK framework, teachers can conceptualize their professional connections in terms of technological, pedagogical, and content knowledge as well as the overlapping areas between each of these knowledge types. Each respondent was asked to indicate the teachers with whom he or she would seek advice or guidance on each of the seven topics. For example, in the technological pedagogical knowledge section of the
survey, teachers were asked to identify their peers on the list from whom they would seek advice or guidance from regarding technological pedagogical knowledge.

The ITL Identification Survey was administered to faculty members digitally using Google Forms. Since each school used the G-Suite tools regularly, the teachers were accustomed to the Google Forms interface. Prior to receiving the survey, the respondents were sent a link to a video that provided an overview to the study and a brief personal introduction by me. The teachers in each site had 48 hours to answer the survey after being sent the link. After 24 hours, all teachers were sent another email to encourage them to respond to the survey if they had not already done so. I encouraged each principal in the study to provide time during a faculty meeting or PLC meeting for teachers to complete the survey. After 48 hours, the survey at closed; survey data were then analyzed to determine who the ITLs are at each school.

To begin survey data collection, all teachers at each school were sent an electronic mail message that contained a link to the survey. To take the survey, each teacher had to sign into their school-based Google account. By signing into their school accounts, teachers could not take the survey more than once. To map the social network ties between teachers, it was important that the survey results were not anonymous (i.e., it is impossible to map the social network without knowing individual interview responses). All survey results were de-identified after the analysis was completed, and no teacher’s name is shared in the results.

Analysis using SNA depicts the flow of technological-pedagogical expertise between teachers within each site. While there were seven unique analyses possible from the survey results, I only used the section on technological-pedagogical expertise, which
is explained more in the next section. It was important to gather survey data from as many teachers in each school to ensure more precise ITL identification and provide an accurate social network mapping. A network that includes input from every node is referred to as a sociocentric data set, the most accurate set for network data analysis (Borgatti et al, 2013).

**Survey framework.** The ITL Identification Survey was designed around the TPACK framework. This theoretical framework is used to examine teacher knowledge that is required for effective technology integration (Mishra & Koehler, 2006). TPACK is an extension of Shulman’s (1986) conception of pedagogical content knowledge (PCK), which describes how a teacher’s knowledge of pedagogy relates to content knowledge in the classroom (Koehler, Mishra, & Cain, 2013). Extending on the PCK model, the TPACK framework includes technology knowledge. TPACK is a useful framework for considering what teachers need to integrate technology effectively into teaching.

As illustrated in Figure 3.2 below, TPACK is represented by a Venn diagram comprised of three knowledge types that overlap to make seven components. Technology, pedagogy, and content are the three primary forms of knowledge assessed using TPACK. The intersections of these knowledge forms create four more components that represent the overlap of understanding between the types. The seven categories in the TPACK model are (a) technology knowledge, (b) content knowledge, (c) pedagogical knowledge, (d) pedagogical content knowledge, (e) technological content knowledge, (f) technological pedagogical knowledge, and (g) technological pedagogical content knowledge. The seven components of the TPACK framework comprise the seven individual questions on the ITL identification survey (see Appendix E).
The TPACK framework was used in this survey so teachers could focus on the attributes of the ITLs that facilitate education-technology leadership. Teachers informed the research process by identifying other teachers in their school that they specifically relied on for technological-pedagogical knowledge. By separating the different knowledge types and thinking about each one, teachers could narrow in on this knowledge type that they relied on from the ITLs.

In one section of the survey, respondents placed a check in the box next to the name of each teacher they sought advice from for technological-pedagogical knowledge. If the respondent did not go to any of these teachers, then he or she selected I would not seek advice on technological pedagogical knowledge from any classroom teacher on this list. For this study, I used the definition of classroom teacher as defined by Spillane, Healy, and Mesler (2009a). That is, classroom teachers were “the primary instructor for a class during a typical day” (p. 411) and had no formal instructional-leadership title or
education-technology leadership responsibility. The overlapping of pedagogical knowledge and technological knowledge represents a knowledge base that evidences using technology effectively for classroom learning and teaching. In Figure 3.3, the overlap between technological knowledge and pedagogical knowledge is highlighted. This overlapped section, known as technological-pedagogical knowledge, is the sectioned I used to guide the ITL Identification and SNA.

*Figure 3.3* TPACK framework with the highlighted section between technological knowledge and pedagogical knowledge. Graphic retrieved from http://tpack.org.

**Survey analysis.** Once the ITL Identification Survey data were collected, a centrality analysis was conducted using the network analysis software UCINET (Borgatti, Everett, & Freeman, 2002). A list of the classroom teachers at a school was generated along with a centrality value for each teacher based on the number of inward ties linking that teacher with other colleagues. Only the technological-pedagogical knowledge category was used for the centrality analysis. By looking at the survey data on this specific category, the school’s teachers identified the teachers who lead integration of
technology use in classrooms. UCINET also provided visual representations of the
technology use in classrooms. UCINET also provided visual representations of the networks across the school building, as reported by Ellwardt et al. (2012). The maps, in which every teacher is represented by a node, show the collegial ties (Penuel et al., 2009) between teachers. These ties represent the flow of advice or guidance in the building concerning technology integration for classroom learning as reported by teachers at the school through their survey responses.

The in-degree centrality, which is used to identify how central an actor is in a network (Daly, 2010), was the specific SNA tool applied in the study. The ties between the teachers at a site represent the connections between teachers on seeking advice or guidance on technology integration. By ranking the entire list of faculty members in terms of in-degree centrality, I was able to identify the ITLs. Details of the second phase of data collection are provided in the following section.

**Phase 2: Explore Relationships**

Once the survey data was analyzed at each site, Phase 2 began. Data collection in Phase 2 consisted of individual interviews with a school’s ITLs, an interview with the school principal, and a focus-group interview with all ITLs at that site. Three different data-collection instruments were used during this phase and involved the ITLs and the principal in each site.

All individual and focus-group interviews were conducted in digital environment using Google Hangouts with one exception: one interview was facilitated via telephone. The audio from every interview was recorded using digital software on a laptop and a smartphone. Multiple devices were used to ensure there was no loss of recordings. The recordings were then transcribed by the researcher.
**ITL interviews.** Once the ITLs were identified in Phase 1, they were recruited to be interviewed via electronic mail or telephone. The ITL interviews followed a semi-structured interview protocol (see Appendix F). In the semi-structured interview, I used a list of numbered questions but altered the question ordering to fit the flow of the interview. The semi-structured interview allowed me to adapt the interview to fit with the situation and provided for more in-depth data. Using an interview protocol with all interviews allowed me to provide consistent interview-data collection from across the ITLs and across all three schools.

**Principal interview.** After the individual ITL interviews were conducted at a site, the school principal was invited to be interviewed via electronic mail. The principal interview protocol (see Appendix G) was designed to answer the guiding research questions and help me design the ITL focus group protocol for that school. I asked the principal about school culture, particularly how teachers’ professional learning communities (PLCs) function, as well as details on the 1:1 program, formal teacher leadership, and informal teacher leadership.

**ITL focus group.** After I conducted individual interviews with each ITL and the principal at a site, an invitation was extended to all ITLs at that school to participate in an ITL focus-group interview. One of the schools had only ITL identified, in which case a follow-up individual interview was conducted instead of a focus group. The protocol for each focus-group interview was developed based on findings from the initial ITL interviews and the interview with the school principal. The emergent topics and themes from the individual interviews were used to create the protocol that was used in the ITL focus group at each site. The focus-group interviews were designed to gather deeper,
richer data than what the individual interviews provided based on the social interactions of the ITLs (Hatch, 2002). The ITL focus-group participants used their unique interactions to provide data and insights that are less accessible without the group context (Morgan, 1997). Because each protocol was designed to gather rich data about that specific school, the focus-group protocols were unique to each school and are provided in the Appendix.

**Phase 3: Observe ITLs**

ITLs were observed facilitating their instructional leadership in Phase 3. During the ITL interviews in each site, I asked for the best opportunities to come observe ITLs acting as informal leaders of technology integration in their buildings. Depending on the ITL and the context of the activity, the observations focused on individual ITLs or multiple ITLs simultaneously. All ITL observations were conducted in a face-to-face environment. Specifically, I visited each school to observe ITLs. During ITL observations, the ITL Observation Protocol (see Appendix H) was used to record extensive notes and observations to ensure a rich analysis, as recommended by Merriam (1988). The ITL Observation Protocol guided the data collection in Phase 3. In the observation-data collection, I focused on recording the context, activities, interactions of the ITLs with other teachers, and any other pertinent details to the research study.

I assumed the role of unengaged observer while conducting ITL observations. As a complete observer, I did not take part in any of the activities or school functions that took place while I observed. Instead, I focused on gathering rich data on the context, the school in general, and the ITL.
Field Notes

Data collection and analysis is an ongoing process in qualitative research. Throughout the data collection procedures, I recorded extensive field notes on the research process, the sites, the activities, and relevant details that provided a richer narrative of each site (Merriam, 1988). The field notes were taken in addition to the three phases of data collection listed above and allowed me to gather more details that may not fit into the research protocols. An overview of the data-collection sources for the study is provided in Table 3.2.

Table 3.2

Data Collection Matrix

<table>
<thead>
<tr>
<th>Phase</th>
<th>Goal</th>
<th>Data collection instrument</th>
<th>Data source</th>
<th>Time required for participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Identify ITLs</td>
<td>ITL Identification Survey</td>
<td>All teachers in the school</td>
<td>Less than 10 minutes</td>
</tr>
<tr>
<td>2</td>
<td>Gather data from ITLs individually</td>
<td>ITL Interview Protocol</td>
<td>ITLs individually</td>
<td>30-45 minutes per interview</td>
</tr>
<tr>
<td>2</td>
<td>Gather data from principal</td>
<td>Principal Interview Protocol</td>
<td>Principal</td>
<td>30-45 minutes per interview</td>
</tr>
<tr>
<td>2</td>
<td>Gather data from ITLs as a group</td>
<td>ITL Focus Group Protocols</td>
<td>ITLs as a group</td>
<td>30-45 minutes per interview</td>
</tr>
<tr>
<td>3</td>
<td>Gather data from observing ITLs</td>
<td>ITL Observation Protocol</td>
<td>ITLs in leadership activity with faculty</td>
<td>Vary based on site and ITL</td>
</tr>
<tr>
<td>All</td>
<td>Field Notes</td>
<td>None</td>
<td>Various</td>
<td>During all Phases of study</td>
</tr>
</tbody>
</table>
Data Analysis

Typological analysis, as described by Hatch (2002), was used to analyze the qualitative data from each site. The typologies were generated from the five research questions. As data were gathered, they were organized into categories, and qualitative data went into multiple categories as needed. After organizing data into the different categories, the data was read again to determine main ideas and develop codes for the emergent patterns.

The emergent patterns were regularities that appeared in the data. These patterns included several forms such as similarities, differences, frequencies, sequences, correspondences, and causations (Hatch, 2002). After identifying patterns, I re-examined the data to assure they supported the patterns while searching for non-examples of the patterns. I then looked for relationships among the patterns identified and wrote my patterns as one-sentence generalizations. Finally, I selected data excerpts that supported my generalizations. As recommended by Hatch, I selected “powerful examples that can be used to make your generalizations come alive for your readers” (p. 159). Computer applications were used to aid the analysis process, as recommended by Merriam (2009). Google Sheets and Google Docs were utilized to help highlight data, develop patterns, and organize emergent themes by typologies. Following the three individual site analyses presented in Chapter 4, a cross-case analysis based on the emergent themes and patterns from all sites to answer the research questions is provided in Chapter 5.

Quality and Verification Checks

Multiple steps were taken to ensure that the study meets standards of quality and credibility (Creswell & Miller, 2000; Yin, 2003). Triangulation is a technique to improve
credibility by using multiple sources of information to inform the themes or categories (Creswell & Miller, 2000). Gathering different data types in each site strengthened the study’s credibility by reducing subjectivity. A survey, individual and focus-group interviews, and observations were used in this study to establish triangulation through multiple sources (Yin, 2003). Each data source was carefully linked to the goal of the study. Having multiple data sources also strengthened triangulation in the data analysis (Creswell, 2003).

Credibility

To strengthen the credibility of the ITL identification survey, I administered the ITL survey to member of the mathematics department where I work. This group of nine individuals took the survey to provide feedback and make suggestions on how to improve the survey. The feedback received from this peer reviewing resulted in adding the pictures of each individual section of TPACK on each question in the ITL identification survey.

Described by Lincoln and Guba (1985) as the “most crucial technique for establishing credibility” (p. 314), member checking was used in the study. Following the data collection and analysis, I provided each ITL with the analysis from their school as well as the emergent themes from the cross-site analysis. Each ITL and principal was given the details on their own school as well as the entire Chapter 5 to review. During the member checking process, I asked the ITLs and principals if the themes make sense and if they agreed or disagreed with the patterns. The participant feedback was used to enrich the narrative and increase credibility of the report (Creswell, 2003). Through the member-checking process, participants added credibility to the study by having a chance
to reflect on the data analysis and contribute their perceptions in the final narrative (Creswell & Miller, 2000).

Peer reviewing was used in this study to strengthen credibility through involving collaboration and input from others during the research process (Johnson, 1997). I conducted peer debriefing with my dissertation advisors throughout the entire research process to help maintain credibility (Creswell, 2003; Johnson, 1997). The peer review process with dissertation advisors includes video-conference meetings as well as exchanges over digital tools such as Google Hangouts and electronic mail.

To increase the reliability of the case study approach, data was carefully organized to create a chain of evidence (Yin, 2003). Deliberate steps were planned to connect the study’s findings from the research questions to the instruments to the data collected. Maintaining a chain of evidence allows readers to trace the steps of the research and ensure that the study’s findings are linked to the research questions and goals of the study (Yin, 2003).

Observing the ITLs increased the study’s credibility. While SNA was used to identify the ITLs, the observational data corroborated results of the teacher survey by examining how the ITLs lead classroom technology integration in the building. By observing the ITLs in leadership activities, I gathered rich data on how their leadership is facilitated and what role the principal played in these activities. This step enhanced the credibility of the study by elaborating on the portrait of what an ITL is and how he or she facilitates leadership in schools.
Dependability

All data were kept on a password-protected computer. Each site had a folder specifically for the data that was gathered within that site. Within a site’s folder, the survey data was placed in its own folder with the original Google Form and the results from the ITL identification survey. The principal’s interview recording and transcription was kept in another folder. A folder for each ITL in that site contained the ITLs interview recording, interview transcriptions, and observational data. The focus group recording and transcription were kept in a separate folder. All field notes and observations that were hand-written were digitized using an iPhone camera and stored in the appropriate folder as well.

Role of the Qualitative Researcher

The lens of this multi-site case study relied on a constructivist perspective. Constructivism posits that reality is not an external singular entity but constructed in the mind of individuals (Ponterotto, 2005). Contrary to positivism, constructivism implies that I am the primary instrument and my impressions are central to the data collection and analysis (Ponterotto, 2005). As a constructivist researcher, I developed understanding by cultivating and aggregating the real experiences portrayed by the participants. Using the rich data, I interpreted the experiences to generate an understanding of the principal support for ITLs in each context. Being the primary instrument of the proposed research, my impressions were crucial to the study, which supports a constructivist role in research.

Researcher Perspective

As the researcher and primary data-collection instrument in the qualitative study, it was important for me to remain objective in each site. I explored the support for ITLs
provided by the principal from the viewpoint of the participants of each site. The study’s participants maintained the emic perspective (LeCompte & Preissle, 1993; Pike, 1954) who assigned subjective meanings to their experiences as insiders. The site’s insiders provided rich data through interview and focus group data to inform the study.

As the outsider of the research site, I adopted the etic perspective (LeCompte & Preissle, 1993; Pike, 1954) and remained objective. By diving into the case and gathering data, I established meaning based on the perspectives provided by those in the emic perspective. When providing evidence and conclusions, both the etic and emic perspectives are important for guiding the reader through the qualitative findings.

**Researcher Bias**

Conducting this multi-site case study had the potential for researcher bias. Specifically, I might be identified as an ITL in the school where I teach. I have worked for many years with colleagues to improve schoolwide classroom technology integration but have never held a formal teacher-leader role. My background as a possible ITL is a unique lens for studying ITLs in other environments. As the primary data collection instrument in this study, I was cognizant of how my personal attitudes might influence the analysis and maintained a personal research journal throughout the entire data collection and analysis process.

**Survey Data Limitation**

A potential limitation of the study was that the survey respondents were self-reporting the teachers whom they would seek for instructional-technology guidance, and thus, their perceptions might not have mirrored what actually took place in the building. However, gathering observational data on all formal and informal interactions between
faculty members throughout a school was not logistically possible and likely would have interrupted the daily interactions between teachers. Similarly, gathering observational data on digital interactions (e.g., electronic mail, social media, texting) would have been equally as challenging and difficult to obtain permission.

Summary

The goal of the study was to understand how a secondary principal supports ITLs to improve classroom technology integration. A literature review for the relevant topics was provided in Chapter 2, and the methods that used for the proposed study are detailed in this chapter. The results of the data analysis for each site are presented in the following chapter.
CHAPTER 4

CASE FINDINGS

In this multi-case study, I examined the nature of support provided by a school principal for informal teacher leaders (ITLs) who help strengthen classroom technology integration. This chapter provides a detailed description of each of the three locations where data were collected. Included in the site-by-site descriptions are the quantitative results that were used to identify the ITL(s) at each school. The purpose of this chapter is to answer the first research question and provide qualitative details about each study site and those who participated through interviews, focus groups, and observations.

Data for the study were collected in three phases within each site (see Figure 4.1). In addition to the three phases of data collection, field notes and a researcher journal were maintained to collect data throughout each phase. Like the school and principal names introduced in Chapter 3, all ITL names are likewise pseudonyms, but each name is connected to the ITL’s school. For example, all ITLs working at Armstrong High have a name that begins with the letter A.

![Figure 4.1 Three phases of data collection](image)

Each case description in this chapter has unique sections that provide details about the school, but all three cases have a section describing the school’s digital environment. In the school’s digital environment section, I provide an overview of the
digital tools that are used as well as an overview of the school culture regarding technology. The digital environment of each school is described to give specific examples of how technology is integrated by teachers and students for learning and teaching, which helps provide a context for how teachers utilize each other for support of education technology. Following the digital environment overview of each site is a section dedicated towards describing the school principal at that site.

Quantitative Measures

After the section describing the school’s principal, the quantitative results of the ITL Identification Survey of that school are provided, along with detailed accounts of each ITL from that case. The quantitative data are presented using multiple elements: in-degree, normalized in-degree, teachers ranked by in-degree, and a social network analysis graphic. The following sections describe each of these quantitative elements used in the study.

In-degree and Normalized In-degree

The in-degree value is the number of teachers in the school that reported seeking advice about technological pedagogical knowledge from that specific ITL. For example, Addison had an in-degree of 11, which means that 11 of the teachers at Armstrong High who completed the ITL Identification Survey listed Addison as someone from whom they seek advice. While it did not directly affect the ITL identification process, the normalized in-degree takes the in-degree and divides that number by the total number of survey-responses at that school. It is important to note that the normalized in-degree is reliant on the number of teachers who responded to the survey and not the actual number of teachers in the building. The normalized in-degree measurement is often used to compare
in-degree measurements across schools and is measured as a percentage. For example, if every teacher in a school listed one person as a source of guidance, then that teacher would have a normalized in-degree of 100%. The in-degree values can vary widely, especially within this study, due to large differences in the number of teachers in a school. The normalized in-degree is a measure that attempts to normalize the in-degree measurement to support comparison of in-degree values between schools. The normalized in-degree was not used in this study to help identify ITLs but is provided so that in-degrees for ITLs can be compared across the three schools. Within an individual school, the in-degree was used to rank teachers and identify the ITLs.

The number of ITLs identified at each site was determined by taking the top 10% of the teachers when ranked by in-degree. Using the top 10% of in-degrees, I identified two ITLs from Armstrong High, one ITL from Bressman High, and three ITLs from Carter Middle. By plugging in the in-degree values for each teacher into UCINET, a graphic is produced that shows the social network mapped out.

**Social Network Analysis Graphics**

The SNA graphic for each site is included in the Appendix. The graphic represents all teachers that were identified as a source of advice for education technology knowledge, all teachers who completed the survey, and how the flow of information of education technology is situated. Each square in the graphic (also called a node) represents one of the classroom teachers in that school. The arrows in the graphic depict the direction of seeking advice. For example, if a square has six arrows pointing into it, that means that six different teachers identified that teacher as a source of knowledge of education technology and someone they would go to for assistance. The teachers who
listed that teacher as a source of education technology knowledge are represented by the squares from which those pointing arrows are coming. The more arrows that are pointing to a square, the more influence that teacher has as a source of education technology knowledge. Teachers at some sites were identified by others as sources of education technology advice, but they did not complete the survey or responded by selecting that they would not seek advice on pedagogical technology from anyone on that list. Those individuals have arrows going to them but no arrows pointing away from them. Only two SNA graphics appear in the study results.

I made an error when designing the ITL Identification Survey for Armstrong High. Specifically, the survey did not track which teachers identified other teachers for advice on education technology. While this error did not impact the in-degree rankings for teachers or the ITL identification process, it did result in a lack of data necessary to create a SNA graphic. As a result, the in-degree rankings are correct, but a SNA graphic was not possible to construct. The next sections provide details on each site as well as the quantitative data that was used to identify the ITL(s) at each school.

**Armstrong High**

Roughly 700 students in grades 9-12 from rural and suburban areas in central Kentucky attend Armstrong High. Approximately 30 teachers were working at the school during the time I collected data for this study. I spent 75 minutes at Armstrong High on a day that a special schedule was in effect. While the freshman, sophomores, and juniors were taking standardized assessments, the seniors were attending small workshops with individual faculty members. Principal Adrian and one of the ITLs, Abigail, were leading different workshops for seniors. Each workshop was focused on a different topic that
high school seniors would need moving forward with their lives and careers. Seniors rotated in groups of 15-20 through the topics during 45-minute segments. One of the more unique aspects of Armstrong High was the school building itself.

Building and Culture

The Armstrong High building is less than a decade old, making it one of the newer in Kentucky. The front office and main hallway were exceptionally open and filled with natural light from the large windows that comprised many of the exterior walls. Between the natural light and the open, clean hallways, walking into Armstrong High was pleasant and inviting. The positive feeling was also felt in the front office.

The front office was the first place I was directed to after walking in the front doors. Not only was the office clean, spacious, and filled with newer furniture, but the sign-in process for visitors was completed on a computer. This was the only school in this study, and the first I had ever experienced as an educator, that uses a Google Form to sign-in visitors. After answering questions about myself and my visit purpose, the last question on the Google Form asked me to type in “something you are grateful for.” Because I had never been asked a personal question like this when signing-in for a school visit, it was a pleasant surprise and helped reinforce the friendly culture at Armstrong High. Instead of the typical visitor pass on a sticker that I have seen at many schools, the Armstrong High secretary handed me a lanyard as a visitor pass. This seemingly trivial procedure of using a lanyard as a visitor pass added to the professional and positive culture that I felt as a visitor. Another unique attribute was the first thing a visitor sees after leaving the front office for the rest of the school building: a cow.
The statue was almost the size of a real cow but colored purple and white, which intrigued me. The cow gave the impression that this school challenged conventional approaches, aspired to be engaging, and worked to stay that way. Based on the interviews and observations I conducted there, the purple cow symbolized the culture of innovation and progressive instruction that Principal Adrian worked with teachers to embrace. Principal Adrian explained to me that the cow is a reference to Seth Godin’s (2003) book *Purple Cow*. Godin uses the purple cow as an example of how companies need to develop innovative techniques to be successful in today’s economy.

Armstrong High was also unique in terms of the furniture in the classrooms. The classroom I visited had modern desks and chairs that still seemed relatively new. The chairs were light, simple, and small, which complimented the versatile desks, which were individually-sized but built in such a way that they could be connected to each other for group work. The desks were light and could be restructured to adapt for other setups in the room. In this classroom, the ceiling was low at the front of the room, and then gradually sloped at a consistent rate to the back of the class. While this ceiling design had no impact on the instructional nature of the classroom, it strengthened the school’s theme of uniqueness.

**Language of Armstrong High: Teachers as Leaders**

One of the common threads across the individual interviews, the focus group, and my physical visit to Armstrong High was how teachers are referred to as *leaders*. The ITLs explained that this was an expectation from Principal Adrian. He explained that he does not support the concept of a *formal teacher leader* because he enforces the belief
that all teachers at his school are leaders. Chapter 5 presents more about Principal Adrian’s perceptions about teachers as leaders.

Digital Environment

One of the most evident examples of the digital environment of Armstrong High was the common culture and language surrounding technology use in the classroom. The ITL that I observed was leading a workshop with many students she had not had in her own classroom prior to this workshop. The group was a random assortment of seniors with no specific connection to her as a teacher. However, observing her lead a workshop with students that had not been in her class made it easy to see the cultural expectations with regards to technology. All students in that classroom were using Google Slides on their Chromebooks during my observation. Not once during the course of the workshop did any student ask a question regarding how to manipulate the Google Slide or how to navigate the Google-based browser Google Chrome. Additionally, the ITL used the phrase “lids down” to indicate that students need to lower their Chromebook screens and make eye-contact with the teacher. When the ITL told students to have lids down, students instantly complied with this instruction. It was clear that Google tools and the language surrounding the Chromebooks were understood. The school’s expectations for the G-Suite tools and software was not limited to student expectations.

Google Hangouts was used as the platform for conducting the video interviews with all of the study participants working at Armstrong High. A primary example of the digital culture of the school is what happened when we began the Google Hangout and there was video but no audio. When we started the interview, we could see each other through Google Hangouts, but we could not hear each other. When the interview started
and there was no audio, none of the participants seemed worried or upset; instead, they worked with me to go through the troubleshooting steps to fix the audio.

The digital culture of the school was also evident through the digital resources that were mentioned during interviews. The ITLs and Principal Adrian mentioned many digital resources during interviews such as Flipgrid, Google Docs, Google Slides, Google Classroom, Google Forms (including Flubaroo), SMART technologies, Twitter, Snapchat, Edpuzzle, and Canva. It was clear from the interviews that the Armstrong High community had expectations for using technology effectively for student learning, teacher engagement and development, and school work-flow.

During the interview with the principal, he described how he used Google Slides to establish a system of teacher leadership. He voluntarily shared his screen over the Google Hangout during the interview to show how all teachers at Armstrong High referenced and edited a Google Slide presentation that was designed to let them work together and learn from each other. Principal Adrian had begun this system a few years prior and explained that every teacher must use this Google Slide presentation for their own personal growth. It was a clear expectation that the G-Suite tools (which are defined in Chapter 1) were important for teachers at Armstrong High.

During her interview, one of the ITLs described her passion for the G-Suite tools, claiming that she did not know much about the G-Suite tools before coming to Armstrong High. However, she quickly learned the importance and while I interviewed her, she often mentioned the importance of Google Docs in her role as a teacher: “I very easily could have ended up becoming a pencil and paper English teacher, which, oh God, is like a horror for me. A nightmare.” When I observed her classroom, she said to the students
that she is “borderline religious about Google Drive.” The digital environment of the school, especially the use of the G-Suite tools, was impacted by Principal Adrian and evidenced by another story one of the ITLs described.

During her first year working at the school, this ITL had left her room with the Chromebook cart unlocked while she was in another part of the building. Later that day, Principal Adrian discussed this situation with her to ensure she did not do this again. He also remarked that he considered stealing one of the Chromebooks to emphasize the issues resulting when leaving the cart unlocked inside an unlocked classroom.

**Principal Adrian**

As mentioned in Chapter 3, a few years before conducting this study I met Principal Adrian at an educational technology conference in Kentucky but had not interacted with him regularly since the conference. When it came time to select sites for the study, I asked Principal Adrian and he agreed to assist with the study. When I arrived at the classroom where I conducted an observation, Principal Adrian was standing near a different classroom door holding a toy lightsaber, a weapon from a well-known series of science-fiction movies. I only saw Principal Adrian during the transitions for the seniors between their workshops during that day, but he was positive, encouraging, and displayed a good rapport with the students. He addressed students by their first names and personally interacted with many students during the transitions between sessions. Principal Adrian contributed to the school’s fun culture by how he introduced me to the students in the room with the ITL I was observing.

When he came by the room before the workshop started, Principal Adrian walked up to the open classroom door and asked all of the students if they recognized me. The
students turned to me, then back to him. He feigned surprise and then challenged the students to see if they could figure out who I am. He claimed I was a local celebrity and that the students should recognize me. Principal Adrian said all of these things with a serious demeanor and straight face before heading back to the classroom where he led a workshop. The students were fascinated and turned to their digital resources to figure out who I was during the moments before the session began. While none of the students figured out who I was, it was unclear if any of them doubted that I was a local celebrity.

During my interview and interactions with Principal Adrian, he was straightforward and displayed a deep understanding of teacher leadership and technology.

During the interview, Principal Adrian described the system of teacher leadership he established throughout the school. Through a screen-share on Google Hangouts, he led me through a Google Slide document that was designed to let teachers observe each other, learn from each other, and reflect on their instructional practice. The document was impressive and showed the digital expectations that he had in place for Armstrong High. He also exhibited his tech-savvy during the interview through how quickly and seamlessly he maneuvered through the Google-Suite tools and the screen-sharing. Principal Adrian asserted that he wanted his teachers to be fluent in using the digital tools that he modeled for me.

Throughout my interview with Principal Adrian, it was evident that he had established cultural expectations for teachers to use technology effectively. All teachers were expected to utilize the Google Chromebooks and the G-Suite tools available to them, an expectation affirmed by the ITLs during their interviews. Both ITLs discussed the cultural expectations that the principal had established, such as how he was direct and
consistent in establishing expectations for teachers to use the G-Suite tools. A specific example of this expectation was his requirement for teachers to edit the teacher leadership Google Slide document. The document contained information about the required expectation of all teachers at the school and helped reinforce the digital cultural expectations that Principal Adrian established.

**Armstrong High ITLs**

The response rate for the ITL Identification Survey was 77.77%. Among the teachers in the school, two ITLs were invited to participate in the study. Table 4.1 provides the ITL Identification Survey results from Armstrong High. Addison and Abigail’s names are listed, but the other teachers are listed as the letter A followed by a number.

Table 4.1

**Armstrong High Social Network Analysis Results**

<table>
<thead>
<tr>
<th>ITL Name</th>
<th>ITL In-degree</th>
<th>ITL Normalized In-degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addison</td>
<td>11</td>
<td>40.7%</td>
</tr>
<tr>
<td>Abigail</td>
<td>8</td>
<td>29.6%</td>
</tr>
</tbody>
</table>

Between the time the ITL Identification Survey was administered and the time the qualitative data were collected, one of the identified ITLs, Addison, moved into an administrative role in a different school. Although she still participated in the individual interview and focus-group interview, she was not observed for this study. As stated above, there is no SNA graphic for Armstrong High due to a researcher error. I now focus on the ITLs from Armstrong High that participated in the study.
**Abigail.** Abigail was the first ITL that I observed. At the time she completed the survey, Abigail was in her fourth year as an English teacher at Armstrong High. Prior to that, she served as a substitute teacher for two years. She was energetic, funny, and happy to help with the research project. Abigail told me that when she took the ITL Identification Survey with the rest of the faculty members, she hoped to be selected based on how much time she had spent helping other teachers with education technology at the school. Specifically, she hoped to have that level of validation from her peers through the survey results. I observed Abigail during the special school schedule while she was working with seniors to improve their resumes. Even though she was leading a session with senior students, I observed multiple occasions of Abigail facilitating informal teacher leadership with education technology in her school.

For example, twice during the session, teachers stopped by the room to ask Abigail about sharing a Google Doc and a Google Slide. Even though she was working with students, she quickly answered her peers’ questions. It was clear from my observations and her interview that Abigail was used to these drop-by questions from her colleagues and that her passion was not limited to working with teachers on digital teaching tools.

Abigail was outwardly passionate about her school. She expressed how proud she was to be at Armstrong High and how much she appreciated the support and leadership of her principal. Abigail was energetic, straightforward, and passionate about having a job at Armstrong High and repeatedly said that she was fortunate to be there. Her passion for teacher leadership in her school was evidenced through her shared energy with the other ITL identified in Armstrong High.
Addison. Addison was in her 18th year as an educator and had spent 12 years as a middle school mathematics and science teacher before moving to Armstrong High. Between the time that the ITL Identification Survey was administered and the time of my visit, Addison had moved into an administrative role in a different school. However, her responses to the interview questions were limited to her experience while working at Armstrong High and with the principal. Addison had a unique role at Armstrong High because she taught classes and also served as the media specialist for the school. As the media specialist, she focused on helping fix and maintain the technological hardware that teachers and students used for learning, but she was not formally in charge of leading other teachers or helping facilitate education technology at Armstrong High. Because her role as media specialist was not a formal teacher-leadership role, she remained eligible to be identified as an ITL in this study. During the focus group, Addison expressed her hopes of being selected as an ITL by her peers while the staff was taking the survey.

Addison viewed her media specialist role as an informal role of education technology leadership. Although her role did not include educational technology teacher leadership, Addison believed that it was informally her job to work with teachers to improve their usage of digital tools. After I clarified that her job was not focused specifically on education-technology leadership, Addison responded “I just felt like it was my job somehow.” As I talked with Addison, her enthusiasm about learning and sharing her knowledge of technology was clearly evident.

When she began working at Armstrong High, Addison had not been utilizing the G-Suite tools for teaching, but she quickly worked to become a source of knowledge on how to utilize the G-Suite tools for student learning. Addison was also acutely aware of
how her principal’s vision for education technology had played a role in the digital environment at Armstrong High.

Addison described how her principal not only modeled the effective use of technology for teaching but also asked for her guidance in choosing digital resources. She noted how he “would often come by and ask for my input on certain resources.” Addison claimed that Principal Adrian had also been a model for her as she moved into a school-leadership position. Addison described how she had incorporated some of the things that Principal Adrian modeled her new role as a school administrator. Specifically, she attributed the way she encourages “out-of-the-box thinking” and “risk-taking” with her own staff. Additionally, she now refers to all of the educators in her building as “lead-learners,” which reflects the way Principal Adrian labels every teacher in Armstrong High as a leader. Although she was no longer working in Armstrong High, she maintains a professional relationship and collegiality with Abigail.

During the focus group, Addison and Abigail were physically together on the other side of the Google Hangout. They referred to each other with nicknames and were comfortably informal with each other. They spoke professionally and reflectively about Armstrong High and showed a sincere appreciation for the school culture and the leadership created by the principal. The focus group with Addison and Abigail was informative and enjoyable due to the informal and energetic atmosphere that the two ITLs provided. The shared energy between them helped reinforce my perception the positive culture I felt while visiting Armstrong High and engaging with the study participants there.
Among the three schools selected as study sites, Bressman High was the smallest and located in a district where I knew the superintendent; he had been the principal at a school where I formerly worked. I contacted him about recommendations for secondary schools where principals supported technology integration. He suggested that I contact the principal at Bressman High, who quickly agreed to participate.

The campus, which was somewhat difficult to find, is nestled in a large urban neighborhood in central Kentucky. I momentarily doubted the directions from my iPhone because it indicated that I was nearly at the school’s location, yet I still did not see the building anywhere. Later, I realized that the school’s small staff size contributed significantly to its culture in many ways.

Although Bressman High had a faculty of less than 20 teachers when I conducted my site visit, I soon realized that the small staff size was crucial to some of the school norms because it allowed the principal to adopt a culture that was flexible with time and policies. From talking with the principal and the ITL, it became evident there was an understanding that schedules are meant to be molded and shaped to reinforce student learning and develop teacher effectiveness. The flexible nature of the school was especially visible on the day that I came to observe the ITL.

I happened to visit on a day that was designated as a half-day for students. This meant that students were in class during the morning, ate lunch in the school’s cafeteria, and then went home; the teachers worked together during the afternoon. They met as a faculty before breaking into smaller groups to develop ideas to address a specific schoolwide problem regarding how students take digital assessments (details on the
meeting are provided in Chapter 5). The half-day schedule was a tool that Principal Bain implemented to provide worktime for teachers collaborating during the school week. Through data gathered during the interviews I conducted at Bressman High, it was clear that utilizing a flexible schedule was important to the culture of the school. Principal Bain was able to alter schedules relatively easily and create opportunities to gather teacher-input quickly through these meetings. I perceive this modified school calendar produced an energetic and unique school culture.

Although most of the building was very old, a sense of pride and energy emerged from the staff and students that I observed. After walking up the worn-down stairs leading to the front office and signing the visitor log, the friendly secretary informed me I did not need to wear a visitor pass. Standing in the small front office, I saw the Bressman High principal in his office on the phone. Even from my first moments in the building, Principal Bain modeled transparent leadership and an open environment. The building was older than many other school buildings in which I have worked or visited, but there were some renovations around the building that added to the energetic culture of the school. The back half of the school that had been entirely renovated was very open, allowing lots of natural light to fill the space. The renovated area was where the cafeteria was located, which provided for one of the important attributes of the school. Principal Bain implemented a special measure to reinforce faculty collaboration: staff lunches.

Principal Bain expected faculty members to eat lunch together in the school cafeteria as a means to support collaboration and facilitate informal leadership. I observed this aspect of the Bressman High culture on the school day that I visited. The teachers ate together at long tables in the cafeteria with the students eating together at
The teachers interacted with the students in professional and friendly ways, which further displayed the high-level energy at the school. While watching many students interacting with teachers during the lunch period, I observed evidence of a school culture that was positive and encouraging. Based on interview data gathered at Bressman High, faculty members eating lunch together provided even more opportunities for informal teacher leadership. Spending more time together with teachers from around the school to discuss instruction was powerful, and it may have helped establish who the ITLs were. Further, the digital environment at Bressman High was integral to the culture and the conversation at the faculty meeting the afternoon I visited.

**Digital Environment of Bressman High**

Bressman High had a crucial digital element that was evident through all of the interviews and observations conducted with Bressman High participants. Bressman High was in its second year of implementing a personalized learning platform called Summit Learning (Jacobs, 2017). In addition to focusing on student learning through personalized projects, Summit Learning provides online software for teachers to track student data and embeds content assessments that can be administered to individual students. The Summit Learning platform is entirely digital, which reinforced the importance of facilitating education technology leadership among the Bressman High teachers. The Summit Learning tools helped establish common terms and language that the principal and teachers use in the context of their communication and instruction.

During the faculty meeting I observed, Principal Bain presented some issues that had developed regarding how students took assessments in the Summit Learning platform. It was clear that every member of the school’s relatively small staff understood
the issues through their constructive feedback provided during a discussion about how to solve a problem. During the discussion of possible actions to take, all teachers had a laptop in front of them and were engaged in the discussion with questions and suggestions. Although the Summit Learning digital infrastructure was integral to the digital environment of Bressman High, my interactions with the study participants provided other examples of how technology is important to Bressman High.

The use of G-Suite tools was evident for a couple of reasons, beginning with how both the Bressman High principal and ITL were fluid with using Google Hangouts for the digital video interview. During the observed faculty meeting, there were multiple times that G-Suite tools such as Google Docs and Google Slides were referenced or being used by teachers. The expectations surrounding the G-Suite tools were clear in how the principal mentioned the tools like Google Docs and received no questions or issues with sending out links to Google Doc documents or Google Forms. Bressman High also had a formal teacher leader for education technology that supported teacher learning.

The formal teacher leader for education technology was a former mathematics teacher at Bressman High. During the faculty meeting, she presented a short demonstration on submitting technology work orders and then facilitated a discussion about fixing Chromebooks that students had checked out to take home. The ITL identified at Bressman High described this formal teacher leader as helping teachers with “very techie questions” such as hardware problems or “programming issues,” rather than education-technology issues. Although this formal teacher leader was competent with both types of questions from teachers, she was not eligible to be identified as an ITL because of her formal position at the school.
Principal Bain

Principal Bain was the only school principal in this study who I had not met prior to initiating the data collection, and thus, the video interview that I conducted with him was my first time directly speaking with him. Principal Bain evidenced a highly-energetic and informal attitude at the beginning of our conversation. Right away, he noticed my tie and jokingly claimed he only wears ties for funerals. I immediately felt comfortable speaking with Principal Bain, and it was evident that he was brought to the school to provide positive energy and create a risk-taking culture. The ITL at Bressman High had described how the principal nurtured, activated, and relied on teacher leadership, which I confirmed during the principal’s interview. He not only spoke highly of the teachers at his school, but also how he made time for talking with each teacher and getting to know them on a personal level. This was especially the case for the school’s ITL, Blake, who had been teaching at Bressman High since before Principal Bain started there.

When Principal Bain was hired, there was a relatively high teacher-turnover rate. Under his leadership, the teacher-turnover rate had greatly diminished. For example, between the school year that I gave the ITL Identification survey and the year I collected interview data, only one teacher left Bressman High. Part of this change in teacher-turnover rate was how the principal had built personal relationships with individual teachers and specifically looked for how every teacher could help lead within the school. Soon after starting, Principal Bain saw how the ITL was already implementing elements of flipped learning into his classroom and how he was ready to help rollout the digital personalized learning platform to his colleagues. Principal Bain began specifically working with the Bressman High ITL to help strengthen the use of education technology
across the school. After I observed the Bressman High ITL during the classroom and talking with colleagues at lunch, I saw the after-school faculty meeting.

During the after-school meeting with faculty members, Principal Bain summarized an issue that teachers had brought up to him regarding student assessments in the Summit Learning program. Instead of outlining a plan to address the issue, he expected the teachers to work together and provide a plan to address the issues. In the follow-up interview with the Bressman High ITL, he clarified that the faculty had done exactly as he said once I left the meeting. The faculty members presented an idea to the principal that were put into action. Relying on teachers to provide school-wide solutions was a part of the organizational culture that Principal Bain had established.

It was evident from my visit and the interviews that Principal Bain not only sought input from teachers but relied on teacher-led solutions. The principal framed his role as a facilitator of teacher leadership in the school and worked to have teachers lead the work of student learning. Principal Bain’s energy and passion for students as well as teachers was clear from my first interactions with him and how friendly he was with students during my visit. Now that an overview of Bressman High has been provided along with the digital environment of Bressman High, the quantitative findings from Bressman High are given, along with a description of the ITLs identified form Bressman High.

**Bressman High ITL**

The response rate for the ITL Identification Survey at Bressman High was 71.42%. While two teachers tied for the top rankings of the in-degree scores, one was unable to participate in the survey, so the other teacher was the only ITL identified at
Bressman High. Table 4.2 shows the overall survey results for Bressman High. The results are also listed by the in-degree ranking by teacher at Bressman High in Appendix N, which shows that Blake had the same in-degree measurement as B12. The SNA graphic for Bressman High is provided in Appendix L. In the next section, I provide an overview of the ITL from Bressman High: Blake.

Table 4.2

Bressman High Social Network Analysis Results

<table>
<thead>
<tr>
<th>Average In-degree</th>
<th>Average Normalized In-degree</th>
<th>ITL Name</th>
<th>ITL In-degree</th>
<th>ITL Normalized In-degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.9</td>
<td>17.3%</td>
<td>Blake</td>
<td>4</td>
<td>36.3%</td>
</tr>
</tbody>
</table>

**Blake.** Blake was quick to respond to my interview invite. He was eager and happy to help with the data collection. Blake was in his eighth year teaching social studies, all of which had been at Bressman High. Throughout the data collection process, Blake was energetic and positive. He showed a passion for his students and the projects they were working on. While I was observing, Blake was working with students to make sure that they incorporated their own experiences and passions into their projects. Blake was calm but focused in his interactions with students. Blake’s room was lined with posters of historical figures such as Martin Luther King Jr. and Rosie the Riveter.

Blake was the coordinator of student internships that took place outside of the building. This was a program that he approached Principal Bain about and saw through to fruition. He also helped start a student-led bike shop for the community at the school. While I was visiting, he briefly worked with students on the bike shop during one
instance after school. However, Blake was also a prominent leader instructionally in the building.

Blake’s informal leadership in the school was primarily evidenced by how he worked with teachers to implement the digital Summit Learning platform. Blake was instrumental in working with other teachers to effectively implement the digital platform. During the afternoon session led by Principal Bain, teachers were working to improve how students were being individually assessed on standards in conjunction with their personalized projects. Blake discussed in his interview that some teachers needed more help on using the digital interface on the platform. He said that he was happy to help other teachers on it and the other teachers were positive on the digital platform. Blake’s informal teacher leadership extended outside the building as well.

Blake and Principal Bain left the faculty meeting early to lead a session at a program called the University of Kentucky Next Generation Leadership Academy (UKNextGen). UKNextGen is a program for K12 districts and schools in Kentucky, led by the University of Kentucky College of Education, aimed at promoting innovation and a re-framing of K12 education in Kentucky. Before this session, I was already familiar with the work that UKNextGen was doing in Kentucky, but I took advantage of the opportunity to see Blake perform leadership outside of the building.

I accompanied Blake and Principal Bain to their session at UKNextGen. The session took place at a school in a neighboring county to Bressman High, located in a ballroom set up with many round tables for the participants. Representatives from across Kentucky were at the UKNextGen sessions. The participants included teachers, principals, and other educational leaders from some of the UKNextGen schools around
Kentucky. Principal Bain was one of three Kentucky school principals who were invited to discuss innovations in student-driven learning and project-based learning. During the session, Blake and Principal Bain presented on how they had implemented the Summit Learning program. Blake specifically talked to the attendees about the importance of a supportive administrative team when implementing a personalized learning platform. Blake shared that he had seen colleagues in other schools unsuccessfully attempt to implement personalized learning because of unsupportive administrators. Blake seemed comfortable talking to the large room during his session and Principal Bain looked proud and happy to have him there. Now that the first two cases of this study have been described, I provide an overview of Carter Middle, the ITL Identification Survey results for Carter Middle, and descriptions of the ITLs from Carter Middle.

**Carter Middle**

Located in a suburban area of central Kentucky, Carter Middle caters to roughly 700 students in grades 6-8. Carter Middle was unique to this multi-site case study for two primary reasons. Carter Middle is the only middle school included in this study and it is housed across two different buildings on the same campus.

**Carter Middle Buildings**

While the 6th and 7th grade students were housed in one building, the 8th grade was housed with the high school students (9-12 graders). These buildings were within walking-distance of each other, and it was clear from my time with the faculty members that they shared a common school culture. The 8th grade branch was still under the leadership of Principal Cortes, whose office was in the building with the 6th and 7th grade students and teachers. While having the school split into two buildings was an
interesting aspect of the school, it seemed to have little impact on the instructional culture and school leadership. I visited on a day reserved for all teachers to work together while all students in the district had a day off. All 8th-grade teachers joined the 6th and 7th grade teachers in the middle school building. As an outsider in the faculty-wide meeting, I would not have guessed that some of the teachers worked in a separate building. There was a strong sense of collegiality, shared culture, and pride. Carter Middle more closely resembled the majority of Kentucky schools I have visited in terms of the building, the hallways, and the procedures.

Because I visited on a teacher-only day, the front office was not bustling with students and office-workers. Although I voluntarily signed into the visitor log, there were no receptionists or desk-workers in the front office and I continued directly on my own into the hallway. The hallways were nondescript but were donned with hanging banners of Kentucky colleges and universities. While college banners may be normal in a high school, I had not seen them in a middle school. I visited Carter Middle on a rainy Monday morning, and while it was cloudy and dreary outside, there was plenty of energy in the faculty meeting I observed.

After exiting the front office, I quickly found all of the faculty and administrators in the library. All of the teachers were drawing monsters when I arrived. Principal Cortes, who was in her third year as the school’s principal, had assigned this task. The goal of drawing monsters was for each teacher to take the monster with them throughout the day of work and remember to channel the negative energy toward that monster. Each teacher was instructed to focus on positive student outcomes throughout the day. Principal Cortes established a comfortable, energetic, and risk-taking atmosphere through this activity and
some of the other activities they completed in the whole-staff setting. Principal Cortes’
energy and positive passion made me feel comfortable and relaxed as a visitor.

Principal Cortes had a tremendous amount of positive energy in the faculty
meeting. She excitedly introduced me to the faculty when I arrived. Her positivity and
passion for improving teacher instruction was clear through how she spoke with teachers
and facilitated the meeting. The focus of the day I observed was to work with the teachers
together as a full-group, address some school-wide topics, and then focus on
improvement instruction in departments.

After the faculty-wide portion of the morning, I visited the departments where the
ITLs were working: mathematics and science. During my observations, the teachers were
working in their departments to help develop plans for student differentiation. The
departments that I visited worked well and stayed positive. In addition to the culture of
collaboration, I experienced a culture of using technology effectively at Carter Middle.

**Carter Middle Digital Environment**

Not only was the monster activity that Principal Cortes facilitated posted up on a
Google Slide document, but Google Drive and the G-Suite tools were referred to often
throughout the morning session regarding important documents and tools for
collaboration. Principal Cortes exclaimed “I expect you to go to your Google Drive
today” more than once to the entire faculty. There was also an important district-level
presence of education-technology leadership.

The district had employed a full-time education-technology specialist that would
occasionally visit the school, lead workshops with teachers, and focus on supporting
teachers with education technology. All of the ITLs described how helpful this person
had been for their own education-technology growth. The ITLs accredited this individual with being accessible if they had individual questions about digital resources. Principal Cortes also modeled how to deal with technology obstacles.

During the course of the morning session, a website that Principal Cortes wanted to share on the projector was blocked by the school’s firewall. Principal Cortes expertly modeled how to work around unexpected technological issues by moving the faculty members on to an activity while she attempted to fix the problem. During the ITL focus group, the ITLs recognized how Principal Cortes always modeled the effective use of technology, including what to do when technological tools cause problems. Similar to the other sites in this study, the Carter Middle ITLs, with one exception, were comfortable with using Google Hangouts for conducting the video interviews. This was evident through how the teachers were accustomed to the Google Hangout interface and flexible with issues that arose during the Google Hangout.

**Principal Cortes**

I initially met Principal Cortes prior to this study through Twitter. We were both heavily involved in a weekly educator-Twitter chat and met in person at one point to discuss teacher leadership. During that in-person meeting, she said she would be happy for her school to participate as a case in this study. I quickly realized from our discussions that she was especially passionate about education technology and teacher leadership.

Principal Cortes led her faculty with a clear vision of student learning and teacher support. After being in the library for only a few minutes, it was clear from what she said that she had the needs of teachers as the top priority to increase student learning. She
described a school-improvement plan that rested on innovations and changes in learning. She often told teachers to take risks and try new things as they went forward with the school year. I visited Carter Middle at an interesting time in the school year because Kentucky school-testing results had just been released. In response to the scores, the district superintendent created a personalized video for the faculty members. The video specifically discussed test scores and goals moving forward for the school. However, Principal Cortes had an interesting response to the superintendent’s message.

While the superintendent was responding to standardized-test scores, Principal Cortes did not design the faculty development session to directly improving scores on these assessments. She focused the faculty on risk-taking, innovation in each classroom, and developing a deeper understanding of creating and measuring student success. It was evident that the teachers were asked to work for a higher-level learning than what the standardized assessments show. The risk-taking culture that Principal Cortes established was highly evident from the time I spent in the school and talking with the ITLs. I provide the results of the ITL Identification Survey in the next section, followed by descriptions of the three Carter Middle ITLs that participated in the study.

**Carter Middle ITLs**

The response rate for the Carter Middle ITL Identification Survey was 67.86% and three ITLs were identified based on the results: Crawford, Claire, and Carly. While Crawford had the highest ranking in-degree, there was a three-way tie for the second-highest rank. I invited all three of these second-highest ranking teachers to participate in the study, but one decided not to participate. As a result, only three total ITLs participated in the study. The results of the SNA are shown in Table 4.3. The SNA graphic for Carter
Middle is in Appendix M. Note that C31’s placement is shown in the SNA graphic and in-degree ranking, as this former teacher had the same in-degree as some of the ITLs but chose not to participate. The arrows pointing to each ITL represent how many teachers looked to that ITL for advice and leadership on education technology. In the following sections, I provide a description of the ITLs from Schools C.

Table 4.3

_Carter Middle Social Network Analysis Results_

<table>
<thead>
<tr>
<th>Average In-degree</th>
<th>Average Normalized In-degree</th>
<th>ITL Name</th>
<th>ITL In-degree</th>
<th>ITL Normalized In-degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>11.3%</td>
<td>Crawford</td>
<td>6</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Claire</td>
<td>4</td>
<td>22.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carly</td>
<td>4</td>
<td>22.2%</td>
</tr>
</tbody>
</table>

**Claire.** Claire was the first ITL I interviewed in this study. Of all the ITLs who participated in this study, Claire had the most year of experience. After 12 cumulative years of working in other schools, Claire was in her 13th year at Carter Middle. Throughout her career, Claire had also been an administrator in previous schools. At Carter Middle, Claire worked as a special education teacher in the mathematics department. Her quick response and enthusiasm to participate in the study was comforting and reflected her deep passion and leadership as a teacher. Between the different interviews and observations, I noticed Claire’s candid and fearless attitude. She liked to jump into trying new things and focus on the excitement of new approaches. She described her teacher leadership to be focused on her refusal to be afraid of digital resources.
Claire claimed that, although it did not surprise her, she did not feel that she was an informal leader of education technology in Carter Middle. She felt that she was identified as an ITL of education technology because many teachers were afraid of failing and trying out digital activities and resources. Her attitude to try new things was not limited to education technology, but this was her approach in everything that she thought would lead to improved student learning. Her enthusiastic attitude was evident through all of my interactions with her, both digital and face-to-face. Claire also found pleasure in participating in teacher conferences around Kentucky.

Claire had recently been to some workshops on revamping the science standards for Kentucky. She had also attended conferences focused on improving instruction for middle school mathematics. She enjoyed going to these conferences and improving her own instruction and working with teachers around Kentucky. Claire especially enjoyed bringing those skills back to her colleagues and sharing what she had learned. Not only was this important to Claire, but all of the Carter Middle ITLs specified that their principal cared deeply about bringing back and sharing ideas from conferences. Due to her energy and risk-taking attitude, it was evident why many teachers looked to Claire for guidance with education technology.

**Crawford.** Crawford was a science teacher in his fourth year at Carter Middle. Crawford responded to my interview invitation quickly and was remarkably flexible in scheduling a time to meet. His flexibility was evident throughout our interactions and he came across as a relaxed individual who did not let the small things get to him. This was overly apparent by how he dealt with an issue that arose during the interview.
After 20 minutes of our video interview using Google Hangouts, the internet service on my end disconnected and shut off. I quickly reached out to Crawford via email and asked if we could continue the interview the next day. He willingly obliged and expressed that he understood my frustration. It was clear that he was used to these types of digital incidents and could relate to what I was experiencing. The next day, I relocated to finish the interview without any connectivity problems. Crawford’s calm attitude was also clear in the observation and focus group interview.

When I observed him, surrounded by his peers in a professional learning community (PLC), Crawford was once again calm and pleasant in his interactions with coworkers. Crawford appeared quieter than his colleagues, but he was focused, positive, and creative in his discussions. It was easy to see why other teachers would look to him for guidance in teaching and education technology in general.

Crawford often presented at school-level, district-level, and statewide conferences or professional developments on education-technology topics. However, Crawford explained that one of the reasons for leading these sessions was what he got in return from attendees. He said that after presenting ways that he had incorporated technology into his classroom, teachers would then take those ideas and tweak them. These teachers would then tell Crawford how they had changed his initial plans and he was able to use these updated approaches. Crawford said that he loved this iterative process and he planned to continue presenting sessions and gaining more ideas from teachers.

Carly. Carly was the last ITL who I interviewed for Carter Middle. Carly had been teaching for 19 years, with nine of those at Carter Middle. Just like Crawford, Carly was a science teacher. Carly was interviewed over the phone. I was immediately
impressed by the way Carly scheduled the interview to take place before she was teaching a class. Of all of the ITLs in my study, Carly was possibly the most outwardly social. In her emails and during our interview, Carly was friendly, energetic, and clearly passionate about education technology. Similar to the other ITLs at Carter Middle, Carly participated in a state-wide network that she was passionate about: the Kentucky Society for Technology in Education (KYSTE).

Carly credited her informal teacher leadership with education technology to her role in attending the state-wide KYSTE conference each year. She did not attend as a presenter, but rather as an attendee on her own time. Carly had attended the state-wide KYSTE conference a few years in a row on a Saturday each year so that she was still in the classroom during the school week. Because she was only able to attend one day of the conference, she certainly missed some sessions, but her interest in the KYSTE network was unmistakable.

Carly said that part of her passion for KYSTE came from connecting to teachers from around Kentucky. She felt an amazing energy from the conference and not only did it refuel her passion for education technology, but it gave her a lot of people that she knew to reach out to regarding the use of digital tools. Carly claimed that she “gravitates towards the same couple of people each year” at the KYSTE conferences she had attended. She listed some specific individuals by name that she always seeks out if they are presenting. Carly also said that “seeing those people” at the KYSTE conference was just as important as the actual topics and devices on display at the conference. I witnessed Carly’s teacher leadership in my visit to her PLC as well.
Of the five teachers in her department meeting, Carly was the most outwardly engaged. She was highly attentive, provided plenty of input, and was utilizing the G-Suite tools effectively for collaboration. It looked like Carly usually took on the role of leader in this group of teachers. Especially with Crawford in the science department with Carly, the group seemed to work well to focus on improving instruction for students.

Summary

In this chapter, I provided the profile for each of the three schools that participated in this multi-site case study. In each section, I provided details on the school in general, the digital environment of the school, the school’s principal, the results of the ITL Identification Survey, and portraits of each of the ITLs from that school. Data for this chapter were collected during all three phases of the study and included data from my personal field notes and observations. The next chapter is where I provide results to the second, third, and fourth research questions for this study.
CHAPTER 5
THEMES

The goal of this multi-site case study was to answer the question, *How do secondary school principals support ITLs to strengthen classroom technology integration?* In Chapter 4, I provided the context for each study site, including details about the ITLs at each of the three participating secondary schools, the demographics of the schools, and the principals. In this chapter, I provide the themes based on the data I collected and analyzed. Specifically, data reported in this chapter emerged from interviews, focus groups, observations, and field notes. The themes are presented according to how they relate to the study’s research questions. The goal of the first research question was to determine who the ITLs were in each school; this was answered in Chapter 4. The second, third, and fourth research questions are addressed in this chapter.

**How ITLs Perceive Support from Principal**

The purpose of the second research question was to determine how ITLs perceive the support provided by their principals. Based on the qualitative data collected at the three schools, I identified two themes: collecting teacher input and modeling education technology. In the following section, I provide specific examples from the data to support these themes.

**Collecting Teacher Input**

Across the research sites, principals relied on teacher input to make leadership decisions. ITLs described how their voices were heard and that their principals made decisions directly based on the input that teachers provided. This teacher input was *not*
limited to ITLs but included all teachers in a school. Principals not only collected teacher input, but also then made decisions based on that feedback.

Addison explained how her principal would ask for her feedback on education-technology tools: “he would share things with me and then I would share things with him that I would like to do. He was always supportive in that way.” Similarly, Blake described how his principal’s door was always physically open for teachers to share concerns and ideas for improving practices in the school.

He definitely makes his job harder as far as he keeps an open-door policy. His door is always open, so you know anytime you go by there are teachers that are in there. Some are blowing-off steam, but a lot of times there is a lot of productive conversations that are going on in there. He is really good as far as he will let you vent, but then also say, “Okay, then what do we do to fix that—I want to hear your suggestions for that.” A lot of times changes that we have are coming from him asking teachers questions, especially if it is a problem that teachers see in the school.

Blake explained that his principal gathered teacher input through simply being available and open to teachers for discussions. While these interactions are more informal, Blake’s principal also gathered ideas from teachers in a more systemic way.

When I observed Blake during a faculty meeting, the principal referenced an issue he heard from faculty members regarding assessments in the Summit Learning platform. Within the Summit Learning platform, students create individualized projects but also complete individual mastery assessments. Many faculty members were struggling with how to facilitate individual assessments through the digital platform that Summit Learning uses. During the semester, teachers brought concerns to Principal Bain regarding how students were assessed in the Summit Learning platform. These assessments were conducted in the library with limited teacher supervision. As a result,
teachers were concerned about the testing environment for the students and the validity of the assessment results.

Blake explained to me that the issue was about how teachers were “handling assessment right now and what students have to do in order to test.” After bringing up the problem and discussing some of the relevant factors relating to the matter, Principal Bain left the faculty meeting so that the teachers could develop a solution. Recalling the situation, Blake said,

We had all of the teachers stay. We just went over with the issues that we are having and suggestions. We basically put together a formal plan and suggested to [Principal Bain] here is what we think we can do.

During my interview with Principal Bain later, he explained how he relies on teacher input: “I would still rather try something new than keep doing the same thing that we have proven does not work. You know to go out and find a new idea.” He admitted not having better ideas than teachers. When it came to many aspects of how the school operates, he expected teachers to develop plans for him to implement at a schoolwide level.

Teachers at Armstrong High contributed ideas to the principal through a Google Slide document. Following observations of their peers, teachers submit their reflections directly to the principal via a Google Slide document. Principal Adrian regularly reviewed this document to facilitate instructional improvement at the school level. He emphasized during the interview that the Google Slide document is updated instantly when teachers record their reflections. At any moment, he can open the Google Slide document and read teacher input.
The ITLs at Carter Middle discussed a systemic way that their principal gathers teacher feedback and ideas. During the Carter Middle focus group, Carly described a procedure the principal implemented recently.

At the end of last year, when we had our teacher-work day, [Principal Cortes] gave us a time to meet individually with an assistant principal and describe what we would like to see. I have never done that before. They have done what I have asked for- they have actually done what I needed them to do.

The other ITLs at Carter Middle agreed this process was helpful for school improvement and strengthened teacher leadership within the school by providing an opportunity for teacher input. This procedure for collecting teacher input gave teachers a formal platform to express their concerns, ideas, and suggestions.

Crawford, the other ILT at Carter Middle, provided a personal example of how the principal gathered teacher input.

The last thing the principal and I collaborated on is called Pocket Points. It is a cell phone app that rewards students for keeping their phones in their pockets. We were trying to make our district a system that is a part of that network, but it fizzled out. [Principal Cortes] is pretty comfortable with coming by my room and asking me what I think about certain situations and brainstorming.

Crawford claimed that his principal relied on him for research and input on tech tools such as cell phone applications. As a result, Principal Cortes was ready to make schoolwide decisions based on what Crawford and other teachers described to her regarding this tool.

The principals at all three schools gathered teacher input in various ways including individual meetings, faculty meetings, and through formal procedures. Through these methods, teachers felt valued, encouraged, and empowered to share their ideas. The next theme that emerged was how each principal modeled education technology in their role as a leader.
Modeling Education Technology

The ITLs at all three schools described how their principals modeled the effective use of education technology. Through observations, I also experienced first-hand examples of each principal displaying a working knowledge of digital tools and how to utilize them in a school setting. For example, Principal Adrian demonstrated his modeling of education technology during the interview.

During the Google Hangout interview, Principal Adrian volunteered to share his screen with me to show some of the ways he facilitates informal teacher leadership. While sharing his screen, he showed the Google Drive documents he set up for the teachers to track professional development, reflect, and observe each other. One of the digital documents he shared was a Google Slide document titled, the “Living LEADER Calendar.” This document helped him connect with teachers and their professional development. Using this G-Suite tool was a schoolwide expectation that he modeled for teachers by interacting with them through the document. He collaborated with teachers by reading and commenting on their reflections, plans, and narratives. Similarly, Principal Bain also exhibited experience with Google Hangouts.

When the Google Hangout interview began with Principal Bain, the audio did not work. Instead of worrying, he worked with me to communicate over the Google Hangout chat feature to establish some trouble-shooting ideas. In this specific example, I restarted the Internet browser I was using, which solved the issue of the missing audio. He had clearly experienced this issue before and knew how to help troubleshoot an issue in Google Hangout.
Additionally, Principal Cortes expertly modeled what to do when digital tools do not operate as expected. During the session she led with her faculty, she attempted to open a web page that was blocked by the school’s firewall. Instead of being upset or losing track of the meeting, she quickly transitioned to an activity for the faculty members to start while she figured out how to address the technological issue. She remained positive during the disruption and worked to fix the problem. Claire credited her principal with effectively modeling failure with education technology, “so you see her try and fail and that is okay. You know she uses this all the time and she is having trouble so, it is a good thing for us.” Claire also mentioned during her individual interview that she felt many teachers were scared to use education-technology tools in their classrooms because things might go wrong. The ITLs at Carter Middle agreed that their principal often had issues with using technology in faculty-wide settings but always modeled how to deal with the problems and kept meetings focused. The ITLs agreed that this style of modeling encouraged teachers to continue building how they use education-technology tools.

The principal at Armstrong High modeled an instructional use of education-technology tools through a schoolwide program that he called morning “Ignite” sessions. The morning Ignite session was a way for a single teacher to “inspire the school” each day using a video. A calendar indicated which teacher presented the Ignite segment for each day. According to Principal Adrian, teachers use iMovie and Flipgrid to share the Ignite videos; Flipgrid is a digital tool and mobile app that can be used to gather quick video-based feedback from individuals. In this case, the Flipgrid assignment was used to gather input from the students and teachers in responding to the video that was posted.
Through the Ignite sessions, Principal Adrian was also modeling how teachers could utilize these digital tools at the classroom level. I provide the themes for the third research question and qualitative data in the following section.

**Leadership Opportunities for ITLs**

The goal of the third research question was to determine what leadership opportunities principals provide for ITLs. Based on the interview and focus group data, I identified two themes to answer the research question: in-school opportunities and out-of-school opportunities. For this section, *in-school opportunities* are defined as opportunities for ITLs to provide instructional leadership for the school’s faculty while *out-of-school opportunities* occur when ITLs are engaging in leadership activities that connect them with groups outside of the building.

**In-School Opportunities**

All ITLs had opportunities for in-school leadership. The opportunities in this section are not schoolwide systems established by principals, which are described later in this chapter. Rather, these opportunities were available to all teachers in the three schools who wanted to take advantage of them.

One of the opportunities for teachers to provide informal leadership at Armstrong High was a “five-minute Friday.” Abigail described how teachers could lead informally through these sessions.

We would be able to teach stuff about different technologies that you can use in the classroom. In the past, on Friday meetings, we could take turns. I think it was myself—a handful of the teachers participated—where [we] got to present on tools we were using in our classrooms.

Abigail said these sessions were important for introducing other teachers to new technological tools without getting “too overwhelmed.” Addison agreed these sessions
were highly beneficial to teachers and provided good exposure to new learning tools. In-school opportunities for teacher leadership with education technology were also evident at Bressman High.

Principal Bain described how he relied on Blake to help lead informally with education-technology tools.

Blake was a leader in his classroom implementing a flipped classroom using a blended environment probably 70% of the time in his classroom. Now he has [become] very good at showing others how to use these tools and helping other teachers convert their classroom to work using the tools that he was really comfortable with.

Principal Bain said that right after he started working at the school, Blake “jumped out pretty quick” as a teacher who embodies teacher leadership. Thus, he supported Blake by providing him multiple opportunities to lead education technology within the building and ultimately serve other faculty members.

Principal Cortes was purposeful about designing teacher-leadership opportunities within Carter Middle. In her interview, she described how she accomplishes that.

When it comes to using a new piece of software or ensuring that everybody knows what the IT updates have done for the gradebook, I put it on some teachers to either carve out some time to work with a team or I could provide coverage for them to work with teams.

These learning opportunities were designated for teachers without formal leadership titles. She also offered in-school informal teacher leadership opportunities for teachers who returned from conferences.

Carly mentioned that after going to conferences, Principal Cortes gave her time to share what she learned during a faculty meeting. “I go to the Kentucky Society of Technology in Education (KYSTE), and I bring back stuff to the faculty.” Principal
Cortes confirmed that teachers sharing what they learned at conferences is an expectation.

When folks come to me and ask to go to a conference or learning experience that requires spending, I am going to question them around how I am going to see that in your culture and the school’s culture when you come back.

Sending teachers to conferences was an important part of how Principal Cortes provided in-school opportunities for informal teacher leadership.

In my interviews with Blake, he described multiple situations when he was asked to lead within Bressman High. One example was how he developed and led the internship program:

I teach social studies, but I am also in charge of our internship program. That is part of our school where all of our seniors go in the field. I am in charge of that program which actually uses quite a bit of technology and that is especially where students are not necessarily in the classroom.

The internship program was something that Principal Bain had helped Blake expand.

With our internship program, that was something I was doing already at a much smaller scale and [Principal Bain] approached me and said, “I really like what you are doing and I think there is something we can go full scale with the seniors. What do you think about that?” [He] gave me the tools to be able to do that and gave me the time to be able to do it.

Bringing this program to a schoolwide level allowed Blake to informally facilitate instructional leadership with more teachers while also providing more learning opportunities for students. The next section is dedicated to the out-of-school opportunities that principals provided for ITLs.

**Out-of-School Opportunities**

Out-of-school opportunities for informal teacher leadership were apparent at all three schools. These opportunities connected teachers with groups and programs outside
of the school faculty, which all three principals encouraged and supported. For example, Principal Adrian explained how he encouraged teachers to participate in EdCamps, which are teacher-led conferences that feature short sessions where they share resources they have been using in their classes. These conferences provide informal teacher leadership opportunities outside of the building. The EdCamp session schedule is developed the day of the event, giving attendees autonomy in designing the schedule, sharing their work at sessions, and collaborating with other like-minded educators. The EdCamps, available primarily for Kentucky teachers, are well attended.

Principal Adrian explained, “We started the first EdCamps in Kentucky three or four years ago. Our teachers present a lot at those.” EdCamps were also discussed during my interview with Abigail.

We actually enjoy the EdCamps or some of the [professional development opportunities] we have had in school, where they are teacher led on different technologies that you can use in the classroom. That is how I learned about a lot of the stuff that I have been using in the classroom.

Abigail explained how Principal Adrian likes to encourage teachers to lead outside of the building in other ways.

We have been encouraged to visit other schools. Say that I found some really cool thing happening in school with technology, and I ask [Principal Adrian] if I could take a day off to go to the school and find out things that they were doing, I feel pretty confident that he would provide a sub for me to go.

Opportunities like these strengthened the sense of teacher leadership by encouraging teachers to get out of the building and experience new techniques in teaching or technology usage.

I witnessed an example of informal teacher leadership with Blake that took place outside of Bressman High. I attended a University of Kentucky Next Generation
Leadership Academy (UKNextGen) break-out session facilitated by Principal Bain and Blake. UKNextGen is a leadership development program designed for districts and school personnel in Kentucky with the vision to “kick off transformative change to learning environments in schools” (University of Kentucky College of Education, 2018, para. 1). Several hundred educators (e.g., district administrators, school principals, teachers, presenters, guests) regularly attend UKNextGen events throughout the year.

Principal Bain was invited to share a 20-minute presentation on “different models and styles of learning” that were being implemented around Kentucky. His presentation included details about the Summit Learning platform used at Bressman High and recommendations gleaned during their journey to implement the program. Next, Blake explained what he experienced as a teacher using Summit Learning and how he and his colleagues were assessing students’ cognitive skills through the program, Principal Bain’s looked proud to have Blake there and pleased that Blake could provide a teacher perspective to a room full of diverse attendees.

At Carter Middle, the ITLs provided a variety of examples about how they embodied teacher leadership outside the school building. An example of these opportunities was a district-wide program in which teachers lead each other. These professional development opportunities were delivered when students were not in school to assure teachers could lead and attend the sessions. Crawford described the leadership opportunity.

They are now teacher-led. It is a sharer-style: if you have an idea for it. That has been awesome and great for what I was saying about looking for these tools actually working in real life in response. You are not trying to impress anybody, people are usually very candid. I have done about five of those sessions.
Crawford shared also that his favorite reason for leading these sessions was getting ideas from the participants about how to change and improve the ideas he was presenting.

I think the best part of the session is the *YouTube* effect where one person has an idea, they share that idea, and then a bunch of people will kind of make small changes or make that idea work for them and by the time it gets back to you the main parts are the same, but it just looks different.

Crawford credited his principal with initially encouraging him and connecting him to these opportunities.

Carly discussed her passion for attending the annual statewide KYSTE conference: “I love it. I even told my principal I would actually pay my own [way] to go. I only go for a day, which is awful, but it is all I can do. I love it.” However, Principal Cortes made it possible for Carly to attend by paying the registration fee and paying for a substitute teacher. Crawford also mentioned that he presented at KYSTE the year prior to my data collection, contributing to his out-of-building teacher leadership. Carly attended KYSTE three straight years and planned to continue attending. Claire, another ITL, also worked outside of the building in a leadership capacity.

Claire said she attended “quite a bit of math” leadership opportunities that were at a statewide level, which focused on developing more effective mathematics instruction at the middle school level. She claimed she was an ideal teacher to bring instructional ideas back from conferences: “I think people see me as non-threatening. You know, I am a non-threatening person that you can come in and I will never say wait, are you serious, you did not know that?” She also described her connection to another leadership opportunity outside of Carter Middle: Elevating and Celebrating Effective Teaching and Teachers (ECET2), a national system of conferences designed to “provide a forum for exceptional teachers to learn from one another and to celebrate the teaching profession”
(Bill and Melinda Gates Foundation, 2016, para. 1). Claire attended one of the sponsored conferences and “enjoyed it” immensely because she not only participated in the conference but also continued to establish network connections with other teachers across Kentucky.

It was evident through interviews and focus groups the principals at every site provided the ITLs with many opportunities. These opportunities took place inside schools and outside. In the next section, I provide themes that help answer the final research question.

**Systems to Strengthen Informal Teacher Leadership**

The goal of the fourth research question was to determine what systems principals establish to strengthen informal teacher leadership. Themes for this research question were determined based on the interview, focus group, and observation data. The following two themes emerged to answer this research question: Treat teachers as leaders and set cultural expectations. In the first theme, I provide examples of how principals conceptualized all classroom teachers as having instructional-leadership positions. In the second theme, I provide examples of how principals established cultural expectations that facilitated informal teacher leadership in the school.

**Treat All Teachers as Leaders**

This theme emerged through hearing numerous examples of how principals in this study treated every teacher like a leader. More specifically, each principal expected leadership from every teacher. The primary example of this theme was found in how Principal Adrian established a culture of teachers-as-leaders. Armstrong High teachers were not called teachers; rather, “we call our teachers leaders” Principal Adrian
explained, an expectation that he established. Regarding calling all teachers leaders, Abigail said that she “felt the building culture was clearly different just because of that.” The expectation of referring to teachers as leaders is even evident on the school’s website. Instead of listing a drop-down tab for teachers, the section is simply titled “Leaders.”

When I asked Principal Adrian if the identified ITLs were important or vital to education technology in the building, he responded, “I think they are as important as anyone.” Principal Adrian gave the impression he expects informal teacher leadership from every teacher, making the ITLs less crucial to the teacher-leadership network within the school. Addison, in her new role as a school administrator, had adopted this cultural expectation as well. She said that teachers in her school were referred to as “teacher leaders” to help strengthen the sense of leadership that every teacher should have.

During his interview with me, Principal Bain made it clear how he relies on his teachers to be leaders in the school.

Now that really is what I am trying to do: Anybody that is worth keeping and that is worth developing is also somebody that should be leading. That is what I am trying to do: find areas for all of our staff, especially [in] a school as small as ours, where you have got everybody wearing multiple hats, you have to do that or else you are going to burn the [ITLs] out because they are wearing every hat.

Principal Bain also expressed that UKNextGen encouraged him to work with teachers to be leaders in their buildings.

I really think that is what UKNextGen did well. It exposes you to not only the ideas that the UKNextGen facilitators are bringing you and you are talking a lot of non-traditional stuff. But you also surround yourself with like-minded people and being able to have that collegial exchange of ideas with your teachers that are open-minded people that are wanting to expand their practices. I think that is as beneficial as anything.
While teachers like Blake had become ITLs at Bressman High, Principal Bain worked to identify areas where each teacher might lead.

Blake described Principal Bain as being “good with identifying the strengths of teachers and seeing what it is that they are doing within the classroom, especially in regard to technology.” When I asked Blake how his principal identifies these strengths, he said, “I think one of the key ways is just by talking to us. He does a really good job just spending time with the staff.” Principal Bain set a goal to get to know every teacher at Bressman High and work with them to fulfill informal instructional leadership in some way, which according to Blake is he is achieving.

Principal Cortes also worked to create a culture where every teacher is a leader. When I asked Claire about what Principal Cortes thinks about teacher leadership, Claire said, “She is definitely a proponent of growing teacher leaders.” Principal Cortes shared in her interview how she moves teachers into leadership roles through watching and listening in meetings.

I attend as many PLC conversations and as many planning conversations and as many team meetings as I possibly can. Not as a consultant, but just to listen and take notes and create a culture where I really try to be an observer that listens in those situations. The teachers still feel safe to just carry on without feeling like they have to do a dog-and-pony show for me. It is through those listening opportunities that I really glean where to start to think “okay, this teacher needs some building up in this area” or “this teacher needs to take on a lead in this area.”

I asked Principal Cortes if she had any policies to drive this work for informal teacher leadership. She responded,

We do not necessarily build strong education teams through having policies in a row. We know from the feeling of responsibility and accountability to the actions that we have. I have told teachers that I believe every action we take with that is a belief and a part of our culture. This is what we believe, and this is how we are going to act on our beliefs.
She described how teacher leadership is an expectation and does not require formal roles. Specifically, she perceives when a teacher moves from being a ITL to a formal role such as instructional leader, it “changes the relationship” with other teachers, something she experienced personally.

I [was assigned] a hybrid role as a coach and teacher. As soon as that label was given to me, immediately the relationships with my colleagues changed. Wow. It was not necessarily negative or bad—it was not a shunning or anything like that. It was a shift in thinking that now . . . I had one foot in the classroom and one foot in their world.

I asked Principal Cortes if she believed in creating more formal teacher-leader roles would be a good idea for her school, and she said that it would not. When turning an ITL into a teacher with a formal leadership role, it changes the nature of the relationship that teacher has with other teachers, and the formal nature of the leadership relationship is not as powerful for leading change in the school. She viewed informal teacher leadership as a crucial part of how teachers work together, rely on each other, and improve their instructional capacities.

The principals in this study viewed all teachers as leaders. The principals facilitated a culture of informal teacher leadership using cultural norms at their schools. These expectations and norms were all informal but clearly had a large impact on each school’s teachers. I provide examples of these expectations in the next section.

Set Cultural Expectations

Each ITL who participated in this study described a set of cultural expectations that was established by their principals. While each school had unique cultural expectations, the expectations were set to reinforce teacher leadership. While these
cultural expectations may not have been based on formal policies, the ITLs attested to their authenticity.

One of the cultural norms that Principal Adrian established to develop informal teacher leadership was the daily Ignite video. The daily Ignite, as mentioned in the previous section, is a video shown to the entire faculty and student body that was designed to get everyone in the school excited and “inspired” for the day. Responsibility for the Ignite sessions rotate daily and are developed by individual teachers. Principal Adrian explained, “Everybody has that opportunity. Basically, your name is on there and if there is no link, no one is going to get an Ignite.” By requiring every teacher to create something for the school, Principal Adrian established a cultural norm of leadership from every teacher. He also established a cultural norm of “Spacewalks.”

Spacewalks was a system that was established by Principal Adrian to allow the teachers at Armstrong High the time and infrastructure to observe each other during a school day. Principal Adrian provided coverage for individual teachers so that they could observe other teachers in the school. Through this mechanism, teachers could informally lead at Armstrong High through modeling exactly what they were doing in the classroom with students. It was explained that teachers conduct Spacewalks “once a month” and then reflect on what they saw during their observations. The reflections are recorded in the “living calendar” that Principal Adrian and other teachers could see. The living calendar is a Google Slide document kept in real-time as teachers update it, and everyone had immediate access to the document. Abigail described Spacewalks as “a good opportunity to collaborate and see what people do.” She then explained how she learned from other teachers through Spacewalks.
In a lot of cases, people are using different structures, and I would never even have thought of. Like a teacher who teaches English with me, she makes her own Google Slides where she makes a whole separate version of her slides that have all the information, but it is more interactive. I would never have thought of using Google Slides in that way. Or some tools that I would be using in a completely different way or that I would never have heard of.

Through the daily Ignite videos and monthly Spacewalks, the principal at Armstrong High established cultural norms that significantly strengthened the sense of informal teacher leadership.

Principal Bain established a system of staff lunches at Bressman High to encourage and develop informal teacher leadership. Blake said that although eating together with the rest of the teachers was not contractually required, it was a cultural expectation at the school. Principal Bain described how the staff lunches have had an impact on his lens as a principal.

We have had more revelations of what people are good at and interested in just eating lunch. That is one of the things that we have got—probably 90% of our staff eats lunch together in the cafeteria with the kids. We have that 30 minutes-a-day of not necessarily education talk, but there is also a lot of education talk, you know, that is going on. It helps them to kind of float things by me in a very safe setting. It is not that formal PLC, it is not during an evaluation, it is not during classroom observation but it is one of those “Hey I was thinking about doing this, what do you think about that?” kind of stuff, which starts to at least open up the pathway in my eyes; starting to look for things that might fit into that, either something they thought would be effective or something they thought would be interesting enough to bring up to me.

Blake said the lunches encouraged teachers to work together: “I think it has helped. I definitely see that teachers are working together a lot more than what they have.” Blake agreed that his own informal teacher leadership was positively affected by eating lunches with other teachers. By informally interacting with his colleagues every day during lunch, Blake could embody informal teacher leadership with the Summit Learning platform and digital-learning tools.
Principal Cortes also implemented cultural norms for informal teacher leadership through how she framed conference opportunities for teachers. She established a cultural expectation of bringing back materials and ideas from conferences. It was understood by the ITLs of Carter Middle that if a teacher attends a conference, he or she is expected to lead a session or apply what was learned at the conference in some capacity with other faculty members at Carter Middle. Carly discussed in her experiences with KYSTE, “the fact that I get to attend KYSTE and then [Principal Cortes] gives me time to share with the faculty.” Principal Cortes discussed the cultural norms for teachers sharing what they get at conferences.

When folks come to me and ask to go to conferences or go to learning experiences that require spending, I am going to question them around how am I going to see that in your culture when you come back. So that it emerges that way where folks know: the conference is not a day off school or a mini vacation, it is a building-up of your pedagogy and I get to hear how you are going to do that.

Crawford and Carly agreed that conference opportunities were meant to be brought back and shared with the rest of the faculty. This cultural norm helped establish a stronger sense of informal teacher leadership, especially with Claire. After attending the KYSTE conference for a few years in a row, Claire had become an ITL of education-technology tools at Carter Middle. After attending each conference, Claire shared the tools and technology tips she had learned at the conference. Without this cultural expectation for teacher leadership, Claire may not have developed into the informal source of knowledge that she was at Carter Middle.

**Pride for Principal**

Another theme emerged from analyses of data gathered at all three study sites that was not linked to research questions but is important with regard to informal teacher
leadership. The identified ITLs expressed their appreciation in being able to work closely with their principals. Each ITL interviewed for this study explicitly expressed a sense of pride in working with his or her principal. Only one of the ITLs expressed pride in working at the school itself, but most ITLs portrayed pride they had in working for the school’s principal. In this theme, I provide examples of how ITLs perceived support for their principals and then found pride in working for their principals.

During the focus group at Armstrong High, both ITLs described how happy they were to work with Principal Adrian. Addison said, “listen, if I could be [Principal Adrian], I would be,” to which Abigail responded, “Hashtag same.” Addison described how she accepted an administrative position in a nearby school and adapted some of the same methods that Principal Adrian used: “We have embraced many [Principal Adrian]-isms and many of the things so that when Abigail walked in here, she said that so much of the stuff looks familiar, because it works!” Abigail seconded that, saying, “it works” and, “it made my heart happy” seeing Addison employ many of the same procedures as Principal Adrian. Addison added that her formal principal “is a really fantastic synthesizer of information—he is just the best.” Similarly, Blake discussed the pride in his principal by comparing his experience before and after Principal Bain assumed the position.

When compared to his previous principal, Blake described a “major cultural shift” that took place when Principal Bain arrived. Blake said there was a shift towards a positive and innovative atmosphere that was evidenced through the decrease in teacher-turnover rate. The turnover rate (i.e., how many teachers leave during or at the end of the school year) had been fairly high at the school until Principal Bain arrived. Blake, who
was in his eighth year at Bressman High at the time of my interviews with him, was the second-most tenured teacher due to a high teacher-turnover rate. However, Blake explained.

Since [Principal Bain] was brought on, we have had a core of teachers that stayed. He has done a really good job empowering other teachers, but he has also created a climate where teachers want to stay here. Last year, Principal Bain’s second year, was the first year that we did not have any turnover. We had one teacher who left for family reasons, but it had nothing to do with [Bressman High] or anything like that. We are getting more teachers that have been here longer.

Blake continued to discuss that at a district level, his principal “has fought for me with the district in regard to getting more support for teacher-leadership activities.” Blake claimed that his principal “very much empowers and gives so much protection to teachers” that he feels free to “go to him with ideas as well.” Blake also articulated he was proud to be working with his principal through the implementation of the personalized learning platform, Summit Learning.

Blake explained how he and a colleague had “talked to a few other teachers in other districts that are getting on board with the personalized learning platform.” Reflecting on the experiences of these other teachers, Blake cautioned that without support from a school’s administrative team, personalized learning efforts are unsuccessful.

One of the things we always advocate is to make sure that the administrative staff of these other schools is on board and they can fully have the support in what they can do to support their staff because that is going to be the key to success. I would say that is the number one reason why we have been successful with that is the leadership that we have had from [Principal Bain] and the structure he has put into place.
Principal Bain led a cultural shift at his school, which resulted in a sense of pride that kept teachers at the school longer. Teachers were more vested in what the principal was doing and felt led to stay with the school.

Crawford described the cultural shift that took place between Principal Cortes and the previous school principal at Carter Middle, asserting that the culture under the previous principal as negative. Walking to the middle school from the high-school building where the eighth grade is housed, Crawford remarked that he and his colleagues suffered a “negative brainstorm” considering how poorly their time would be spent. When Principal Cortes began working at the school, Crawford said that “it was so open.” Claire agreed and added that Principal Cortes was teacher-centered, asked questions, and specifically used ideas from teachers for school improvement. By putting a focus on teacher input and strengthening the role of teachers in making decisions, Principal Cortes shifted the culture to a teacher-centered environment and the ITLs appreciated the shift in culture. This movement to a teacher-centered school culture resulted in a deep-seeded pride for the school principal.

**Summary**

In this chapter, I provided a presentation of the themes based on the qualitative data. I answered the second, third, and fourth research questions using excerpts from the qualitative data gathered in this study. In the final chapter, I provide conclusions from the study, an updated model for informal teacher leadership, and recommendations for future studies.
CHAPTER 6
CONCLUSION

Especially since the early 2000s, digital technologies have been deeply integrated into secondary school classrooms. The increase in 1:1 device environments in schools has steadily continued to grow (EdNet Insight, 2015; McCarthy, 2015). To help establish the effective use of these education-technology tools, principals must work to facilitate knowledge and guidance on how teachers can use these tools. One of the ways that principals facilitate education-technology learning is by empowering and tasking teacher leaders to work with each other on strengthening the use of education-technology tools (Sauers et al., 2014). These teacher-leader roles may be formal or informal (Jones & Dexter, 2014; York-Barr & Duke, 2004).

While formal teacher leaders typically have an official title and specific assigned duties, informal teacher leaders (ITLs) do not (Moller & Pankake, 2006; Pitts & Spillane, 2009). Rather, they lead by supporting their colleagues as role models, peer mentors, instructional coaches, classroom facilitators, curriculum developers, and resources providers to enhance learning and teaching (Harrison & Killion, 2007; Lumpkin, Claxton, & Wilson, 2014). ITLs are usually only known only by the teachers with whom they work and identified through informal networks that develop within a school. Although curricular and instructional teacher-leader roles are known to be effective (Berry, 2015; Jones et al., 2015), less is known about the nature of informal teacher-leadership roles that support technology adoption (Jones & Dexter, 2014; Riel & Becker, 2008). More specifically, it is unclear how principals support, identify, or interact with these ITLs.
Because ITLs are identified by their colleagues and not the school’s principal, it is possible that the principal could not correctly identify the ITLs in a school.

**Research Questions**

The purpose of this study was to understand how secondary principals use a distributed perspective of leadership to support ITLs to improve classroom technology integration. The goal of the study was to answer the umbrella question: *How does a secondary school principal support ITLs to strengthen classroom technology integration?* The specific research questions that helped answer the overarching question were:

1. Who are the ITLs in the school as identified by the classroom teachers in the building?
2. How does an ITL perceive the support provided by the principal?
3. What leadership opportunities do principals provide for ITLs?
4. What systems do principals establish to strengthen informal teacher leadership?

A conceptual framework based on Wenger’s (1998) theories of communities of practice (COPs) and Bandura’s (1977) social learning theory was used to guide the study.

**A Review of Methodology**

To answer the research questions, I used a multi-site case study approach. I identified three secondary public schools in Kentucky, all of which had implemented 1:1 device programs. Qualitative and quantitative data were collected at each site in three phases.

The first phase consisted of administering the ITL Identification Survey to all classroom teachers at the school through a Google Form. In the survey, teachers were given a list of all teachers in the school and directed to check-off boxes next to the
name(s) of the teachers that, based on the respondent’s experiences, act as a source of knowledge and guidance of education technology. Social network analysis (SNA) methods were applied to the survey results to identify the ITLs at each school. The second phase consisted of conducting individual interviews and a focus group interview with all of the ITLs at each school, as well as an individual interview with the school’s principal. During the final phase of the study, I observed the ITLs and collected field notes about each site.

In Chapter 4, I provided detailed accounts of each of the three schools that participated in the study, along with narratives of the ITLs and principals that participated. I also provided the ITL Identification Survey analysis with the narrative for each school. In Chapter 5, I used qualitative data collected during the study to support the emergent themes. The themes are organized based on the study’s research questions.

In this chapter, I discuss the study’s findings as related to the literature, acknowledge the limitations of the study, and make recommendations for future studies. I begin by connecting the study’s findings to literature on a distributed perspective of leadership. I then provide models of formal and informal teacher leading and learning in schools. I also provide a revised model of informal teacher leadership based on the study’s findings. I close the chapter by providing the study’s limitations, the study’s implications, policy recommendations, and a researcher reflection.

**Discussion**

In a distributed perspective of leadership, attention is given to interactions rather than a function of one or more leaders’ actions (Spillane et. al, 2009). In this study, I
examined how principals supported the teachers that were identified as ITLs and facilitated education-technology leadership.

Researchers have worked to quantify (Daly & Finnegan, 2010), dissect (Frank, Zhao, Penuel, Ellefson, & Porter, 2011), and explore social networks in schools (Frank, Lo, & Sun, 2014) and how they connect to school leadership (Daly, 2010). While strong evidence exists for how these networks can be used as a powerful tool in understanding how to lead and manage schools (Daly, 2012; Spillane et al., 2009b), researchers quickly blur the lines between formal and informal networks. When Spillane’s (2009) conceptualization of distributed leadership is applied to a network of teachers in a school, the principal is not at the top of a hierarchical structure, but rather in the middle of a structure built on ties between individuals. A distributed perspective of leadership is used to focus on the individuals that surround the principal in the network and how those interactions look. However, this perspective inherently addresses the formal network of how instructional leadership is espoused in a school.

While a principal is a school’s instructional leader and holds a formal leadership role, the distributed perspective of leadership helps researchers examine how the principal interacts with formal and informal leaders in a school. In this study, I interviewed individuals that did not have formal leadership roles in their school. By focusing on the teachers without formal leadership roles, I explored the informal leading and learning networks within the three schools, rather than the formal networks that exist. In the following section, I present a model for how a principal develops teacher leading and learning in a school using the networks that exist between teachers.
Formal Leading and Learning Network

A formal network of leading and learning is used to conceptualize the formal flow of leadership and teacher learning in a school. I define this network, represented in Figure 6.1 below, as the formal connections of learning that occur between teachers, who are represented by circles, and the principal in a school. In this figure, the principal is in the center of this network as the primary “instructional leader” (Glickman, 1989, p. 6) of a school, connected to the teachers in the building with solid lines. The solid lines represent the formal connections that exist between principals and teachers. All teachers at a school are connected to each other and the principal through the formal professional development sessions and formal teacher learning that is facilitated in a school (Jurasaitė-Harbision & Rex, 2010). This formal network of leading and learning exists naturally based on the nature of formal leadership roles.

![Formal leading and learning network](image)

*Figure 6.1 Formal leading and learning network*
Formal professional development. Some connections that exist between principals and teachers in a school building are formal professional development sessions. These may include faculty meetings, in-house workshops, or in-service work days. For example, Carter Middle had an in-service day of PLC time preceded by formal time together as a faculty. These formally-run interactions include all teachers in the school, represented by the circles surrounding the principal in Figure 6.1, and are mandated and controlled by the principal.

Formal leadership interactions. The formal leadership interactions between principals and teachers include scheduled formal classroom observations, principals attending workshops with teachers, or distribution and facilitation of district-mandated information. For example, in the faculty meetings I observed at Bressman High and Carter Middle, the principals were required to convey messages from the offices of the superintendent. While Principal Bain had a guest presenter from the district to provide information, Principal Cortes played a video from the superintendent that was unique to the Carter Middle faculty members. These interactions are examples of connections between teachers and principals in the formal leading and learning network within a school.

Informal Leading and Learning Network

Rather than the formal learning structure in a school, teachers rely on more often on peer interactions to advance professionally (Jones & Dexter, 2014; York-Barr & Duke, 2004). They typically rely on each other and seek out learning opportunities on their own within the school’s network comprised of all teachers (Donaldson, 2007, Margolis & Huggins, 2012). According to Jurasaitė-Harbision and Rex (2010), the
“informal professional learning in the workplace” (p. 267) is distinctly different from the formal network of learning that includes a principal.

To describe the networks that teachers develop for informal learning, Jones and Dexter (2014) used the term communities of practice (COPs). Although COPs typically emerge spontaneously, have no formal leadership titles, and thus are difficult to identify due to their informal structure (Wenger & Snyder, 2000), they are examples of informal leading and learning networks. Participants of these COPs may include small groups of teachers with similar interests or all teachers within a school. Therefore, the informal leading and learning network within a school may be comprised of multiple COPs.

Figure 6.2 Informal leading and learning network

In Figure 6.2, I depict the informal leading and learning network. This informal network is the same as the formal network, but the interactions between the principal and the teachers are dashed, which represent the informal interactions and cultural norms established by the principal for the teachers. Some teachers, represented by the circles,
are ITLs while others may be informal mentors for one or two of their peers. The principal is not directly connected to the informal leading and learning network in the school. Hence, the dotted lines indicate that principals have only indirect connections to this informal network. Through the informal interactions and cultural norms that a principal establishes, teachers lead their peers and learn from each other.

**Informal interactions.** I saw and heard examples of the informal connections between principals and ITLs in my data collection. For example, the staff lunches at Bressman High were highly informal in nature, which allowed the teachers to speak more candidly with Principal Bain. These interactions allowed him to identify unique teacher strengths, which he used to design leadership opportunities for teachers. Another example of the informal interactions is how Principal Adrian and Principal Cortes relied on ITLs for feedback on digital resources and technology tools. Since these interactions were not based on policy or formal guidelines, they allowed the principals to connect indirectly to the informal leading and learning networks within their schools.

**Cultural norms.** As discussed in Chapter 5, cultural norms were a primary mechanism for principals to influence teacher leading and learning in a school. While Principal Adrian had not contractually required teachers to create a morning Ignite video, there was a cultural understanding and expectation that teachers were relied on to create something. Principal Bain invited Blake to lead a session at UKNextGen as an informal method of leadership and not as a policy or formal leadership interaction. These cultural norms, established by the principals, are represented by the dashed lines in Figure 6.2 and help highlight the ways that principals influence informal teacher leading and learning.
While Jurasaitė-Harbision and Rex (2010) cautioned the use of a binary paradigm for teacher leading and learning, they claimed that this “simple binary permits us to explore the cultural dimensions of the phenomenon we refer to as informal learning” (p. 267). Principal Cortes spoke about this binary paradigm in how teachers lead and learn from each other through the informal leading and learning network.

Informal Leadership and Formal Leadership.

The nature of informal versus formal leadership within a school was expressed by Principal Cortes in her interview. She explained that earlier in her career, she made a role change from a classroom teacher to a hybrid teacher-leader. When she assumed this type of formal teacher-leader role, “it changed the relationship” she had with her peers: She was no longer connected to the school’s informal network. Once she was disconnected from the informal leading and learning network, there was nothing she could do directly to control or influence the network. The nature of her formal leadership role changed the relationships that she had with classroom teachers. Neither a principal or formally identified teacher leader are connected to a school’s informal leading and learning network.

This disconnect between a principal and the informal leading and learning network was evidenced by how Principal Adrian responded to one of my questions. When asked if he thought Addison and Abigail were crucial to the improvement of education-technology integration in Armstrong High, he said they were “as important as any other teachers.” To Principal Adrian, these ITLs were not unique because he was disconnected from the informal network of leading and learning that took place between teachers. The Armstrong High teachers identified Addison and Abigail as ITLs, but
Principal Adrian was unaware of their actual role in this informal network. The informal network was indirectly impacted by Principal Adrian, who could not be connected to the informal network due to his formal role as the school’s instructional leader. However, I determined how the principals in my study did have major impacts the informal leading and learning network in their schools.

**Influencing the Informal Network**

In Figure 6.2, I use dashed lines to depict the informal interactions and cultural norms that principals established for teachers in order to facilitate informal teacher leadership in the school. These interactions and norms are derived from the themes that I provided in Chapter 5. Specifically, principals indirectly influenced the informal leading and learning network by collecting teacher input, providing in-school and out-of-school opportunities for teacher leadership, and establishing cultural norms for all teachers to be leaders. For example, Crawford described how Principal Cortes facilitates informal teacher leadership and unofficially directs the informal leading and learning network in Carter Middle.

*I think [Principal Cortes] is doing a good job of creating a kind of garden area. She creates the conditions where teacher leaders are grown, and she is letting that sit. It is also the way we do [professional development], and the communications going on with tech I would say that right now she is cultivating a crop.*

The garden analogy is coincidently how Wenger and Snyder (2000) described the role of a principal in cultivating formal PLCs and teacher leadership. These authors described how a principal develops teacher leadership in the school by “tilling the soil, pulling out weeds, and supplementing water supply during dry spells” (p. 43).

Specifically, Wenger and Snyder recommended principals develop COPs and teacher leadership by establishing an infrastructure and cultural atmosphere so that teachers then
embody teacher leaders. Because principals cannot directly influence the informal network of leading and learning, they must use these strategies to cultivate a healthy crop of teacher leadership. Hearing Crawford describe the same analogy as I found in the literature was telling and profound. In the next section, I provide a revised model of the ITL based on the study’s findings.

**Revised ITL Model**

In Chapter 2, a proposed model of ITLs was provided, which was created using the empirical teacher-leadership literature; it highlights characteristics that teacher leaders possess. Specifically, teacher leaders (a) commit to improved teaching and learning (Birky, 2002; Riel & Becker, 2008), (b) possess instructional expertise (Marks & Printy, 2003; Nappi, 2014), (c) establish strong relationships with administrators (Angelle & DeHart, 2011; Snell & Swanson, 2000), and (d) participate in teacher networks (Angelle, 2007; Riel & Becker, 2008). However, the studies that were used to inform these traits focused predominantly on formal teacher leaders. Due to the nature of informal teacher leadership, a principal may be unaware of ITLs, and thus, the proposed model for ITLs contained an error (see Figure 6.4).

![Proposed model of ITLs](image)

*Figure 6.3 Proposed model of ITLs.*
I revised my original model of ITLs (Figure 6.3) by deleting the trait about their having strong relationships with administrators. While many ITLs may have strong relationships with administrators, those identified by their peers in this study did not display unique or stronger relationships than any other teachers in the three schools where data were collected. For example, in every ITL observation where the entire faculty was involved, ITLs interacted with the principals no differently than other teachers. There was no evidence of special considerations or dialogue between the ITLs and the principals. During interviews, no ITLs described their relationship with the principal as anything special or unique. No direct quotes or incidents within the data to support my revised model; rather, the change is based on my interactions with each individual ITL and principal throughout the study.

Based on the study’s findings, the importance of the school principal in developing the necessary culture and environment for ITLs to thrive is undeniable. While the relationships between principals and ITLs remains unclear, there is much work done
by the principal in supporting ITLs indirectly. The nature of the school principal in the revised model of ITLs is represented by the bubble added in the background to help show that these actions help make the other characteristics possible.

Aside from developing strong relationships with principals, the other aspects of the proposed teacher-leadership model were evident in the study’s data. I saw that the participating ITLs were committed to improved learning and teaching, possessed instructional experience, and participated in teacher networks. Connecting to the theme of participation in teacher networks, I now describe a finding of the study that I found especially interesting.

**Professional Networks in Kentucky**

One of the consistent themes between participating ITLs and principals was the inherent role of statewide communities and programs with which study participants were connected. Having been connected to many of these communities as a teacher in Kentucky, I appreciated the passion evidenced for working with teachers across the state. Throughout my time spent in these three distinct schools, I felt that they were each part of a unified and statewide effort of improving the nature of public education in Kentucky. Programs such as Hope Street Group, EdCamp, and KYSTE were mentioned in interviews and observed comments as ways that study participants worked with educators across the state to improve learning and leading in schools. An innate sense of innovation and teacher leadership spanned throughout comments made by study participants and heard during site visits. While I expected to see these connections to educator networks, I was surprised at the impact these groups had made on the schools in general. One
example of this was the role of the University of Kentucky’s UKNextGen Academy in the schools.

UKNextGen, created and facilitated by the College of Education faculty, supports educational leaders across the state in upgrading “educational systems to deepen the learner experience of every student” (University of Kentucky College of Education, 2018, para. 1). More specifically, UKNextGen helps districts across Kentucky to reframe how administrators make decisions and what the vision for every school and district should be. While only two of the three schools participating in this study were formal participants in UKNextGen, the other school was indirectly connected to the program through its principal, who is a doctoral student at the University of Kentucky. The influence of UKNextGen was evident through how the participating principals spoke about vision and goals for their schools. They discussed their passion for trying new things and reframing the traditional school narrative. The principals did not describe goals for raising standardized-assessment scores or getting higher rankings by the state. Instead, each principal displayed a focus on empowering teachers to make decisions, working to connect students to local businesses for field-learning experiences, and changing curriculum to address the needs of an ever-progressing field of careers and jobs. These changes were featured during UKNextGen sessions as pathways for leading student success in Kentucky.

**Potential Study Limitations**

Numerous items should be considered regarding study limitations. The first was the error I made in administering the Identification Survey at Armstrong High. Although this error did not directly impact the results of the survey, it was still an unfortunate error
that limited how I presented my findings of the data analysis. Specifically, an SNA mapping is not provided for Armstrong High because of this researcher error.

When performing SNA methods, the highest response rates are desirable. Because the response rate for the ITL Identification Survey at each school was not 100%, the ITL identification may have been affected. It is unclear whether or not a 100% rating would have made an impact on the ITLs selected in the study.

Another study limitation may be the caliber of principals identified as potential participants for this study. In order to locate schools that rely on a digital infrastructure and encourage teacher leadership of education-technology tools, I considered only secondary schools with existing 1:1 device programs as potential study sites. Not only did this condition narrow the list of potential schools, I now realize that it also limited the site selection to schools led by progressive principals. Establishing or maintaining a 1:1 device environment in Kentucky is a relatively innovative undertaking for secondary school principals. I now realize that the success of such an enterprise requires not only a progressive principal but also teachers who lead and support their peers throughout the implementation stage and beyond. Additionally, during the interviews with these principals, I learned that all three were actively engaged in doctoral studies. It is unknown the extent to which their advanced graduate studies may have had on their leadership performance. It is entirely possible that the principals that were used in this study represent a small fraction of the secondary principals across Kentucky due to their diligence in education technology and desire for improvement through doctoral degrees.
Implications for Research

As described above, the ambiguous nature of an informal learning network makes it difficult to establish policies. No matter what formal policies are in place, teachers will continue to work together and learn together informally. Considering the nature of a school’s informal leading and learning network described earlier, it is difficult for principals to know which teachers are facilitating expertise and knowledge. I recommend applying the SNA approach from this study to identify the ITLs in a school and compare those results with the principal’s perceptions of who the ITLs are. Using these methods at a larger scale might further inform the nature of informal leading and learning that takes place in schools. Specifically, more research is needed to conceptualize how informal leadership is enacted in schools. Many of the existing studies on teacher leadership unintentionally focus on formal teacher leaders by relying on formal titles or principals to identify teacher leaders.

Another opportunity for research is comparing the role of teacher leadership between ITLs and formal teacher leaders. Essentially, are ITLs more or less influential in a school than formal teacher leaders? ITLs could be identified using SNA, and teachers could then compare how effective those informal leaders are in providing professional support compared to the school’s formal teacher leaders. Principal Adrian asserted that, as ITLs become more important to leading other teachers, “formal roles dissipate.” He explained that formal teacher-leader roles are “a flawed assumption.” Likewise, Principal Cortes shared her perception that a formal leadership role removes the teacher from the informal leading and learning network among peers.
Researchers could also examine patterns in how information flows in the informal leading and learning networks with regard to teachers’ physical location in a building, their years of experience engaging with peers, departments to which they are assigned, and other aspects of how teachers learn from each other. If school leaders have a better understanding of how informal learning networks function with regards to these factors, they may understand more clearly the cultural expectations that are needed to strengthen informal teacher leadership.

Researchers agree that teacher leaders—including those formally identified as such—positively impact schools (Blase & Blase, 2006; Lieberman & Miller, 2005; Wilmore, 2007). However, because formal teacher leaders have been recognized with a title, there is often an opportunity for them to receive special benefits, pay increases, or other considerations. With ITLs, recognition and sundry benefits might invalidate their informal leadership, which would decrease their effectiveness as teacher leaders. In terms of policy changes, more research is needed to guide and inform a compensation structure for ITLs. Could a principal provide compensation for an ITL without negating the ITLs power as a leader of the informal leading and learning network? More research needs to be done in the space of informal teacher leadership to help address questions like these and ultimately inform principal-leadership actions. Now that I have outlined the study limitations and recommendations for future research, a researcher reflection is provided.

**Researcher Reflection**

While my interviewing skills improved throughout my data collection, I could have done a better job of interviewing, especially during the first interview that I conducted in this study. Here, I could have asked better questions and strayed more from
the semi-structured protocol. My reflection on interviews connects to how these interviews were conducted.

Between collecting the survey data in Phase 1 and conducting my first ITL interviews, I moved from Kentucky to Indiana for professional reasons. I originally planned to conduct interviews in a face-to-face environment but moving out-of-state required me to utilize Google Hangouts for all interviews. I do not consider this a limitation of the study, but I believe that conducting interviews in a face-to-face environment may be more effective and enjoyable.

While reflection on the findings from this study, I considered several ways that principals could use them. First, the nature of informal teacher leadership is ambiguous. Second, there are many things that a principal can do to help provide a structure in which ITLs can thrive. In regard to making sure that money for education technology is spent effectively, it was clear in this study that principals modeling the effective use of education technology is certainly felt across the school faculty. The digital culture and expectations established by the principals in this study were clearly important to how individual teachers approached technology and collaborated together. This indication for principals may result in more education technology preparation for principals and training so that they are comfortable with modeling how education technology can be used in the classroom. Not only did the modeling seem to provide a more comfortable environment for trying new technology, it helped show teachers the expectation of using technology effectively in the classroom.

I framed the ITL Identification Survey around how teachers, working as informal leaders in a school, facilitate leadership on education technology. To do this, I framed the
survey using the TPACK framework. After completing the study, I am glad that I used this specific framework to guide the ITL identification. However, I am curious about how the use of TPACK impacted the study. Would those same ITLs had been identified had I asked about teacher leadership in general, or were they specific to education technology? How would the study had been different had I focused on a different strand of the TPACK framework?

Another personal reflection as a researcher is on my researcher journal. Specifically, I never found a comfortable and consistent medium for my journal. I commonly bounced between using Google Docs, Google Keep, a notebook, and mobile whiteboards. Throughout the roughly two years of the dissertation process, I recorded many notes between these resources, some specifically about the study and others on the process of the study. All of my reflections were valid and important for the process of writing the dissertation, but I found that I could not stick to one medium. My journaling helped the most with remembering small details about interviews, site visits, and observations.

Additionally, the opportunities provided by some of the Google tools were remarkably helpful throughout my study. For example, I relied heavily on Google Docs to write and share my work with my committee members. Not only was every word saved as I typed, but also my writing was accessible from any device at any time. I could quickly share a link to my work with my committee members, and the Google Doc would stay updated if I changed something. This way, I could continue to edit my writing without having to send a new document or version to committee members. All of these
edits took place in real-time and made the process of receiving feedback much faster and easier.

My doctoral program at the University of Kentucky utilized a cohort-based learning model. I was one of eight students who participated in my cohort, which was centered in a digital-learning environment. The effectiveness, utility, convenience, and support of the cohort was overwhelming. Nearly every course that prepared me for my dissertation included the same seven other individuals. We connected daily throughout the coursework via Google Hangouts and continued to communicate digitally after we finished taking courses. Building and maintaining personal relationships with these individuals was not only powerful but also helpful in working together. We were always able to provide more personalized feedback for each other because we knew each other’s research interests, passions, and personal lives. Having individuals that could quickly provide feedback on writing, assignments, or issues of practice was highly valuable to my success in completing doctor studies. I believe the cohort model was crucial to my skills development as a researcher, scholar, and writer.

Conclusion

In this multi-site case study, I examined how a principal supports ITLs that strengthen technology integration. I found that principals established many cultural expectations for teacher leadership, participated in external learning networks, and implemented teacher-based ideas at a school wide level to support ITLs. Although the results of this study are not generalizable at a large scale, the results can be used to further inform the nature of principal leadership and informal teacher leadership in
schools. The study’s findings can also be applied to how principals lead with education technology.
APPENDIX A

IRB APPROVAL

Initial Review

Approval Ends: May 10, 2018
IRB Number: 17-0310-P4S

TO: Taylor Clements

FROM: Chairperson/Vice Chairperson
Non-medical Institutional Review Board (IRB)

SUBJECT: Approval of Protocol Number 17-0310-P4S

DATE: May 12, 2017

On May 11, 2017, the Non-medical Institutional Review Board approved your protocol entitled:

Informal Teacher Leadership for Technology Integration: A Multi-site Case Study of Distributed Leadership

Approval is effective from May 11, 2017 until May 10, 2018 and extends to any consent/assent form, cover letter, and/or phone script. If applicable, attached is the IRB approved consent/assent document(s) to be used when enrolling subjects. [Note, subjects can only be enrolled using consent/assent forms which have a valid "IRB Approval" stamp unless special waiver has been obtained from the IRB.] Prior to the end of this period, you will be sent a Continuation Review Report Form which must be completed and returned to the Office of Research Integrity so that the protocol can be reviewed and approved for the next period.

In implementing the research activities, you are responsible for complying with IRB decisions, conditions and requirements. The research procedures should be implemented as approved in the IRB protocol. It is the principal investigators responsibility to ensure any changes planned for the research are submitted for review and approval by the IRB prior to implementation. Protocol changes made without prior IRB approval to eliminate apparent hazards to the subject(s) should be reported in writing immediately to the IRB. Furthermore, discontinuing a study or completion of a study is considered a change in the protocol’s status and therefore the IRB should be promptly notified in writing.

For information describing investigator responsibilities after obtaining IRB approval, download and read the document "PI Guidance to Responsibilities, Qualifications, Records and Documentation of Human Subjects Research" from the Office of Research Integrity's IRB Survival Handbook web page [http://www.research.uky.edu/ori/IRB-Survival-Handbook.html#PI responsibilities]. Additional information regarding IRB review, federal regulations, and institutional policies may be found through ORI's website [http://www.research.uky.edu/ori]. If you have questions, need additional information, or would like a paper copy of the above mentioned document, contact the Office of Research Integrity at (859) 257-9428.

Norm Van Tubergen PhD/TH
APPENDIX B

SITE INTRODUCTION VIDEO TRANSCRIPT

Hello! My name is Taylor Clements! Thank you for taking the time to watch this video and possibly helping me out. I am a math teacher at Atherton High School in Louisville, KY and a PhD Candidate at the University of Kentucky.

If you are watching this, your principal has graciously agreed to let me use your school as a site for my multi-site case study! At this point, all I need from you is to fill out a very short and closed-ended survey: there are only 8 questions.

My dissertation study is about teacher leadership. Specifically, I am trying to understand more about how informal teacher leaders work with others in the building. For this study, I am focusing on those teachers who act as informal leaders of education technology leaders in the building.

All I need is for you to select which teachers you go to in the building with certain needs. These needs are based on the technological pedagogical and content knowledge framework, or TPACK, which will be described in the survey.

The survey should take no more than five minutes and it is very important that you enter your email address. Your responses are completely confidential, but I do need to know who goes to whom to guide my data analysis. So please don’t worry about others finding out who you select for each question. The results will provide a mapping of the faculty with lines connecting each teacher that shows who is more central to the network in regard to each of the TPACK strands.

The survey will be available for 48 hours after it is sent, and I greatly appreciate your help. The more people who respond, the more accurate the data is and the more helpful my study will be.

Thank you.
APPENDIX C

ITL IDENTIFICATION SURVEY CONSENT FORM

Consent to Participate in a Research Study

Informal Teacher Leadership for Technology Integration: A Multi-site Case Study of Distributed Leadership

Teacher Survey

WHY ARE YOU BEING INVITED TO TAKE PART IN THIS RESEARCH?
You are being invited to take part in a research study about how a principal provides support for informal teacher leaders that strengthen technology integration. You are being invited to take part in this research study because you are a teacher in the secondary school that is being used for the case study. You will be one of roughly 80 participants in this study.

WHO IS DOING THE STUDY?
The person in charge of this study is Taylor Clements, a Ph.D. candidate of University of Kentucky Department of Educational Leadership. Taylor is being guided in this research by Tricia Browne-Ferrigno, Ph.D. (University of Kentucky).

WHAT IS THE PURPOSE OF THIS STUDY?
The goal of the study is to answer the overarching question: How does a high school principal support informal teacher leaders (ITLS) to strengthen classroom technology integration? The four guiding research questions to assist in answering the overarching question are:
1. Who are the ITLS in the school as identified by the classroom teachers in the building?
2. How does an ITL perceive the support provided by the principal?
3. What leadership opportunities does the principal provide for ITLS?
4. What systems does the principal establish to strengthen informal teacher leadership?

By doing this study, we hope to learn more about the relationships between principals and informal teacher leaders.

ARE THERE REASONS WHY YOU SHOULD NOT TAKE PART IN THIS STUDY?
There is no reason why a participant should not take part in this study.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?
The research procedures will be conducted through a 7-item digital survey that will take approximately 5 minutes to complete. Every teacher in the building will be invited to participate.

WHAT WILL YOU BE ASKED TO DO?
In this survey, you will be asked to identify the names of teachers in your buildings for 7 different topics. For each of the components of the Technological Pedagogical Content Knowledge (TPACK) framework, you will be asked to identify the name(s) of any teachers to whom you would go to for advice or guidance on that topic. The topics included in the survey are (a) content knowledge, (b) technical knowledge, (c) pedagogical knowledge, (d) pedagogical content
knowledge, (e) technological content knowledge, (f) technological pedagogical knowledge, and (g) technological pedagogical content knowledge. For each of these knowledge types, you will be asked to place a check next to the name(s) of the teachers, if any, that you would go to for advice or guidance. This survey will be used to identify the informal teacher leaders for the study.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?
To the best of the researcher’s knowledge, the things you will be doing have no more risk of harm than you would experience in everyday life.

WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?
There is no guarantee that you will get any benefit from taking part in this study. Your willingness to take part, however, may help future principals understand and improve how teacher leaders guide instructional leadership in schools.

DO YOU HAVE TO TAKE PART IN THE STUDY?
If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any benefits or rights you would normally have if you choose not to volunteer. You can stop at any time during the study and still keep the benefits and rights you had before volunteering.

IF YOU DON’T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?
If you do not want to be in the study, there are no other choices except not to take part in the study.

WHAT WILL IT COST YOU TO PARTICIPATE?
There are no costs associated with taking part in the study.

WILL YOU RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?
You will not receive any rewards or payment for taking part in the study.

WHO WILL SEE THE INFORMATION THAT YOU GIVE?
Only the researcher will have access to the raw data and this will be stored on a password-protected computer. Before the survey results are seen by anyone other than the researcher, all names will be de-identified. When any results from the survey and study are published, pseudonyms will be used for the name of the school and all of the individuals involved in the study. The exact location of the school will also not be identified.

We will make every effort to keep confidential all research records that identify you to the extent allowed by law. Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be personally identified in these written materials. We may publish the results of this study; however, we will keep your name and other identifying information private.

Please be aware, while we make every effort to safeguard your data once received from the online survey/data gathering company, given the nature of online surveys, as with anything
involving the Internet, we can never guarantee the confidentiality of the data while still on the
survey/data gathering company’s servers, or while en route to either them or us. It is also
possible the raw data collected for research purposes may be used for marketing or reporting
purposes by the survey/data gathering company after the research is concluded, depending on
the company’s Terms of Service and Privacy policies.

We will make every effort to prevent anyone who is not on the research team from knowing that
you gave us information, or what that information is. We will keep private all research records that
identify you to the extent allowed by law. However, we may be required to show information
which identifies you to people who need to be sure we have done the research correctly; these
would be people from such organizations as the University of Kentucky.

CAN YOUR TAKING PART IN THE STUDY END EARLY?
If you decide to take part in the study you still have the right to decide at any time that you no
longer want to continue. You will not be treated differently if you decide to stop taking part in the
study.

The individuals conducting the study may need to withdraw you from the study. This may occur if
you are not able to answer the questions, if they find that your being in the study is more risk than
benefit to you, or if the technology malfunctions and your data is lost.

WHAT ELSE DO YOU NEED TO KNOW?
There is a possibility that the data collected from you may be shared with other investigators in
the future. If that is the case the data will not contain information that can identify you unless you
give your consent or the UK Institutional Review Board (IRB) approves the research. The IRB is a
committee that reviews ethical issues, according to federal, state and local regulations on
research with human subjects, to make sure the study complies with these before approval of a
research study is issued.

WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS, CONCERNS, OR COMPLAINTS?
Before you decide whether to accept this invitation to take part in the study, please ask any
questions that might come to mind now. Later, if you have questions, suggestions, concerns, or
complaints about the study, you can contact the investigator, Taylor Clements at
taylor.clements1@uky.edu at any time. If you have any questions about your rights as a volunteer
in this research, contact the staff in the Office of Research Integrity at the University of Kentucky
between the business hours of 8am and 5pm EST, Mon-Fri. at 859-257-9428 or toll free at 1-866-
400-9428.
Consent to Participate in a Research Study

Informal Teacher Leadership for Technology Integration: A Multi-site Case Study of Distributed Leadership

ITL Interview/Focus Group

WHY ARE YOU BEING INVITED TO TAKE PART IN THIS RESEARCH?
You are being invited to take part in a research study about how a principal provides support for informal teacher leaders that strengthen technology integration. You are being invited to take part in this research study because you have been identified by your peers as an informal teacher leader of pedagogy and technological knowledge. You will be one of roughly 80 participants in this study.

WHO IS DOING THE STUDY?
The person in charge of this study is Taylor Clements, a Ph.D. candidate of University of Kentucky Department of Educational Leadership. Taylor is being guided in this research by Tricia Browne-Ferrigno, Ph.D. (University of Kentucky).

WHAT IS THE PURPOSE OF THIS STUDY?
The goal of the study is to answer the overarching question: How does a high school principal support informal teacher leaders (ITLs) to strengthen classroom technology integration? The four guiding research questions to assist in answering the overarching question are:
1. Who are the ITLs in the school as identified by the classroom teachers in the building?
2. How does an ITL perceive the support provided by the principal?
3. What leadership opportunities does the principal provide for ITLs?
4. What systems does the principal establish to strengthen informal teacher leadership?

By doing this study, we hope to learn more about the relationships between principals and informal teacher leaders.

ARE THERE REASONS WHY YOU SHOULD NOT TAKE PART IN THIS STUDY?
There is no reason why a participant should not take part in this study.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?
The procedures will be conducted first as an individual interview and second as one focus group interview. The individual interview can be a face-to-face or video web conference interview depending on your needs. If you opt for a face-to-face interview, this one-time interview can take place in your personal workspace on your campus or in a public location of your choice. If you opt for a video web conference meeting, this one-time interview can take place at your convenience. The individual interview will last approximately 45 to 60 minutes.

The focus group interview will either take place via a video web conference meeting or take place on your campus at a time that works for all of those invited to the focus group interview. The other individuals invited to participate in the focus group interview will be the other teachers also identified as informal teacher leaders in your school. The focus group will last approximately 45 to 60 minutes.

WHAT WILL YOU BE ASKED TO DO?
The interview and focus group will involve gathering your input regarding your relationship with the principal and your thoughts about how the principal provides support, if any, for you as an ITL. This includes asking what opportunities or support systems the principal provides you with to be an informal teacher leader. While focusing on the same topics, the focus group interview will gather more data and be designed to investigate further on emergent themes from the individual interviews. Although the content focus will be the same, the exact questions between the individual interview and focus group interview will differ.

**WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?**

To the best of the researcher’s knowledge, the things you will be doing in the individual interview have no more risk of harm than you would experience in everyday life.

In the focus group, a few of the questions asked might result in a comment that could be perceived as speaking negatively about your principal, such as “What opportunities, if any, could your principal provide that he/she is not currently offering?” If there are questions where you do not feel comfortable providing an answer, you will not be compelled to do so. All teachers participating will be asked to keep the discussion private, but I cannot guarantee this as the researcher. Due to the potential negative answers and the group setting, participating in this focus group does involve some risk. Your participation is entirely voluntary, and you are free to withdraw your participation at any time for any reason.

Please understand that the interview and focus group will be audio-recorded.

**WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?**

There is no guarantee that you will get any benefit from taking part in this study. Your willingness to take part, however, may help future principals understand and improve how teacher leaders guide instructional leadership in schools.

**DO YOU HAVE TO TAKE PART IN THE STUDY?**

If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any benefits or rights you would normally have if you choose not to volunteer. You can stop at any time during the study and still keep the benefits and rights you had before volunteering.

**IF YOU DON’T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?**

If you do not want to be in the study, there are no other choices except not to take part in the study.

**WHAT WILL IT COST YOU TO PARTICIPATE?**

There are no costs associated with taking part in the study.

**WILL YOU RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?**

You will not receive any rewards or payment for taking part in the study.

**WHO WILL SEE THE INFORMATION THAT YOU GIVE?**

Only the researcher will have access to the raw data and this will be stored on a password-protected computer. Before the survey results are seen by anyone other than the researcher, all names will be de-identified. When any results from the survey and study are published, pseudonyms will be used for the name of the school and all of the individuals involved in the study. The exact location of the school will also not be identified.

We will make every effort to keep confidential all research records that identify you to the extent allowed by law. Your information will be combined with information from other people taking part.
in the study. When we write about the study to share it with other researchers, we will write about
the combined information we have gathered. You will not be personally identified in these written
materials. We may publish the results of this study; however, we will keep your name and other
identifying information private.

We will make every effort to prevent anyone who is not on the research team from knowing that
you gave us information, or what that information is. We will keep private all research records that
identify you to the extent allowed by law. However, we may be required to show information
which identifies you to people who need to be sure we have done the research correctly; these
would be people from such organizations as the University of Kentucky.

CAN YOUR TAKING PART IN THE STUDY END EARLY?
If you decide to take part in the study, you still have the right to decide at any time that you no
longer want to continue. You will not be treated differently if you decide to stop taking part in the
study.

The individuals conducting the study may need to withdraw you from the study. This may occur if
you are not able to answer the questions, if they find that your being in the study is more risk than
benefit to you, or if the technology malfunctions and your data is lost.

WHAT ELSE DO YOU NEED TO KNOW?
There is a possibility that the data collected from you may be shared with other investigators in
the future. If that is the case the data will not contain information that can identify you unless you
give your consent or the UK Institutional Review Board (IRB) approves the research. The IRB is a
committee that reviews ethical issues, according to federal, state and local regulations on
research with human subjects, to make sure the study complies with these before approval of a
research study is issued.

FOLLOW-UP
You will be invited to review the initial data analysis and give feedback on the analysis. This
process is called member checking and will let you review the interview transcription, the focus
group transcript, and the emerging themes from the site analysis. Any feedback you have will be
encouraged and will help the research process.

WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS, CONCERNS, OR COMPLAINTS?
Before you decide whether to accept this invitation to take part in the study, please ask any
questions that might come to mind now. Later, if you have questions, suggestions, concerns, or
complaints about the study, you can contact the investigator, Taylor Clements at
taylor.clements1@uky.edu at any time. If you have any questions about your rights as a volunteer
in this research, contact the staff in the Office of Research Integrity at the University of Kentucky
between the business hours of 8am and 5pm EST, Mon-Fri. at 859-257-9428 or toll free at 1-866-
400-9428. We will give you a signed copy of this consent form to take with you.

Signature of person agreeing to take part in the study                      Date

Printed name of person agreeing to take part in the study

Name of (authorized) person obtaining informed consent                      Date

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APPENDIX E

PRINCIPAL INTERVIEW CONSENT FORM

Consent to Participate in a Research Study

Informal Teacher Leadership for Technology Integration: A Multi-Site Case Study of Distributed Leadership

Principal Interview

WHY ARE YOU BEING INVITED TO TAKE PART IN THIS RESEARCH?

You are being invited to take part in a research study about how a principal provides support for informal teacher leaders that strengthen technology integration. You are being invited to take part in this research study because you are the principal of one of the schools used in this multi-site case study. You will be one of roughly 80 participants in this study.

WHO IS DOING THE STUDY?

The person in charge of this study is Taylor Clements, a Ph.D. Candidate of University of Kentucky Department of Educational Leadership. As dissertation chair and faculty advisor, Tricia Browne-Ferrigno, Ph.D. is guiding Taylor Clements in this research study. There may be other people on the research team assisting at different times during the study.

WHAT IS THE PURPOSE OF THIS STUDY?

The goal of the study is to answer the overarching question: How does a high school principal support informal teacher leaders (ITLs) to strengthen classroom technology integration? The four guiding research questions to assist in answering the overarching question are:

1. Who are the ITLs in the school as identified by the classroom teachers in the building?
2. How does an ITL perceive the support provided by the principal?
3. What leadership opportunities does the principal provide for ITLs?
4. What systems does the principal establish to strengthen informal teacher leadership?

By doing this study, we hope to learn more about the relationships between principals and informal teacher leaders.

ARE THERE REASONS WHY YOU SHOULD NOT TAKE PART IN THIS STUDY?

There is no reason why a participant should not take part in this study.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?

The interview can be a face-to-face or video web conference interview depending on your needs. If you opt for a face-to-face interview, this one-time interview can take place in your personal workspace on your campus or in a public location of your choice. If you opt for a video web conference meeting, this one-time interview can take place at your convenience. The interview will last approximately 45 to 60 minutes.

WHAT WILL YOU BE ASKED TO DO?

You will be asked to take part in an individual interview with the researcher. The researcher will gather your input on the school culture, particularly how teachers’ professional learning communities (PLCs) function, as well as details on the 1:1 program, the digital infrastructures in place to support technology integration, formal teacher leadership, and informal teacher
leadership. The principal may also provide relevant insight about his or her conceptions of teacher leadership, technology integration, and the school-wide vision for how to support teacher leaders in general.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?
To the best of the researcher’s knowledge, the things you will be doing have no more risk of harm than you would experience in everyday life.

Please understand that the interview will be audio-recorded.

WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?
There is no guarantee that you will get any benefit from taking part in this study. Your willingness to take part, however, may help future principals understand and improve how teacher leaders guide instructional leadership in schools.

DO YOU HAVE TO TAKE PART IN THE STUDY?
If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any benefits or rights you would normally have if you choose not to volunteer. You can stop at any time during the study and still keep the benefits and rights you had before volunteering.

IF YOU DON’T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?
If you do not want to be in the study, there are no other choices except not to take part in the study.

WHAT WILL IT COST YOU TO PARTICIPATE?
There are no costs associated with taking part in the study.

WILL YOU RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?
You will not receive any rewards or payment for taking part in the study.

WHO WILL SEE THE INFORMATION THAT YOU GIVE?
Only the researcher will have access to the raw data and this will be stored on a password-protected computer. Before the survey results are seen by anyone other than the researcher, all names will be de-identified. When any results from the survey and study are published, pseudonyms will be used for the name of the school and all of the individuals involved in the study. The exact location of the school will also not be identified.

We will make every effort to keep confidential all research records that identify you to the extent allowed by law. Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be personally identified in these written materials. We may publish the results of this study; however, we will keep your name and other identifying information private.

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. We will keep private all research records that identify you to the extent allowed by law. However, we may be required to show information
which identifies you to people who need to be sure we have done the research correctly; these would be people from such organizations as the University of Kentucky.

**CAN YOUR TAKING PART IN THE STUDY END EARLY?**

If you decide to take part in the study you still have the right to decide at any time that you no longer want to continue. You will not be treated differently if you decide to stop taking part in the study.

The individuals conducting the study may need to withdraw you from the study. This may occur if you are not able to answer the questions, if they find that your being in the study is more risk than benefit to you, or if the technology malfunctions and your data is lost.

**WHAT ELSE DO YOU NEED TO KNOW?**

There is a possibility that the data collected from you may be shared with other investigators in the future. If that is the case the data will not contain information that can identify you unless you give your consent or the UK Institutional Review Board (IRB) approves the research. The IRB is a committee that reviews ethical issues, according to federal, state and local regulations on research with human subjects, to make sure the study complies with these before approval of a research study is issued.

**FOLLOW-UP**

You will be invited to review the initial data analysis and give feedback on the analysis. This process is called member checking and will let you review the interview transcription and the emerging themes from the site analysis. Any feedback you have will be encouraged and will help the research process.

**WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS, CONCERNS, OR COMPLAINTS?**

Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions, suggestions, concerns, or complaints about the study, you can contact the investigator, Taylor Clements at taylor.clements1@uky.edu at any time. If you have any questions about your rights as a volunteer in this research, contact the staff in the Office of Research Integrity at the University of Kentucky between the business hours of 8am and 5pm EST, Mon-Fri. at 859-257-9428 or toll free at 1-866-400-9428. We will give you a signed copy of this consent form to take with you.

_________________________________________
Signature of person agreeing to take part in the study  Date

_________________________________________
Printed name of person agreeing to take part in the study

_________________________________________
Name of (authorized) person obtaining informed consent  Date
APPENDIX F

ITL IDENTIFICATION SURVEY

ITL Identification Survey

Thank you for your necessary and valued input on this study!!! Your individual responses will NOT be published or made known to anyone outside of the researcher. The data analysis and results will be published under pseudonyms, keeping your input anonymous.

This instrument is based on the Technological Pedagogical Content Knowledge (TPACK) framework (see below). There are seven questions, one for each section of the TPACK framework.

For each of the sections, you will have a list of all of the classroom teachers at TNHS. Please check off the names of the teacher(s), if any, that YOU WOULD SEEK ADVICE OR GUIDANCE ON FOR THAT KNOWLEDGE TYPE.

FOR EXAMPLE: the category of Technological Knowledge would include seeking advice from a colleague on how to fix a digital device only whereas the Technological Pedagogical Knowledge category might include seeking advice from a colleague on how to use a digital device to gather/analyze formative assessments.

* Required

1. Email address *

Technological Pedagogical and Content Knowledge (TPACK) Framework

Technology Knowledge
Technology knowledge refers to the knowledge about various technologies and being able to solve technical issues. Individuals with technology knowledge know a lot about different technologies and keep up with new technologies.

https://docs.google.com/forms/d/1511tkb8T3zkyAPRFBhNrs6vY_1B95Z5dR9VBVv01pZTgQ/edit
2. Technology Knowledge. Please select the teacher(s), if any, that you would seek advice from on technology knowledge.*

Check all that apply.

☐ Teacher Name A.
☐ Teacher Name B.
☐ Teacher Name C.
☐ Teacher Name D.
☐ Teacher Name E.
☐ Teacher Name F.
☐ Teacher Name G.
☐ Teacher Name H.
☐ Teacher Name I.
☐ Teacher Name J.
☐ Teacher Name K.
☐ I would not seek advice on technology knowledge from any classroom teacher on this list.

Content Knowledge

Content knowledge is the knowledge about specific subject matter such as mathematics, social studies, and science. This knowledge type includes using strategies to develop understanding in a specific content area.

3. Content Knowledge. Please select the teacher(s), if any, that you would seek advice from on content knowledge.*

Check all that apply.

☐ Teacher Name A.
☐ Teacher Name B.
☐ Teacher Name C.
☐ Teacher Name D.
☐ Teacher Name E.
☐ Teacher Name F.
☐ Teacher Name G.
☐ Teacher Name H.
☐ Teacher Name I.
☐ Teacher Name J.
☐ Teacher Name K.
☐ I would not seek advice on content knowledge from any classroom teacher on this list.

Pedagogical Knowledge

Pedagogical knowledge refers to the methods and processes of teaching. This knowledge includes assessing student performance, adapting instruction, organizing classrooms, and being familiar with common student misconceptions.
4. Please select the teacher(s), if any, that you would seek advice from on pedagogical knowledge. *

Check all that apply.

☐ Teacher Name A.
☐ Teacher Name B.
☐ Teacher Name C.
☐ Teacher Name D.
☐ Teacher Name E.
☐ Teacher Name F.
☐ Teacher Name G.
☐ Teacher Name H.
☐ Teacher Name I.
☐ Teacher Name J.
☐ Teacher Name K.
☐ I would not seek advice on pedagogical knowledge from any classroom teacher on this list

Pedagogical Content Knowledge
Pedagogical content knowledge refers to the content knowledge that deals with the teaching process. This knowledge type includes using effective teaching practices with specific content areas such as mathematics.

5. Please select the teacher(s), if any, that you would seek advice from on pedagogical content knowledge. *

Check all that apply.

☐ Teacher Name A.
☐ Teacher Name B.
☐ Teacher Name C.
☐ Teacher Name D.
☐ Teacher Name E.
☐ Teacher Name F.
☐ Teacher Name G.
☐ Teacher Name H.
☐ Teacher Name I.
☐ Teacher Name J.
☐ Teacher Name K.
☐ I would not seek advice on pedagogical content knowledge from any classroom teacher on this list

Technological Content Knowledge
Technological content knowledge includes how technology can create new representations for specific content. This content includes using technology to develop a deeper understanding of content areas such as social studies.
6. Please select the teacher(s), if any, that you would seek advice from on technological content knowledge. *
   Check all that apply.
   - Teacher Name A.
   - Teacher Name B.
   - Teacher Name C.
   - Teacher Name D.
   - Teacher Name E.
   - Teacher Name F.
   - Teacher Name G.
   - Teacher Name H.
   - Teacher Name I.
   - Teacher Name J.
   - Teacher Name K.
   - I would not seek advice on technological content knowledge from any classroom teacher on this list.

Technological Pedagogical Knowledge
Technological pedagogical knowledge refers to the knowledge of how various technologies can be used to enhance teaching. This knowledge type might include thinking critically about how to use technology in the classroom and using new technologies for teaching.

7. Please select the teacher(s), if any, that you would seek advice from on technological pedagogical knowledge. *
   Check all that apply.
   - Teacher Name A.
   - Teacher Name B.
   - Teacher Name C.
   - Teacher Name D.
   - Teacher Name E.
   - Teacher Name F.
   - Teacher Name G.
   - Teacher Name H.
   - Teacher Name I.
   - Teacher Name J.
   - Teacher Name K.
   - I would not seek advice on technological pedagogical knowledge from any classroom teacher on this list.

Technological Pedagogical Content Knowledge
Technological pedagogical content knowledge refers to the culmination of the three knowledge types: content, technology, and pedagogy. An example of this knowledge type would include using technologies in the classroom to enhance what is taught, how it is taught, and what students learn. A teacher in this knowledge type would combine a content area, technologies, and effective teaching approaches in the classroom.

https://docs.google.com/a/uky.edu/form/1516kW7zkiyARF8bNmo9v_1BB9ZhrQYBV0j2TgQ/edit
8. Please select the teacher(s), if any, that you would seek advice from on technological pedagogical content knowledge. *
Check all that apply.

☐ Teacher Name A.
☐ Teacher Name B.
☐ Teacher Name C.
☐ Teacher Name D.
☐ Teacher Name E.
☐ Teacher Name F.
☐ Teacher Name G.
☐ Teacher Name H.
☐ Teacher Name I.
☐ Teacher Name J.
☐ Teacher Name K.
☐ I would not seek advice on technological pedagogical content knowledge from any classroom teacher on this list

☐ Send me a copy of my responses.

Powered by

Google Forms

https://docs.google.com/a.uky.edu/forms/d/151etw7klyAPRF6bNu09c_zBh9Z9aR9V6tLeZTgQ/edit
APPENDIX G

ITL INTERVIEW PROTOCOL

Introduction: Thank you so much for agreeing to be interviewed for my project. Based on our data gathered through survey, you have been identified as an informal teacher leader that helps lead classroom technology integration. This means that you have been identified as a central actor in the network of instructional technology guidance. You have been provided information about this research already, but before we get started, do you have any questions about the goal of this project?

Opening Questions: *These questions are designed to establish rapport with the interviewee and gather background on the ITL.*
1. You have been identified by your peers as a source of instructional technology advice, do you agree with this identification by your peers?
2. What is your comfort level with technology in the classroom?

Key Questions: *These questions are designed to answer the research questions and elicit responses that will guide the focus group discussion with the other ITLs.*
3. Do you feel that you are supported by your principal in leading instructional technology?
4. What type of support, if any, do you get from your principal for leading instructional technology?
5. What type of support do you think would be beneficial for your instructional technology leadership in your school?
6. What opportunities, if any, are provided to you in your school or by your principal for leading with instructional technology?
7. What types of opportunities could be provided to you, by your principal or school, that might help your current role as an informal instructional technology teacher leader?
8. What might help make you more effective in leading your peers with instructional technology?
9. Would you like to have more opportunities for instructional technology leadership provided to you?
10. Has your principal established any systems to help you as an informal instructional technology teacher leader? What are they and what are the results?
11. How have these systems helped you lead your peers with instructional technology?
12. What systems do you think would support you well in your role as an ITL?
13. What systems, developed by the principal, might encourage other teachers to be ITLs?

Closing Questions: *These questions are designed to wrap up the interview and gather any last thoughts from the ITL.*
14. What other reflections do you have on your principal in general or their support for teacher leadership in general?
15. Are there any other thoughts you would like to share pertaining to the topics we have covered in this interview?

**Closing:** Thank you, again, for providing me with your insights for my study. I will gather information from you and the other ITLs to determine when we will have the focus group.
APPENDIX H

PRINCIPAL INTERVIEW PROTOCOL

Introduction- Thank you so much for agreeing to be interviewed for my study. I especially appreciate your help in encouraging all faculty members completing the survey. After the faculty-wide survey, I was able to identify the ITLs. The ITLs in your school are ____________________. This means that, using a centrality analysis on the data provided by the school’s faculty, these teachers have been statistically identified as central actors in the network of instructional technology guidance. You have been provided information about this research already, but before we get started, do you have any questions about the goal of this project?

Opening Questions - These questions are designed to establish rapport with the interviewee and gather background on the ITL.
1. Are you surprised by any of the teachers identified as ITLs? Why is that?
2. What characteristics would you use to define a formal teacher leader? An informal teacher leader?
3. Do you think that these teachers have been vital to technology integration in your school?

Key Questions - These questions are designed to answer the research questions and develop rich data for the qualitative analysis.
4. What opportunities, if any, do you provide for all teachers in the building to increase technology integration?
5. What opportunities, if any, do you provide specifically for the identified ITLs in your building?
6. What opportunities would you like to provide for ITLs or teacher leaders in general?
7. Do these opportunities take time away from the ITL’s teaching responsibilities? Why/why not?
8. Have you established any systems to help strengthen informal instructional technology teacher leader? Could you tell me about them, what they are, and what they do?
9. After seeing the names of the identified ITLs, can you think of any other programs you might be able to develop to support these individuals to improve technology integration?

Closing Questions - These questions are designed to wrap up the interview and gather any last thoughts from the principal.
10. What other reflections do you have on your role in supporting the ITLs?
11. Are there any other thoughts you would like to share pertaining to the topics we have covered in this interview?

Closing: Thank you, again, for providing me with your insights for my study. I will be sharing the final report with you and your faculty members.
APPENDIX I

ITL OBSERVATION PROTOCOL

Date:___________
ITL Observed (pseudonym):_________________________

Site: _____________

Context: Activity observed (e.g., professional development, informal session, formal session, audience):

Duration of observation:

Location:

Audience/Participants:

Other relevant details on activity:

Observations on leadership activity and interpersonal correspondence:

Additional notes:
APPENDIX J

ARMSTRONG HIGH FOCUS GROUP INTERVIEW PROTOCOL

Introduction: Thank you so much for agreeing to be interviewed for my project, again. The goal of this focus group is to dive deeper into the same topics we discussed last time. Specifically, how has Principal Adrian supported you two individually as informal teacher leaders and how he strengthens teacher leadership in the building in general? I have already interviewed you two individually as well as Principal Adrian and I designed this protocol based on those interactions and data.

1. Are you surprised that you two were the highest ranking informal teacher leaders of ed-tech?
2. Abigail, how has your department been influential for you as an ITL? Do you feel that your department generally needs more help with ed-tech than perhaps other departments?
3. Do you all feel that each department looks inside itself for ed-tech leadership generally? How so?
4. Principal Adrian showed a lot about the structures you have in place for teacher leadership. I am talking about the Spacewalks as well as the Ignite sessions? The care/connect? I heard these terms, and he showed me the documents. How have those helped influence your teacher leadership?
5. Can you tell any specific stories from leading any of these sessions possibly in your first year? How did that feel? Do you feel that these structures/stories helped encourage you to be an informal TL in your school?
6. What type of logistical calculations are made for these structures? Does the school have to pay for subs for your TL?
7. What about time? This looks like a lot of extra work, but do you make it work fine? Any new teachers struggle with this TL structure?
8. Do either of you feel that the structures here are a bit excessive?
9. What about EdCamps? Have you done those? How did you feel about coming in Saturday mornings? Were you compensated? Was Principal Adrian at them as well?
10. How else has Principal Adrian (and others?) helped instill such a sense of culture that is clear? He seems to expect everyone to be tech-savvy and use these programs. How does he do that or how do others help do that?
11. For Abigail, how do you think your relationship is with other teachers given that you have no formal ed-tech role? People clearly come to you with questions. Do you think that would look quite different if you did have a formal role? Do you think that dynamic is different and unique and important?
12. Was there formal training for figuring out the ‘living documents’ that you all rely on? Or was it ask/figure it out?
13. What does the Ignite process look like in general
14. Principal Adrian said that he calls all teachers ‘leaders’. Does that help? Does that make a difference?
15. Do you think the abovementioned system is a different paradigm than most schools have?

**Next Steps:** I will be doing member-checking and sending you most of my Chapter 4 and all of Chapter 5 after completion and ask for your feedback. If you don’t respond, that’s fine, but otherwise you need to let me know.

**Closing:** Thank you all so much for participating. Any last thoughts to give me relating to these topics that have not been heard?
APPENDIX K

BRESSMAN HIGH FOCUS GROUP INTERVIEW PROTOCOL

Introduction: Thank you so much for agreeing to be interviewed for my project, again. The goal of this follow-up interview is to dive deeper into the same topics we discussed last time. Specifically, how has Principal Bain supported you individually as an informal teacher leader and how he strengthens informal teacher leadership in the building in general? I have already interviewed you individually as well as Principal Bain and I designed this protocol based on those interactions and data.

1. Are you surprised that you were the highest ranking informal teacher leaders of ed-tech?
2. Do you all feel that each department looks inside itself for ed-tech leadership generally? How so?
3. How has eating together played a role in informal teacher leadership for you and your colleagues?
4. How was the lunch expectation established? Was that Principal Bain?
5. That younger teacher that you were talking with- would you consider him another ITL? Why?
6. What type of logistical calculations are made for UKNextGen meetings? Does the school have to pay for subs for your involvement?
7. What about time? This looks like a lot of extra work, but do you make it work fine? Any new teachers struggle with this TL structure?
8. How else has Principal Bain (and others?) helped instill such a sense of culture that is clear? He seems to expect everyone to be tech-savvy and use these programs. How does he do that or how do others help do that?
9. How do you think your relationship with other teachers are different than relationships between the official education-technology person at your school? Why? People clearly come to you with questions. Do you think that would look quite different if you did have a formal role? Do you think that dynamic is different and unique and important?
10. During the faculty meeting, you stepped out to work with a student, what was that regarding?
11. Have you approached Principal Bain about adjusting the week scheduled?
12. Did you inform Principal Bain on any of the issues he brought up in the meeting?
13. Last time you said that Principal Bain is very good at identifying the strengths of individual teachers- how does he do that exactly?
14. How has the Summit Learning platform had an impact on your role as an informal teacher leader in the building?

Next Steps: I will be doing member-checking and sending you most of my Chapter 4 and all of Chapter 5 after completion and ask for your feedback. If you don’t respond, that’s fine, but otherwise you need to let me know.
Closing: Just wonderful, thank you so much for participating. Any last thoughts to give me relating to these topics that have not been heard?
APPENDIX L
CARTER MIDDLE FOCUS GROUP INTERVIEW PROTOCOL

Introduction: Thank you so much for agreeing to be interviewed again for my project. The goal of this focus group is to dive deeper into the same topics we discussed previously in the individual interview. Specifically, how has Principal Cortes supported you three individually as informal teacher leaders and how has she strengthened informal teacher leadership in the building in general? I have already interviewed you three individually as well as Principal Cortes and I designed this protocol based on those interactions and data.

1. Are you surprised that you three were the highest ranking informal teacher leaders of ed-tech?
2. Do you all feel that each department looks inside itself for ed-tech leadership generally? How so?
3. Do you feel that your geographic location in the building as had an important role in your informal teacher leadership? Can you provide some examples of that?
4. Would you all say that Principal Cortes has been an ed-tech model in any way?
5. I heard a lot about in-house or in-district opportunities for leading ed-tech. Have you heard a lot of other teachers jumping at these opportunities? How do others feel about these opportunities?
   a. Why do you like volunteering for these opportunities?
6. So I’ve heard KYSTE mentioned a few times- how many of you do that? Does that influence your informal teacher leadership? How?
7. What type of logistical calculations are made for participating in these out-of-school opportunities? Does the school have to pay for subs for you?
8. What about time? This looks like a lot of extra work, but do you make it work fine? Any new teachers struggle with this TL structure?
9. Would you like if there was a pay structure for informal teacher leadership? What do you think that may look like?
10. Are there any formal structures for informal teacher leadership?
11. All of you mentioned an “open-door policy” for Principal Cortes, what does that look like specifically?
12. Principal Cortes mentioned Hope Street Group- have any of you looked into that or taken part? Any interest in doing it later?
13. What about any other state-wide networks?
14. What about EdCamps? Have you done those? How did you feel about coming in Saturday mornings? Were you compensated? Was at them as well?
15. How else has Principal Cortes (and others?) helped instill such a sense of culture that is clear? He seems to expect everyone to be tech-savvy and use these programs. How does he do that or how do others help do that?
16. Principal Cortes mentioned homing in on individual teachers to work with on certain things. How does she do that? Have you seen that? What does it look like?
17. When you go to a conference, such as KYSTE, and Principal Cortes said when you come back you are expected to share what you learned. How do you do that? What does it look like?

18. Do you feel that when you guys do these things- it encourages others to then do it?

19. Has anyone participated in ECET2?

20. How does Principal Cortes establish a culture of informal teacher leadership?

21. Do you feel that when teachers come to you it’s different than if they went to the formal district-level education-technology leader? How so?

22. Do you feel, from talking to colleagues at other schools, that the culture here for informal teacher leadership is different than in other schools? How so?

23. Some of you have mentioned the “open-door” policy. What does that look like?

24. How did you come to just “asking” things or throwing ideas at Principal Cortes and seeing what she’d want to do?

25. Principal Cortes said she spends a lot on professional development- how do you see that play out?

26. How would you all see your skills as informal teacher leaders play out in action?

27. A lot, according to Principal Cortes, is going to conferences. Do you agree with that?

28. What does teacher leadership look like to the superintendent? How does he support that?

29. Learning walks. Do you do those? What would those look like? The superintendent mentioned them.

30. How would the other teachers see you as a leader with an official title? How would that change things?

31. Considering today’s breakout groups- how would those look different if you had formal titles?

Next Steps: I will be doing member-checking and sending you most of my Chapter 4 and all of Chapter 5 after completion and ask for your feedback. If you don’t respond, that’s fine, but otherwise you need to let me know.

Closing: Thank you all so much for participating. Any last thoughts to give me relating to these topics that have not been heard?
APPENDIX M

BRESSMAN HIGH SOCIAL NETWORK MAP
APPENDIX N

CARTER MIDDLE SOCIAL NETWORK MAP
REFERENCES


Bolivar, J. M. (2009). Distributed leadership and social networks in the school-based development of the international baccalaureate’s middle years program in a Venezuelan k-12 (Doctoral dissertation). Retrieved from ProQuest. (Accession No. 3389297)


doi:10.1177/0013161X13492795


Waters, T., Marzano, R. J., & McNulty, B. (2003). *Balanced leadership: What 30 years of research tells us about the effect of leadership on student achievement.* A working paper. Mid-Continent Regional Educational Lab: Aurora, CO.


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