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Principals as Instructional Leaders: Building Knowledge of Applied Learning to Confidently Lead Implementation

Janell Lynn McClure
University of Kentucky, janellmcclure@gmail.com
Author ORCID Identifier:
https://orcid.org/0000-0002-2915-8819
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Janell Lynn McClure, Student

Dr. Beth Rous, Major Professor

Dr. John Nash, Director of Graduate Studies

PRINCIPALS AS INSTRUCTIONAL LEADERS: BUILDING KNOWLEDGE OF APPLIED LEARNING TO CONFIDENTLY LEAD IMPLENTATION

DISSERTATION

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

By

Janell Lynn McClure

Lexington, Kentucky

Director: Dr. Beth Rous, Professor of Educational Leadership Studies

Lexington, Kentucky

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https://orcid.org/0000-0002-2915-8819

ABSTRACT OF DISSERTATION

PRINCIPALS AS INSTRUCTIONAL LEADERS: BUILDING KNOWLEDGE OF APPLIED LEARNING TO CONFIDENTLY LEAD IMPLEMENTATION

Principals need to understand best practices and research-based strategies that foster student success and that align to their instructional expectations and professional goals. Some of those practices include applied learning strategies such as integrated learning, student-driven learning, and authentic applications. Unfortunately, little professional learning, specifically for principals, is made available on the topic of instructional leadership, current strategies, or applied learning in general. As a result, school leaders continue to follow a traditional instructional model that includes teacher-directed instruction, student recall of information, and standardized tests as measures of content mastery.

This dissertation was a mixed-methods action research study. The purpose of this MMAR study was to identify and employ professional learning resources for principals that increased their perceived knowledge of applied learning and impacted their instructional leadership plans for classroom expectations and professional goals. The intended outcome was to build principals' confidence in leading applied learning implementation in their local schools.

Findings indicated that professional learning designed specifically for principals increased their knowledge of applied learning strategies through training, observations, and collaboration. The results further showed that the professional learning impacted principals' inclusion of applied learning in their expectations and goals and indicated that principals' confidence to lead applied learning implementation in their schools increased after participating in the professional learning.

These findings suggest that principals benefit from professional learning that strengthens their instructional leadership capacity to implement research-based strategies such as applied learning. By building principals' knowledge in understanding, recognizing, and leading applied learning, school districts can influence instructional changes at the school and classroom level.

KEYWORDS: Instructional Leadership, Applied Learning, Professional Learning, Instructional Expectations, Principal Leadership

Janell Lynn McClure

Janell Lynn McClure

July 20, 2023

Date

PRINCIPALS AS INSTRUCTIONAL LEADERS: BUILDING KNOWLEDGE OF APPLIED LEARNING TO CONFIDENTLY LEAD IMPLEMENTATION

By

Janell Lynn McClure

Dr. Beth Rous
Director of Dissertation

Dr. John Nash
Director of Graduate Studies

July 20, 2023
Date

DEDICATION

To husband, Ken, and my dog, Winston, for always staying by my side.

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I succeeded in this doctoral journey due to the help and support of many people. First, I want to thank my committee chair, Dr. Beth Rous, for her calm demeanor, guiding questions, and continued patience. Often uncertain of what to do, I found comfort in knowing that she would provide subtle encouragement, a gentle nudge, or a full-on push depending on what I needed. I'm grateful to my entire committee for sharing their thoughts and expertise throughout this process, and especially for taking personal time during the summer to sit for my defense. I extend special thanks to Dr. Zixue Tai for serving as my outside examiner, even when off-contract and visiting China.

This experience was even more possible due to the ongoing support of my cohort. I remember our program orientation when EDL staff and students suggested that we start a back channel. From our first class to the present day, we have talked, shared, complained, laughed, cried, collaborated, and encouraged one another. They are friends forever, and I look forward to celebrating doctoral success with every one of them. I also want to thank my work colleagues and neighborhood friends who cheered me along with every milestone.

Most importantly, though, I am grateful for my family. Thanks to my mother who completed her own doctoral journey years ago and provided the support, confidence, advice, and love that I needed every step of the way. To my sister whose own writing perseverance encouraged me to do the same. And to my wonderful husband, who gave me ample time, complete understanding, listening ears, and supportive hugs when I struggled to continue or doubted my efforts. His undying love and friendship have carried me through yet another monumental moment in my life. Thanks, honey – I love you more.

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A primary responsibility of Georgia school principals is to provide instructional leadership through a shared vision of teaching and learning that meets the needs of all students ("Georgia Department of Education LAPS standards reference sheet: Performance standards and sample performance indicators," 2014). To accomplish this, principals need to understand best practices and research-based strategies that foster student success and that align to their instructional expectations and professional goals. Some of those practices include applied learning strategies such as integrated learning, student-driven learning, and authentic applications. Unfortunately, little professional learning, specifically for principals, is made available on the topic of instructional leadership, current strategies, or applied learning in general. As a result, school leaders continue to follow a traditional instructional model that includes teacher-directed instruction, student recall of information, and standardized tests as measures of content mastery.

In this chapter, I provide the purpose for this study, the study context, and findings from the diagnosis phase which informed the problem of practice. I also present organizational data, literature reviews, and an overall study plan.

Purpose of the Study

The Leader Keys Effectiveness System (LKES) is the evaluation tool for Georgia school administrators and consists of eight standards. The language in standard one, instructional leadership, describes a leader that "fosters the success of all students by facilitating development, implementation, and evaluation of a shared vision of teaching and learning that leads to school improvement" ("Leader keys effectiveness system: Fact

sheets," 2014, p. 7). Two performance indicators for this standard include making decisions to improve classroom instruction by analyzing current instructional practices and being aware of research-based instructional best practices to lead teachers in the implementation of those practices in the classroom ("Leader keys effectiveness system: Fact sheets," 2014).

The LKES evaluation tool lists professionalism as standard seven, a definition that includes "fostering the success of students by…engaging in continuous professional development" ("Leader keys effectiveness system: Fact sheets," 2014, p. 34). Three of the performance indicators for standard seven suggest that leaders assume responsibility for their own professional learning, remain current with research-based best practices, and maintain a high level of professional knowledge ("Leader keys effectiveness system: Fact sheets," 2014). Additionally, the LKES tool describes professional development as principals participating in a variety of activities such as observing other principals, attending professional learning with their teachers, and visiting other schools.

Studies on research-based instructional practices list creativity, critical thinking, challenging tasks, and the generating and testing of hypotheses as having large effect sizes on student learning (Darling-Hammond et al., 2021; Hattie, 2009; Hilton, 2015; Lin-Siegler et al., 2016; Marzano, 2009). Other effective strategies include making learning active, such as participating in project-based learning (Blake, 2007; Darling-Hammond et al., 2021; McLeod, 2017; Noguera et al., 2015), solving real-world problems (Blake, 2007; Campbell et al., 2010; Darling-Hammond et al., 2021; Mansilla, 2019; McLeod, 2017; Mehta, 2022; Noguera et al., 2015), and giving students autonomy over their learning (Campbell et al., 2010; Darling-Hammond et al, 2021; Mansilla, 2019;

Mehta, 2022; Noguera et al., 2015). In the Cobb County School District (CCSD), these practices fall under the term applied learning.

Based on the LKES tool, principals should serve as instructional leaders and model professional growth by setting their visions, expectations, and goals for classroom use of research-based, teaching and learning practices; yet in the CCSD, little professional learning specifically addresses applied learning strategies and how to implement them across all content areas. I, therefore, designed this study to identify and employ professional learning resources for principals that increase their knowledge of applied learning strategies and impact their instructional leadership plans for classroom expectations and professional goals. The intended outcome was to build principals' confidence in leading applied learning implementation in their local schools. The overall research question guiding this study was: *How can professional learning resources increase principals' perceived knowledge of applied learning and impact their instructional leadership plans thus building confidence to lead implementation?*

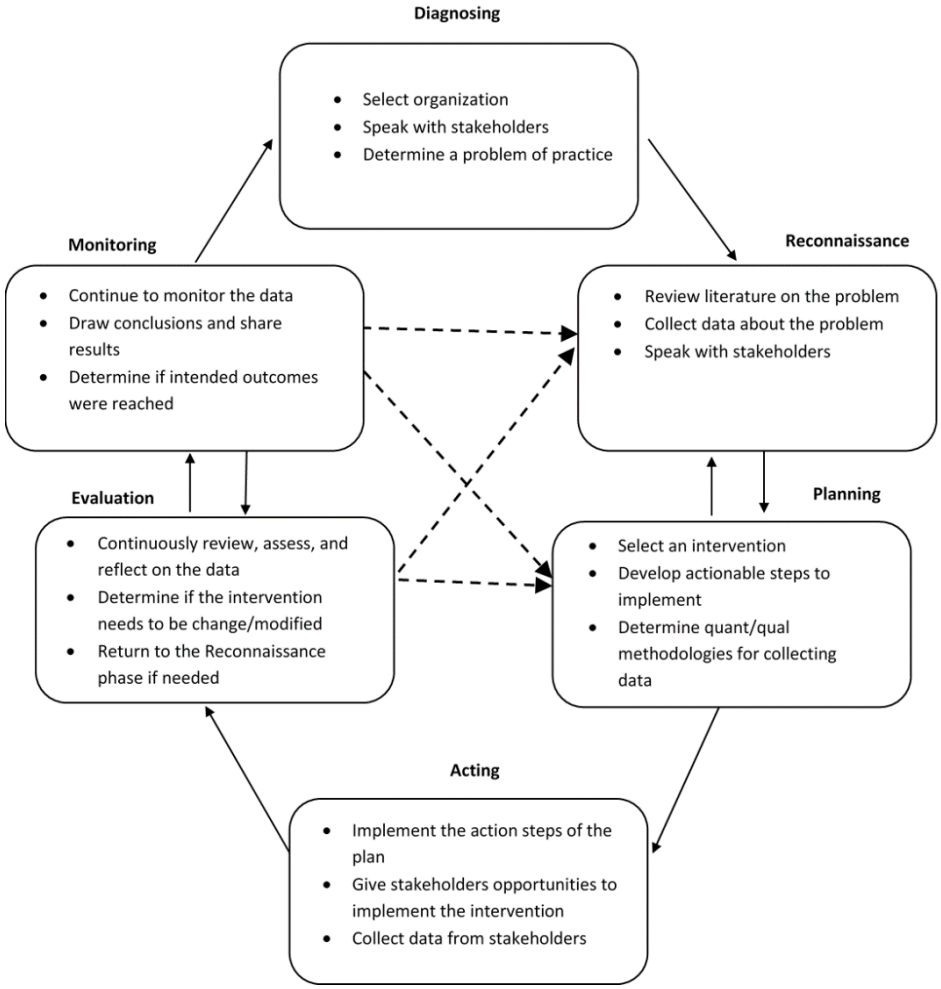
MMAR Framework

A mixed-methods action research framework (MMAR: Ivankova, 2015) consists of six phases (Figure 1.1), starting with diagnosis, where researchers speak with organizational stakeholders to define a problem of practice. In the next phase, reconnaissance, researchers collect data and review literature to further confirm and define the problem of practice identified in diagnosis. Based on data analyses in reconnaissance, researchers engage in the planning phase which includes crafting a step-by-step strategy for implementing the intervention and methodologies for evaluating its effectiveness. The acting phase follows with the implementation of the intervention plan,

after which is the evaluation phase. This consists of the collection, review, and analyses of data to determine if the intervention effectively addressed the problem of practice.

Figure 1.1

Phases of a Mixed Methods Action Research Process



Note: This figure is adapted from *Mixed Methods Applications in Action Research: From Methods to Community Action* (p. 142), by N.V. Ivankova, 2015, Sage. Copyright 2015 by Sage Publications, Inc.

Finally, the last phase is monitoring which includes the ongoing assessment and analysis of the intervention to determine if it met the intended objectives and outcomes of the study or whether the researcher needs to revisit reconnaissance for additional data.

Study Context

This MMAR study occurred in the Cobb County School District (CCSD) in Marietta, Georgia. The second-largest district in the state and the 25th-largest in the country, CCSD hosts 106,703 students in 109 traditional schools and is the largest employer in the county ("The district", n.d.). The mission of the CCSD is One Team, One, Goal: Student Success, and the vision statement is *a school district of excellence where all students succeed* ("The district," n.d.). The Superintendent started in 2014 having previously served as the CCSD's Deputy Superintendent for Operations from 2011-2014 and as the Chief Technology Officer from 2006-2014. His three priorities have remained the same since assuming the superintendency: (a) make Cobb the best place to teach, lead, and learn; (b) simplify the foundation of teaching and learning to prepare for innovation; and (c) use data to make decisions (Cobb County School District, n.d.). The Superintendent's Executive Cabinet consists of seven Chiefs who lead the following divisions and offices: School Leadership; Staff; Finance; Strategy and Accountability; Technology and Operations; Human Resources; and Academics ("Leadership," n.d.).

The district hosts 66 elementary schools, 26 middle schools, and 17 high schools and employs over 17,000 people of which more than 7,300 are teachers and 10,160 are certificated in their area of expertise such as subject area, support area, or leadership. At the time of this study, approximately 41% of all students qualified for free and reduced lunch, and the CCSD graduation rate was 87.4% ("The district," n.d.).

Stakeholders

This study involved the School Leadership and Academic Divisions. The School Leadership Division consisted of a Chief School Leadership Officer and seven Assistant Superintendents, three of whom oversaw elementary schools, two oversaw middle schools, and two oversaw high schools. The Assistant Superintendents evaluated the school principals each year using the Georgia Department of Education's Leader Keys Effectiveness System (LKES), a tool comprised of eight professional standards, two of which are instructional leadership and professionalism ("Georgia Department of Education LAPS standards reference sheet: Performance standards and sample performance indicators," 2014).

The Academic Division included the Chief Academic Officer and two Assistant Superintendents, the Assistant Superintendent of Teaching and Learning and the Assistant Superintendent of Teaching and Learning Support and Special Services. The former supported the Offices of Instruction and Innovative Practice, Federal Programs and ESOL, Assessment and Personalized Learning, and Applied Learning and Design. The latter led the Offices of Special Education, Special Education Compliance, and Student Assistance Programs.

The School Leadership Assistant Superintendents and principals informed and were informed by this study.

Researcher Role

At the time of this study, I served as the Academic Division's Director of Applied Learning and Design (ALD) and supported eight departments: Career, Technical, Agricultural Education (CTAE), Digital Transformation, General

Music/Choral/Dance/Theatre, Instrumental Music, Learning Resources, Library Media Education, STEM and Innovation (Science, Technology, Engineering, and Math), and Visual Arts. The ALD team consisted of 22 certified and classified staff for whom I provided system support, professional learning, and leadership development. I also worked closely and collaboratively with the Office of Instruction and Innovative Practice, which included the departments of Early Learning, English Language Arts, Health and PE, Math, Professional Learning, Science, Social Studies, and World Languages. Together with that Office, and in conjunction with others in the Academic Division, the ALD departments trained, supported, and modeled research-based instructional practices for teachers and leaders.

Because of my district-level role in the organization, and due to my 25 years in the district, potential biases existed regarding classroom practices, professional learning, and instructional leadership at the local schools. These inherent opinions or perspectives could result in limitations to the study.

Diagnosis Phase

For the diagnosis phase of this study, I spoke to two School Leadership Assistant Superintendents and six K-12 school principals. Additionally, I captured organizational data about the establishment of the Applied Learning and Design Office (ALD) and the process we used for defining applied learning in the CCSD. Finally, I studied peer-reviewed literature on instructional leadership and applied learning.

Stakeholder Perspectives

I spoke to two School Leadership Assistant Superintendents (SLAS), one who led elementary schools and one who led middle, and six principals - three elementary, two middle, and one high school. The principals represented a wide range of educational experiences and perspectives, and their schools varied in geographical locations across the district. Through individual phone calls or video chats, I spoke with each person about instructional leadership and leading change. The conversations lasted approximately 20 minutes.

School Leadership Assistant Superintendents

The Elementary SLAS assumed the role in June 2020 having previously served as an elementary school principal in the West Cobb area. That school served 944 students that were 54% White, 27% Black, 10% Hispanic, and 3% Asian ("Georgia school grades report," n.d.). At the time of this study, the Elementary SLAS oversaw 22 elementary school principals located primarily on the west side of the county, seven of whom received Title I funds.

The Middle SLAS joined the CCSD in 2015 as a district-level supervisor, was promoted to a director-level position in 2016, and then entered the SLAS role in 2019. He/she oversaw 14 middle school principals in the East Cobb area, six of whom received Title I funds.

I asked them the following questions during the diagnosis phase:

1. How often are principals discussing instructional practices with you?
2. What kinds of questions do they ask, or challenges do they pose, regarding instructional practices?
3. What professional learning do you provide to principals about leading change?

4. Do you think principals know how to lead change?

Through these conversations, the following emerged. Both SLAS' identified a need to speak with principals about effective instructional practices. The Middle SLAS identified the following issues or concerns to be addressed. First, current principals did not teach using student-led strategies, therefore they did not know how to lead it. Second, if principals established concrete steps for their instructional expectations, then change would happen. Third, principals who employed the Professional Learning Community process with fidelity would eventually dialogue with teachers about instruction. Finally, school leaders needed to set expectations around best practices, such as engagement and two-way feedback, which would consequently lead to change.

The Elementary SLAS stated that elementary principals thought classroom instruction needed to change and shared the following statements based on personal experience. Teacher resistance made leading change one of the hardest tasks for principals. Teachers at the primary grade levels accepted change more readily than those in the intermediate grades, specifically fourth and fifth. Change takes time, buy-in, and trust-building to be effective, and school culture contributes to accomplishing those goals. Overall, the Elementary SLAS believed that principal training would be beneficial.

Principals

The six principals represented three elementary schools, two middle schools, and one high school. Elementary principal one started at his/her school in the North Cobb area in July 2020, having previously served seven years as the principal of an East Cobb elementary school. The principal's current school served 862 students, of which 41% were White, 29% Black, 17% Hispanic, and 4% Asian ("Georgia school grades report,"

n.d.). Elementary principal two was starting his/her tenth year at a Northeast Cobb school, the only school he/she ever worked as principal. The school population consisted of 671 students, of which 76% were White, 7% Black, 7% Hispanic, and 5% Asian ("Georgia school grades report," n.d.). Elementary principal three worked as a principal from 2012-2018 before accepting a director position in the CCSD's Academic Division. He/she stayed in that role from July 2018-June 2020 before returning to a principalship at a Northeast Cobb elementary school that served 482 students of which 64% were White, 12% Black, 15% Hispanic, and 3% Asian ("Georgia school grades report," n.d.).

Middle school principal one started at a school in the Southwest Cobb area in July 2016. The school served 1,039 students, of which 5% were White, 36% Black, and 54% Hispanic ("Georgia school grades report," n.d.) and received Title I funds. Middle school principal two first worked as principal at an East Cobb elementary school, then moved to an elementary school in the South Cobb area, before being named principal of an East Cobb middle school in July 2018. This school represented one of the larger middle schools in the CCSD and served 1,303 students, of which 66% were White, 5% Black, 6% Hispanic, and 19% Asian ("Georgia school grades report," n.d.).

The high school principal started at an East Cobb high school in July 2019 after being a middle school principal in the South Cobb area from January 2015-June 2019. The high school served 2,190 students, of which 26% were White, 39% Black, 19% Hispanic, and 13% Asian ("Georgia school grades report," n.d.).

I asked them the following questions during the diagnosis phase:

1. Do you believe that a change is needed in instructional practices? If not, why not?

2. If so, what instructional practices do you see most often, and what do you believe needs to change?
3. How are you leading change?
4. What training, if any, do you need to lead change more effectively?

All six principals agreed that instructional practices needed to change, and they wanted to see more student-led strategies, such as engaging, relevant, and problem-based activities. During classroom observations, however, they did not witness these strategies used pervasively in their schools. Elementary principal one said that during classroom observations, he/she saw lots of teacher-directed instruction, teachers talking, and Teachers Pay Teachers worksheets. Elementary principal three stated that the lessons observed in classrooms were not engaging or active, but rather 90% teacher led. He/she also mentioned that teachers provided coloring sheets and dot-to-dot puzzles once students completed their work. Middle school principal one wanted teachers to focus more on relevance in the classroom, relating learning to students' lives and making it meaningful through student-led, project-based learning. The high school principal also wanted more student-centered, active learning and not just "sit and get," recounting a classroom observation where an AP Computer Science teacher lectured for a full 90-minute block, and students never spoke.

Some principals admitted not knowing where to begin to lead change and believed that other principals would not know either because they lacked the knowledge of current best practices even though they recognized the urgency to minimize teacher-led instruction, static worksheets, and disengaged students. Elementary principal two admitted that instructional change would require some shift as a leader, while the high

school principal stated that the entire administrative team would need to understand best practices when monitoring and evaluating classroom instruction. They shared that some school leaders and veteran teachers did not know how to teach in student-led classrooms and therefore defaulted to teacher-directed practices such as lectures, worksheets, and note-taking that were familiar and comfortable. Of the six principals involved in the diagnosis phase, five felt that professional learning would help them shift teacher-led practices towards more engaging strategies.

Establishment of the Applied Learning and Design Office

The second data source for diagnosis was the establishment of the Applied Learning and Design Office (ALD) and the CCSD definition of applied learning. In September 2019, the Chief Academic Officer (CAO) decided to divide and combine the 13 departments in the Instruction and Innovative Practice Office with the three departments in the Digital and Multimedia Learning Office. After restructuring, each Office contained eight departments, and the CAO renamed the Digital and Multimedia Learning Office, of which I served as Director at the time, to Applied Learning and Design. Because the combination of departments in the ALD Office had not previously existed, I worked with the team to identify our purpose and mission.

Defining Applied Learning

In August 2021, the ALD team met offsite for a day-long retreat to develop the Office's purpose and mission. Using a technology tool called Padlet (San Francisco, CA) to visually capture the team's thoughts in real-time, I created two columns, one titled *Applied Learning* and a second labeled *Design*, to represent the dual areas of the Office name. I asked each ALD member to first record on the Padlet all the words they thought

of when hearing *applied learning*. Next, I shared several definitions of applied learning with the group and asked them to read each one, highlight anything that resonated with them, and then add any of those highlighted words or phrases to the applied learning column of the Padlet, if not already listed. I then asked ALD members to record all the words that came to mind when they heard *design* and add those to the designated Padlet column. Once finished, the team watched a video on instructional design, noted anything that resonated with them while watching, and added any additional words to the design column of the Padlet, if not already represented (Table 1.1).

ALD team members then formed four groups, and I asked each one to review all the language under both columns of the Padlet and use it to craft purpose and mission statements for the ALD Office. Each group brainstormed, drafted, and revised their statements on chart paper, and once finished, reflected on their work, and considered the following questions:

- Does the purpose statement represent applied learning *and* design?
- Does the mission statement capture the overall purpose of the Office?
- Does the purpose statement contribute to an elevator pitch?

Table 1.1 *Results from ALD Padlet Activity on Applied Learning and Design*

Applied learning	Design
Synthesis - a higher level of Bloom's	Innovative student experiences
Highest graduation rates in the district	Problem-solving
Experiential	educational intrigue
Using core content in the real world	Creation of Educational Opportunities
DOK 4 thinking	Engagement that requires students to
Change agents	think/problem solve.
Connecting	Balance-formal; informal; radial
The "do" of education	instructional design that facilitates student-
Balance	centered learning
Doing	solving problems in a logical and
Innovation	calculated manner
The why	Innovative educational experiences
Practice	Goal of design is Unity
Actions	Creative Space
Passion	A method of organization
Real-world experience	Engage
Integrative learning	Collection
Authentic	“Human” experience
Performance-based	the learning is process-oriented
Opportunity	Creating an intentional environment for
Visible	learning to happen.
Driving integration	Harmony; emphasis
Student-led	Variety of Perspectives
Multi-faceted services	vehicle for learning
Kinesthetic learning	Different solutions
The reason many kids stay in school	Learning-centered perspective (vs.
Experiential	teacher-centered perspective)
Synthesis	iterative process
Exciting	Activates unique talents
What drives innovation and ideas	Range of outcomes
Creative, artistic, supplemental learning,	it is the approach to learning, focusing in
hands-on learning, fun	on HOW you teach/ facilitate instruction
Relevant	Intentional
Independent	Doing that drives learning
Growing student thinkers	Essential to student development
Embedded learning	Intention!!! The meaning of design
Soft skill development	Creating opportunities, physical and
Contribute	mental space, for learning
Adds context and relevance	Different modes of thinking
Application of what is gained	Show what you know
Engaging in direct application	Ways to engage
Synthesis of theoretical learning	Success
	Creativity

Table 1.1 Continued	
Applied learning	Design
Application occurs inside and outside the classroom Experiences that get learners thinking, collaborating, and communicating Place-based learning Real-world, student-centered, high impact	

With draft purpose and mission statements created, each group completed a gallery walk to read other groups' statements and used sticky notes to comment on what they liked or questioned about each one. When finished, each group returned to their original statements and made modifications based on what they liked from other groups and from any sticky note comments left for them. Finally, a representative from each group read the final versions of their statements out loud to the whole team.

Taking each group's purpose, mission, and sticky notes into consideration, we spent several months editing, combining, and revising until we formed one, collective purpose statement, *The purpose of the ALD Office is to develop integrated, student-driven learning experiences through authentic applications that engage critical thinking and creative exploration,* and agreed upon the mission of *doing drives learning.*

Literature

Research on instructional leadership, leading instructional implementations, the science of learning, and traditional practices versus research-based instructional strategies informed the problem of practice. I also reviewed literature on the characteristics of applied learning and common strategies for classroom use. Of the 12 education databases

available in the University of Kentucky's online library, I used Education Database (ProQuest) and ERIC (Educational Resources Information Center) [EBSCOhost] to find research. Keywords included instructional leadership, research-based strategies, deeper learning, applied learning, project-based learning, integrated learning, student-driven learning, student agency, and authentic applications. I employed variations of these words and phrases while often supplementing the searches with keywords like public education, K-12 education, or education, to further narrow results.

Instructional Leadership

Murphy et al. (2006) suggested a learning centered leadership framework which consisted of eight domains and 31 dimensions that described the actions, behaviors, and practices of strong instructional leaders. Among those were developing and setting a vision, possessing knowledge of the instructional program, and establishing communities of learning that include professional development. Leaders accomplish this by modeling behaviors, visiting classrooms, and maintaining a high level of professional knowledge. These leaders stay actively involved in all instructional aspects of the school to influence change and improve practice. "Learning-centered leaders are the catalysts in school-based efforts at continuous improvement. They understand and communicate that complacency is the enemy of improvement, that the status quo is more tightly linked to decline than to growth" (p. 24).

Robinson et al. (2008) conducted a study comparing the impact of transformational and instructional leadership practices on student outcomes. Three of the five leadership dimensions identified included the establishing and setting of goals and expectations, direct involvement in the instructional program, and promoting and

participating in professional development. Some of the descriptors included classroom observations and feedback, being "leading learners" of their school, and serving as knowledge experts (p. 663). "The leadership in higher-performing schools was reported by teachers to be…more focused on teaching and learning, to be a stronger instructional resource for teachers, and to be more active participants in and leaders of teacher learning and development" (p. 658).

Hitt and Tucker's (2016) review and synthesis of research on leader practices, which included Murphy et al. (2006) and Robinson et al. (2008), resulted in a unified framework comprised of domains and "bundles of activities" (Leithwood, 2012, p. 5) that effectively impacted student achievement. The framework consisted of five domains representing 28 practices, but for the purpose of this study, the first, second, and fourth domains were most applicable. The first domain, establishing and conveying the vision, included a shared mission and vision and goals and expectations. In this domain, another dimension was modeling aspirational and ethical practices which included the leader not only espousing change but modeling those practices as well.

The second domain was building professional capacity which included the leader developing others as well as themselves, often side by side. By doing so, the leader built their professional knowledge capacity while earning the trust of their teachers as an instructional leader (Murphy et al., 2006; Robinson et al., 2008). Additionally, leaders provided ongoing opportunities for teachers to learn and created communities of practice from which they can learn from one another, foster adult learning, and provide job-embedded practices (Murphy et al., 2006; Robinson et al., 2008). The final dimension of this domain was engendering responsibility for learning that also included setting goals at

the individual teacher level using baseline data. “Leaders should assume a positive mindset for growth, invite teachers to use innovation in meeting the goals, encourage teachers to have high self-expectations, and promote an environment in which teachers assume responsibility for meeting expectations” (Hitt & Tucker, 2016, p. 552).

The fourth domain was facilitating a high-quality learning experience for students which again emphasized the need for leaders to remain the building experts in curriculum and instruction, so they clearly understood the classroom environment and the challenges presented there. By staying actively involved in the instructional program, leaders influenced practice and affected change by observing classrooms, providing feedback, and monitoring expectations (Murphy et al., 2006, Robinson et al., 2008). Dimensions within this domain also included leaders who ensured that students were engaged in the learning experience, who expected rigorous instruction for all students, and again, who maintained a deep knowledge of effective teaching practices (Hallinger & Murphy, 2012; Murphy et al., 2006, Robinson et al., 2008).

Based on these frameworks and additional research, some characteristics of instructional leadership included leading curriculum and instruction, setting clear visions and expectations, providing professional learning, and modeling life-long learning and change (Devos & Bouckenooghe, 2009; Edmonds, 1979; Hallinger, 2003; Hitt & Tucker, 2016; Leithwood & Montgomery, 1982; Murphy et al., 2006; Ovando & Ramirez, Jr., 2007; Robinson et al., 2008). Similarly captured in standards one and seven of the Leader Keys Effective System (LKES) for Georgia school administrators, these characteristics influence the successful implementation of instructional best practices that improve teaching and learning in the classroom (“Leader keys effectiveness system: Fact sheets,”

2014). Consequently, principals as instructional leaders impact student achievement by working with and through their classroom teachers (Devos & Bouckenooghe, 2009; Hallinger, 2003; Hitt & Tucker, 2016; Murphy et al., 2006; Quinn, 2002; Robinson et al., 2008).

Leading Curriculum and Instruction. School principals serving as instructional leaders will plan, coordinate, and evaluate teaching and learning through regular classroom visits that immerse them in the teachers' instructional approaches and behaviors (Edmonds, 1979; "Innovative pathways to school leadership," 2004; Leithwood & Montgomery, 1982; Murphy et al., 2006; Ovando & Ramirez, Jr., 2007; Robinson et al., 2008). By actively engaging in curriculum and instruction, principals can evaluate teaching and learning practices and enhance them by providing feedback and professional learning opportunities (Devos & Bouckenooghe, 2009; Hitt & Tucker, 2016; Murphy et al., 2006; Shinkfield, 1994).

Clear Visions and Expectations. Instructional leaders establish and communicate clear visions and expectations for teaching and learning in classrooms (Devos & Bouckenooghe, 2009; Hallinger, 2003; Hitt & Tucker, 2016; Ovando & Ramirez, Jr., 2007; Robinson et al., 2008). This begins with developing, articulating, and operationalizing an instructional vision that includes goals and objectives for impacting student achievement (Hitt & Tucker, 2016; Leithwood, 2012; Murphy et al., 2006, Robinson et al., 2008). Principals then identify research-based instructional strategies aligned with their visions to establish teacher expectations for implementation (Ovando & Ramirez, Jr., 2007; Robinson et al., 2008; Zimmerman, 2006).

Professional Learning. Principals as instructional leaders craft professional learning plans for teachers each year that build professional capacity (Hitt & Tucker, 2016; Murphy et al., 2006; Ovando & Ramirez, Jr., 2007; Robinson et al., 2008). Based on their established instructional vision and expectations, principals provide professional development sessions that focus on building teachers' skills and knowledge for implementing the research-based best practices communicated in their goals and objectives and as aligned to the evaluation system (Hitt & Tucker, 2016; Ovando & Ramirez, Jr., 2007; Robinson et al., 2008). Principals synthesize and determine the topics addressed in whole-group training but also consider and implement Professional Learning Communities, or communities of practice, for targeted and individualized coaching (Hitt & Tucker, 2016; Murphy et al., 2006, Robinson et al., 2008; Westberry and Hornor, 2022).

Modeling Life-Long Learning and Change. Principals serve as change agents when leading the implementation of their instructional vision and expectations; therefore, instructional leaders need to stay abreast of best practices so that teachers view them as building experts on teaching and learning (Hallinger, 2003; Hallinger & Murphy, 2012; Hitt & Tucker, 2016; Leithwood, 2012; Murphy et al., 2006, Robinson et al., 2008). These principals purposefully model risk-taking and growth mindsets by actively pursuing professional learning opportunities that build their instructional self-confidence, oftentimes side-by-side with the teachers as a collective commitment to instructional expectations (Andrews & Soder, 1987; Chesley & Jordan, 1996; Hitt & Tucker, 2016; Murphy et al., 2006; Quinn, 2002; Robinson et al., 2008). This allows principals to gain and earn trust, which represents the first step to influencing and mobilizing others to

follow. Leading by example builds credibility, which proves necessary when introducing and implementing strategies for effective instruction (Hallinger, 2003; Hitt & Tucker, 2016; Zimmerman, 2006).

Leading Implementation as an Instructional Leader

In addition to participating in professional learning about best practices, principals also need to improve their change readiness skills (Hallinger, 2003; Murphy et al., 2006; Zimmerman, 2006). Once they establish and communicate their instructional visions and expectations, and they determine their goals and objectives, then principals align their leadership behaviors to the expected outcomes (Devos & Bouckenooghe, 2009; Hitt & Tucker, 2016; Murphy et al., 2006; Quinn, 2002; Robinson et al., 2008).

Principals' continual articulation of teaching and learning expectations, including specific classroom practices, proves essential to implementing their instructional visions (Chesley & Jordan, 1996). Because traditional teacher-led practices are deeply embedded in today's schools, and student-led strategies are challenging to implement, principals serving as change agents must model language and behaviors aligned to student-engagement expectations and learning outcomes while compelling and engaging teachers in the organization's vision for change (Hallinger, 2003; Hitt & Tucker, 2016; Murphy et al., 2006; Quinn, 2002).

Traditional Instructional Practices vs Research-Based Strategies

Teacher-directed instruction prevails in our nation's schools even though research shows that active learning is a more effective practice (Blake, 2007; Evans & Boucher, 2015; Klein, 2005; Metha, 2022; Mims, 2003; Noguera et al., 2015; Quinn, 2002; Thibaut et al., 2018). Based on findings from John Goodlad's study of classrooms

nationwide, Carbo (1996) described the predominant instructional delivery as "…frontal teaching. In most classrooms, the teacher is active, and the student is passive. Teachers lecture, write on the board, and work with groups. Students, for the most part, are expected to listen and watch…and to do worksheets" (p. 64). Teachers consistently require students to recall and retell information.

Hammond (2015) explains that students' inability to do higher-order thinking, read and write analytically, and solve problems is contributing to the ongoing achievement gap. Studies on underserved communities, such as English learners, students of color, and students living in poverty, show that their instructional experiences typically include lower-level skills and a less rigorous curriculum. This denies learners the ability to engage in challenges that build brainpower (Hammond, 2015). Teachers that continue to control the learning process also deprive students of the opportunity to build self-regulatory skills (Boekaerts, 1997).

Science of Learning. The science of learning research integrates what scientists know about brain function with educational opportunities for teaching and learning. Darling-Hammond et al. (2021) conducted a study that resulted in guiding principles for equitable whole child design which included positive developmental relationships, environments filled with safety and belonging, rich learning experiences and knowledge development, development of skills, habits, and mindsets, and integrated support systems (p. viii). Although all five principles influence educational practices, developing rich learning experiences addresses the pedagogical approach to teaching and learning. The researchers speak to authentic experiences, relevancy to students' lives, integrating subject areas, and student ownership of learning (Darling-Hammond et al., 2021). This

coupled with the brain science that suggests students learn better once positive relationships are built and they feel physically and psychologically safe, teachers and leaders can design instructional experiences that allow all students to retain, master, and transfer knowledge.

> "Knowledge that is transferable is learned in ways that engage children in genuine, meaningful applications of knowledge: writing and illustrating a book or story, rather than completing fill-in-the-blank worksheets; conducting a science investigation, rather than memorizing disconnected facts that might quickly be forgotten. Such learning engages higher order skills of analysis, synthesis, critical thinking, and problem-solving and allows knowledge to be understood deeply enough to be recalled and used for other purposes in novel situations" (Darling-Hammond et al., 2021, p. 60).

Because the brain needs to make connections between new learning and prior knowledge, schools need to focus on individualized and scaffolded instruction by pursuing students' areas of interest through inquiry and personal curiosities.

Research-Based Instructional Strategies. When asked what research-based practices are, educators struggle to differentiate among strategies, materials, and programs (Goodwin & Webb, 2014). Therefore, principals as instructional leaders need to define those practices, as aligned with their visions and expectations, so they can provide professional learning and lead implementation.

Hattie (2009) synthesized over 800 meta-analyses related to student achievement and then categorized instructional strategies according to their effect size on teaching and learning. Curriculum, for example, had a larger effect size when teachers' instructional

strategies contributed to the balance of students' surface, deep, and conceptual understanding of the content. This included active programs that led to student engagement, the development of problem-solving skills, and the mastery of content and understanding. Other areas in the analyses showing greater impact on student achievement included creativity, questioning, collaboration (i.e., peer tutoring and cooperative learning), and critical thinking via meta-cognitive strategies (Hattie, 2009).

Marzano et al. (2001) described nine high-probability strategies that positively influenced student achievement, some of which included cooperative learning, questioning, and applying knowledge to extend understanding. Marzano (2009) would later caution educators, however, about solely accepting these original nine strategies as the only effective practices. He instead suggested that educators consider a larger, more comprehensive instructional framework and identify effective strategies according to the situation or needs of the students (Marzano, 2009).

Marzano (2009) expanded the original list of nine strategies to 41 and organized them into one of three categories: Content, Routine Activities, and Behaviors That Are Enacted On The Spot As Situations Occur (p. 33). Under the category of Content, he included one of three sub-headings: Lessons Involving New Content, Lessons Involving Practicing and Deepening Content That Has Been Previously Addressed, and Lessons Involving Cognitively Complex Tasks (Generating and Testing Hypotheses). Under the second and third subheadings, Marzano (2009) referenced additional research-based strategies that also aligned with Hattie's work (Table 1.2). Finally, Marzano (2009) suggested that teachers employ strategies that allow students to participate in decision-making and inquiry opportunities.

Table 1.2

Comparison of Marzano (2009) and Hattie's (2009) Research-Based Teaching Strategies

Marzano (2009) sub-heading	Marzano (2009) strategies	Hattie (2009) strategies
Lessons Involving Practicing and Deepening Content That Has Been Previously Addressed	Organizing students to practice and deepen knowledge Examining similarities and differences (i.e., comparing, classifying, creating, etc.) Revisiting knowledge	Deep and conceptual understanding of the content Mastery of content and understanding
Lessons Involving Cognitively Complex Tasks (Generating and Testing Hypotheses)	Organizing students for cognitively complex tasks Engaging students in cognitively complex tasks Providing resources and guidance	Questioning Critical thinking via meta-cognitive strategies Collaboration Problem-solving skills

(Hattie, 2009; Marzano, 2009)

Studies on instructional best practices highlight similar strategies to those identified by Hattie and Marzano such as engaging students in challenging tasks (Darling-Hammond et al., 2021; Hilton, 2015; Lin-Siegler et al., 2016), questioning and problem-solving (Blake, 2007; Buchanan et al., 2016; Darling-Hammond et al., 2021; Hilton, 2015; Klein, 2005; Mehta, 2022; Noguera et al., 2015; Thibault et al., 2018), creativity (Darling-Hammond et al., 2021; Bresler, 1995; Gullatt, 2008), and collaboration/teamwork (Darling-Hammond et al., 2021; Gullatt, 2008; Hilton, 2015; Mehta, 2022; Saltman, 2011; Toshalis & Nakkula, 2012).

Other research suggests integrating student's coursework across disciplines (Bresler, 1995; Darling-Hammond et al., 2021; Gullatt, 2008; Huber et al., 2007; Marcotte & Gruppen, 2022; Mims, 2003) and with college and community through projects or internships (Darling-Hammond et al., 2021; Georgia Department of Education, n.d.; Huber et al., 2007; Humphreys, 2005; Mehta, 2022). Research also

included connecting learning to students' lives through authentic, real-world experiences and assessments (Blake, 2007; Campbell et al., 2010; Darling-Hammond et al., 2021; Hilton, 2015; Mansilla, 2019; McLeod, 2017; Mehta, 2022; Noguera et al., 2015) as well as providing opportunities for student-driven learning and agency (Campbell et al., 2010; Darling-Hammond et al., 2021; Harrison, 2012; Mansilla, 2019; Mehta, 2022; Mims, 2003; Noguera et al., 2015; Saltman, 2011).

Applied Learning as Research-Based Instructional Strategies. Applied and active learning are defined as learning by doing and being engaged with events, projects, or solving a problem (Siegel, 2020; Stooksberry, 1996). Additional characteristics include relevancy to the real world, the application and transference of skills and knowledge, experiential learning, and hands-on, practical applications (Blake, 2007; "Common definitions of applied learning," n.d.; Darling-Hammond et al., 2021; Klein, 2005; Mehta, 2022; Noguera et al., 2015; Siegel, 2020; Stooksberry, 1996).

Research further supports a learner's active role in the learning process, whether independently or cooperatively, to build metacognitive and self-regulatory skills (Boekaerts, 1997; Darling-Hammond et al., 2021; Marzano, 2009; Niemi, 2002; Noguera et al., 2015). These skills allow a learner to process knowledge, solve problems, and evaluate information (Darling-Hammond et al., 2021; Niemi, 2002; Noguera et al., 2015). Mehta (2022) and Wagner and Dintersmith (2015) reiterated the need for students to apply knowledge and suggested that students engage in learning by researching problems or issues through apprenticeships, projects, activities, collaboration, and experiences as opposed to rote memorization of content and information.

Additionally, learning theories such as constructivism and experiential learning highlight the need for learners to drive their own learning by constructing meaning and knowledge through inquiry and reflection as opposed to passively consuming information (Bada, 2015; Blake, 2007; Campbell et al., 2010; Niemi, 2002). Constructivists suggest that learning is social and aligned to real-world problems which allow learners to develop skills needed for the workplace, build autonomy, and own their learning through goals and outcomes (Bada, 2015; Campbell et al., 2010; Thibaut et al., 2018). Comparably, experiential learning theorists recommend authentic, multi-disciplinary approaches to teaching that allow for real-world connections (Blake, 2007; Heinrich & Green, 2020; Thibaut et al., 2018).

Mehta (2022) discussed the differences between traditional approaches to instruction in core classrooms versus what he observed in extracurricular environments where students excelled, seemed joyful, demonstrated motivation, and tried harder to succeed. He suggested that the latter included purpose, student agency, community, and learning by doing. In these situations, students understood the why of their actions as opposed to being compliant. Students owned their learning and impacted outcomes based on decision-making and critical thinking. By building community, they found support, collaboration, and learned from others. Finally, students learned by actively involving themselves in the construction of knowledge thus building their abilities to retain and apply their learning.

CTAE, Fine Arts, and STEM as Applied Learning. Mehta (2021) references extracurriculars, clubs, and electives as what's happening in the "periphery," or edges of a school, and as being more vital than what occurs in core subject classrooms (Mehta,

2021, 3:38). These periphery courses, such as Career, Technical, and Agricultural Education (CTAE) pathways, the Fine Arts (visual arts, music, dance, and theatre), and Science, Technology, Engineering, and Math (STEM), exemplify applied learning. CTAE program goals, for example, include fostering authentic experiences through employer partnerships and providing student-centered learning approaches to drive decision-making (Georgia Department of Education, n.d.). All CTAE programs also teach foundational employability skills that prepare students to enter the workforce, college, the military, or an internship (Georgia Department of Education, n.d.). The Georgia Department of Education (GaDOE) defines employability skills "as work ethic, soft skills, lifelong learning skills, workplace readiness skills, or 21st-century skills" ("Career, technical and agricultural education glossary," n.d., p. 5). Comparably, the World Economic Forum's Top Ten Skills for 2025 include active learning, complex problem-solving, critical thinking and analysis, and creativity (Whiting, 2020).

Fine Arts programs and classrooms support 'learning by doing' by immersing students in learning experiences that promote higher-order thinking, encourage collaboration, build creativity, and allow the construction of meaning (Gullatt, 2008). "The arts encourage students to apply their arts-related intelligences to perceive and organize new information into concepts that are used to construct meaning" (Gullatt, 2008, p. 24). Teachers of core subjects, like English Language Arts, Math, Science, and Social Studies, can also integrate fine arts strategies. Students, for example, can use drama, or theatre, to demonstrate new knowledge or apply knowledge to other subject areas through movement, acting, or interpretation (Gullatt, 2008).

Bresler (1995) defines four "styles" of arts integration, some of which are more immersive and aligned to applied learning than others. For example, a less effective arts integration model is the Social Integration Style where principals leverage the arts to further the connection between school and community by using student performances to increase festivity at school events like PTA meetings, ethnic celebrations, and holiday gatherings (Bresler, 1995). Another arts integration style, however, called the Co-equal, Cognitive style, involves the collaboration of teachers across disciplines. "Clearly, the co-equal style…has the potential for intellectual stimulation, in integrating the specialized, discipline-based knowledge of arts specialists with academic and student knowledge of the classroom" (Bresler, 1995, p. 36).

Finally, STEM strategies represent applied learning by nature. Student activities often include design thinking and the engineering process which provide opportunities for engaging in experimentation, failing, returning to research, revising thinking, and trying again (Buchanan et al., 2016). Thibaut et al. (2018) analyzed existing STEM research to identify and categorize pervasive instructional practices such as integration of content, problems and inquiry, student-centered learning, and hands-on activities. The researchers referenced the integration of content as an approach that "starts with a real-world problem or issue and focuses on interdisciplinary content and skills (e.g., critical thinking and problem-solving), rather than subject-specific content and skills" (Thibaut et al., 2018, p. 5). They further defined a student-centered approach as an active learning experience based on authentic, real-world issues that allowed for problem-solving and the transference of knowledge. Additional descriptions of inquiry and hands-on approaches included questioning and experiential learning (Thibaut et al., 2018).

Research-Based Instructional Strategies Aligned to Applied Learning.

Several strategies emerged in applied learning research, including project/problem-based learning (Blake, 2007; Darling-Hammond et al., 2021; McLeod, 2017; Noguera et al., 2015), authentic experiences and assessments (Blake, 2007; Campbell et al., 2010; Darling-Hammond et al., 2021; Mansilla, 2019; McLeod, 2017; Mehta, 2022; Noguera et al., 2015), student-driven learning/agency (Campbell et al., 2010; Darling-Hammond et al., 2021; Mansilla, 2019; Mehta, 2022; Noguera et al., 2015), and integrated learning (Blake, 2007; Darling-Hammond et al., 2021; Mansilla, 2019; Noguera et al., 2015). Effective teaching of meaningful learning requires students' active participation which leads to intentional application thus allowing for metacognitive thinking (Blake, 2007; Campbell et al., 2010; Darling-Hammond et al., 2021; Klein, 2005; Noguera et al., 2015). "Application of knowledge takes precedence over acquisition and mastery of facts alone, activating a dynamic process of question posing, problem posing and solving, decision making, higher-order critical thinking, and reflexivity" (Klein, 2005, p. 10).

Project/Problem-Based Learning. McLeod (2017) lists 10 building blocks for future-ready schools, one of which is project- and inquiry-based learning environments that emphasize "greater student agency and active application of more cognitively-complex thinking, communication, and collaboration skills" (McLeod, 2017, *10 building blocks for schools of the future* [Image]). An inquiry-based approach allows students to connect ideas and knowledge which enhances the retention and transference of learning typically associated with active and applied learning experiences (Blake, 2007; Darling-Hammond et al., 2021; Noguera et al., 2015). Problem-based learning forces students to

develop strategies, skills, and solutions, all of which align with experiential learning (Blake, 2007).

Authentic Experiences and Assessments. Another building block for future-ready schools is authentic, real-world work (McLeod, 2017). “The choices we open to students must be authentic choices through which students can see that their opinions and – most importantly – their actions can have a real impact on themselves and the world around them” (Williams, 2017, p. 10). Connecting new knowledge to prior understandings makes learning active, and authentic environments make learning relevant (Darling-Hammond et al., 2021; Mehta, 2022; Mims, 2003). These experiences help students build skills that will prepare them for college and career such as problem-solving, critical thinking, and creativity (Darling-Hammond et al., 2021; Noguera et al., 2015; Whiting, 2020).

School leaders at Butler Tech in Ohio and Kettle Moraine High School in Wisconsin implemented pathways (computer science, healthcare, cybersecurity, etc.) into traditional school settings. These pathways promoted authentic, hands-on, relevant experiences through projects and industry partnerships (Richardson et al., 2021). This required teaching practices where students actively engaged with content, considered real-world problems, and communicated outside the classroom in practical, hands-on experiences.

Authentic assessments, sometimes referred to as performance-based assessments, help students make connections beyond school (Darling-Hammond et al., 2021; Mehta, 2022; Mims, 2003; Moon et al., 2005; Noguera et al., 2015). Demonstrating mastery of content, as opposed to testing for accountability, through performance assessments allows

students to manage and assess their progress. “Assessments such as Socratic seminars, exhibitions, and projects result in tangible products and encourage learners to draw on multiple kinds of knowledge in order to demonstrate higher order and integrated learning” (Noguera et al., 2015, p. 10). When students are allowed to share their projects and products with audiences outside the classroom, then the experience becomes much more authentic (Darling-Hammond et al., 2021; Mims, 2003; Moon et al., 2005; Noguera et al., 2015).

Student-Driven Learning/Agency. Student agency can be defined as owning learning and solving real-world problems (Darling-Hammond et al., 2021; Mansilla, 2019; Mehta, 2022; Noguera et al., 2015). Students are afforded opportunities for independent thinking as opposed to solving a problem defined by the teacher (Blake, 2007; Buchanan et al., 2016; Campbell et al., 2010; Toshalis & Nakkula, 2012). This student-centered approach engages learners in authentic and relevant work so they can explore, collaborate, make choices, and self-assess (Blake, 2007; Buchanan et al., 2016; Darling-Hammond et al., 2021; Mehta, 2022; Mims, 2003; Saltman, 2011; Thibaut et al., 2018).

To achieve student-driven learning, teachers’ instructional practices must enable students to take an active role in their learning (Blake, 2007; Darling-Hammond et al., 2021; Evans & Boucher, 2015; Mehta, 2022; Noguera et al., 2015; Saltman, 2011; Toshalis & Nakkula, 2012). In classrooms, “…youth (like adults) generally need to feel they have a voice in how it is conducted and an impact on how it concludes” (Toshalis & Nakkula, 2012, p. 32). For example, activities geared towards student voice show greater student responsibility for learning when given opportunities for:

- decision-making through a partnership with the teachers,
- activism by identifying problems, seeking solutions, soliciting change inside and outside the school, and
- leadership in the teaching and learning approach through co-planning, co-guiding, and co-conducting instructions (Toshalis & Nakkula, 2012, p. 34)

Shifting the learning design away from the teacher consequently enhances student motivation and critical-thinking skills (Mehta, 2022; Saltman, 2011). The "core of student-centered motivation and engagement entails engaging deeply with one's own thinking" (Toshalis & Nakkula, 2012, p. 35). Teachers and principals, therefore, need to understand that opportunities for student-driven learning should not be implemented at a structured time or in small doses, but rather student choice and voice should be pervasive in the classroom and considered the norm (Williams, 2017).

Integrated Learning. Integrated learning helps students retain and apply information by connecting knowledge and skills across disciplines, thus building learners' understanding and application of knowledge to diverse settings and problems (Blake, 2007; Bresler, 1995; Darling-Hammond et al., 2021; Huber et al., 2007; Mansilla, 2019; Marcotte & Gruppen, 2022; Mehta, 2022; Mims, 2003; Noguera et al., 2015; Thibaut et al., 2018). "Integrative learning occurs when knowledge from different subjects or disciplines is connected by the learner to enhance the learner's overall understanding" (Marcotte & Gruppen, 2022, p. 267). The connection of concepts and contexts may not typically be linked (Huber et al., 2007), yet Dintersmith (2018) still recommends integrating subjects to include "the academic and the applied" (p. 57), such

as integrating the arts into all humanities courses or combining chemistry and culinary (Dintersmith, 2018; Wagner & Dintersmith, 2015).

Clarke Middle School in Wisconsin implemented integrated learning structures that would allow for authentic and relevant experiences for teachers and students (Richardson et al., 2021). Skyline High School in Colorado implemented a STEM curriculum and a Visual and Performing Arts Academy where teachers focused on integrated skills and strategies such as creativity, teamwork, problem-solving, challenging tasks, and authentic projects (Richardson et al., 2021). The need for integrative learning is not limited to K-12 education, however; organizations, professions, businesses, and cognitive researchers are also recognizing the need for integrative learning (Humphreys, 2005), thus making these skills essential for post-secondary success.

Effective Professional Learning

Darling-Hammond et al. (2017) identified seven characteristics that contributed to effective professional learning (PL) for teachers and administrators: content-focused, active learning, job-embedded collaboration, modeling, coaching, feedback and reflection, and duration (p. 4). Successful professional development often includes multiple characteristics happening simultaneously to positively impact changes in practice and ultimately in student gains. To ensure success, those providing PL include these characteristics while also learning of teacher needs, soliciting teacher input, and evaluating the PL regularly (Darling-Hammond et al., 2017).

In addition to well-designed PL, trainers also consider implementation practices necessary to meet intended outcomes. Common obstacles to overcome include a lack of

resources, vision, time, or knowledge. By anticipating potential barriers in advance of the PL and during the design phase, developers plan accordingly. “In the end, well-designed and implemented PD should be considered an essential component of a comprehensive system of teaching and learning that supports students to develop the knowledge, skills, and competencies they need to thrive in the 21st century” (Darling-Hammond et al., 2017, p. 24).

Westberry and Hornor (2022) interviewed principals about effective professional learning and four characteristics emerged. Principals wanted practical and immediate applications of their learning, a systems approach, the opportunity to address knowledge gaps, and communities of practice (p. 37). “The study also proved that principals continue to need professional development beyond their principal preparation programs as noted by the desire for extended learning opportunities by all participants” (Westberry & Hornor, 2022, p. 41).

Research Problem Statement

Principals serving as instructional leaders establish visions and expectations for teaching and learning, possess knowledge of current research-based strategies, and participate in professional learning (“Georgia Department of Education LAPS standards reference sheet: Performance standards and sample performance indicators,” 2014). Some of those strategies and practices align with applied learning where students apply knowledge and skills learned in the classroom to relevant, problem-based situations; or in other words, learn by doing (Darling-Hammond et al., 2021; Mehta, 2022; Siegel, 2020; Stooksberry, 1996). The CCSD applied learning definition includes some of those

research-based strategies such as integrated learning, student-driven learning, authentic applications, critical thinking, and creative exploration.

In the diagnosis phase, School Leadership Assistant Superintendents and principals acknowledged that they expected teachers to move away from teacher-led, traditional practices and towards engaging and relevant strategies such as applied learning; however, they rarely saw this shift during classroom observations. The principals did not have experience using applied learning strategies as teachers and consequently struggled to lead implementation. Most wanted professional learning on how to lead that instructional change.

The literature further supported the importance of principals engaging in professional learning when serving as instructional leaders. Staying apprised of best practices allows principals to set instructional expectations, lead implementation, and model life-long learning. This also builds trust and confidence among staff by demonstrating change readiness skills and serving as the instructional experts in the building. Finally, literature on research-based strategies included the five applied learning components in the CCSD definition.

I needed additional information about principals' baseline knowledge of applied learning, as aligned to the CCSD definition, in order to identify and develop professional learning resources. By employing the phases of an MMAR study, I collected preliminary data, designed and implemented a professional learning intervention, and evaluated the increase in principals' perceived knowledge and the impact on their instructional leadership plans for expectations and goals. The results of this study benefit the School Leadership Assistant Superintendents who lead and evaluate principals, principals

wanting to lead applied learning implementation, and district departments who develop professional learning for principals.

Overall Study Plan

The purpose of this MMAR study was to identify and employ professional learning resources for principals that increased their perceived knowledge of applied learning and impacted their instructional leadership plans for classroom expectations and professional goals. The intended outcome was to build principals' confidence in leading applied learning implementation in their local schools. The goal of the reconnaissance phase was to collect and evaluate principals' baseline knowledge of, experience using, expectations for, and confidence with applied learning by using a multistrand mixed methods design that would inform the development of professional learning as an intervention. The goal of the evaluation phase was to assess the effectiveness of a professional learning intervention by using a concurrent mixed methods design to collect and analyze any increase in principals' perceived knowledge of applied learning and any impact on their instructional leadership plans. The rationale for applying mixed methods in this study was to capture principals' perceptions and perspectives on applied learning to inform a practical intervention. By collecting contextual data, I developed professional learning directly aligned with principals' needs and that immediately impacted principals' instructional leadership plans and confidence to lead applied learning implementation.

Ethical Considerations

Ethical considerations in this MMAR study included obtaining Institutional Review Board approval from the University of Kentucky and the CCSD Office of Accountability for data collection during the reconnaissance and evaluation phases.

Because the study included principals, I obtained informed consent, and I made participants aware of the study's purpose in advance to ensure voluntary participation. I implemented procedures to ensure confidentiality and to protect study participants' physical, emotional, and mental well-being.

As the Director of Applied Learning and Design for the CCSD, I inherently had some bias regarding the need to increase implementation of applied learning strategies in CCSD classrooms. I also had prior opinions about participating principals' instructional leadership capacity since I worked with them directly and was therefore aware of the teaching and learning practices prevalent in their buildings. I compared all quantitative and qualitative data analyses and conclusions to personal opinions about applied learning to avoid unconscious bias during interpretation.

Summary

The first standard in the Leader Keys Effectiveness System, the Georgia evaluation tool for school administrators, is instructional leadership and the seventh is professionalism. Standard one performance indicators include setting instructional expectations and making decisions to improve classroom instruction based on research-based strategies. Standard seven indicators suggest the need for principals to maintain their knowledge of current best practices through continued professional learning and development.

During the diagnosis phase of this MMAR study, I spoke with School Leadership Assistant Superintendents and principals about current instructional practices and leading change. Based on those conversations, I learned that principals struggled to understand and implement applied learning because some had not taught using those strategies and

therefore felt unsure how to lead it with teachers. I also shared organizational data about the district's process for defining applied learning and literature reviews on instructional leadership, research-based strategies, and applied learning. Finally, I outlined the general study plan and ethical considerations.

Chapter 2

Johnson, Onwuegbuzie, and Turner (2007) defined mixed methods action research (MMAR) as an approach to uncovering multiple viewpoints and perspectives through quantitative and qualitative data analyses to find knowledge in the areas of theory and practice. The purpose of this MMAR study was to identify and employ professional learning resources for principals designed to increase their perceived knowledge of applied learning and impact their instructional leadership plans for classroom expectations and professional goals. In this chapter, I outline the reconnaissance phase of this study including research questions, instrumentation, data analyses, and findings aligned to the problem of practice. The purpose of this phase was to collect and analyze data to inform an intervention.

Reconnaissance Phase

In an MMAR framework, the second phase is reconnaissance, often referred to as the fact-finding phase, where researchers collect data to further define and support the problem of practice identified in the diagnosis phase (Ivankova, 2015). By gathering quantitative and qualitative data, researchers can analyze results and integrate findings to draw meta-inferences that inform an intervention. Topics covered in the following sections include this study's reconnaissance phase design, the quantitative and qualitative data collection instruments, data analyses, integration, and findings.

Research Setting

This research setting included two CCSD Divisions: The Academic Division, to which I belonged, and the School Leadership Division, which supports all school principals. In the CCSD, the School Leadership Division includes the Chief School Leadership Officer and seven Assistant Superintendents who lead, supervise, and evaluate principals. Three Assistant Superintendents oversee elementary schools with each providing support to approximately 22 to 23 principals, two manage the middle schools with each leading approximately 12-13 principals, and two supervise the high schools with each leading eight to nine principals.

When evaluating principals, the Assistant Superintendents use the Leader Keys Effectiveness System (LKES) provided by the Georgia Department of Education (GaDOE). Using this tool, the Assistant Superintendents measure principals' effectiveness based on four domains consisting of eight performance standards (Figure 2.1). They also base their evaluation on whether the principals met a self-defined professional learning goal established each year as required by the Georgia Professional Standards Commission (GaPSC).

At the beginning of each school year, principals complete a self-assessment document aligned to the LKES performance standards to determine personal strengths and areas of growth. They then use the results to create a professional learning goal for the year. Principals submit evidence around the successful meeting of that goal to their evaluating Assistant Superintendent during their summative conference (*Leader keys effectiveness system: Fact sheets*, 2014).

Figure 2.1

GaDOE LKES Domains and Performance Standards

School Leadership
1. Instructional Leadership The leader fosters the success of all students by facilitating the development, communication, implementation, and evaluation of a shared vision of teaching and learning that leads to school improvement.
2. School Climate The leader promotes the success of all students by developing, advocating, and sustaining an academically rigorous, positive, and safe school climate for all stakeholders.
Organizational Leadership
3. Planning and Assessment The leader effectively gathers, analyzes, and uses a variety of data to inform planning and decision-making consistent with established guidelines, policies, and procedures.
4. Organizational Management The leader fosters the success of all students by supporting, managing, and overseeing the school's organization, operation, and use of resources.
Human Resources Leadership
5. Human Resources Management The leader fosters effective human resources management through the selection, induction, support, and retention of quality instructional and support personnel.
6. Teacher/Staff Evaluation The leader fairly and consistently evaluates school personnel in accordance with state and district guidelines and provides them with timely and constructive feedback focused on improved student learning.
Professionalism and Communication
7. Professionalism The leader fosters the success of students by demonstrating professional standards and ethics, engaging in continuous professional development, and contributing to the profession.
8. Communication and Community Relations The leader fosters the success of all students by communicating and collaborating effectively with stakeholders.

(Georgia Department of Education, 2022)

The GaDOE also provides indicators for each performance standard that further describe leader expectations and behaviors (Table 2.1). Sample performance indicators for Performance Standard 1: Instructional Leadership, and Performance Standard 7: Professionalism, target instructional expectations and professional knowledge. For example, performance standard one indicators include establishing and communicating goals and expectations for instructional programs and monitoring and analyzing best practices and research-based strategies in the classroom. Example indicators for performance standard seven reference leaders assuming responsibility for their own professional development and maintaining a current and high level of professional

knowledge. These two standards align to the purpose of this study which aims to provide professional learning for principals to increase their knowledge of research-based strategies, like applied learning, and to impact their instructional plans for expectations and goals.

Table 2.1

Sample LKES Indicators for Performance Standards 1 and 7

Performance standard	Indicators
1: Instructional leadership	Articulates a vision and works collaboratively with staff, students, parents, and other stakeholders to develop a mission and programs consistent with the district's strategic plan. Monitors and evaluates the effectiveness of instructional programs to promote the achievement of academic standards. Possesses knowledge of and directs school staff to implement research-based instructional best practices in the classroom. Works collaboratively with staff to identify needs and to design, revise, and monitor instruction to ensure effective delivery of the required curriculum.
7: Professionalism	Model self-efficacy to staff Assumes responsibility for own professional development by contributing to and supporting the development of the profession through service as an instructor, mentor, coach, presenter and/or researcher**.** Remains current with research related to educational issues, trends, and practices. Maintains a high level of technical and professional knowledge.

(*Leader keys effectiveness system: Fact sheets*, 2014)

The CCSD gives principals full autonomy over their schools' vision and expectations. Principals determine the instructional goals and objectives for their schools. In addition to deciding and planning school-based professional learning for their teachers, principals also choose their own professional learning, ideally as aligned to LKES performance standards and their annual GaPSC professional learning goal.

Professional Learning Opportunities Available for Principals in the CCSD

The CCSD provides professional learning (PL) opportunities for principals every year. The School Leadership Assistant Superintendents plan the PL delivered during mandatory, monthly principal meetings with topics mostly addressing operational responsibilities such as discipline, testing, and allotments. Additionally, that Division also arranges the topics covered during day-long Leadership and Learning (L&L) meetings which occur five times a year and include the superintendent, the executive cabinet, assistant superintendents from all divisions, all divisional district leaders from the coordinator level to executive directors, all principals, and one assistant principal from each high school.

The topics discussed at L&L during school level break-out sessions typically include operational matters again, even the sessions requested of the Academic Division. For example, during the 2022-23 school year, topics covered by academic departments during L&L meetings included, but were not limited to, current and upcoming initiatives, such as the science of reading or dyslexia screening, pertinent information like math adoption updates and summer school plans, as well as changes and enhancements to the district's learning management system. The School Leadership Assistant Superintendents rarely asked Academics to provide PL on understanding research-based strategies, setting instructional expectations, or serving as instructional leaders.

The Academic Division, of which the Applied Learning and Design Office resides, provides PL for principals and teachers throughout the school year and during the summer on a variety of topics such as instructional strategies, district-led initiatives, and technology integration; however, the voluntary nature of the PL impacts attendance. Some of the PL offered by the Academic Division includes applied learning such as arts

integration strategies or Science, Technology, Engineering, and Math (STEM) implementation, but thus far, the Division offers no PL specifically addressing the broader topic of applied learning in all classrooms.

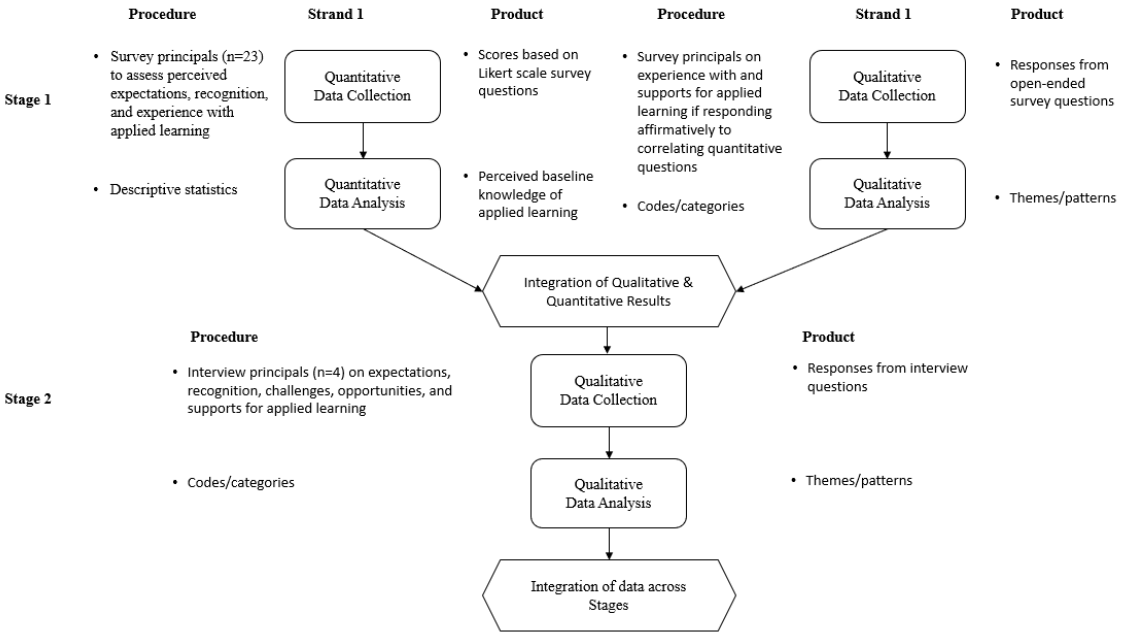
Reconnaissance Phase Design and Overarching Research Questions

Researchers collect data in MMAR studies using one of several designs such as concurrent, where they collect quantitative and qualitative data simultaneously, or sequential, where they collect quantitative or qualitative data first, analyze these data, and then use those analyses to inform a second collection of the quantitative or qualitative data needed. If researchers use multiple concurrent and/or sequential designs, then that is considered a multistrand design (Ivankova, 2015).

I used a multistrand design in the reconnaissance phase of this study (Figure 2.2) to collect complementary data that explored and confirmed the identified problem of practice (Ivankova, 2015). The overarching research question that guided the reconnaissance phase was: *How do principals' perceived knowledge of and experiences with applied learning inform the development of professional learning resources?*

Figure 2.2

Visual Diagram of Multistrand Quantitative-Qualitative Study Design



Note: This figure is adapted from *Mixed Methods Applications in Action Research: From Methods to Community Action* (p. 174), by N.V. Ivankova. Copyright 2015 by Sage Publications, Inc.

I collected baseline data of principals' perceived expectations for, recognition of, experience with, and confidence leading applied learning through close-ended survey questions (quantitative data) while concurrently exploring principals' teaching experience through classroom examples and identifying their professional learning recommendations through open-ended survey questions (qualitative data). After the survey, I continued to gather qualitative data through semi-structured interviews to further understand principals' instructional expectations, abilities to recognize, encounters when leading, and PL needs for applied learning.

Pros and cons existed for using a multistrand quantitative-qualitative design. In this study, the reconnaissance phase involved school principals whose busy schedules

limited their availability to participate. Advantages with a multistrand design included saving the respondents time by completing both forms of data collection simultaneously in the survey. I also scheduled the voluntary semi-structured interviews to accommodate principals' choice of date, time, and location.

Disadvantages of the design consisted of having to conduct and interpret quantitative and qualitative data simultaneously on the survey while also analyzing and categorizing interview responses. Additionally, the quantitative and qualitative data collected in the survey and the additional qualitative data collected through interviews could have been contradictory in nature instead of complementary. Overall, employing quantitative and qualitative stages and strands allowed me to conduct a more thorough analysis of the problem of practice (Ivankova, 2015).

Reconnaissance Stage 1

The overarching research question for stage one was: *How do principals perceive their current applied learning knowledge?* In this stage, I used a within-strategy survey for data collection (Appendix A). The quantitative survey strand (close-ended questions) focused on principals' perceptions about their instructional expectations for applied learning, recognition of applied learning as defined in the CCSD, teaching experience using applied learning, and confidence with leading implementation. The qualitative survey strand (open-ended questions) elicited personal teaching examples, advice for others, and professional learning recommendations from those respondents who agreed or strongly agreed to statements about teaching experience using applied learning and confidence with leading implementation.

Stage 1 Research Questions. Six research questions guided this stage of the reconnaissance phase.

RQ1: To what extent do principals report aligning instructional expectations to applied learning? (Quantitative)

RQ2: What are principals' perceived abilities to recognize applied learning in classrooms? (Quantitative)

RQ3: To what extent do principals report using applied learning as teachers? (Quantitative)

RQ4: How do principals describe their applied learning experiences as teachers? (Qualitative)

RQ5: How do principals perceive their abilities to lead implementation of applied learning in their schools? (Quantitative)

RQ6: What professional learning resources do principals recommend when implementing applied learning? (Qualitative)

Sample.

I employed a population sampling strategy for the survey. This strategy allowed me to collect background knowledge and needs assessment data (Ivankova, 2015). I invited all 109 principals in the CCSD to participate in the survey since data from as many principals as possible increased the probability of a varied representation (i.e., K-12 leaders, years of leadership experience, and geographical location of the schools). A total of 23 principals completed the survey for an overall response rate of 21.1%.

The first five questions of the survey collected the participants' background information (Table 2.2).

Table 2.2 *Participant Background for Survey Population (N=109) and Respondents (n=23)*

Participant background	Population		Respondents	
	%	N	%	n
Years as a school administrator[1] (SLI, AP, Principal)				
1-5			0	0
6-10			17	4
11-15			48	11
16-20			22	5
21-25			9	2
26-30			4	1
More than 30			0	0
School level 2021-22				
Elementary	61	66	56	13
Middle	23	26	22	5
High	16	17	22	5
Location of school 2021-22				
Northwest	20	22	26	6
North	5	5	0	0
Northeast	25	28	43	10
East	5	6	0	0
Southeast	11	12	9	2
South	16	17	13	3
Southwest	13	14	9	2
West	5	5	0	0
Years as principal at 2021-22 school[2]				
1-5			57	13
6-10			17	4
11-15			13	3
16-20			4	1
21-25			0	0
26-30			0	0
More than 30			0	0
Not a principal 2021-22			9	2

I wanted to compare the respondents' information to the overall population in terms of geographic location of their 2021-22 school, school level (elementary, middle,

[1] The population data for years as a school administrator were not available.
[2] The population data for years as principal at 2021-22 school were not available.

or high), years of experience as a school administrator (School Leadership Intern [SLI], Assistant Principal, Principal), and number of years serving as principal at their 2021-22 schools. The respondents provided the name of their 2021-22 school, and based on a district map, I divided the schools into geographic areas (Appendix B).

The respondents' backgrounds represented varied years as a school administrator (6-30 years), school levels (K-12), and years as a principal (0-20 years). The geographic location for over two-thirds of the respondents' 2021-22 schools, however, favored the northeast and northwest sides of the district.

Instrument.

I used a survey created with Qualtrics (Provo, UT) to collect the concurrent quantitative and qualitative data, but first I shared it with three members of my doctoral committee for review. They provided feedback on the design and content to further increase validity.

Recommended changes included making the survey shorter as it originally spanned more than 30 pages when printed, which suggested a longer completion time for respondents and thereby the potential for less participation. One committee member met with me in-person, and we mapped each of the quantitative questions to the corresponding qualitative questions on a whiteboard. In looking at this visual representation of the survey, we narrowed the focus of the survey to the first three components of the CCSD applied learning definition – integrated learning, student-driven learning, and authentic applications – instead of all five (the first three plus critical thinking and creative exploration). We also determined, based on the mapping, which survey questions would more appropriately be asked during interviews.

After these changes, the same committee member recommended that I "unpack" the three applied learning components by adding research-based definitions and descriptions to the survey for each one, ensuring that all participants responded to survey questions with a collective understanding of the terms. Finally, the committee member recommended I check for alignment of the survey edits to my research questions so that the purpose of my data collection remained valid. I shared all these suggestions with another committee member and my committee chair who both agreed that the changes made the survey stronger and more concise.

I started the survey with a consent statement asking respondents to confirm their voluntary agreement to complete the survey as part of my study, and all who started the survey consented to complete the questions. After consent, the next section of the survey included five questions focused on participants' background information as presented above in the Sample section. This was followed by an opening section that introduced the intent of the survey, which was to investigate principals' expectations for, and knowledge and recognition of, applied learning to inform the development of professional learning resources for leading classroom implementation. Additionally, the introduction section of the survey included the full CCSD definition of applied learning and a statement that the three bolded components in the definition, on which the survey was based, would be defined in the following sections.

The next three sections represented each of the three components, and each section started with an introduction containing that component's research-based definition (Table 2.3), followed by two Likert scale questions (1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree). The first Likert

scale question asked respondents to rate their perceived instructional vision and expectations for the identified applied learning component, and the second Likert question inquired about principals' perceived abilities to recognize the component when observing classrooms.

Table 2.3 *Research-Based Definitions for Three of CCSD's Applied Learning Components*

Applied learning components	Research-based definitions
Integrated learning	Students connect across disciplines and differences in order to create new meaning (Ithaca College, 2022; Pack, 2016).
Student-driven learning	Sometimes referenced as student agency, this is giving students choice, voice, and ownership of their learning. Some examples include service learning, internships, and project/problem-based learning (Vaughn, 2020).
Authentic applications	This can include assessments, audiences, or experiences that provide relevancy to learning and connect learning to the real world (Burns, 2016; Shaw, 2019).

A section on leading implementation followed the three component sections. This section included two quantitative questions and three possible qualitative questions depending on the respondents' quantitative answers. The first quantitative question again asked respondents to use a Likert scale (1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree) to rank their perceived usage of applied learning as teachers. If a respondent answered that question with agree or strongly agree, then the survey prompted them, via skip logic, to answer the first of three qualitative survey questions. The first open-ended question asked principals to give an applied learning example they used as teachers and include whether it was integrated learning, student-driven learning, and/or authentic applications. If the respondent answered neither

agree nor disagree, disagree, or strongly disagree to the quantitative question about using applied learning as a teacher, then skip-logic led them to the second quantitative question in this section.

The second quantitative question asked respondents to rank their perceived abilities to confidently lead implementation of applied learning. If a respondent answered with agree or strongly agree, then the survey prompted them, via skip-logic, to answer the second and third qualitative survey questions which asked them to give advice for other school administrators wanting to lead applied learning and offer recommendations for training or professional learning. If the respondent answered neither agree nor disagree, disagree, or strongly disagree to the quantitative question about confidently leading implementation, then skip-logic led them to the closing section of the survey thus bypassing the two qualitative questions. After the other principals responded to the two qualitative questions, they too were led to the closing section.

In the closing section of the survey, I asked respondents if they would be willing to participate in a follow-up interview, and if so, complete the form field with their name, email address, and phone number. Whether the respondent completed the form or not, they were led to the end of the survey after that question. The end-of-survey section included a thank you to respondents for their time and a statement notifying them that their survey responses had been recorded.

Specific survey questions and their alignment to research questions guiding this stage are presented in Table 2.4.

Table 2.4 *Alignment of Research and Survey Questions for a Concurrent Quantitative-Qualitative Design*

Research questions	Survey questions
RQ1: To what extent do principals report aligning instructional expectations to applied learning? (Quantitative)	Q1, Q3, Q5
RQ2: What are principals' perceived abilities to recognize applied learning in classrooms? (Quantitative)	Q2, Q4, Q6
RQ3: To what extent do principals report using applied learning as teachers? (Quantitative)	Q7
RQ4: How do principals describe their applied learning experiences as teachers? (Qualitative)	Q8
RQ5: How do principals perceive their abilities to lead implementation of applied learning in their schools? (Quantitative)	Q9
RQ6: What professional learning resources do principals recommend when implementing applied learning? (Qualitative)	Q10, Q11

Data Collection Procedures.

After receiving Institutional Review Board approval from the University of Kentucky (Appendix C) and from the CCSD Office of Accountability (Appendix D), I sent emails containing the letter of consent and the survey link (Appendix E) from my University of Kentucky account to the 109, K-12 principals via their CCSD email addresses. I selected "anonymize responses" in the survey settings prior to collecting responses to avoid recording IP addresses, location data, or contact information. I allowed two weeks for principals to respond to the survey and sent the same initial email as a reminder after the first week the survey opened.

Quantitative Strand Data Analysis and Findings. The quantitative survey questions established baseline data on principals' perceived expectations for and experience with applied learning as well as confidence in recognizing usage and leading implementation. I downloaded the quantitative survey responses from Qualtrics into a

Microsoft Excel spreadsheet after removing any identifying information and coding the data for confidentiality. I analyzed the quantitative data using descriptive statistics including frequencies, means, and standard deviations.

The first quantitative research question guiding this stage was: *To what extent do principals report aligning instructional expectations to applied learning?* I used a 5-point Likert scale with coded values from 1=Strongly disagree to 5=Strongly agree to measure responses. Overall, most principals reported aligning teaching and learning expectations to one or more of the three applied learning components (Table 2.5). Integrated learning received the largest variance in responses and the lowest level of agreement (M = 3.91).

Table 2.5 *Level of Reported Alignment of Teaching and Learning Expectations to Applied Learning*

Applied learning component	M (SD)	SD		D		Neither		A		SA	
		%	N	%	N	%	N	%	N	%	N
Integrated	3.91 (.93)	4.3	1	4.3	1	8.7	2	60.9	14	21.7	5
Student-driven	3.96 (.69)	0	0	4.3	1	13.0	3	65.2	15	17.4	4
Authentic applications	3.96 (.69)	0	0	4.3	1	13.0	3	65.2	15	17.4	4

1 = Strongly disagree to 5 = Strongly agree

Upon further disaggregation of the responses for the three statements about instructional expectations, however, I discovered that the higher variance was impacted by one principal responding with strongly disagree to expectations for integrated learning. That same principal answered strongly agree or agree to all other quantitative survey statements, so I concluded that the respondent may have inadvertently selected strongly disagree to the first survey question about expectations for integrated learning since that response did not align with all other affirmative survey responses given by that same principal.

The second quantitative research question for this stage focused on principals' perceived abilities to recognize the three applied learning components in classrooms, and most respondents answered agreed or strongly agreed (Table 2.6). They reported the highest agreement levels for student-driven learning (M = 4.13; SD .54), and overall, principals felt stronger about recognizing all three components than setting expectations for them.

Table 2.6 *Level of Reported Abilities to Recognize Applied Learning in the Classroom*

Applied learning component	M (SD)	SD		D		Neither		A		SA	
		%	N	%	N	%	N	%	N	%	N
Integrated	4.04 (.62)	0	0	0	0	17.4	4	60.9	14	21.7	5
Student-driven	4.13 (.54)	0	0	0	0	8.7	2	69.6	16	21.7	5
Authentic applications	4.09 (.78)	0	0	4.3	1	13.0	3	52.2	12	30.4	7

1 = Strongly disagree to 5 = Strongly agree

The third quantitative research question addressed the extent to which principals report using applied learning as teachers. The survey question again included a coded, 5-point Likert scale for measuring the responses (Table 2.7). Fewer principals agreed or strongly agreed with personal experience using applied learning compared to those who established instructional expectations and who believed they could confidently recognize it. These data demonstrated the highest variance and lowest level of agreement compared to all other quantitative survey responses.

Table 2.7 *Level of Reported Use of Applied Learning as a Teacher*

Principal perception	M (SD)	SD		D		Neither		A		SA	
		%	N	%	N	%	N	%	N	%	N
Using applied learning as a teacher	3.65 (1.09)	0	0	26.1	6	4.3	1	47.8	11	21.7	5

1 = Strongly disagree to 5 = Strongly agree

The fourth quantitative research question for this stage was: *How do principals perceive their abilities to lead implementation of applied learning in their schools?*

Although responses showed slightly higher agreement (Table 2.8) than those rating their teaching experience, principals still reported less confidence leading it compared to expecting and recognizing it. Even though the level of agreement and the variance mirrored those reporting expectations for student-driven learning and authentic applications, more respondents remained uncertain about their ability to lead implementation as determined by the higher number answering neither agree nor disagree.

Table 2.8 *Level of Principal Confidence Leading Applied Learning*

Principal perception	M (SD)	SD		D		Neither		A		SA	
		%	N	%	N	%	N	%	N	%	N
Confidence leading applied learning	3.96 (.69)	0	0	0	0	26.1	6	52.2	12	21.7	5

1 = Strongly disagree to 5 = Strongly agree

Qualitative Strand Data Analysis and Findings. The qualitative survey questions elicited additional information about principals' teaching experience with applied learning, and advice and professional learning recommendations for other principals wanting to lead implementation. These responses helped me determine if the teaching examples provided by respondents aligned to any of the three CCSD applied learning components, as well as gather professional learning ideas that could potentially serve as interventions.

I downloaded all qualitative survey data from Qualtrics at the same time as the quantitative survey data and into the same Microsoft Excel spreadsheet for analysis. For each of the three open-ended questions, I copied and pasted the responses into Microsoft Word tables with two columns labeled responses and categories. Using an inductive approach, I read and reread the responses for each question, noticed common themes, and

added keywords and phrases to the category columns. I continued to combine, simplify, and hone the categories until only a few remained. Finally, I analyzed the applied learning teaching examples for alignment to the component definitions from the survey, and I compared the categories for the advice and professional learning recommendations to determine if complementary data existed.

The first research question guiding the qualitative survey strand was: *How do principals describe their applied learning experiences as teachers?* Fifteen of the 16 principals who answered agreed or strongly agreed to the quantitative question about using applied learning as teachers also provided responses to the first qualitative prompt. Six of those 15 respondents (40.0%) did not include the applied learning component in their responses, so I noted those in the corresponding column as DNP for Did Not Provide (Table 2.9).

Table 2.9 *Examples of Applied Learning that Principals Used as Teachers*

Numerical order of responses	Examples provided by survey respondents	Applied learning component identified by participant		
		Integrated learning	Student-driven learning	Authentic applications
1	Current events used to make connections to past	DNP	DNP	DNP
2	I was a middle school band director. I would frequently "pair up" my middle school students with high school student mentors. (student-driven and authentic)		X	X
3	I often used Student Choice Boards as a strategy for learning, which is a student-driven applied learning strategy.		X	

Table 2.9 Continued

4	Students had to create instruments to perform a piece for a target audience. This integrated multiple subject areas, was student-driven, and involved an authentic application.	X	X	X
5	When teaching standards on economic systems in China, students took on a career role and selected how to spend their salary in a communist system and then in a capitalist system. Students then wrote a synthesis statement about their learning of lifestyle under each economic system. This activity modeled authentic application.			X
6	STEM activity to design and create something to solve a real-life problem	DNP	DNP	DNP
7	STEAM student portfolios	DNP	DNP	DNP
8	Linear programming project in Algebra II was integrated and an authentic application.	DNP	DNP	DNP

Table 2.9 Continued

9	Students were learning area in math. As a classroom we were creating a garden. Students were asked to draw a garden box. Students had to show their knowledge of area through the drawing. Students then collaborated with Chattahoochee Nature Center to build their own garden box based on the measurements they drew. Students planted different plants according to the measurements on each seed bag. Once the plants began to grow, students were on a measurement unit, so they went out to their garden box and measured the height of their plant. These measurements were put into a graph to show the growth of their plant. This was student driven and authentic application.		X	X
10	A student driven example was students selecting a research topic and presentation modality.		X	
11	Economics budget project students had to complete.	DNP	DNP	DNP
12	Authentic application - connected math to science through the use of veterinary practices and x-rays			X
13	Students developed and implemented a budget based on a set "wage" earned	DNP	DNP	DNP
14	Finding perimeter and area of different parts of room/school...collaborating with other peers to help measure and apply previously taught concepts with a real-world authentic learning experience.			X
15	Project-based learning. Often used speakers or did projects with students to provide hands-on, real-world experiences. Most times prior knowledge had to be built.	DNP	DNP	DNP

Unfortunately, only two examples given by the 15 responding principals proved descriptive enough to determine alignment to one or more of the applied learning component definitions. One described a project that embedded math lessons in the development of a garden with the help of a community partner. The respondent noted this as student-driven learning and an authentic application. Based on the definitions provided in the survey, student-driven learning includes project-based learning (using what was learned to create a garden), and authentic applications connect learning to the real world (collaboration with a community partner to further understand environmental impact).

The second example that aligned to applied learning definitions detailed how students assumed a career role and used an identified salary to spend money in a communist and capitalist system to better understand economics in China and the United States. The respondent labeled the example as an authentic application which aligned to the definition provided in the survey because students connected learning to a real-world scenario (careers, salaries, and budgets in different economic systems). Although the respondent did not note it, the writing of a synthesis statement and the math component of a budget suggested the example also aligned to integrated learning since it included Social Studies, English Language Arts, and Math.

Ten of the 15 examples (1, 4, 6, 7, 8, 10, 11, 12, 13, and 15 in Table 2.9) did not include enough information for me to determine alignment to applied learning definitions. Although language in the responses suggested a possibility of applied learning (veterinary x-rays, current events, target audience, student choice, project-based learning, real-life), the details provided by the principals did not support full interpretation.

I did determine, however, that some responses would not be considered applied learning as defined in the survey. For example, one respondent noted the pairing of a high school and middle school band student for the purpose of mentoring as student-driven learning and an authentic application. On the survey, student-driven learning was defined as student voice, choice, and ownership in learning which this example did not demonstrate, and authentic applications suggest real-world opportunities for experiences, assessments, or audiences which this example did not imply.

Another example described students working together to measure the classroom or parts of the school when learning about perimeter, and the respondent labeled this as a real-world, authentic application. Unless the students measured for a relevant purpose such as the laying of carpet or the arrangement of desks, then this was not an applied learning example. Finally, allowing students to pick from a choice board as an example of student-driven learning meant that students did not have ownership or agency in their learning as they were limited to the choices designed and determined by the teacher as opposed to creating the choices themselves.

The second research question for the qualitative strand focused on professional learning recommendations for principals wanting to lead applied learning implementation. Seventeen (73.9%) principals answered agreed or strongly agreed to the quantitative question about confidently leading applied learning implementation (Table 2.8 above), and 15 of those responded to the second qualitative prompt about advice for other principals wanting to lead implementation (Table 2.10). After analysis, I identified six categories based on emerging themes: training, leadership behaviors, observations, teacher leaders, teacher buy-in, and principal collaboration.

Table 2.10 *Advice for Principals Wanting to Lead Implementation of Applied Learning (n=15)*

Advice for leading implementation	Categories
You must provide training, including yourself as one of the trainers to show what you expect so it is clear to teachers, and they can implement it with fidelity.	Training Leadership behaviors
They need to see it done well. Observation is always a great way to gain understanding.	Observation
Learn about STEAM and PBL	Training
Go to schools where implementation of applied learning is occurring. It is very helpful to see it in action.	Observation
Start with a small group/sampling of teachers who are already doing this or who you can build up to this expectation. Let them be the building teacher leaders for applied learning and bring on additional staff as appropriate.	Teacher leaders
If you want to support this expectation, design a professional learning plan that focuses on applied learning to train all staff. Make it a focus of your CCCs.	Training Leadership behaviors
You have to embrace it, model it, live and breathe it if you want it to happen!	
STEM/STEAM instruction has helped me lead applied learning strategies, and that is one avenue for pursuing a greater focus on this type of instruction.	Training
Provide support and training	Leadership behaviors
Start with a team such as a STEM/STEAM Academy team of teachers working together utilizing applied learning and then spread out to the entire school.	Teacher leaders
Have clear expectations for teaching and learning.	Leadership behaviors
Start small and let teachers' success facilitate the process for schoolwide implementation	Teacher leaders
Administrators need to be visible and in classrooms to ensure this is taking place. They also need to review lesson plans to ensure student success in the implementation of applied learning.	Leadership behaviors
You need to have teacher buy-in to the process in order for this to be effective	Teacher buy-in
Participate in professional development which focus on applied learning.	Training

Table 2.10 Continued

Provide time for teachers to collaborate and create interdisciplinary instructional activities based on the Georgia Standards of Excellence.	Leadership behaviors
Surround yourself with experts in the field. I continue to learn year after year but "steal tips" from everyone I meet.	Principal collaboration

Fourteen of the 17 (82.3%) respondents that gave advice for leading implementation also answered the third open-ended question about professional learning recommendations for those seeking to lead applied learning (Table 2.11). I categorized the responses based on patterns and themes that emerged, but I noted two responses as not-codable, or NC, due to the vagueness of the response. The four categories included training, leader collaboration, professional resources, and observations.

Table 2.11 *Professional Learning Recommendations for Principals Wanting to Lead Implementation of Applied Learning (n=14)*

Professional learning recommendation	Categories
School-based training in grade-level groups on PBL and integrated learning. Some teachers find it difficult to do integrated as they get stuck on how to grade it, instead of the benefits of it.	Training
Collaborate with other colleagues who have made this a priority or focus. Reaching out to county support.	Leader collaboration Professional resources
STEAM and PBL	Training
Visiting sites where applied learning is occurring. Meet with administrators who are implementing applied learning in their schools.	Observations Leader collaboration
Utilize the district-level support to provide PL to your staff (including yourself!). Reach out to colleagues who are already implementing applied learning at their school for advice and guidance. Create a principal CCC with this focus if it doesn't already exist.	Professional resources Leader collaboration
There are a multitude of resources for this, but STEM/STEAM resources and support from the district will assist with this. I have also used Kagan resources to support this instruction as well.	Professional resources

Table 2.11 Continued

Ongoing support	NC (not codable)
I would suggest working within the PLC process so training to make sure the school's PLCs are strong would be needed training.	Training
Training/PD would include seeing applied learning in action!	Observations
It is hard to recommend specific training because it depends on the needs of the teacher/staff.	NC (not codable)
School administrators need to learn the "look-fors" in regards to applied learning so they can recognize them when in classrooms	Observations
Teacher leaders should attend applicable conferences and make a plan to redeliver to the rest of the staff. This will help to increase buy-in from other teachers since it is coming from colleagues rather than administration.	Professional resources
How to Raise Students™ Milestones Scores Using STEAM Activities in the Academic Classroom	Professional resources
Knowledge is power. Effective teaching strategies change every year. Attending conferences, reading literature, etc. is critical.	Professional resources

Stage 1 Data Integration and Quality. The overarching research question guiding this stage was: *How do principals perceive their current applied learning knowledge?* The survey data confirmed that principals believed they set instructional expectations that included one or more CCSD applied learning components based on the definitions provided. They equally believed in their abilities to recognize the components in classrooms; however, I questioned that perception based on the examples given for applied learning lessons they used as teachers. Even though 69.5% of respondents agreed or strongly agreed that they used applied learning as teachers, the data from the corresponding qualitative question asking for examples suggested a misconception as to what constituted applied learning. If principals lacked a clear understanding of what applied learning strategies look like in action, then how can they confidently recognize them being used? Additionally, does that lack of knowledge then influence the clarity of

vision for their instructional expectations? This disconnects between principals' perceptions of applied learning and how it's defined and implemented in the CCSD influenced an intervention.

I also compared the data from the question about using applied learning as teachers to that collected about confidence in leading implementation. I found that slightly more respondents agreed or strongly agreed with the latter versus the former. In breaking down the data further, I learned that over half the respondents (56.5%) agreed or strongly agreed with having taught using applied learning and responded the same to confidently leading implementation. Three (13.0%) neither agreed nor disagreed, disagreed, or strongly disagreed with teaching experience and neither agreed nor disagreed with leading it. Another three (13.0%) agreed with teaching experience, but neither agreed nor disagreed with leading implementation. Finally, four (17.4%) suggested no teaching experience, but then agreed or strongly agreed with confidently leading applied learning. Overall, teaching experience with applied learning led to greater confidence leading it, and most respondents with no experience reported less confidence. Despite a few anomalies, I interpreted this data to mean that less experience using applied learning as teachers impacted principals' confidence with leading implementation.

Finally, categories established from the question about advice for principals wanting to lead applied learning implementation included leadership behaviors, such as setting expectations and modeling (46.0%), professional learning/training (33.3%), teacher leaders, (20.0%), and observations and collaboration (19.3%). My analysis of the question about professional learning recommendations produced similar categories such as engaging with professional resources like district support, literature, and teacher

leaders (46.0%), observations and collaboration (46.0%), and training (23.0%). By integrating the two analyses, I concluded four overarching themes: professional resources/training, observations, collaboration, and teacher leaders.

In summary, principals' perceived knowledge of applied learning included setting instructional expectations for it and confidently recognizing it in classrooms. Some felt they taught using applied learning and could confidently lead it, although at smaller percentages than those expecting and recognizing it. Because the lesson examples provided by respondents proved inconclusive, I added an interview question about examples of applied learning observed in classrooms to more clearly determine if principals could recognize one or more of the three components when used. Also, because fewer respondents felt confident leading applied learning implementation, I constructed interview questions about perceived challenges and opportunities with implementation, and PL needed to increase confidence with leading it.

Reconnaissance Stage 2

The overarching research question guiding this stage was: *How do principals explain their applied learning experiences?* I conducted semi-structured interviews to further explore how principals explain their instructional expectations for applied learning as well as how they describe classroom examples that they observed. Additionally, I designed interview questions to capture principals' challenges, opportunities, and professional learning needs for implementing applied learning in their schools.

Stage 2 Research Questions. Three research questions guided this stage of the reconnaissance phase:

RQ1: How do principals describe applied learning in their school?

RQ2: What do principals encounter when leading applied learning?

RQ3: What professional learning resources do principals need to effectively lead applied learning in their schools?

The alignment of research questions to interview questions is captured in Table 2.12.

Table 2.12 *Research Questions Aligned to Interview Questions*

Research questions	Interview questions
RQ1: How do principals describe applied learning in their school?	Based on the definitions of integrated, student-driven, and authentic applications, describe the instructional vision and expectations you have for applied learning at your school. Based on the definitions of integrated, student-driven, and authentic applications, give an example of applied learning you have observed in a classroom at your school.
RQ2: What do principals encounter when leading applied learning?	What challenges did you experience, or do you anticipate, with leading applied learning? What opportunities did you experience, or do you anticipate, with leading applied learning?
RQ3: What professional learning resources do principals need to effectively lead applied learning in their schools?	What professional learning resources do you need to better understand, recognize, and/or lead applied learning?

Sample.

I employed a convenience sampling strategy for the interview stage. The population for follow-up interviews consisted of survey respondents who volunteered to

participate via the last survey question. The sample was determined by those in the population who were willing and available to schedule an in-person interview after receiving an email invitation from me. Nine of the 23 principals who completed the survey indicated a willingness to participate in a follow-up interview. Of the nine CCSD principals receiving the email invitation, four scheduled an interview for a response rate of 44%.

Two of the four interviewees were elementary school principals. Elementary principal one (ES1) led a school in the Southwest area of the county and received Title I funds. This principal worked 16-20 years in school administration, with 11-15 of those years as the principal of his/her 2021-22 school. The second elementary school principal (ES2) led a school in the Northeast area of the county for the last 1-5 years and spent a total of 11-15 years as a school administrator. One middle school principal (MS) scheduled an interview, and he/she worked as principal at a Northeast Cobb school for 1-5 years and a total of 16-20 years in administration. Finally, a high school principal (HS) serving as the leader of a Northwest Cobb school for the last 1-5 years also interviewed. He/she worked in school administration for a total of 11-15 years.

Instruments.

I developed five interview questions to capture additional details, insights, and perspectives around the quantitative and qualitative survey results (Appendix F). The first interview question prompted principals to describe their instructional expectations for one or more of the three applied learning components. This question aligned to quantitative survey questions one, three, and five about instructional visions and expectations for integrated learning, student-driven learning, and authentic applications. I wanted to verify

if principals could not only agree or disagree with applied learning expectations but also explain and describe them.

The second interview question aligned to quantitative survey questions two, four, and six about whether principals could confidently recognize the three applied learning components in classrooms, and it aligned to qualitative survey question eight that asked respondents to share personal teaching examples of applied learning. Because I questioned the principals' perceptions about this, and since the lesson examples collected on the survey were inconclusive, I wanted to ask the interviewees to share an example of applied learning they observed in their school so I could more clearly assess their abilities.

The last three interview questions asked respondents to share challenges, opportunities, and needs experienced or anticipated when leading applied learning implementation. These questions aligned to quantitative survey question nine which asked about respondents' confidence with leading applied learning implementation, and to qualitative survey questions 10 and 11 on providing advice and PL for others wanting to lead the same. My intent was to identify trends and patterns with responses that would inform an intervention.

I shared my interview questions with three members of my doctoral committee for review prior to data collection. The questions about expectations and classroom observations remained as written, but committee members encouraged me to expand upon principals' experiences with applied learning rather than simply asking about PL needs. Therefore, we added the specific questions about challenges and opportunities that principals encounter when implementing applied learning.

A committee member also coached me on how many questions to ask based on principals' time and availability, which we assumed to be limited. Recognizing that interviewees sometimes engage in storytelling when in an interview, thus potentially increasing the length of the interview session, the committee member suggested that I limit interview questions to those that provide ample information without encouraging specific personal experiences. Finally, per the committee's suggestion, I compared my interview questions to the purpose of my research study to ensure alignment.

Data Collection Procedures.

After receiving Institutional Review Board approval from the University of Kentucky (Appendix C) and the CCSD Office of Accountability (Appendix D), I sent emails from my University of Kentucky account to the CCSD email addresses of the nine principals who volunteered on the survey to participate in a follow-up interview. The email contained the letter of consent and a Doodle poll link for scheduling a date and time to conduct the interview (Appendix G). The email also included the purpose of the study, goals of the interview, and that the interview should last no longer than 30 minutes.

I allowed two and a half weeks for the nine principals to respond to the Doodle poll that included multiple interview dates and times over a three-week period from which they could select. I sent the same initial email as a reminder to any of the nine principals who had not responded after the first week the poll opened. After the two and half weeks, I closed the poll, and via my University of Kentucky email address, contacted each of the four principals who indicated a date and time on the poll for the interview. I

asked them to confirm the date and time selected and their desired location for the interview.

I conducted all four semi-structured interviews in-person at the principals' schools, on a weekday, and during or after school hours. We held the interviews in the principals' office or in a room located in the schools' front office spaces. Immediately before each interview, I read the same interview consent document included in the email, asked if he/she had any questions, and obtained explicit verbal consent from him/her to participate in the interview. Although I initially told participants that interviews should take no more than 30 minutes, one interview lasted 34 minutes.

With permission from the interviewees, I used voice memos on a personal cell phone to record interview data. After the interviews, I downloaded all data from the cell phone and uploaded the files to my password-protected laptop. I removed all identifiers and stored the data in a password-protected Microsoft SharePoint site. The middle school voice memo audio failed to record during the interview; therefore, I analyzed the typed notes I took during the interview instead. I transcribed the other three audio files using the platform, Sonix (San Francisco, CA), and I manually edited the produced transcripts to correct any errors caused by the automation process.

Data Analysis and Findings.

I created a Microsoft Excel spreadsheet with individual tabs representing each of the five interview questions in the order in which I asked them. I labeled the tabs Expectations, Examples, Challenges, Opportunities, and Professional Learning to represent the subject of each interview question. I created columns for each of the four interviewees on each of the five tabs and labeled them as Elementary School 1 (ES1),

Elementary School 2 (ES2), Middle School (MS), and High School (HS) to serve as anonymous identifiers.

I first reviewed the transcripts for each question to identify trends and patterns. I then added keywords and phrases to the Excel spreadsheet based on the corresponding interviewee column, the interview question tab, and the identified trends. In doing so, I found that sometimes the interviewee responded to a specific interview question with an answer that more adequately addressed a different question; therefore, I deductively added some responses to different question tabs as deemed applicable.

For example, ES2 responded to interview question one about instructional expectations with information regarding the school's striving population in literacy and how integration of subject areas was harder in 4th and 5th grades because teachers were departmentalized. I deduced that these comments more accurately addressed challenges the principal faced and therefore added those responses to the spreadsheet tab for question three which asked about principals' challenges with leading applied learning implementation.

Again, using an inductive approach, I looked through all the identified keywords and phrases to craft categories. I combined, simplified, and honed the categories until only a few remained for each topic (Table 2.13).

Table 2.13 *Analysis of Interview Responses (n=4)*

Interview question topics	Categories
Instructional expectations	STEM/STEAM
	Performance and project-based tasks
	Real-world connections
	Integrating subject areas
Recognition	School events
	CTAE classrooms
	Gifted classrooms
	Science classrooms
Leading implementation: challenges	Teacher buy-in and motivation
	Time
	New teachers
	Principal training
Leading implementation: opportunities	Teacher leadership
	Student progress
Professional learning	Principal training
	Observations

Applied Learning in Schools. The first research question for this stage focused on how principals described applied learning in their schools. I first asked interviewees about their instructional expectations for applied learning based on the definitions originally provided in the survey. The ES1 and MS principals immediately referenced their STEM expectations with the ES1 principal specifically referencing arts integration strategies for accomplishing the A in STEAM. The MS principal mentioned that the school already held STEM certification when he/she became principal, but he/she intended to obtain STEAM certification as well.

The HS principal mentioned several instructional expectations such as standards-based instruction, differentiation, and performance tasks. Although the first two did not represent applied learning, performance tasks are considered authentic applications as defined in the CCSD and as referenced in literature on best instructional practices (McTighe, 2015; Noguera et al., 2015; Richardson et al., 2021). The HS principal also

commented about using applied learning where it was a “good fit” like in the science classroom where teachers can naturally make connections to the real-world. The principal at ES2 stated that he/she wanted teachers to do a better job of applying learning to the real-world and that he/she expected more project-based learning to occur.

Both ES1 and ES2 principals spoke to wanting more integration of subject areas. The principal of ES2 mentioned the challenge with that expectation since he/she departmentalized 4th and 5th grade teachers, but he/she suggested that the primary grades could help the intermediate grades by integrating phonics instruction with science and social studies lessons.

A couple interviewees shared expectations not aligned to applied learning which suggested that principals may not include it in their instructional vision and expectations as much as they thought. For example, the ES2 principal mentioned a focus on phonics and math as well as a desire to see more differentiation in the Advanced Content classes (i.e., gifted). The HS principal listed expectations that included standards-based instruction and addressing interpersonal skills. These examples referenced the “what” to teach without referencing the “how” to teach it that applied learning strategies often address.

The next interview question also aligned to the research question about how principals described applied learning in their schools. I asked principals to give examples of applied learning observed in classrooms, and all four principals paused before answering. Interestingly, most could confidently speak to their applied learning expectations but struggled to identify something they observed. When they did respond, most examples included areas where curriculum and standards naturally aligned to

applied learning, such as engineering and business classes (Georgia Department of Education, n.d.), or they referenced science experiments and activities in gifted classes. A couple principals shared school events that included applied learning such as STEM/STEAM nights or a grade-level project. Some examples were not applied learning as defined in the CCSD and further spoke to principals' needs for additional training on recognizing applied learning in core subject (English Language Arts, Math, Science, and Social Studies) classrooms.

For example, the ES1 principal spoke to the STEAM Showcase the school hosted the night before in honor of Hispanic Heritage month. Kindergarten, first, third, and fifth grade students participated by writing songs and creating dances. The principal mentioned that he/she planned two more STEAM Showcases for Veteran's Day and Black History Month. These experiences included applied learning by providing real-world connections (Hispanic and African American history and cultures, for example) and authentic audiences (audiences outside of the classroom such as family and community members attending the evening showcase), but these examples represented one-time events as opposed to ongoing instructional expectations for classroom practice. This mirrors the less immersive Social Integration Style described by Bresler (1995) as using student performances to increase festivity at school events. Only after I further prompted the ES1 interviewee for a classroom example did he/she provide information about an environmental literacy lab.

> "…Basically, everything that they [teachers and students] do is around supporting the garden, but they weave in literacy elements. So…they created like posters that went along…they were doing something like soil conservation. They didn't just

> learn about what is soil conservation. They did some of that previewing and building background knowledge and that kind of stuff in the classroom. And then they actually went out and they amended the soil…".

The ES2 principal shared a grade-level project called Market Day as an applied learning example. First grade students designed and created products, marketed their creations, and then sold them to other students on Market Day. Again, the event aligned to applied learning components by allowing some students to creatively explore the real world of marketing and business, but the example did not imply that teachers embedded applied learning in classroom instruction on a regular basis in response to teaching and learning expectations. This principal also mentioned an applied learning lesson on cross-contamination led by the Target (gifted) teacher, but he/she struggled to provide an example outside of that limited realm.

During interview question one, the MS principal confidently shared the school's STEAM certification and consequent classroom expectations for applied learning. When asked to give an example observed in action, he/she hesitated. After a little thought, he/she mentioned the two Career, Technical, and Agricultural Education (CTAE) courses offered at the school: Engineering and Business. The principal described those courses as skills-based and preparing students for post-college life, which do align to the authentic application component of applied learning, but CTAE courses naturally do that through curriculum and standards (Georgia Department of Education, n.d.) The MS principal did not offer a core subject, classroom example of STEAM strategies being used even though he/she suggested that the expectations included school-wide implementation.

When answering question one, the HS principal described his/her expectations for performance tasks, increased depth of knowledge, and specifically mentioned wanting science teachers to include real-world connections. The prompt for question two, however, caused him/her to pause. Like the MS principal, he/she answered shortly after with examples from CTAE classrooms. The HS principal referenced one CTAE class that employed technology and coding, and he/she mentioned the Audio, Visual, Technology, and Film class that produced morning broadcasts and marketing videos. When asked to consider an example from a science class as he/she described in question one, the principal briefly spoke about one class that grew an ecosystem in a bottle.

> "Those pieces in that environmental class I was in the other day, …they had a whole ecosystem in a bottle going on. I mean that was the conversation. I don't know the details of those two-liter bottles, but there was a whole ecosystem going on in the bottle."

He/she could not provide more details than that for me to determine if that was an example of applied learning as defined in the CCSD.

Encounters with Applied Learning Implementation. Research question two for this stage was: *What do principals encounter when leading applied learning?* I asked the interviewees to identify challenges faced or anticipated when leading applied learning. The overwhelming response was teacher buy-in, with principals giving varied reasons for teacher hesitation around implementing these strategies despite their instructional expectations.

For example, the ES1 principal sent teachers to STEM and Arts Integration trainings provided by the STEM & Innovation and the Fine Arts departments. He/she

modeled leadership behaviors by also attending some of the trainings with the teachers (Andrews & Soder, 1987; Chesley & Jordan, 1996; Hitt & Tucker, 2016; Quinn, 2002; Robinson et al., 2008) and by establishing clear expectations for the inclusion of those strategies in classrooms. Despite all that, he/she readily admitted to not seeing classroom implementation often enough. The principal commented that the kindergarten team, for example, embraced STEAM strategies, but the first-grade team did not. He/she described "dragging some people along." Having previously observed a school where teachers used arts integration strategies pervasively, the ES1 principal knew that he/she aspired to that same level of implementation.

When I asked the ES2 principal about challenges for applied learning implementation, he/she echoed the sentiment about teacher buy in. "So, the buy in, them seeing the value in it, not just because I'm saying, hey, please try this. Just because when I do, when we do stuff, I want them to be valuable."

The MS principal leads a school with academically successful students who perform well in school and on state assessments. He/she mentioned that teacher buy-in for including more applied learning strategies proved to be a challenge because teachers questioned the need to change their instructional practices if students already performed at such high levels. The HS principal echoed a similar sentiment regarding Advanced Placement teachers. They typically strived for a high percentage of students with scores of three or more on the AP exams and considered those passing scores as a reflection on their professional success and the students' academic success. For those teachers, this meant focusing solely on test prep as opposed to including applied learning strategies.

Interviewees mentioned time as another challenge for leading applied learning implementation. At the school where the HS principal leads, students attend classes on a block schedule which means completing an entire course in 90 days. The principal stated that because of the pressure to cover all standards in one semester, teachers felt little opportunity for embedding activities or strategies, such as applied learning, that would potentially slow down the pace of the course.

> "I think our challenge is…in high school, our teachers want to shut the door and teach the content and be the expert in front of the room and getting them to release that. I'm telling you what to know and letting them explore and discuss and balance that against finishing the course in 90 days. So, they sometimes will squelch good conversations and they'll cut back on activities and tasks that take a while because they feel like they have to stick to the pacing guide."

The ES2 principal works with a large population of students who need additional help in the areas of literacy and math; therefore, he/she planned professional learning around the teaching of those skills and standards, leaving little, if any, time for applied learning training.

Finally, the ES1, ES2, and HS principals all mentioned the challenge of new teachers. The ES1 principal spoke about difficulties providing time for PL on instructional expectations for newly hired teachers. The ES2 and HS principals described new teachers fresh out of college as being ill-equipped professionally and/or emotionally to lead innovative strategies such as applied learning. The HS principal also mentioned that current college and university graduates did not complete the student teaching experience traditionally done in local schools due to the pandemic. As a result, the

principal noticed an even larger deficit in new teacher abilities and preparation for the face-to-face classroom.

Interview question four also aligned to the research question on principal encounters when leading applied learning. I asked principals to share opportunities that they anticipated or experienced with leading applied learning. Three out of the four principals mentioned the potential to positively impact students, whether through engagement or academic growth. The other common theme from principals included leveraging teacher leadership.

The MS principal spoke to student engagement and excitement as an applied learning opportunity, whereas the HS principal mentioned seeing student academic gains when teachers embraced the instructional expectations for performance tasks and integrating literacy and writing across disciplines. The ES2 principal commented that 40% of his/her school's student population received Free and Reduced Lunch; therefore, when asked about opportunities anticipated with leading applied learning, he/she referenced exposure for students that might not otherwise receive it.

> "…I think just the opportunities for our kids to be able to see how because they're not getting that at home… I mean, the parents are doing the best they can. They're working, but they come home, you know, go to bed. There's not a whole lot of language or opportunity. If you're going to have opportunity, we're going to be the ones providing it for the most part…".

Three principals also spoke to teacher leadership as a potential opportunity. The ES1 principal shared that he/she designated specific teachers as "leads" for the arts integration trainings based on their individual strengths and skills.

> "…I try to always recognize people and build them up…and help them to realize what they're good at… And so, I feel like that's given us that opportunity. I mean, there's some of my quietest teachers that you don't really hear. You know, they sit in the meeting and…I've watched them, I know them well enough and they're my ArtsNow leads. And when I went to them and I was like, you know what…? I would really like you to be the third-grade lead for ArtsNow... And I said, how do you feel? And she's like, oh, my God, I love the arts, I'm so excited, but she would never do it herself."

These teachers now provided peer-to-peer support for using these strategies as opposed to the principal giving a top-down directive. The MS principal also noted using teacher leaders to start a phased rollout of applied learning instead of attempting a whole school implementation all at once.

Professional Learning for Leading Implementation. The last research question guiding this stage focused on principals' professional learning needs to effectively lead applied learning implementation, so I asked interviewees that same question. Interestingly, three of the four answered initially with PL needs for teachers. When I asked them to specifically recommend PL needs for principals, they hesitated before responding. Eventually, two emerging themes from their answers included offering applied learning training specifically for principals and observing applied learning in classrooms.

The principal at ES1 said he/she participated alongside the teachers when they received training on STEM and arts integration strategies. "And I always took part, my APs take part, you know, because we need to know what the teachers are learning

and…that helps us set expectations." The ES2 principal mentioned that once he/she became a principal, he/she no longer received PL, stating "Once you become a principal, you don't get stuff really anymore." Instead, he/she learned from colleagues when serving as an assistant principal or when speaking with fellow principals now. The MS principal also mentioned needing more opportunities to learn additional strategies.

The HS and ES2 principals suggested the need to see examples of applied learning in classrooms. The former asked to hear from national speakers at principals' meetings and for district leaders to share examples of what school leaders should look for when leading "great instruction."

> "And like right now…the theme is tier one, level one question [PLCs], …great instruction in front of kids. So, you put that quality instruction in front of them. So that needs to be the PL for leadership in the district. What is great instruction? What are you looking for? What can you, we, share with you to help you facilitate that with your teachers?"

The latter wanted to see applied learning in action so he/she could understand "exactly what it should look like." The ES2 principal was never a classroom teacher, so he/she consistently looked for opportunities to grow in LKES standard one, instructional leadership.

Data Integration and Quality. The overarching research question for this stage focused on how principals explained their applied learning experiences. All four principals answered interview question one with instructional expectations for one or more of the three applied learning components. ES1 and MS principals mentioned STEAM implementation which suggested recognition of the inherent correlation between

applied learning and STEM/STEAM strategies (Bresler, 1995; Buchanan et al., 2016; Gullatt, 2008; Mehta, 2022; Thibault et al., 2018).

Interviewees did not mention excluding core subject teachers from adhering to their instructional expectations for applied learning, so I did not think to specifically ask for core classroom examples in question number two. Even if principals eliminated applied learning from their instructional expectations, classroom teachers outside the four core subjects would still use those strategies. Content areas such as CTAE, the Fine Arts, and STEM/STEAM naturally include integrated curriculums, project-based learning, and authentic applications by nature of the course standards and curriculum (Bresler, 1995; Buchanan et al., 2016; Georgia Department of Education, n.d.; Gullatt, 2008; Mehta, 2022; Thibault et al., 2018). These interview data, therefore, suggested a need for PL on recognizing and identifying applied learning strategies when observing core subject classrooms.

When asked about challenges with leading implementation, principals quickly shared the struggle with teacher buy-in. This might also explain why the principals could not immediately identify examples of applied learning in core classrooms. If core teachers had not yet "bought in" to the inclusion of these strategies, then principals might not have strong examples to give. Teacher hesitancy to embrace new or different strategies aligns with the research on leading change which suggests that asking teachers to shift their instructional approaches can make them feel inadequate, overwhelmed, and fearful (Chesley & Jordan, 1996; Hussain et al., 2016; Zimmerman, 2006). Therefore, I also concluded a need for PL on addressing teacher buy-in.

Principals often mentioned student success when asked about opportunities experienced or anticipated with applied learning implementation. The interviewees also recognized the opportunities for building and/or recognizing teacher leaders in their schools. These responses suggested that principals understood the positive impact of applied learning on students and the "why" for implementing these strategies, so they may only need reminders as opposed to fully designed PL on these topics.

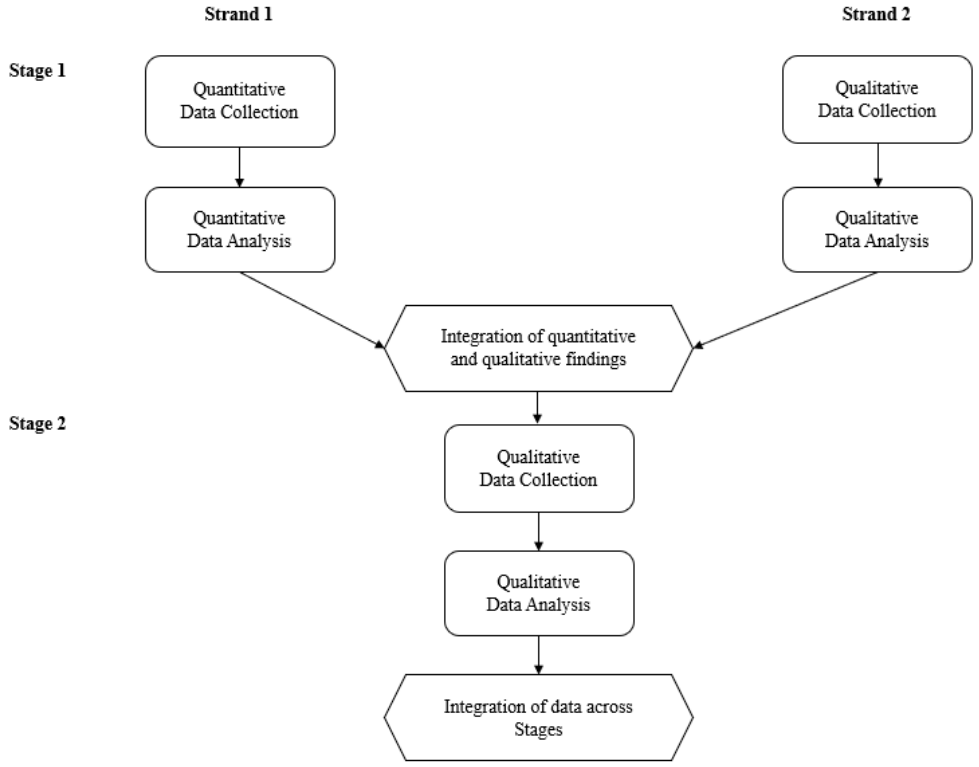
Finally, the last question regarding PL for principals caused some pause from the two interviewees who led STEAM certified schools; however, these two principals also struggled to provide examples of applied learning outside of STEAM events or CTAE courses. I deduced that if the principals already felt that they implemented applied learning through their STEAM efforts, then they would struggle to identify anything more needed in terms of PL; however, since the principals did not intuitively identify examples from core classrooms, I concluded that all principals, including those of STEM/STEAM certified schools, would benefit from applied learning PL, especially if their instructional expectations already include whole school implementation.

Overall Phase Integration and Findings

In a multistrand design, researchers analyze each stage and/or strand independently, and then integrate the data from each analysis to determine if the results converge or diverge. Using a combining strategy, I integrated the data from the survey strand results and the analyses of interview responses for this multistrand quantitative-qualitative design (Figure 2.3).

Figure 2.3

Conceptual Diagram of a Multistrand Quantitative + Qualitative Mixed Methods Data Analysis



Note: This figure is adapted from *Mixed Methods Applications in Action Research: From Methods to Community Action* (p. 174), by N.V. Ivankova. Copyright 2015 by Sage Publications, Inc.

I compared Likert scale survey responses side-by-side to the open-ended responses of the corresponding qualitative survey questions. I intentionally aligned the close-ended and open-ended questions when creating the survey, and then developed the interview questions based on additional data needed or gaps identified during the survey data analyses. I integrated the findings from all three to determine meta-inferences that would inform an intervention.

The overarching research question that guided the reconnaissance phase was: *How do principals' perceived knowledge of and experiences with applied learning inform*

the development of professional learning resources? By integrating the quantitative and qualitative data collected through the survey and the qualitative data captured in the semi-structured interviews (Table 2.14), I drew the following conclusions in response to the research questions.

Table 2.14 *Integration of Survey and Interview Analyses*

Research questions	Quantitative survey questions and analyses		Qualitative survey questions and analyses		Interview questions and categories	
RQ: To what extent do principals report aligning instructional expectations to applied learning? (Quantitative)	SQ1,3,5: The instructional vision and expectations for teaching and learning in my school include:		NA	NA	IQ1: Based on the definitions of integrated, student-driven, and authentic applications, describe the instructional vision and expectations you have for applied learning at your school.	STEM/STEAM Integrated subject areas Performance/ Project-based learning Real-world connections
	integrated learning	82.6% M=3.91 SD=0.93				
RQ: How do principals describe applied learning in their school? (Qualitative)	student-driven learning	82.6% M=3.96 SD=0.69				
	authentic applications	82.6% M=3.96 SD=0.69				
RQ: What are principals' perceived abilities to recognize applied learning in classrooms? (Quantitative)	SQ2,4,6: When I observe classrooms, I can confidently recognize the use of:		NA	NA	IQ2: Based on the definitions of integrated, student-driven, and authentic applications, give an example of applied learning you have observed in a classroom at your school.	School events CTAE classrooms Gifted classrooms Science classrooms
	integrated learning	82.6% M=4.04 SD=0.62				
RQ: How do principals describe applied learning in their school? (Qualitative)	student-driven learning	91.3% M=4.13 SD=0.54				
	authentic applications	82.6% M=4.09 SD=0.78				

Table 2.14 Continued

RQ: To what extent do principals report using applied learning as teachers? (Quantitative)	SQ7: Based on the definitions of integrated, student-driven, and authentic applications, I used applied learning strategies when I was a teacher.	69.5% M=3.65 SD=1.09	SQ8: If yes, give one example of an applied learning strategy that you used and include whether it was integrated, student-driven, and/or an authentic application.	Inconclusive based on lack of details provided by respondents	NA	NA
RQ: How do principals perceive their abilities to lead implementation of applied learning in their schools? (Quantitative) RQ: What do principals encounter when leading applied learning?	SQ9: Based on the definitions of integrated, student-driven, and authentic applications, I can confidently **lead** the implementation of applied learning.	73.9% M=3.96 SD=0.69	SQ10: If yes, what advice do you have for other school administrators wanting to lead implementation of applied learning?	Teacher leaders Leadership behaviors Observations Collaboration	IQ3: What challenges did you experience, or do you anticipate, with leading applied learning? IQ4: What opportunities did you experience, or do you anticipate, with leading applied learning?	Teacher buy-in and hesitation Time New teachers Teacher leaders Student progress

Table 2.14 Continued

RQ: What professional learning resources do principals recommend when implementing applied learning? RQ: What professional learning resources do principals need to effectively lead applied learning in their schools? (Qualitative)	NA	NA	SQ11: What professional learning resources would you recommend to other school administrators wanting to lead implementation of applied learning?	Professional resources Training Observations Collaboration	IQ5: What professional learning resources do you need to better understand, recognize, and/or lead applied learning?	Training Collaboration Observations

Fewer principals taught using applied learning than those expecting and recognizing it. Unfortunately, the personal teaching examples that some respondents provided proved inconclusive due to lack of detail; therefore, I could not definitively deduce whether the principals taught using applied learning strategies. Because this also led me to question principals' abilities to recognize applied learning, I included interview questions about examples observed in classrooms. The interview responses, however, did not elicit examples from core classrooms, so I concluded that additional PL on recognizing applied learning would be beneficial.

Principals reporting confidence to lead applied learning implementation were fewer in number as well. One-third of respondents did not believe they taught using these strategies and one-fourth did not feel confident leading it. Using the Data & Analysis function and the Stats IQ tab in Qualtrics, I learned that no statistically significant relationship existed between lack of experience with applied learning and lower confidence with leading implementation. That result, however, could have been impacted by the relatively small sample size; therefore, I decided that additional PL on leading implementation was still necessary.

Principals wanted additional PL, specifically designed for them, on applied learning strategies. Themes captured when integrating survey and interview data included training to increase understanding, observations to see applied learning "in action," collaboration with colleagues already leading this work, and leveraging teacher leaders to help with implementation. This information would inform the development of professional learning resources to increase principals' applied learning knowledge and to impact instructional leadership plans for expectations and professional goals.

Even though the six principals who contributed to the diagnosis phase did not participate in the reconnaissance survey or interviews, the data collected did support the problem of practice which suggested that principals set expectations and understood the need for more applied learning strategies in classrooms but struggled to lead implementation having never taught using those practices themselves. Based on the data analyses and integrations, I determined that professional learning resources developed for the purpose of increasing principals' knowledge in understanding, recognizing, and leading applied learning needed to include training on the three components, examples of core classroom implementation, collaboration with colleagues who already lead applied learning, and information about leveraging teacher leaders for this purpose.

Summary

In this chapter, I described the reconnaissance phase in relation to the problem of practice identified during the diagnosis phase. I employed a multistrand quantitative-qualitative design by first collecting quantitative and qualitative data concurrently through a within-strategy survey, and then based on the survey data analyses, conducting semi-structured interviews.

Survey questions asked for principals' instructional expectations, abilities to recognize, experience using, and confidence leading three applied learning strategies as defined in the CCSD: integrated learning, student-driven learning, and authentic applications. I aligned interview questions to survey questions and responses in order to gather additional information about expectations, recognition, and implementation. I also asked survey and interview respondents to recommend professional learning that would help principals lead applied learning implementation.

Using a combining strategy, I integrated the results from each survey strand with the interview responses to identify meta-inferences. Results from the data analyses confirmed the problem of practice which suggested that although principals expected and recognized applied learning, they lacked teaching experience using these strategies and therefore struggled to lead implementation. The data collected, analyzed, and integrated showed higher percentages for expecting and recognizing the three applied learning components, compared to those who used them or could confidently lead them.

Professional learning recommendations included developing training specifically for principals on applied learning, providing opportunities to observe applied learning in action, and collaborating with colleagues about how they lead implementation and leverage teacher leaders. These results informed the planning of an intervention.

Chapter 3

The third and fourth phases of the MMAR framework are planning and acting. In the planning phase, researchers use reconnaissance data to plan an intervention that addresses the problem of practice identified in diagnosis (Ivankova, 2015), and the acting phase is the implementation of the intervention action plan. The plan includes intended outcomes, action steps, and data collection. Stakeholders impacted by the problem of practice develop and/or contribute to the intervention plan.

The following information describes the planning process for this study including meta-inferences drawn during reconnaissance, stakeholder involvement, and the development of an intervention. Also included in this chapter are details about the acting phase including objectives and outcomes, the intervention site, resources, and the implementation of action steps.

Problem of Practice

During diagnosis, I spoke with two School Leadership Assistant Superintendents and six CCSD principals about instructional practices and leading change. I learned that most wanted to see teachers using research-based practices and applied learning strategies, such as student-driven learning, relevancy to students' lives, and project-based learning. Principals indicated, however, that since they did not use applied learning strategies as teachers, then their lack of experience influenced their abilities to lead implementation. They alluded to a need for professional learning (PL) to understand more about leading this instructional change.

Based on this problem of practice, I conducted a multistrand quantitative-qualitative design during reconnaissance to collect additional data about principals'

baseline knowledge and experience with applied learning. The inferences drawn from the reconnaissance phase findings suggested that most principals felt they had instructional expectations for applied learning, but they could not always articulate them clearly. Most principals also believed in their abilities to recognize applied learning in classrooms, but when asked to provide examples they used or observed, they struggled to respond or could not give examples from core subject classrooms.

As learned in diagnosis and confirmed in reconnaissance, fewer principals taught using applied learning or felt confident in leading implementation compared to those who believed they expected and recognized it. Principals participating in reconnaissance identified PL needs for applied learning, and they most often recommended principal training to increase understanding, classroom observations to help with recognition, and collaboration with colleagues to hear about implementation.

Planning Phase

For the planning phase of this study, I worked with stakeholders to design a PL session that would serve as the intervention. The plan included developing the PL specifically for a principal audience and embedding the training, observations, and collaboration pieces identified in reconnaissance. Finally, the plan included research, activities, and an assessment for evaluating the impact of the intervention on intended outcomes.

Stakeholder Involvement

The stakeholders involved in the planning phase included the Applied Learning and Design (ALD) Office's eight department supervisors: CTAE, Digital Transformation, General Music/Choral/Dance/Theatre, Instrumental Music, Learning Resources, Library

Media Education, STEM & Innovation, and Visual Arts. Additionally, the ALD planning team included two CTAE Coordinators, one Digital Transformation Coordinator, and the two Professional Learning Specialists (PLS) for STEM & Innovation and Fine Arts. The School Leadership Division Assistant Superintendents also contributed to the planning phase.

ALD Team

I shared the reconnaissance data with the ALD Office's planning team during a bimonthly team meeting. I chose these team members because they regularly develop and deliver PL on applied learning strategies. Using a PowerPoint presentation, I shared the research study purpose, the problem of practice, and the results from reconnaissance. I intentionally organized the slides by the four purposes of reconnaissance – expectations, recognitions, experience, and implementation – and concluded with meta-inferences drawn from the responses.

The ALD team and I collaborated on a preliminary outline for a PL opportunity specifically designed for principals around the three applied learning components addressed in my study. We drafted a plan that aligned to increasing principals' abilities to understand, recognize, and lead applied learning implementation through training, observations, and collaboration.

We discussed beginning the PL by unpacking the definitions for each component and showing videos of each being used in classrooms. Using video footage of CCSD classrooms implementing applied learning was considered for the observation piece of the PL. Finally, the team suggested a principal panel for collaborating with colleagues

who already led implementation and considered crafting structured questions in advance to guide the discussion.

The ALD team recommended using engagement strategies throughout the PL, including icebreakers, protocols for leading conversations, and giving participants an opportunity to plan and commit to next steps. We wanted to design the PL experience to intentionally model applied learning strategies by making learning active, applying and transferring knowledge, and collaborating with others.

We completed a rough draft of the PL outline during the meeting, and I invited the ALD team to add to or comment on the plan in our Microsoft Team chat. I scheduled another meeting to continue planning the specific PL details, activities, and information.

School Leadership Assistant Superintendents

I shared the reconnaissance data and draft PL plan with the School Leadership Assistant Superintendents during their monthly meeting. When we met, only five of the seven were present, three elementary and two high school. I shared the same PowerPoint presentation that I showed to the ALD team. When I finished, one person asked a question about whether the participating principals could provide examples of applied learning in classrooms, and I reiterated that they could only reference STEM nights or CTAE classrooms, which naturally aligned to applied learning. No one offered any additional input or feedback for the PL plan, and all approved of me offering a PL session for principals on applied learning.

Actions or Interventions Considered

During the planning phase, the ALD team considered offering separate PL sessions over time for training, observations, and collaboration instead of including them

all in one session. We also discussed offering the PL asynchronously through a course developed in our learning management system. To observe examples of applied learning in action, we considered taking a group of principals on a tour of classrooms across the district. The ALD team also considered hiring a video crew to capture classrooms identified by them as having strong applied learning implementation and using that footage to show principals.

Finally, options for collaborating with colleagues included scheduling a series of virtual sessions via Microsoft Teams when principals could drop-in and speak with those already leading applied learning. Based on feedback in reconnaissance, we also thought about connecting in-person or virtually with a national leader and speaker of applied learning and offering a time when principals could hear from them and ask questions.

Final Intervention Identified

In the end, time and budget influenced the final decision, which was to offer one, face-to-face PL session for principals that included applied learning training, videos captured by ALD team members of CCSD classroom implementation, and a principal panel with structured prompts facilitated by a moderator. A two-hour PL session, called Applied Learning for Principals, was scheduled for March 14, 2023, after a Leadership and Learning (L&L) meeting.

Six ALD team members attended a three-hour strategy meeting for finalizing the PL plan. Everyone at the strategy meeting agreed that the PL should be aligned to adult learning theory by setting goals based on data and prior knowledge, aligning content to grounded research on learning, and engaging participants through active learning (Darling-Hammond et al., 2017; “Transformational processes,” 2022; Westberry and

Hornor, 2022). Additionally, we embedded opportunities for feedback and reflection often in collaboration with colleagues (Darling-Hammond et al., 2017). Recognizing that an principals appreciated opportunities to address knowledge gaps, we designed the PL to include the unpacking of applied learning language and opportunities to practice what they learned through real-world classroom scenarios (Westberry & Hornor, 2022).

We chose an icebreaker called three in a boat. In this strategy, everyone walks around the room until the facilitator says something like, "five in a boat," at which time everyone must form groups of five. They are prompted with a question, such as mountains or the beach, and they share out with their group. This repeats, so we decided to cap it at three rounds and do five, three, and then end with four in a boat with the last group being the people with whom they sit for the PL session. The Fine Arts PLS offered to lead this activity at the PL session.

The next piece of the PL was establishing the "why" of applied learning implementation using research to support the reasoning. Learning Forward (2022) echoes this idea in their revised standards, suggesting that educators ground PL in scientific research and theories about the learning process ("Transformational processes," 2022). The Visual Arts Supervisor and the Fine Arts PLS offered to lead this part of the PL using research about applied learning strategies leading to higher engagement and lower discipline (Ellis & Fouts, 2001; Krakaur, 2017; Wolkowicz, 2017). I also added the World Economic Forum's Top 10 Skills of 2025 as a reason for the "why" (Whiting, 2020). Because reconnaissance data suggested that principals already understood the reason for applied learning, we decided that this piece of the PL would be short.

Goodwin and Webb (2014) found that a common understanding for research-based practices did not exist among educators who often confused programs, materials, and strategies; so, we unpacked the three components using the same research-based definitions from reconnaissance, included quotes from peer-reviewed articles, and provided video examples from across the country. We thought this training piece would improve understanding of best practices. I asked the team if anyone would like to lead this part of the PL, but they deferred to me.

For the observation piece of the PL, the team decided to offer six stations through which principals could rotate and see different videos of elementary, middle, and/or high school CCSD classrooms implementing applied learning using footage we had started uploading to the Office 365 shared folder. Principals would rotate through three of the six stations, and they would choose which three they visited. The stations would allow for collaboration with other principals which we felt modeled the basics of student-driven learning which include choice and working with peers (Buchanan et al., 2016; Darling-Hammond et al., 2021; Mehta, 2022; Saltman, 2011; Toshalis & Nakkula, 2012). For engaging with the videos, we chose a protocol called "I see, I think, I wonder" where groups at each station would use these prompts to share what they observed, and the station facilitator would capture their thoughts on chart paper. Six ALD team members would facilitate each of the six video stations.

Finally, we selected six principals to serve on a principal panel for the collaboration piece of the PL. Our choices represented each level (elementary, middle, and high) as well as those we knew to be strong leaders of applied learning. We also considered varied school locations and student demographics so that all principals

participating in the PL could relate to what was shared by the panel. Finally, we created four structured questions, based on reconnaissance data, to ask the panel and planned to leave time for general Q&A from the audience. We selected the Instrumental Music Supervisor to serve as moderator.

We agreed to close the PL with next steps for setting expectations and goals aligned with applied learning. The team was already developing a PL course on applied learning for next school year that would be accessed asynchronously through the district's learning management system, so they planned to mention it as a future resource. Finally, we decided to schedule time for principals to complete the post-survey before they leave.

The week after the strategy meeting, I crafted a PowerPoint to guide the PL session. I started with a slide on the goals of the PL, which were to:

- unpack three applied learning components: integrated learning, student-driven learning, and authentic applications,
- observe and discuss examples of applied learning in action through videos of K-12, CCSD classrooms, and
- collaborate with K-12, CCSD principals who were implementing applied learning.

I also added a bullet for the two LKES Standards aligned to the PL purpose: LKES Standard 1: Instructional Leadership and LKES Standard 7: Professionalism.

Next, I added the three in a boat icebreaker questions that included the beach or the mountains for the first grouping of five and sing in public or 50 free throws in public for the second grouping of three. For the last group of four, we would ask them

approximately what percentage of their time was spent as a building manager versus an instructional leader. The team agreed that the first two provided a little levity and helped people become more comfortable, while the third one helped transition their thinking to align with the PL purpose.

I created slides for the CCSD definition of applied learning, the "why" of applied learning, and the unpacking of the three component definitions. I found a strategy used for unpacking standards which was to underline verbs and circle nouns (and sometimes adjectives), so I planned to ask principals to do the same for each of the component definitions. I also found one-to-four-minute video clip(s) of each component being used in classrooms outside the CCSD. As a close-reading strategy, I planned to give principals a purpose for watching each video which was to look for examples of the verbs and nouns unpacked from the definitions as well as any of the top 10 skills of 2025 shared during the "why" part of the PL.

I added a section on "applying your learning" to model the transference of knowledge. I created eight classroom scenarios that represented lessons principals might observe in core classrooms. The PL participants would be instructed to work with a partner and read at least two scenarios provided at their table and consider the following questions based on what they had learned so far in the PL session:

- Is the scenario an example of one or more of the three applied learning components?
- If so, identify and explain the component(s).
- If not, how could the lesson be changed to include one or more of the components?

We would make sure that every table had at least one applied learning scenario and one that was not so they could understand the difference.

For the next step, I created a slide for the station rotation and reviewed all the video clips that the ALD team uploaded. When selecting which to use for the six stations, I made sure that K-12 core classrooms and all three components were represented while also considering the tight timeline for the PL session. I had already contracted with a professional video group to help me edit and combine videos into six, two-to-four-minute links.

The final two slides introduced the principal panel participants and closing commitments. After sending email invitations to the six principals (2 elementary, 2 middle, and 2 high) identified by the ALD team explaining the PL purpose and asking them to serve on the panel, I received confirmations from all six that they would participate.

I timed each section of the PL down to the minute to ensure we would finish within two hours and added the time to the notes section of each PowerPoint slide. The day before the PL, I shared video links with each of the station facilitators and solicited an ALD team member to serve as timekeeper. I scheduled two drop-in Microsoft Teams meetings from which the ALD team could choose to attend and learn about the final plan and presentation.

The day before the PL, one of the supervisors facilitating a video station learned he would be unavailable, so the team decided to disperse the videos for that station amongst the other five stations and eliminate the sixth. That same day, I learned that one

of the high school principals would not be able to serve on the panel. Because this happened at the last minute, the team and I decided not to find a replacement.

Timeline

In January 2023, I was given two options for offering applied learning PL to principals: two hours after a February 2023 monthly principal meeting or two hours after the March 14, 2023, Leadership and Learning (L&L) meeting, and I selected the latter. In February 2023, I received Institutional Review Board approval from the University of Kentucky (Appendix H) and the CCSD Office of Accountability (Appendix I) for the PL post-survey data collection.

- February 8, 2023: Diagnosis and reconnaissance data shared with the ALD Office's eight department supervisors, three coordinators, and two professional learning specialists. The initial outline for the PL was drafted.
- February 15 – March 10, 2023: ALD team members added classroom videos of applied learning implementation to a shared Microsoft Office 365 folder.
- March 3, 2023: I held a three-hour strategy meeting with ALD members to finalize the PL plan.
- March 7, 2023: I met with the School Leadership Assistant Superintendents to share diagnosis and reconnaissance data and the PL plan crafted by ALD.
- March 7, 2023: I sent an email to six principals inviting them to serve on a panel at the PL session.
- March 10 – March 13, 2023: I worked with a professional video company to edit video clips selected from the Office 365 folder.

- March 10 and March 13, 2023: I communicated with principals about the PL session being offered after L&L on March 14, 2023, and provided a registration link.
- March 10-March 13, 2023: I finalized the PL plan based on stakeholder feedback.
- March 13, 2023: I shared the final PL plan with ALD members and made final edits to the CCSD classroom videos to allow for five stations instead of six.
- March 14, 2023: The PL session was offered from 1:30-3:30 p.m.

Acting Phase

During the acting phase of an MMAR study, researchers implement an intervention developed in the planning phase (Ivankova, 2015). The purpose of the intervention is to address the problem of practice identified in the diagnosis phase using data collected in the reconnaissance phase. Reconnaissance data for this study suggested that principals set instructional expectations for applied learning, and believed they recognize it, but they lacked experience using it and struggled to lead it. They recommended professional learning (PL) to improve their abilities to lead applied learning; therefore, the purpose of the intervention was to provide a PL session designed specifically for principals to increase their knowledge in understanding, recognizing, and implementing applied learning strategies and impact their instructional leadership plans for expectations and goals.

Objectives and Outcomes of the Intervention

The intervention included three objectives: unpack three, CCSD applied learning components (integrated learning, student-driven learning, and authentic applications), observe and discuss examples of applied learning in action, and collaborate with K-12,

CCSD principals who implement applied learning. The proposed outcomes were to increase principals' knowledge in understanding, recognizing, and leading applied learning and to impact instructional leadership plans for expectations and goals.

Intervention Tasks and Activities

The Applied Learning and Design (ALD) Office's supervisors, coordinators, and professional learning specialists (PLS) primarily planned, designed, and delivered the intervention. We offered the PL session, Applied Learning for Principals, after a CCSD Leadership & Learning (L&L) meeting, which was attended by all principals. The tasks and activities included in the PL aligned to the meta-inferences drawn during reconnaissance. Those inferences suggested that principals wanted to, 1) understand more about applied learning as defined in the CCSD, 2) observe applied learning in action, and 3) hear from colleagues already implementing applied learning in their schools.

Two workdays before the PL, the Assistant Superintendent of Teaching and Learning sent an email on my behalf to all CCSD principals with information about the PL. The email consisted of several details including a "why" statement for attending the PL that read, "If your instructional vision is to build student engagement and reinforce mastery of learning, then this session is for you. We will discuss how to transition from traditional, teacher-led instruction and move more towards hands-on, applied learning strategies." The email also included the date, time, and location of the PL as well as the three PL objectives: unpack the three applied learning components (integrated learning, student-driven learning, and authentic applications), observe and discuss examples of applied learning in action through videos of K-12, CCSD classrooms, and collaborate with colleagues who are implementing applied learning in their schools. We listed the

principals that agreed to serve on the panel, and finally, we asked principals to register in advance using a link provided.

Every other week, the Chief Academic Officer (CAO) sends an Academic Division Newsletter via email to all CCSD principals. Because she sent one the day before the PL, I included the same information in the newsletter that we shared in the email. On the morning of the PL, 19 principals had registered to attend. Just in case someone wanted to attend but didn't register, an ALD team member created a flyer with the PL information, and another ALD member helped disperse the flyers at L&L shortly before the PL started.

Fourteen of the 19 principals who registered attended the PL, and they represented all K-12 levels. I began the session with the PL purpose before moving into the icebreaker led by the Fine Arts PLS. She guided the principals through the "three in a boat" strategy, and when finished with the last grouping, instructed them to sit with those same four people throughout the PL.

Next, I introduced the CCSD definition of applied learning and highlighted the three components that would be the focus of the PL: integrated learning, student-driven learning, and authentic applications. The Visual Arts Supervisor and the Fine Arts PLS then discussed the "why" of applied learning. They spoke to the impact of applied learning on students, such as personalized experiences, higher engagement, deeper understanding, and greater cognition (Ellis & Fouts, 2001; Krakaur, 2017; Wolkowicz, 2017). I continued with the "why" discussion by introducing the World Economic Forum's Top 10 Skills of 2025, which highlighted areas such as problem-solving, self-management, working with people, and technology use (Whiting, 2020). We provided a

print version of the World Economic Forum's Top 10 Skills infographic (Appendix J) at participants' tables and gave principals a minute to turn and talk with a table partner about whether current instructional practices instilled these skills in our students. After that brief table discussion, principals shared their thoughts with the whole group.

Having established the reason for applied learning, we unpacked the research-based definition(s) for each component, which we also printed and provided to participants at their tables (Appendix K). I asked each principal to underline the verbs and circle the nouns in the definition(s), and once completed, I displayed the answers on PowerPoint. I then showed a video clip(s) from non-CCSD classrooms that demonstrated students and teachers implementing the component. Using a close-reading strategy, I prompted each video clip with the question: What verbs and nouns from the definition(s) and/or which top 10 skills of 2025 do you see in the video? After watching the clips, principals shared what they observed in response to the prompt. I repeated this process for each of the three components.

The activity that followed had principals applying what they learned to real-world classroom scenarios as a way of modeling authentic applications. I created eight scenarios, four applied learning examples and four that represented more traditional practices (Appendix L). We allotted enough time for principals to review at least two scenarios and intentionally gave them one of each to compare. Principals worked with their groups to read the examples and consider the following question: Was the scenario an example of one or more applied learning components, and if so, which one(s), and if not, then how could the lesson be changed to include a component? Some ALD members joined a group to participate in the discussion, and I visited each group, listening to

conversations. Principals had time to review more than two scenarios, and when we debriefed as a whole group, they easily identified the applied learning examples and components.

With principals demonstrating an understanding of the three components, we next invited them to visit three of the five stations assembled around the room that featured video clips of CCSD classrooms implementing applied learning. ALD members, including myself, facilitated each of the five stations. After viewing videos at a station, principals responded to three prompts written on a piece of chart paper: I see, I think, I wonder. The ALD facilitator for each station captured their responses on chart paper for future reference. Principals rotated through three stations of their choosing before returning to their seats. At that time, I walked to each station, read their responses out loud, and identified common themes. The principals shared with the whole group what they observed and learned from the videos.

We then transitioned to the last part of the PL which was the principal panel. The five principals sat at the front of the room and represented various areas of the district, years of experience, and approaches to applied learning implementation. Prior to the PL, we crafted four discussion questions aligned to the inferences drawn during reconnaissance and the intended outcomes of the PL. We shared the questions with the principals in advance:

1) Please describe/explain which one or more of the three applied learning components you implemented in your building.
2) What instructional expectations did you set and share with your staff regarding that implementation?

3) How did you address the challenge of teacher buy-in?
4) How did you use this opportunity to leverage teacher leaders?

The Instrumental Music supervisor led the panel discussion by asking each of the four scripted questions followed by time for Q&A from the audience.

I concluded the PL by asking principals to consider closing commitments such as using what they learned to inform their instructional expectations and/or professional goals. I also spoke to the resources that the ALD team was creating for next year including an asynchronous PL course on applied learning and a video library of CCSD classrooms implementing applied learning, such as the ones observed at the stations. Finally, I informed the group of a post-survey link sent to their CCSD emails via my University of Kentucky account asking them to allow the use of their survey responses in my study (Appendix M). I explained that they could respond to the survey whether they consented or not because the survey data would also be used to inform future PL that the ALD team offered. Most of the principals stayed and used the time we provided to complete the survey.

Intervention Site

CCSD holds every L&L meeting at the Kennesaw State University Continuing Education Center in Kennesaw, Georgia. The CCSD Events Staff sets up and controls the technology in each room used for these meetings. I emailed the Executive Director of the Events Staff a week in advance and requested the use of one of the larger rooms for our post-L&L session. The ALD team set up the room during lunch at L&L.

We rearranged the tables in the room to form groups of four and determined where the five video stations would be located so that people could hear the audio most

effectively. One ALD member helped to group the scenario cards into pairs of applied learning and traditional examples, while others hung the chart paper at each video station and wrote the “I see, I think, I wonder” prompts on each. Others grouped the handouts into stacks while I pulled up the PowerPoint on a large screen in the front of the room and tested the audio.

Each video station facilitator set up their laptops in the designated areas and pulled up the video links to test for audio as well. The CTAE supervisor used the promotional flyers created and printed to solicit any last-minute attendees shortly before the PL started. One of the high school Assistant Superintendents also announced a reminder in each of the three rooms occupied by principals for L&L.

Timeline for the Intervention

The intervention occurred in one day and over two hours. The L&L meeting began at 8:30 a.m. and ended around 1:20 p.m. on Tuesday, March 14, 2023. We scheduled the Applied Learning for Principals PL for 1:30-3:30 p.m. that same day. We gave principals 10 minutes at the end of the session to complete the post-survey, but I also kept the link open for one week after that. I sent a reminder email from my University of Kentucky account to the PL participants three days before the survey closed. After one week, I closed the survey, at which time thirteen of the fourteen participants responded. Twelve permitted me to use their responses in my study but only 11 of those completed the survey.

Resources for the Intervention

We needed several resources to accomplish the action plan. The Visual Arts supervisor created the marketing flyer about the PL, so we printed a dozen to disperse at

L&L. During the planning phase, I developed a PowerPoint (PPT) to guide the PL. In the notes section of each slide, I added the exact times allocated for the discussion or activity so that we would accomplish everything in the two hours provided. An ALD member volunteered to be the timekeeper, so I printed a copy of the PPT with the notes and times for her to follow.

Because the activity for unpacking the component definitions required principals to underline verbs and circle nouns, I created and printed a one-page document that included the three component definitions. We handed those out so principals could write directly on them. Resources also included peer-reviewed research for definitions and information about the "why" of applied learning. Additionally, I copied and pasted the World Economic Forum's Top 10 Skills of 2025 infographic onto a Word document and printed those for each participant to reference throughout the PL.

I created the scenario cards in canva.com using a postcard template. I added the ALD logo and downloaded the scenario cards as PDFs. We printed them on cardstock and then laminated each card so that we could use them again. We also printed any lesson plans associated with the video clips so the station facilitators could share as needed, and we used chart paper and markers to capture responses at each station. Finally, we printed the four scripted questions for the principal panel so the moderator could lead the discussion.

We also used several video resources for the intervention. First, I needed video examples outside the CCSD to demonstrate each component. I used the three applied learning components as keywords to conduct YouTube and Google searches. That

resulted in several video clips featuring K-12 classrooms from which I selected two for integrated learning, one for student-driven learning, and one for authentic applications.

The ALD team uploaded CCSD classroom video clips, captured on their phones during STEM, STEAM, and Arts Integration walks, to a shared Microsoft Office 365 folder. For the five stations, I chose a variety of clips and worked with an outside video company to combine the clips into the five video station links needed. For principals to make informed station choices, I also included the overarching video topics for each station on the same one-page document with the three component definitions.

Before the PL, I crafted the email I would send to principals with the information regarding my study and the post-survey link. I saved the email as a draft in my University of Kentucky Microsoft Outlook account and added the participants' CCSD email addresses during the principal panel discussion. The post-survey was created in advance because I needed prior Institutional Review Board approval from the University of Kentucky and the CCSD Office of Accountability.

Reflection

A few challenges existed during the implementation of this intervention. First, the timing proved to be a significant barrier. I would learn the morning of the PL that the School Leadership Division sent allotment sheets to all principals the day before, and principals only had until the day after to submit teacher names for reassignment. The urgency of that timeline influenced principal participation in the PL. A few principals approached me during L&L to say they either registered but could not attend or wanted to attend but did not have time.

Knowing that those who did participate in the PL felt the same pressure of the time and task before them, I started the session by recognizing the 24-hour deadline they faced. I encouraged them to consider how the PL content could be used to inform their personnel decisions. How does applied learning as an instructional approach influence teachers and classrooms? What opportunities does applied learning present for teacher collaboration? How do your instructional expectations influence the courses, schedule, or teams you create? I assured them that the two hours would be well spent, and when one principal told me she would be leaving early, I explained that she would not want to miss the activities and conversations planned. She stayed the whole time.

Another challenge was establishing the CCSD classroom links and stations. First, reviewing all the video clips uploaded by the ALD team took tremendous time, and then grouping them into stations was difficult. I needed to represent all three levels (K-5, 6-8, and 9-12) and all three components (integrated learning, student-driven learning, and authentic applications). I struggled to create five links that represented enough variance to be worthwhile and would request many edits from the video company helping me.

Some video clips had audio while others did not, so we also needed the station facilitator to be familiar enough with the clips to speak to those without audio. We solicited lesson plans from the teachers whose classrooms were represented in those videos and dispersed them to station facilitators in advance, but some proved difficult to follow out of context or without the teacher. I discovered a day before the PL that I would need to lead a station, so I reached out to the teacher whose classroom was featured in my videos to better understand the lesson content.

Because we all presented in the same room, sound constraints occurred at each station. Laptop speakers were limited and external speakers for each device were unavailable. Therefore, when setting up the room the day of the PL, a few ALD team members decided to establish four of the stations in the four corners of the large room and one in the center to help with competing audio.

Finally, I found the lack of time to be a challenge. We could easily leverage an entire day for presenting the amount of content covered in the PL session. Planning for only two hours meant sacrificing essential elements such as discussions, reflections, and next steps. During an after-PL debrief, the ALD team agreed we needed more time to effectively deliver this information. We addressed this challenge in the moment by establishing one ALD member to serve as timekeeper to ensure strict adherence to the time allotted for each part of the PL. As a result, we completed all activities and collaboration without sacrificing content or meaningful delivery.

Also, because I did not receive Institutional Review Board approval until mid-February, I had limited time to develop the PL with the ALD team. We considered offering a second PL opportunity, but because it was already March, principals would spend the remainder of the school year dealing with state testing deadlines and end-of-year activities, allowing little time for PL. Instead, we committed to continuing the development of the asynchronous course on applied learning and the creation of the video library, both of which we started this school year.

Based on these challenges, I learned the importance of allowing ample time to plan, develop, deliver, and communicate PL. The time of year and the time-of-day influence participants' attention, motivation, and engagement in PL, so in the future, we

will offer sessions at multiple times over multiple days to allow for flexibility and choice. We also recognize that planning needs to begin well in advance to allow for the development of activities, the creation of resources, and the assigning of roles. Any technology needed for the PL will be determined early and tested often to ensure all works as designed. Finally, we will plan and communicate PL dates with Assistant Superintendents and other district departments far in advance to avoid scheduling conflicts or pressing deadlines.

Summary

The meta-inferences drawn from reconnaissance informed the planning phase of this study. The intended outcome of the reconnaissance phase was to determine how principals' perceived knowledge of and experience with applied learning could inform the development of professional learning resources. Reconnaissance data analyses and integration showed that principals wanted training on applied learning, opportunities to observe applied learning in action, and time to collaborate with colleagues already leading it. I shared the reconnaissance data with stakeholders impacted by the problem of practice, and their input contributed to the development of the PL session.

The objectives and outcomes of the two-hour PL aligned to reconnaissance data. Tasks and activities modeled applied learning strategies, engaged participants in the learning process, and allowed time to plan commitments for implementation and setting goals. The same site was used as the principals' L&L meetings to allow for convenience, and the PL session occurred immediately following one of those meetings in March 2023. The ALD team implemented the intervention plan in the two hours provided and covered the intended content.

Chapter 4

In an MMAR study, researchers use the fifth phase, evaluation, to assess the effectiveness of the intervention in achieving the intended outcomes (Ivankova, 2015). Quantitative and qualitative data collected during evaluation are integrated and analyzed to determine if the intervention, developed based on meta-inferences drawn in reconnaissance, addressed the problem of practice identified in diagnosis.

Following evaluation, researchers implement the last phase, monitoring, where they continue to observe and assess the intervention to determine if adjustments are necessary. This chapter outlines the evaluation phase including research questions, instrumentation, data analysis, and findings, as well as the monitoring phase observations and reflections. Finally, a discussion of the overall study, including limitations and implications for research and practice is presented.

Evaluation Phase

In this study, data from reconnaissance showed that principals believed they set instructional expectations for applied learning, and that they recognized applied learning in classrooms; however, they lacked teaching experience using applied learning, and consequently, the confidence to lead implementation. They recommended training on applied learning, wanted to see applied learning in action, and wished to speak with colleagues already implementing these strategies. The intervention, therefore, included a professional learning session specifically designed for principals to increase their knowledge of applied learning and to impact their instructional leadership plans for expectations and goals.

Research Setting

The intervention occurred at the Kennesaw State University Continuing Education Center in Kennesaw, Georgia, on Tuesday, March 14, 2023, from 1:30-3:30 p.m. Earlier that day, the CCSD hosted a Leadership & Learning (L&L) meeting which occurs five times a year at the same location from 8:30 a.m.-1:20 p.m. and includes all principals. The Chief Academic Officer allowed me to offer the professional learning (PL) session, Applied Learning for Principals, that same afternoon. For every L&L, the CCSD Events Staff reserves three rooms at the Continuing Education Center, so I arranged to use one of the larger rooms after the L&L meeting.

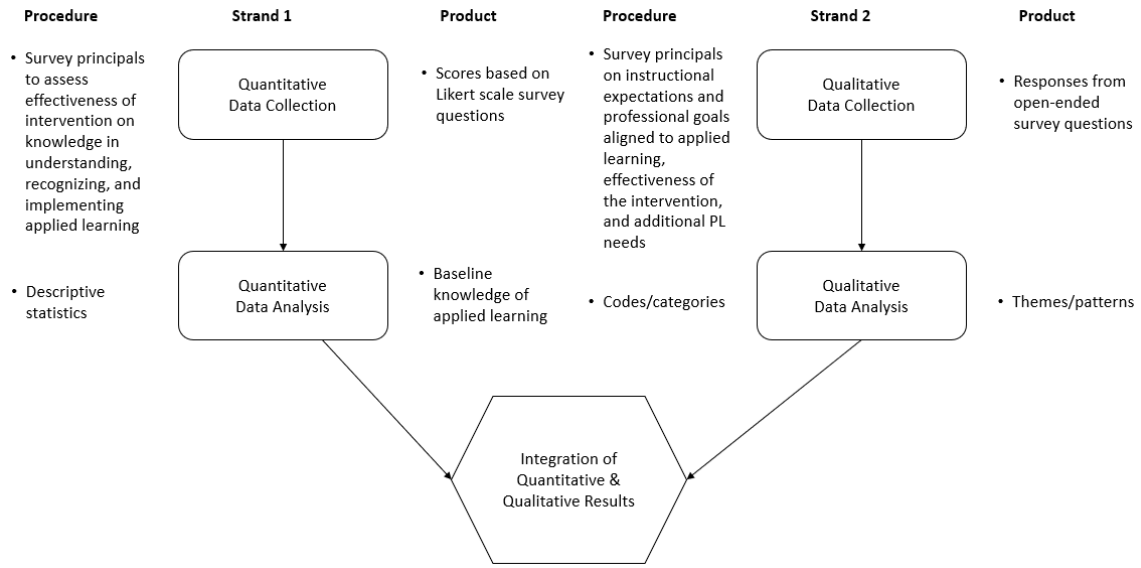
Evaluation Phase Design and Overarching Research Questions

In this phase, I employed a concurrent design (Figure 4.1) to evaluate principals' perceived knowledge of applied learning before and after the PL, to determine plans they had for setting instructional expectations and professional goals for applied learning, to assess the quality of the PL experience, and to gather additional PL suggestions on applied learning. The rationale for using a concurrent design was to collect quantitative and qualitative data simultaneously, compare results, and obtain complementary evidence (Ivankova, 2015).

The overarching research question that guided the evaluation phase was: *How do professional learning resources increase principals' knowledge of applied learning and impact their instructional leadership plans?* I employed a within-strategy survey for collecting data during this phase.

Figure 4.1

Visual Diagram of Concurrent Quantitative + Qualitative Study Design



Note: This figure is adapted from *Mixed Methods Applications in Action Research: From Methods to Community Action* (p. 174), by N.V. Ivankova. Copyright 2015 by Sage Publications, Inc.

I assessed principals' perceived knowledge of the three applied learning components before and after the PL and captured principals' feedback on the quality of the PL based on goals, design, and content using close-ended survey questions (quantitative data). Concurrently, I captured the impact of the PL on principals' instructional leadership plans for setting expectations and professional goals and their feedback on PL improvements and additional PL needed using open-ended survey questions (qualitative data).

Evaluation Strand 1

Strand 1 of the evaluation phase consisted of close-ended survey questions designed to collect principals' perceived knowledge of each of the three applied learning components before and after the PL session, Applied Learning for Principals.

Quantitative questions also captured the quality of the PL based on goals, engagement, content, and time. These questions aligned with one intended outcome which was to increase principals' perceived knowledge of applied learning through effective PL.

Strand 1 Research Questions.

Meta-inferences drawn from all quantitative and qualitative data collected in the reconnaissance phase resulted in three professional learning needs identified by principals: to build knowledge in understanding, recognizing, and leading applied learning through training, observations, and collaboration. That data informed the first quantitative research question in the evaluation phase: *To what extent do principals perceive an increase in applied learning knowledge after participating in professional learning?* Determining the quality of the PL experience informed the other quantitative research question guiding this phase: *How do principals evaluate the professional learning experience based on goals, design, and content?*

Sample.

I used a population sampling strategy for the survey. All CCSD principals and directors of school programs (i.e., South Cobb Early Learning Center, Elementary Virtual Program, H.A.V.E.N. Academy [Hope. Achievement. Victory. Encouragement. Nobility], and the Cobb Innovation and Technology Academy) received the invitation to participate in the PL session in hopes we would achieve a varied representation of grade levels and years of leadership experience. Of the 109 principals and four program directors invited, 14 completed the PL session for an overall participation rate of 8.1%.

Of the 14 PL participants, 11 consented and completed the survey, one did not consent but completed the survey, one consented, started, but did not complete the

survey, and one did not start the survey at all. In the first three survey questions, I asked for participants' background information on years of experience as a school administrator (School Leadership Intern [SLI], Assistant Principal, Principal), current school level, and years as principal at their 2022-23 school (Table 4.1).

Table 4.1 *Background Information for PL Participants (n=11)*

Participant background	Respondents	
	%	n
Years as a school administrator (SLI, AP, Principal)		
1-5	18.1	2
6-10	36.3	4
11-15	0	0
16-20	27.2	3
21-25	18.1	2
26-30	0	0
More than 30	0	0
School level		
Elementary	54.5	6
Middle	27.2	3
High	18.1	2
Years as principal at 2022-23 school		
1-5	54.5	6
6-10	27.2	3
11-15	9.0	1
16-20	9.0	1
21-25	0	0
26-30	0	0
More than 30	0	0

Based on the data, we accomplished the goal of varied representation across all three areas.

Instrument.

I created a survey with Qualtrics (Provo, UT) to collect the quantitative survey data (Appendix N). Before data collection, I shared the survey with my doctoral committee chair for review. She provided feedback on aligning the survey questions to

my research questions for the evaluation phase. In doing so, I revisited the purpose of the evaluation phase and restructured my research questions to align with the intended outcomes.

I started the survey with a consent statement giving PL participants the option to allow the use of their responses in my study. Regardless of how they responded, all participants moved to the next section of the survey which included three questions about the participants' background information as presented above in the Sample section. The section that followed introduced the intent of the survey and included the CCSD definition of applied learning with the three components bolded: integrated learning, student-driven learning, and authentic applications.

The subsequent three sections of the survey represented the three applied learning components. Each section included an introduction that listed the research-based definition(s) of the component (Table 4.2), followed by two Likert scale questions (1=Not knowledgeable at all, 2=Slightly knowledgeable, 3=Moderately knowledgeable, 4=Very knowledgeable, 5=Extremely knowledgeable). Respondents rated their perceived knowledge of the component before and after participating in the PL. Each question included three statements from which principals measured their knowledge: understanding, recognizing, and leading implementation of the applied learning component.

Table 4.2 *Research-Based Definitions Used in the PL for CCSD's Applied Learning Components*

Applied learning components	Research-based definitions
Integrated learning	Students connect across disciplines and differences in order to create new meaning (Ithaca College, 2022; Pack, 2016) Students retain and apply information by connecting knowledge and skills to other disciplines, thus building learners' understanding and application of knowledge to diverse settings and problems.
Student-driven learning	Students are given choice, voice, and ownership of their learning. Student agency can be defined as owning learning and solving real-world problems that engage learners in authentic and relevant work so that they can explore, collaborate, make choices, and self-assess (Vaughn, 2020).
Authentic applications	Students build skills through relevant and real-world opportunities that prepare them for college and career such as problem-solving, critical thinking, and creativity. Connecting new knowledge to prior understandings makes learning active, and authentic assessments, audiences, experiences, and environments make learning relevant. (Burns, 2016; Shaw, 2019).

The last quantitative section of the survey, Evaluation of Professional Learning, included five questions for evaluating the PL using a Likert scale (1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree). Questions included the clarity of goals, the engagement of strategies used, the knowledge and skills gained, the time allotted, and if we should offer the PL again. Specific survey questions and their alignment with research questions guiding this stage are presented in Table 4.3.

Table 4.3 *Alignment of Quantitative Research and Survey Questions for a Concurrent Design*

Research questions	Survey questions
RQ1: To what extent do principals perceive an increase in applied learning knowledge after participating in professional learning? (Quantitative)	Q1, Q2, Q3, Q4, Q5, Q6
RQ3: How do principals evaluate the professional learning experience based on goals, design, and content? (Quantitative)	Q9

Data Collection Procedures.

Before sharing the PL session post-survey, I received Institutional Review Board approval from the University of Kentucky (Appendix H) and the CCSD Office of Accountability (Appendix I). Fifteen minutes before the PL session concluded, I sent emails from my University of Kentucky account to the 14 principals, via their CCSD email, containing the letter of consent and the post-survey link (Appendix M). I selected "anonymize responses" in the survey settings before collecting responses to avoid recording IP addresses, location data, or contact information.

While introducing the post-survey at the end of the PL, I asked principals to please allow the use of their survey responses in my study. I explained that they could complete the survey even if they did not consent. I encouraged principals to spend the last ten minutes of the PL session completing the survey but also left it open one week for those choosing to complete it later. Three days after the PL, I sent the same email as a reminder to complete the survey before it closed and reiterated the choice to complete the survey even if they did not consent to the use of their responses in my study.

Strand 1 Data Analysis and Findings. I downloaded the quantitative survey responses from Qualtrics into a Microsoft Excel spreadsheet, removed any identifying information before analysis, and coded data for confidentiality. I analyzed the quantitative data using descriptive statistics including frequencies, means, and standard deviations.

The first research question guiding this stage was: *To what extent do principals perceive an increase in applied learning knowledge after participating in professional learning?* I used a 5-point Likert scale with coded values from 1=Not knowledgeable at all to 5=Extremely knowledgeable to determine changes in knowledge based on PL participation (Table 4.4). Measurements of increased knowledge included principals' perceptions of how well they understood the meaning of the component, recognized the component in a core classroom, and could lead implementation of the component.

Table 4.4 *Level of Reported Knowledge of Applied Learning Before and After the Intervention*

Applied learning component	Pre-intervention						Post-intervention					
		Not	Slight	Moderate	Very	Extreme		Not	Slight	Moderate	Very	Extreme
	M (SD)	% (n)	% (n)	% (n)	% (n)	% (n)	M (SD)	% (n)	% (n)	% (n)	% (n)	% (n)
Integrated												
Understanding	3.00 (.60)	0 (0)	18.1 (2)	63.6 (7)	18.1 (2)	0 (0)	3.82 (.72)	0 (0)	0 (0)	36.3 (4)	45.4 (5)	18.1 (2)
Recognizing	3.36 (.48)	0 (0)	0 (0)	63.6 (7)	36.3 (4)	0 (0)	3.91 (.51)	0 (0)	0 (0)	18.1 (2)	72.7 (8)	9.0 (1)
Leading	3.00 (.85)	0 (0)	27.2 (3)	54.5 (6)	9.0 (1)	9.0 (1)	3.64 (.88)	0 (0)	9.0 (1)	36.3 (4)	36.3 (4)	18.1 (2)
Student-driven												
Understanding	3.36 (.77)	0 (0)	9.0 (1)	54.5 (6)	27.7 (3)	9.0 (1)	4.00 (.60)	0 (0)	0 (0)	18.1 (2)	63.6 (7)	18.1 (2)
Recognizing	3.18 (.83)	0 (0)	18.1 (2)	54.5 (6)	18.1 (2)	9.0 (1)	3.91 (.67)	0 (0)	0 (0)	27.2 (3)	54.5 (6)	18.1 (2)
Leading	3.09 (.90)	0 (0)	27.2 (3)	45.4 (5)	18.1 (2)	9.0 (1)	3.73 (.75)	0 (0)	0 (0)	45.4 (5)	36.3 (4)	18.1 (2)
Authentic applications												
Understanding	3.18 (.72)	0 (0)	18.1 (2)	45.4 (5)	36.3 (4)	0 (0)	3.91 (.67)	0 (0)	0 (0)	27.2 (3)	54.5 (6)	18.1 (2)
Recognizing	3.36 (.64)	0 (0)	9.0 (1)	45.4 (5)	45.4 (5)	0 (0)	4.00 (.60)	0 (0)	0 (0)	18.1 (2)	63.6 (7)	18.1 (2)
Leading	3.18 (.83)	0 (0)	27.2 (3)	27.2 (3)	45.4 (5)	0 (0)	3.82 (.72)	0 (0)	0 (0)	36.3 (4)	45.4 (5)	18.1 (2)

1 = Not knowledgeable at all to 5 = Extremely knowledgeableOverall, principals reported increased knowledge of all three components after the PL, with higher averages and lower variances for understanding and recognizing applied learning. Leading implementation received the lowest averages and highest variances before and after the PL for all three components.

The second research question for this strand asked respondents to evaluate the PL based on goals, design, and content. I used a 5-point Likert scale with coded values from 1=Strongly disagree to 5=Strongly agree (Table 4.5) for statements regarding goals, strategies, information, time, and recommendations.

Table 4.5 *Evaluation of Professional Learning*

Statement	M (SD)	SD		D		Neither		A		SA	
		%	N	%	N	%	N	%	N	%	N
The goals of the professional learning were clear.	4.73 (.45)	0	0	0	0	0	0	27.2	3	72.7	8
The strategies used by the presenters were engaging and appropriate for the goals of this professional learning.	4.82 (.39)	0	0	0	0	0	0	18.1	2	81.8	9
I gained knowledge and skills to implement this professional learning into my job.	4.82 (.39)	0	0	0	0	0	0	18.1	2	81.8	9
The time allotted was appropriate for the information presented.	4.64 (.88)	0	0	9.0	1	0	0	9.0	1	81.8	9
I recommend offering this	4.82 (.39)	0	0	0	0	0	0	18.1	2	81.8	9

Statement	M (SD)	SD		D		Neither		A		SA	
		%	N	%	N	%	N	%	N	%	N
professional learning again in the future.											

1 = Strongly disagree to 5 = Strongly agree

Principals evaluated the PL highly (agree and strongly agree) in all areas except for the amount of time allotted, which received one rating of disagree.

Evaluation Strand 2

Strand 2 of the evaluation phase consisted of two open-ended survey questions on how the PL influenced principals' instructional leadership plans for setting expectations and professional goals. Three additional qualitative questions prompted principals to evaluate the PL based on impact, areas of improvement, and additional PL needs. These questions aligned with the other intended outcome of this phase which was to impact principals' instructional leadership plans through effective PL.

Strand 2 Research Questions. In addition to increasing principals' applied learning knowledge, this study intended to impact principals' instructional leadership plans for setting expectations and establishing professional goals. That objective informed the first qualitative research question in the evaluation phase: *How did professional learning impact principals' instructional leadership plans for applied learning implementation next school year?* Evaluating the current PL experience and identifying future PL needs influenced the second and third qualitative research questions guiding this phase: *How do principals describe the impact of professional learning on their applied learning knowledge*, and *What additional PL do principals need on applied learning?*

Sample.

Of the 11 participants consenting to use their data in this study and completing the survey, nine answered the first qualitative survey question on instructional expectations, and eight responded to the second about professional goals. For the three open-ended survey questions about the PL quality, eight responded to the question about impact, seven provided answers about improvements, and six replied to additional PL needed.

Instrument.

I used the same survey from strand one for collecting qualitative data in strand two. A survey section called Instructional Leadership included the first two qualitative questions and followed the three quantitative applied learning component sections. The open-ended questions asked principals to explain whether they have plans to include applied learning in their instructional expectations and/or professional goals next year.

The survey section, Evaluation of Professional Learning, also contained three qualitative questions. These open-ended questions prompted principals to consider what part of the PL had the most impact on their applied learning knowledge, what areas of the PL could be improved, and what other suggestions they had for applied learning PL. Specific survey questions and their alignment with research questions guiding this stage are presented in Table 4.6.

Table 4.6 *Alignment of Qualitative Research and Survey Questions for a Concurrent Design*

Research questions	Survey questions
RQ 2: How did professional learning impact principals' instructional leadership plans for applied learning implementation next school year? (Qualitative)	Q7, Q8
RQ 4: How do principals describe the impact of professional learning on their applied learning knowledge? (Qualitative)	Q10
RQ 5: What additional PL do principals need on applied learning? (Qualitative)	Q11, Q12

Data Collection Procedures.

After receiving Institutional Review Board approval from the University of Kentucky (UKY) and the CCSD Office of Accountability, I conducted the PL and shared the post-survey link with the 14 participants. I sent the consent letter with the post-survey link via my UKY email to the principals' CCSD email addresses. Principals could allow me to use their survey data as part of my study, but I also encouraged them to complete the survey whether consenting or not. I informed them that the survey should take no more than 10 minutes to complete, and I afforded them the last 10 minutes of the PL to finish it should they choose to do so. I sent a reminder email after three days asking them to complete the survey before it closed four days later.

Strand 2 Data Analysis and Findings. I downloaded the qualitative responses into a Microsoft Excel spreadsheet, creating a column for each question. I labeled the columns Expectations, Goals, Impact, Improvements, and PL Needed to represent the subject of each question. Using an inductive approach, I reviewed the responses for each

question individually to identify any themes and patterns. I then documented keywords and phrases for each column based on the identified themes, and from there, established categories (Table 4.7).

Table 4.7 *Analysis of Qualitative Question Responses*

Question topic	Categories
Expectations	Establish teachers' baseline knowledge
	Leverage teacher leaders
	Set expectations
	Implement authentic applications
	Address teachers buy-in
Goals	Increase applied learning knowledge
	Identify real-world problems to solve
	Pursue STEM certification
	Establish expectations
Impact	Observing components in action
	Understanding components
	Collaborating and discussing
Improvements	None given
PL needed	Teacher support
	Implementation support
	Site visits
	Principal PL

The first research question for this strand focused on how the PL impacted principals' instructional leadership plans. The first qualitative survey question about

setting instructional expectations for the next school year received the most responses, nine out of eleven. Two wanted to address teacher buy-in by working with teacher leaders and/or teacher volunteers to implement and facilitate applied learning, an idea discussed during the principal panel. One mentioned using the Top 10 Skills of 2025 to prompt teacher reflection on current instructional practices and help with the "why" of applied learning. Another respondent suggested conducting a staff survey to establish baseline knowledge and understanding of applied learning before determining next steps for implementation. One specifically mentioned bringing in more authentic applications, where others submitted broader responses like "unpacking the expectation for applied learning" or "pursuing cross-disciplinary instruction including all three components."

The second open-ended survey question also aligned to the first research question by asking respondents about the impact of the PL on their professional goals for next year. Of the eight responses, three principals mentioned wanting to become more knowledgeable about applied learning, with a couple specifically referencing professional learning and research. One planned to pursue STEM certification, and another described finding real-world problems to solve inside and outside the school. Finally, one responded with "NA," another with "increasing expectations," and a third with "doing drives learning," which is our Applied Learning and Design Office mission and Twitter hashtag. None of these three responses answered the survey question.

The last three qualitative survey questions aligned to the second and third research questions guiding this strand which focused on impact of the PL and additional PL needed. The Applied Learning for Principals PL consisted of three parts: understanding the three applied learning components, observing applied learning in action, and

collaborating with colleagues already implementing it. Principals included all three parts in their responses to the first qualitative survey question about impact, but six out of eight specifically mentioned seeing applied learning in action.

The other two qualitative survey questions in this section asked about improvements to the PL and recommendations for additional PL. The principals did not suggest any improvements, but rather a couple commented that it was “perfect” and “awesome.” Only six principals responded to the question on recommendations, and two were “NA” and “Don’t think learning is ever done,” which did not answer the question. The other responses included helping teachers reduce their “worries” about meeting all standards, providing support for “effective levels” of implementation, and offering more PL such as the Applied Learning for Principals session. Not surprisingly, someone also mentioned site visits to schools that are "doing it well" so they can observe and talk to teachers.

Data Integration and Quality

In this phase, I employed a within-strategy survey to collect data about whether the intervention met the intended outcomes: to increase principals’ perceived knowledge of applied learning and to impact their instructional leadership plans through effective PL. Using a concurrent design, I collected and analyzed quantitative and qualitative data independently for each strand and then integrated the data sets using a combining strategy to draw meta-inferences and determine if the data were complementary (Ivankova, 2015).

Principals perceived an increase in their applied learning knowledge for all three components after participating in the PL, noting in strand two that all areas of the PL - training, observations, and collaboration - impacted their knowledge. They also noted an

increase in their abilities to recognize the components in core classrooms, although when asked for additional PL, some suggested more classroom examples.

Additionally, the principals evaluated the PL design and content favorably based on reaching intended goals, using effective strategies, gaining new knowledge, allowing enough time, and offering the session again which was also reiterated in strand two when asked for improvements and none were given. The principals' responses about setting instructional expectations and professional goals for applied learning suggested a desire to include one or more components in their plans, but again, when asked about additional PL, some did recommend continuing to build principal knowledge. Overall, principals reported an increase in confidence leading applied learning implementation after the PL.

Potential issues of validity, reliability, and trustworthiness can occur with data collection and analysis. For example, questions could be interpreted by principals in such a way that the responses do not garner what the survey intended to measure, in this case, principals' knowledge in understanding, recognizing, and leading applied learning. Also, the reliability of responses may vary in consistency depending on the time of day or year it is administered, the length of time given to finish it, or the willingness with which the principals completed it.

For example, principals participated in the PL while facing a time-sensitive deadline for reviewing allotments and submitting teacher names for reassignment. They also attended a five-hour meeting before the PL that may have influenced their concentration. Although I gave them ten minutes to complete the survey, principals might have rushed to finish so they could leave, where others opted to complete it later where the passing of time might have influenced their responses.

Although the survey questions aligned with the overarching research question for the evaluation phase, I cannot confirm that the responses would correlate to a similar measurement tool. The closed-ended questions asked about principals' perceptions, which were entirely subjective, so if I gave the same survey to those principals again, the responses might vary.

Similarly, the trustworthiness of the qualitative questions could be an issue. The survey respondents represented a small sample (n=11) of the overall population invited to participate (N=113) thus impacting whether comparable results would occur in similar situations (Ivankova, 2015). Researcher bias might have played a role when interpreting the qualitative results, thus impacting confirmability, since I am a 25-year, CCSD employee with long-standing, working relationships with principals. Their responses to qualitative questions were also open to interpretation as some were not descriptive enough for me to draw definitive conclusions, such as "unpacking expectations" or "application" as responses to setting instructional expectations and which PL part proved most impactful, respectively.

Evaluation Phase Findings

The overarching research question that guided the evaluation phase was: *How do professional learning resources increase principals' perceived knowledge of applied learning and impact their instructional leadership plans?* The quantitative data analysis confirmed that principals' knowledge in understanding and recognizing applied learning, and their perceived abilities to lead implementation, increased after participation in the Applied Learning for Principals PL session. The qualitative data analysis suggested that some principals planned to include applied learning in their instructional expectations for

next year, but fewer committed to creating a professional goal about it. I wondered whether the brevity or lack of structure in their responses to these questions suggested a lack of understanding in how to complete these two instructional leadership tasks and whether PL on writing instructional expectations and professional goals would prove helpful for principals in the future.

The data analysis regarding PL quality also showed an impact on principals' applied learning knowledge. Respondents stated that all three parts of the PL impacted their knowledge of applied learning, and none offered suggestions for improving the PL. Additional PL suggestions included offering more PL for principals and helping teachers with buy-in and implementation, both of which represent logical next steps to leading this work. Overall, the PL proved successful for achieving the intended outcomes of increasing principals' knowledge of applied learning and impacting their instructional leadership plans.

Overall Findings

The research question guiding this study was: *How can professional learning resources increase principals' perceived knowledge of applied learning and impact their instructional leadership plans thus building confidence to lead implementation?* The problem of practice identified in the diagnosis phase was that principals believed they set instructional expectations for applied learning but lacked teaching experience using it and therefore struggled to lead it. The intended outcome of this study was to build principals' confidence in leading applied learning implementation in their local schools.

The findings in the first reconnaissance strand established principals' perceived expectations for, recognition of, experience with, and confidence leading, one or more

CCSD applied learning components: integrated learning, student-driven learning, and authentic applications. Overall, principals reported expecting and recognizing all three components, with fewer having experience using it or confidence leading implementation. The survey respondents prompted for advice offered leveraging teacher leaders and setting instructional expectations. Those responding to PL recommendations suggested professional resources, observations, collaboration, and teacher leaders.

In the second reconnaissance strand, I further explored data collected in the first strand through semi-structured interviews, and the findings complemented those from the survey. Principals had expectations for applied learning, but when I asked them to explain, they struggled to articulate them. Also, although principals said they felt confident in recognizing applied learning when asked on a quantitative survey question, they could not provide classroom examples outside CTAE and gifted classrooms or school events and grade-level projects during interviews. When asked about opportunities, interviewees echoed the advice in strand one about using teacher leaders. An interview question about PL needed for principals also elicited similar responses to those mentioned in the survey strand: professional learning/training on applied learning, observing applied learning "in action," leveraging teacher leaders, and speaking with others already leading this work.

The professional learning session developed specifically for principals served as the intervention. We intentionally unpacked the CCSD applied learning components, provided observations through CCSD classroom video footage, and offered collaboration with colleagues implementing applied learning to ensure alignment with the reconnaissance findings in both strands. We also purposefully scripted panel questions

around information gathered in reconnaissance about setting instructional expectations and leveraging teacher leaders. Findings from evaluation proved that the PL increased principals' applied learning knowledge, impacted their instructional expectations and professional goals, and built their confidence to lead implementation.

Research Ethics

Ethical considerations regarding general research, action research, and mixed methods were considered in every phase of this study (Ivankova, 2015). General issues such as obtaining Institutional Review Board (IRB) approval, securing informed consent from study participants, and protecting confidentiality were consistently addressed. Because I worked in the CCSD, researcher bias proved a common consideration since I had prior knowledge of principals' leadership styles and their schools' instructional practices; therefore, I often reflected on personal biases, opinions, and preconceived notions when engaging with participants or the data.

Before data collection for reconnaissance and evaluation, I received IRB approval from the University of Kentucky (UKY) and the CCSD Office of Accountability. I emailed consent letters from my UKY account, as opposed to my CCSD address, for both reconnaissance and evaluation, to avoid any unintended coercion associated with my director role in the district. I also avoided coercion through the voluntary nature of the study and by not employing tactics for persuading principals to participate.

In consent letters shared via email with potential study participants, I included the study purpose, the guarantee of anonymity, the right to end participation at any time, and contact information for reporting concerns. Using the survey tool, Qualtrics, I anonymized responses for the reconnaissance and evaluation surveys to avoid collecting

IP addresses, location data, or contact information. For the interviews, I read the same email consent letter out loud to the interviewees to reiterate that our conversations remained confidential and to confirm their consent. When sharing data with stakeholders, I removed all identifiers and coded participants instead.

For the interviews, I allowed participants to choose the date, time, and location should they wish to conduct the interview off-campus. Before recording the interviews using my cell phone, I asked participants for consent. I uploaded all interview data to a password-protected, Microsoft Office 365 folder on my laptop and then deleted files from my phone.

Monitoring Phase

The last phase of an MMAR study is monitoring, where researchers continue to track the progress and impact of the intervention employed during the acting phase and assessed during evaluation (Ivankova, 2015). At this point, researchers use the meta-inferences drawn during evaluation to adjust the intervention or to pursue alternative solutions. The iterative nature of MMAR allows researchers to reflect on data, experiences, and outcomes and decide whether a return to reconnaissance proves necessary or if continuing the intervention, with or without adjustments, would produce the intended results.

Methods and Recommended Changes

In this study, monitoring included sharing the evaluation data with the Applied Learning and Design (ALD) team who planned and delivered the intervention, a PL session called Applied Learning for Principals. During a bi-monthly ALD team meeting, I shared the data via a PowerPoint presentation, starting with the post-survey quantitative

data followed by the qualitative data. As I presented, the team discussed thoughts, questions, and implications.

Ideally, we would have contacted the PL participants during the monitoring phase and asked if they would willingly share their instructional expectations and professional goals with us. In doing so, we could have determined if they included applied learning as reported by some on the survey. Next time, we will ask to meet with participants after the PL session to help craft their expectations for applied learning or, at a minimum, read what principals drafted on their own and provide feedback.

The ALD team also agreed that we needed more time when offering this PL as two hours were not enough. One principal echoed this sentiment by responding "disagree" to the survey question about the time allotted. Therefore, changes would include allowing extended time to present the PL so principals could experience more in-depth learning, conversations, and collaboration.

Outcomes and Consequences

Based on post-survey feedback, we successfully achieved the intended outcomes of the PL which consisted of increasing principals' applied learning knowledge, impacting their instructional leadership plans, and building their confidence to lead implementation. Survey responses concerning additional PL also confirmed that principals wanted to learn more about helping teachers, and they needed levels of implementation. One principal responded to my post-survey email and requested the same PL session for her teachers.

Although refutable, I believe some unintended consequences of the intervention included principal resistance to leading applied learning. Educators often speak about

addressing *teacher* buy-in when implementing instructional changes, but principals struggle as well. Learning more about applied learning and seeing it used in classrooms during the PL could have inadvertently deterred principals from accepting this challenge of change. The shift to applied learning from traditional practices can appear daunting after decades of stagnant instructional models; therefore, with a better understanding of what it looks like and what leading it entails, principals may choose to avoid it.

Reflection

The ALD team was excited by the growth in principals' perceived knowledge and their positive feedback about the PL session. The team felt most encouraged by the qualitative feedback, especially the number of respondents planning to include applied learning in their expectations and goals, as well as those requesting more PL to help with implementation. The team agreed that, based on responses, principals wanted to learn more about the "how" of applied learning now that they understood the "why" and "what."

This intervention proved very successful in meeting intended outcomes but also in modeling principal PL needs and opportunities. We intentionally designed the intervention for principals based on their voice, as captured during reconnaissance. By personalizing the PL for the specific audience, we created a meaningful experience with actionable next steps for leading the work. Nineteen principals originally registered to attend the PL, 17% of the overall population, and I believe more would have attended if not facing the allotment and reassignment deadlines. I interpret this as principals wanting to learn more about instructional topics like applied learning, so much so that 14 participated anyway, despite the same deadlines.

The ALD team echoed these sentiments when we debriefed after the PL and after I shared the post-survey data. Principals were engaged, attentive, and reflective during the PL session proving they were immersed in the experience and content. They asked questions and shared insights with each other and the group and responded similarly on the post-survey. Overall, we agreed that the PL launched additional opportunities for us to train and share this essential instructional approach as reiterated by the participating principals who wanted to know and learn more.

Limitations and Improvements

Despite the positive outcomes, the intervention had several limitations that impacted its implementation and effectiveness. One limitation was the timing of the intervention, which occurred during end-of-year responsibilities, limiting principals' availability. Additionally, the intervention was offered only once, limiting my ability to establish any causal relationships. The two-hour duration of the PL session also proved to be a limitation, as it did not allow for extended conversations, longer moments with classroom videos, or more Q&A time with the principal panel, all of which would have provided additional data to inform future PL. To address these limitations, in the future, we will plan to offer the PL session over multiple times and dates earlier in the year while being cognizant of pending deadlines.

Another limitation included a lack of student voice in video footage. Each time PL participants visited a station to watch classroom videos of applied learning, they responded to three prompts: I see, I think, I wonder. Repeatedly, principals responded to "I wonder" with questions about the students such as, "Did they see themselves as scientists or mathematicians after engaging in applied learning," "Did this experience

lead them to new possibilities," "Did they assume roles," or "What did they do before the events captured on the video?" The lack of voice from these essential stakeholders limited principals' exposure to the overall implementation and impact of applied learning experiences. Future improvements, therefore, would include adding student voice to the PL or speaking with students during classroom visits so principals can hear their perspectives on applied learning.

Discussion

Based on this study, I strongly believe that principals understand the need to shift pedagogical practices from teacher-led approaches to more applied learning strategies, and I learned that principals believe they set instructional expectations for applied learning. Upon reflection, what appears to be lacking is the initial or ongoing support needed to build their knowledge and confidence so they can successfully lead implementation. This study provided evidence to support this conclusion after principals participated in a PL session on applied learning and then reported an increase in their abilities to understand, recognize, and lead three components: integrated learning, student-driven learning, and authentic applications. They then committed to setting instructional expectations and professional goals that included applied learning. But now what? How do we keep the work moving? How do we learn from this experience so that other districts can also begin leading a shift in classroom practices?

First, resoundingly, principals wanted to see more applied learning in action. Often the research on applied learning features charter, private, progressive, or themed schools (i.e., STEM, College and Career, Fine Arts, etc.) that may or may not represent the challenges and barriers of K-12, public education. Principals need real-world,

authentic applications – just like students do – that represent their school buildings and their student populations. They need realistic and relatable examples from core classrooms to help build their vision and set their instructional expectations for applied learning. They struggle to effectively lead what they did not experience, cannot envision, and fail to fully understand. Building school leaders' knowledge and awareness is the essential first step. Yes, teachers will play a shared leadership role in the implementation, but first, principals must recognize and accept the instructional vision so they can successfully and confidently support their teachers in doing the same.

Secondly, years of research espouse the reasons to change traditional instructional models to include more applied learning strategies (Darling-Hammond et al., 2021; Hattie, 2009; Hilton, 2015; Marzano, 2009; Mehta, 2022); consequently, researchers can easily articulate the 'why' and 'what' of applied learning, but principals (and teachers) also need the 'how.' Studies that outline roles, frameworks, and competencies for leading applied learning offer high-level suggestions for starting the change process, but at some point, principals need help unpacking those resources and identifying specific action steps in the context of their community, culture, and capabilities.

Finally, if principals are expected to serve as instructional leaders, then they need professional learning experiences to build their capacity for setting expectations, developing visions, and leading change (Hallinger, 2003; Hitt & Tucker, 2016). Additionally, they need ongoing education on research-based, best practices to collectively support educators and students (Hallinger, 2003, Hallinger & Murphy, 2012; Hitt & Tucker, 2016; Murphy et al., 2006; Robinson et al., 2008). These opportunities should consistently exist within school districts since principals influence student

achievement through their leadership and support of teachers (Hallinger, 2003; Hitt & Tucker, 2016; Murphy et al., 2006; Robinson et al., 2008).

Interpretation of Findings

In the diagnosis phase, School Leadership Assistant Superintendents and principals expressed a desire for less teacher-led instruction, printed worksheets, and quiet compliance in classrooms and more student-driven strategies, hands-on activities, and active learning, which aligns with research by Mehta (2022) who emphasized the importance of restructuring the approach to teaching and learning to include student ownership of learning and applied learning practices in core subject areas. Principals also indicated that since they did not use applied learning strategies as teachers, then their lack of experience influenced their abilities to lead implementation. These leaders recognized the need to change pedagogical approaches but lacked the knowledge and confidence to do so. The need for increased knowledge of teaching and learning practices is echoed in the research of Hallinger and Murphy (2012) and Robinson et al. (2008) who list expertise to lead learning as contributing to instructional leadership.

Based on the research by Hitt and Tucker (2016), principals are expected to serve as instructional leaders by staying apprised of research-based best practices, setting instructional expectations, and modeling change, and they are expected to maintain their professional knowledge and development (Hallinger & Heck, 1996, 1998; Leithwood, 2012; Murphy et al., 2006, Robinson et al., 2008). I, therefore, identified the problem of practice as principals needing professional learning opportunities to increase applied learning knowledge and to impact instructional leadership plans.

During reconnaissance, I focused on school leaders' knowledge of, experience with, expectations for, and confidence in leading three applied learning strategies defined in the CCSD: integrated learning, student-driven learning, and authentic applications. I also wanted to identify any professional learning that principals recommended or needed for increasing applied learning knowledge since instructional leaders are expected to participate in professional learning about teaching and learning strategies, thus building instructional self-confidence (Andrews & Soder, 1987; Chesley & Jordan, 1996; Hallinger, 2003; Hitt & Tucker, 2016; Murphy et al., 2006; Quinn, 2002; Robinson et al., 2008).

The reconnaissance survey results confirmed the initial discussions in diagnosis. Principals strongly believed they set expectations for all three components and thought they could recognize them when used in classrooms. However, when I conducted interviews to gather more detail and insight, I learned that principals' inability to share strong core classroom examples suggested a need for additional observations. This finding is consistent with Mehta's (2022) research that determined a lack of applied learning strategies being employed in core subject classrooms, but rather emerging in "periphery" classes such as electives.

The interviewees' instructional expectations lacked specific references to applied learning but rather surfaced through broader terms such as STEM/STEAM or arts integration. My confidence in their abilities to recognize applied learning in core classrooms, despite their self-professed acknowledgements, also waned after asking for specific classroom examples observed in their schools. When principals only referenced classrooms such as CTAE and gifted, or school-wide and evening events, I realized their

perceived knowledge of applied learning differed from my interpretation. Classrooms such as CTAE, the Fine Arts, and STEM include applied learning strategies naturally (Georgia Department of Education, n.d.; Gullatt, 2008; Mehta, 2022; Thibault et al., 2018), so the principals' inability to provide core classroom examples (English Language Arts, Math, Science, or Social Studies) was an indication that their knowledge of applied learning may need reinforcement.

Findings from diagnosis and reconnaissance supported the need for PL on the topic of applied learning. Despite their perceived knowledge, principals consistently requested training, observations, and collaboration to understand, recognize, and lead applied learning when asked in this study. This aligns with research by Hallinger (2003) which emphasizes the importance of ongoing professional development for principals wanting to serve as instructional leaders. They not only wanted to understand more but also to see it "in action" and to speak with colleagues already leading implementation. Principals' abilities to model academic language and instructional behaviors aligned to their expectations is necessary to compel and engage teachers in shifting practice (Hallinger, 2003; Hitt & Tucker, 2016; Quinn, 2002); therefore, developing and offering a PL session called Applied Learning for Principals, seemed a research-aligned and data-informed intervention.

The design of the intervention reflected the data captured in reconnaissance. Principals received training on the three components, observed classroom examples of each, and collaborated with principals already leading implementation. Findings from a post-intervention survey conducted during the evaluation phase supported the positive impact the PL had on building principals' knowledge of applied learning and impacting

their instructional leadership plans for expectations and goals. This finding is consistent with the study by Murphy et al. (2006), which found that professional learning can significantly improve principals' instructional leadership skills. Overall, principals reported an increase in confidence leading implementation because of the PL experience.

In response to qualitative post-survey questions, several principals committed to incorporating applied learning into their instructional expectations and their professional goals. They also requested additional PL on leading applied learning, addressing teacher buy-in, and leveraging teacher leaders. The topics of teacher hesitancy and teacher leaders were also themes captured in reconnaissance data which was why we intentionally asked the principal panel during the PL session how they managed those two items. So, again, the findings across the study supported the problem of practice by providing PL specifically for principals to increase applied learning knowledge, impact instructional leadership plans, and build confidence to lead implementation. This aligns with research which emphasizes the importance of principals serving as instructional resources and leaders for all teachers in order to advance active learning practices and affect change (Hitt & Tucker, 2016; Quinn, 2002; Robinson et al., 2008; Zimmerman, 2006).

Implications for Leadership, Policy, and Practice

Implications of this study influence leaders, policymakers, and practitioners because all people involved in education need to stay apprised of effective instructional practices, participate in professional learning, and provide opportunities for student success. Continuing to lead, act, and teach under the same instructional model established seven decades ago, and using the same classroom strategies that our parents and

grandparents experienced, means jeopardizing the future of today's children. Change is essential and urgent.

Implications for Leadership

District and school leaders need to always be aware of current research-based strategies. Although benefits exist for grass-roots implementation at the teacher level, those in leadership roles still need to understand, accept, and learn the 'what,' 'why,' and 'how' of instructional shifts, regardless of where the change begins. The quantitative and qualitative data collected during reconnaissance and evaluation confirmed principals' need for more PL opportunities. Intentional, regular, and required PL about instructional leadership topics should be provided in every school district and for all leaders.

Although developing principals' applied learning knowledge was imperative to actualizing their expectations and goals, I realized that those who hire and evaluate principals, like the CCSD School Leadership Assistant Superintendents (SLAS), also need to understand these strategies since they serve a critical role in supporting instructional change. Historically in the CCSD, the SLAS' plan most of the principal PL without the Academic Division, so pursuing collaborative opportunities between divisions when developing PL experiences around instructional leadership and research-based strategies will prove essential to advancing this work in any district.

Similarly, Academic Division leadership need an understanding of research-based instructional approaches, like applied learning. In the CCSD, Cabinet and Executive Cabinet leaders, such as Assistant Superintendents and Chiefs, speak with principal audiences more often than mid-level leaders do; therefore, increased knowledge of strong instruction would allow them to share information more effectively when presented with

speaking opportunities. Finally, all district meetings and discussions about Tier 1 instruction should include the topic of applied learning, which requires expanding the knowledge and capacity of all teaching and learning leaders through continued training.

Implications for Policymakers

If federal and state governments continue to evaluate principals' effectiveness based on student test scores, then traditional teaching practices will remain the instructional priority of K-12 public education. Results from this study demonstrate principals' increased understanding of applied learning and their desire to elicit change in their buildings but that requires taking instructional risks that do not always translate into higher test scores. One implication, therefore, is for policymakers to change school leaders' evaluation tools to reflect a larger emphasis on implementing soft skills, such as creativity, problem-solving, and teamwork (Whiting, 2020), in classrooms and less on the recall of information as measured on state assessments.

Another implication for policymakers is to offer flexibility in staffing and seat time. Why did principals skip the PL session on applied learning? Because they had to make district allotments work in a traditional setting that already limited applied learning opportunities. Under current educational policies, students must sit for a scripted number of hours, classroom schedules must have a subject-certified teacher, and class sizes must adhere to state guidelines. The scheduling and hiring nightmare that principals face every spring hinders the implementation of instructional change. Policymakers can assist with eliminating those challenges. "We've tried doubling down on the factory model of schooling — double blocks of reading and math, test-and-punish strategies, summer

school, remediation — and the record is not pretty. The solution is not more of the same" (Metha, 2022).

Implications for Practitioners

Based on the data collected in this study, implications for practitioners begin with building and offering training, observations, and collaboration on applied learning strategies. In academic studies, the term 'practitioners' typically refers to teachers, but in this research, I identify them as the district-level department leaders, such as the CCSD Applied Learning and Design (ALD) Office. In the CCSD, professional learning and resources for applied learning often originate with the leaders of the ALD team (supervisors for STEM, CTAE, the Fine Arts, etc.), due to the natural inclusion of these strategies in those courses; therefore, they would logically create and lead PL on these strategies.

Additionally, leaders of applied learning need to build district-wide awareness by finding opportunities other than scheduled PL to share language, references, and/or resources with principals. For example, the ALD team considered posting applied learning language in school buildings such as hanging signs outside the classrooms of strong applied learning teachers that say, "Applied Learning Classroom." Also, when the Chief Academic Officer asked Academic Division directors to provide a list of classroom strategies for supporting math and literacy instruction, the ALD team added integrated learning, student-driven learning, and authentic applications to the list so that principals would see that language in the context of core subjects.

Implications for Future Research

During the PL, we presented the academic and behavioral advantages of using applied learning strategies, and the principals quickly grasped the impact on teaching and learning. When asked on the post-survey about additional PL needed, respondents did not reference more research, theoretical perspectives, or explanations 'why.' They wanted actionable support such as levels of implementation and more PL like the one we provided; they needed logistics, road maps, teacher help, and guidance.

Historical and current research outline several topics addressed in this study such as the qualities of strong instructional leaders, identification of research-based strategies, and the benefits of professional learning (Darling-Hammond et al., 2021; Hallinger, 2003; Hitt & Tucker, Mehta, 2022; Murphy et al., 2006; Robinson et al., 2008). Similarly, people can find an abundance of research on sub-topics of this study such as leading change, securing teacher buy-in, and transformational leadership (Hallinger, 2003; Hitt & Tucker, 2016; Robinson et al., 2008; Quinn, 2002; Zimmerman, 2006). Theoretically, the information gleaned from all these studies make perfect sense on paper, but how do educators cohesively put theory into practice?

For example, I recently sat with a leadership team from a small, Georgia school district during a Georgia Deeper Learning Network quarterly meeting. The team consisted of teachers, building leaders, district leaders, and the Superintendent. They held wonderful conversations about how to embed deeper learning practices into their schools' classrooms. One person stated that the school strategic plan template recently created did not provide room for deeper learning to be added since the district's focus was on literacy and math. These leaders did not understand that applied learning strategies were not an additional goal on a strategic plan, but rather represented the 'how' of meeting their

literacy and math goals. Applied learning practices expand students' literacy and math knowledge in the context of core classrooms. This experience further emphasized the need to research and develop additional training that includes practical steps for implementing instructional changes.

Based on this study, future research includes capturing, or creating, a how-to approach for instructional change through the lens of current leaders and practitioners and in the context of evaluation tools and state-wide priorities. I recognize that this research already exists as there is no such thing as new research; however, teachers remain traditional in their practices, governments continue to focus on test scores, and school leaders struggle to implement changes despite decades of research. Perhaps action research that contextualizes all the individual studies into one practical application would prove beneficial.

Limitations and Strengths of the Study

Several limitations impacted my study. For example, the sample sizes for the reconnaissance and evaluation phases represented low percentages of the overall population. This small sample size might have introduced variability in the data due to differences in the participants' school locations, years of leadership experience, and school levels. Additionally, I conducted the research in one large suburban school district in metro Georgia, which may not represent the size, demographics, or locations of other districts that might want to implement similar research. This context could limit the reliability and transferability of my results.

Furthermore, I made several assumptions about principals' instructional leadership abilities. I assumed that principals understood how to set instructional expectations and

effectively communicate them to their staff. I also presumed that their professional goals were aligned more with personal growth than with school improvement. I built the study on the premise that principals perceived themselves as instructional leaders and change agents in their buildings. These assumptions may have influenced the interpretation of my results and should be considered when applying the findings.

Despite these limitations, my study also had several strengths. One of the key strengths was the practical application of action research. By working directly with district and school leaders on the development of the research study, I collected authentic data that can inform current practices. The sample for the reconnaissance and evaluation phases included principals from all levels, providing a range of perspectives on applied learning. This diversity of perspectives is a strength of my study and contributes to the richness of the data.

Moreover, the intervention employed in my study has the potential to lead to future implementation of applied learning through instructional expectations and professional goals. This could have a significant impact on practical change in the district. By building awareness and knowledge of applied learning with a small group of principals, I contributed to building the confidence and capacity of others to share these strategies and professional learning opportunities.

However, it's important to note that the action research approach, while a strength in terms of its practical application, also introduces potential biases. As the researcher, my own biases and assumptions may have influenced the data collection and analysis process. Future research should aim to replicate this study in different contexts and with larger samples to confirm the results and address these potential biases.

Conclusion

Georgia principals are expected to serve as the instructional leaders of their buildings which includes staying apprised of research-based, best practices that influence student achievement. Teachers look to their principals as instructional experts, change agents, and life-long learners; therefore, principals need to engage in professional learning opportunities that improve their abilities to set instructional expectations, lead change, and implement strong teaching and learning practices such as applied learning.

The results of this MMAR study indicated that a PL session on applied learning increased principals' knowledge of integrated learning, student-driven learning, and authentic applications, and impacted their instructional expectations and professional goals. By participating in a professional learning session that embedded applied learnig training, observations, and collaboration, principals' perceived abilities to understand, recognize, and lead applied learning increased as did their confidence to lead implementation. Although additional research is needed on steps to implementing applied learning in K-12, public education core classrooms, this study shows that principals benefited from professional learning and wanted to know more.

Leaders of public education are far from making radical changes or shifting classroom practices, but I am encouraged and inspired by the results of this study. Beginning with the principals as instructional leaders will help influence school-based practices. Providing principals with more PL around strong teaching and learning strategies might be a first step in shifting the traditional educational model to one of applied and meaningful learning.

APPENDICES

Appendix A: Applied Learning Survey for Reconnaissance Phase of MMAR

Start of Block: Consent

Consent To Cobb County School District Principal:

As a Doctoral Candidate conducting research at the University of Kentucky, I am inviting you to take part in a survey about applied learning. The purpose of my research is to investigate principals' knowledge and recognition of applied learning strategies that align with the leaders' instructional expectations to develop professional learning resources for leading classroom implementation. The survey will capture principals' self-assessment of their knowledge, recognition, and ability to lead the implementation of applied learning which will then inform the design of this study.

Although you may not get personal benefit from taking part in this research study, your responses may help me understand more about principals’ experience, recognition, expectations, and confidence with applied learning so that we can develop professional learning resources for principals leading applied learning implementation. Some volunteers experience satisfaction from knowing they have contributed to research that may possibly benefit others in the future.

The survey will take about 10 minutes to complete. There are no known risks to participating in this study. Your response to the survey will be kept confidential to the extent allowed by law. Individual responses will be kept private, and no one else in the Cobb County School District will know whether you participated or be provided with survey responses. When I write about the study, you will not be identified. Any information collected as part of the research will not be used or distributed for future research studies, even if identifiers are removed. We will make every effort to safeguard your data, but as with anything online, we cannot guarantee the security of data obtained via the Internet. Third-party applications used in this study may have Terms of Service and Privacy policies outside of the control of the University of Kentucky.

I hope to receive completed surveys from about 50 people, so your answers are important to me. Of course, you have a choice about whether or not to complete the survey, but if you do participate, you are free to skip any questions or discontinue at any time. You will not be penalized in any way for skipping or discontinuing the survey. If you do choose to leave the study early, data collected until that point will not remain in the study database and will be removed. If you do not want to be in the study, there are no other choices except not to take part in the study.

If you have questions about the study, please feel free to ask; my contact information is given below. If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the staff in the University of Kentucky Office of Research Integrity at 859-257-9428 or 1-866-400-9428.

Thank you in advance for your assistance with this important project. To ensure your responses will be included, please submit your completed survey **by Friday, October 7, 2022.**

Principal Investigator, Janell McClure
Department of Educational Leadership Studies, College of Education, University of Kentucky
PHONE: 678-431-0037
E-MAIL: janell.mcclure@uky.edu

Faculty Advisor, Dr. Beth Rous
Department of Educational Leadership Studies, College of Education, University of Kentucky

PHONE: 859-257-6389
E-MAIL: brous@uky.edu

- ○ I have read the cover letter and details of the study and provide consent to use my responses as part of the study.

End of Block: Consent

Start of Block: Participant Background

PB1 How long have you been a school administrator (This includes time as an SLI, Assistant Principal, and Principal)?

- ○ 1-5 years
- ○ 6-10 years
- ○ 11-15 years
- ○ 16-20 years
- ○ 21-25 years
- ○ 26-30 years
- ○ More than 30 years

PB2 At what school did you work in SY2021-22?

PB3 At what school do you work in SY2022-23?

PB4 What was your administrative role in SY2021-22?

- ○ Principal
- ○ Assistant Principal
- ○ Other (Please explain.)

PB5 How long have you been a principal at your SY2021-22 school?

- ○ 1-5 years
- ○ 6-10 years
- ○ 11-15 years
- ○ 16-20 years
- ○ 21-25 years
- ○ 26-30 years
- ○ More than 30 years
- ○ I was not a principal in SY2021-22.

End of Block: Participant Background

Start of Block: Opening

Intro The intent of this survey is to investigate school principals' instructional expectations for, and knowledge and recognition of, applied learning to inform the development of professional learning resources for leading implementation in the classroom.

For the purpose of this survey, the definition of applied learning is the development and

implementation of **integrated**, **student-driven learning** experiences through **authentic applications** that engage critical thinking and creative exploration.

Each of the 3 bolded components are defined in the following questions. Please base your responses on your administrative experience for SY2021-22.

End of Block: Opening

Start of Block: Intergrative Learning

Intro Integrative Learning: Students connect across disciplines and differences in order to create new meaning (Ithaca College, 2022; Pack, 2016)

"Students draw on knowledge and skills from many subject areas and experiences to build something together. The exercise is preparing them for real life and the types of applied learning they will take on beyond the school environment" (William + Flora Hewlett Foundation, n.d.).

Based on this definition, respond to the following statements.

IL1 The instructional vision and expectations for teaching and learning in my school include integrated learning.

- ○ Strongly disagree
- ○ Disagree
- ○ Neither agree nor disagree
- ○ Agree
- ○ Strongly agree

IL2 When I observe classrooms, I can confidently **recognize the use** of integrated learning.

- ○ Strongly disagree
- ○ Disagree
- ○ Neither agree nor disagree
- ○ Agree
- ○ Strongly agree

End of Block: Intergrative Learning

Start of Block: Student-Driven Learning

Intro Student-driven learning experiences: Sometimes referenced as student agency, this is giving students choice, voice, and ownership of their learning. Some examples include service learning, internships, and project/problem based learning.

"Opportunities to capitalize on students' ideas, questions, and interests...are central to supporting and cultivating student agency in classrooms" (Vaughn, 2020).

Based on this definition, respond to the following statements and questions.

SDL1 The instructional vision and expectations for teaching and learning in my school include student-driven learning.

- ○ Strongly disagree
- ○ Disagree
- ○ Neither agree nor disagree
- ○ Agree
- ○ Strongly agree

SDL2 When I observe classrooms, I can confidently **recognize the use** of student-driven learning.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

End of Block: Student-Driven Learning

Start of Block: Authentic Applications

Intro Authentic applications: This can include assessments, audience, or experiences that provide relevancy to learning.

"Authentic audiences help students connect their work in the classroom to the real world. They provide a sense of buy-in for students and bring attention to their work" (Burns, 2016).

"Authentic assessment is the idea of using creative learning experiences to test students' skills and knowledge in realistic situations. Authentic assessment measures students' success in a way that's relevant to the skills required of them..." (Shaw, 2019).

Based on this definition, respond to the following statements and questions.

AA1 The instructional vision and expectations for teaching and learning in my school include authentic applications.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

AA2 When I observe classrooms, I can confidently **recognize the use** of authentic applications.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

End of Block: Authentic Applications

Start of Block: Leading Implementation

LI1 Based on the definitions of integrated, student-driven, and authentic applications, I used applied learning strategies when I was a teacher.

- ○ Strongly disagree
- ○ Disagree
- ○ Neither agree nor disagree
- ○ Agree
- ○ Strongly agree

Skip To: LI3 If Based on the definitions of integrated, student-driven, and authentic applications, I used applie... = Strongly disagree

Skip To: LI3 If Based on the definitions of integrated, student-driven, and authentic applications, I used applie... = Disagree

Skip To: LI3 If Based on the definitions of integrated, student-driven, and authentic applications, I used applie... = Neither agree nor disagree

LI2 Give one example of an applied learning strategy that you used and include whether it was integrated, student-driven, and/or an authentic application.

LI3 Based on the definitions of integrated, student-driven, and authentic applications, I can confidently **lead** the implementation of applied learning.

- ○ Strongly disagree
- ○ Disagree
- ○ Neither agree nor disagree
- ○ Agree
- ○ Strongly agree

Skip To: End of Block If Based on the definitions of integrated, student-driven, and authentic applications, I can confide... = Strongly disagree

Skip To: End of Block If Based on the definitions of integrated, student-driven, and authentic applications, I can confide... = Disagree

Skip To: End of Block If Based on the definitions of integrated, student-driven, and authentic applications, I can confide... = Neither agree nor disagree

LI4 What advice do you have for other school administrators wanting to lead implementation of applied learning?

LI5 What training or professional learning would you recommend to other school administrators wanting to lead implementation of applied learning?

End of Block: Leading Implementation

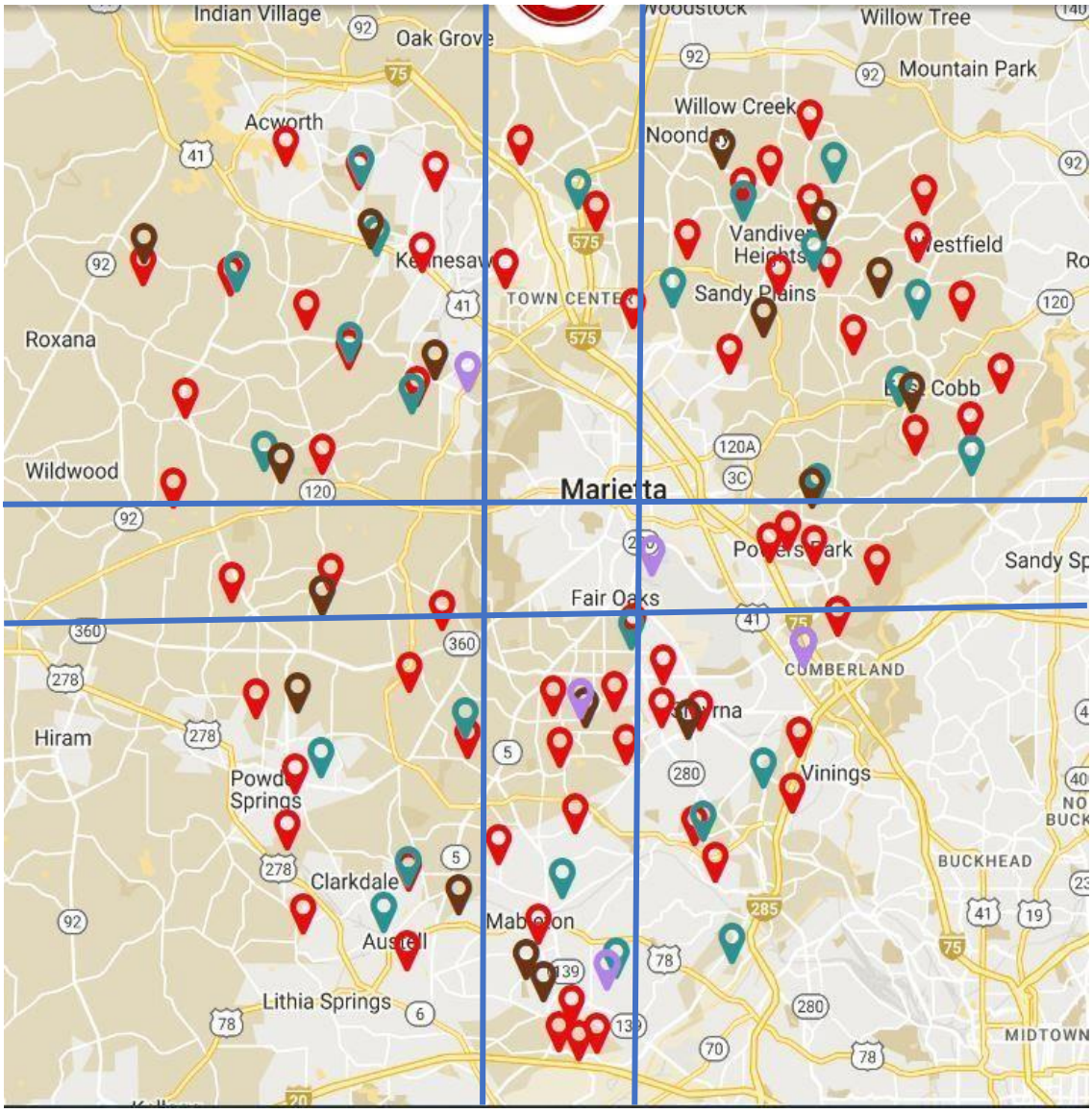
Start of Block: Closing

Closing If you would be willing to participate in a follow-up interview, please include your contact information here. Thank you!

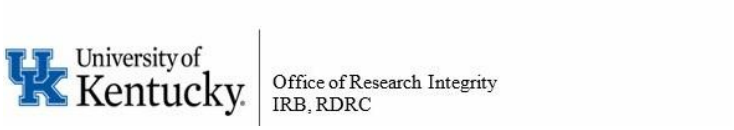
- ○ Name _____
- ○ Email address _____
- ○ Phone number _____

End of Block: Closing

Appendix B: CCSD School Map with Geographic Locations



Appendix C: IRB Approval for Reconnaissance from the University of Kentucky



EXEMPTION CERTIFICATION

IRB Number: 79617

TO: Janell McClure
Educational Leadership Studies
PI phone #: 6784310037

PI email: Janell.McClure@uky.edu

FROM: Chairperson/Vice Chairperson
Nonmedical Institutional Review Board (IRB)
SUBJECT: Approval for Exemption Certification
DATE: 9/21/2022

On 9/21/2022, it was determined that your project entitled "*Principals as Instructional Leaders: Building Knowledge of Applied Learning Strategies to Confidently Lead Implementation*" meets federal criteria to qualify as an exempt study.

Please note that this approval covers only the activities described in your application as belonging to the reconnaissance phase. **A Modification Request must be submitted and approved by the IRB before conducting any further research activities** (i.e., "Additional MMAR Phases" including "planning, acting, evaluating, and monitoring an intervention").

Because the study has been certified as exempt, you will not be required to complete continuation or final review reports. However, it is your responsibility to notify the IRB prior to making any changes to the study. Please note that changes made to an exempt protocol may disqualify it from exempt status and may require an expedited or full review.

The Office of Research Integrity will hold your exemption application for six years. Before the end of the sixth year, you will be notified that your file will be closed and the application destroyed. If your project is still ongoing, you will need to contact the Office of Research Integrity upon receipt of that letter and follow the instructions for completing a new exemption application. It is, therefore, important that you keep your address current with the Office of Research Integrity.

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" available in the online Office of Research Integrity's IRB Survival Handbook. Additional information regarding IRB review, federal regulations, and institutional policies may be found through ORI's web site. 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.

seeblue.
405 Kinkead Hall | Lexington, KY 40506-0057 | P: 859-257-9428 | F: 859-257-8995 | www.research.uky.edu/ori/
An Equal Opportunity University

Appendix D: IRB Approval for Reconnaissance from the Cobb County School District

COBB COUNTY SCHOOL DISTRICT
One Team, One Goal: Student Success

514 Glover Street
Marietta, GA 30060
Telephone: (770) 426-3300
www.cobbk12.org

September 13, 2022
Ms. Janell McClure
125 Sunset Peak Ct.
Waleska, Ga. 30183

SENT VIA EMAIL

Dear Ms. McClure,

Your application titled, Principals as Instructional Leaders: Building Knowledge of Applied Learning Strategies to Confidently Lead Implementation has been administratively approved.

Should modifications or changes in research procedures become necessary during the research project, submit changes in writing to the Office of Accountability and Research. If you have any questions regarding the final approval process, contact our office at (770) 426-3450.

Sincerely,

Cindy Nichols

Cindy Nichols
Assistant Director, Grants & Research
Office of Accountability & Research

Appendix E: Consent Email for Reconnaissance Survey

To Cobb County School District Principal:

As a Doctoral Candidate conducting research at the University of Kentucky, I am inviting you to take part in a survey about applied learning. The purpose of my research is to investigate principals' knowledge and recognition of applied learning strategies that align with the leaders' instructional expectations to develop professional learning resources for leading classroom implementation. The survey will capture principals' self-assessment of their knowledge, recognition, and ability to lead the implementation of applied learning which will then inform the design of this study.
Although you may not get personal benefit from taking part in this research study, your responses may help me understand more about principals' experience, recognition, expectations, and confidence with applied learning so that we can develop professional learning resources for principals leading applied learning implementation. Some volunteers experience satisfaction from knowing they have contributed to research that may possibly benefit others in the future.

The survey will take about 10 minutes to complete. There are no known risks to participating in this study. Your response to the survey will be kept confidential to the extent allowed by law. Individual responses will be kept private, and no one else in the Cobb County School District will know whether you participated or be provided with survey responses. When I write about the study, you will not be identified. Any information collected as part of the research will not be used or distributed for future research studies, even if identifiers are removed. We will make every effort to safeguard your data, but as with anything online, we cannot guarantee the security of data obtained via the Internet. Third-party applications used in this study may have Terms of Service and Privacy policies outside of the control of the University of Kentucky.

I hope to receive completed surveys from about 50 people, so your answers are important to me. Of course, you have a choice about whether or not to complete the survey, but if you do participate, you are free to skip any questions or discontinue at any time. You will not be penalized in any way for skipping or discontinuing the survey. If you do choose to leave the study early, data collected until that point will not remain in the study database and will be removed. If you do not want to be in the study, there are no other choices except not to take part in the study.

If you have questions about the study, please feel free to ask; my contact information is given below. If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the staff in the University of Kentucky Office of Research Integrity at 859-257-9428 or1-866-400-9428.

Thank you in advance for your assistance with this important project. To ensure your responses will be included, please submit your completed survey **by Friday, October 7, 2022**.

If you consent to participate, please access the survey here, Applied Learning Survey.

Sincerely,

Principal Investigator, Janell McClure
Department of Educational Leadership Studies, College of Education, University of Kentucky
PHONE: 678-431-0037
E-MAIL: janell.mcclure@uky.edu

Faculty Advisor, Dr. Beth Rous
Department of Educational Leadership Studies, College of Education, University of Kentucky
PHONE: 859-257-6389
E-MAIL: brous@uky.edu

Appendix F: Interview Questions for Reconnaissance

Based on the definitions of integrated, student-driven, and authentic applications, describe the instructional vision and expectations you have for applied learning at your school.
Based on the definitions of integrated, student-driven, and authentic applications, give an example of applied learning you have observed in a classroom at your school.
What challenges did you experience, or do you anticipate, with leading applied learning? What opportunities did you experience, or do you anticipate, with leading applied learning? What professional learning resources do you need to better understand, recognize, and/or lead applied learning?

Appendix G: Consent Email for Reconnaissance Interview

Thank you for volunteering to participate in an interview for my dissertation research.

As a Doctoral Candidate conducting research at the University of Kentucky, I am inviting you to take part in an interview about applied learning. The purpose of my research is to investigate principals' knowledge and recognition of applied learning strategies that align with the leaders' instructional expectations to develop professional learning resources for leading classroom implementation. The interview will capture additional information about principals' expectations, challenges, opportunities, and training needs for leading implementation of applied learning which will then inform the design of this study.

Although you may not get personal benefit from taking part in this research study, your responses may help me understand more about principals' vision for and knowledge of applied learning so that we can develop professional learning resources for principals wanting to lead applied learning implementation. Some volunteers experience satisfaction from knowing they have contributed to research that may possibly benefit others in the future.

The interview will take about 30 minutes to complete. There are no known risks to participating in this study. Your responses during the interview will be kept confidential to the extent allowed by law. Individual responses will be kept private, and no one else in the Cobb County School District will know whether you participated or be provided with interview responses. When I write about the study, you will not be identified.

Any information collected as part of the research will not be used or distributed for future research studies, even if identifiers are removed. We will make every effort to safeguard your data, but as with anything online, we cannot guarantee the security of data obtained via the Internet. Third-party applications used in this study may have Terms of Service and Privacy policies outside of the control of the University of Kentucky.

I hope to interview about 10 people, so your answers are important to me. Of course, you have a choice about whether or not to participate in the interview, but if you do participate, you are free to skip any questions posed to you. You will not be penalized in any way for not responding to an interview question or ending the interview early. If you do not want to be in the study, there are no other choices except not to take part in the study.

If you have questions about the study, please feel free to ask; my contact information is given below. If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the staff in the University of Kentucky Office of Research Integrity at 859-257-9428 or 1-866-400-9428.

Thank you in advance for your assistance with this important project. All interviews will occur face-to-face at your school unless you designate an alternative location.

If you consent to participate, please follow this link to a scheduling tool where you will choose a date and time when the interview will be conducted.

Sincerely,

Principal Investigator, Janell McClure
Department of Educational Leadership Studies, College of Education, University of Kentucky
PHONE: 678-431-0037
E-MAIL: janell.mcclure@uky.edu

Faculty Advisor, Dr. Beth Rous
Department of Educational Leadership Studies, College of Education, University of Kentucky
PHONE: 859-257-6389
E-MAIL: brous@uky.edu

Appendix H: IRB Approval for Evaluation from the University of Kentucky

Modification Review

Approval Ends:
9/20/2028

IRB Number:
79617

TO: Janell McClure
Educational Leadership Studies
PI phone #: 6784310037

PI email: Janell.McClure@uky.edu

FROM: Chairperson/Vice Chairperson
Nonmedical Institutional Review Board (IRB)
SUBJECT: Approval of Modification Request
DATE: 2/15/2023

On 2/14/2023, the Nonmedical Institutional Review Board approved your request for modifications in your protocol entitled:

Principals as Instructional Leaders: Building Knowledge of Applied Learning Strategies to Confidently Lead Implementation

If your modification request necessitated a change in your approved informed consent/assent form(s), the new IRB approved consent/assent form(s) to be used when enrolling subjects can be found on the approved application's landing page in E-IRB. [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.]

Note that at Continuation Review, you will be asked to submit a brief summary of any modifications approved by the IRB since initial review or the last continuation review, which may impact subject safety or welfare. Please take this approved modification into consideration when preparing your summary.

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" available in the online Office of Research

Integrity's IRB Survival Handbook. Additional information regarding IRB review, federal regulations, and institutional policies may be found through ORI's web site. 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.

Appendix I: IRB Approval for Evaluation from the Cobb County School District

COBB COUNTY SCHOOL DISTRICT
One Team, One Goal: Student Success

514 Glover Street
Marietta, GA 30060
Telephone: (770) 426-3300
www.cobbk12.org

September 13, 2022
Ms. Janell McClure
125 Sunset Peak Ct.
Waleska, Ga. 30183

SENT VIA EMAIL

Dear Ms. McClure,

Your application titled, Principals as Instructional Leaders: Building Knowledge of Applied Learning Strategies to Confidently Lead Implementation has been administratively approved.

Should modifications or changes in research procedures become necessary during the research project, submit changes in writing to the Office of Accountability and Research. If you have any questions regarding the final approval process, contact our office at (770) 426-3450.

Sincerely,

Cindy Nichols

Cindy Nichols
Assistant Director, Grants & Research
Office of Accountability & Research

Appendix J: World Economic Forum Top 10 Skills of 2025

Appendix K: Applied Learning for Principals Professional Learning Session Handout

The definition of applied learning in the CCSD is the development and implementation of integrated, student-driven learning experiences through authentic applications that engage critical thinking and creative exploration.

Research-based Definitions for Integrated/ive Learning
Students connect across disciplines and differences in order to create new meaning.
Students retain and apply information by connecting knowledge and skills to other disciplines, thus building learners' understanding and application of knowledge to diverse settings and problems.

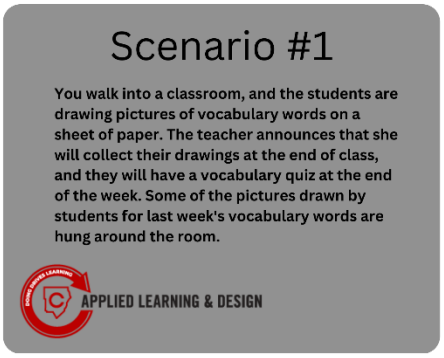
Research-based Definitions for Student-driven Learning
Students are given choice, voice, and ownership of their learning.
Student agency can be defined as owning learning and solving real-world problems that engage learners in authentic and relevant work so that they can explore, collaborate, make choices, and self-assess.

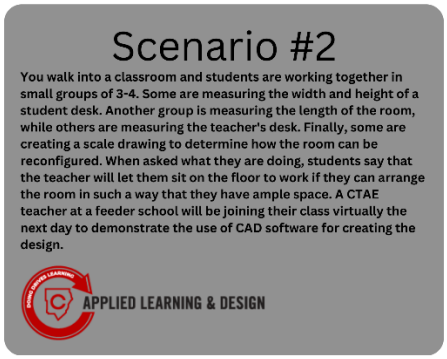
Research-based Definitions for Authentic Applications
Students build skills through relevant and real-world opportunities that prepare them for college and career such as problem-solving, critical thinking, and creativity.
Connecting new knowledge to prior understandings makes learning active, and authentic assessments, audiences, experiences, and environments make learning relevant.

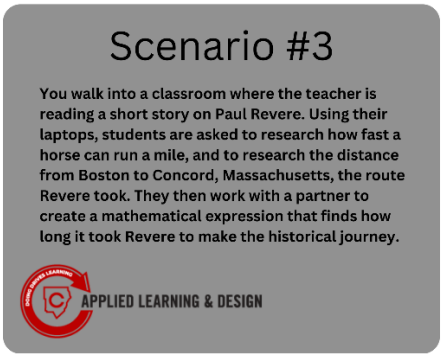
Summary of Stations:

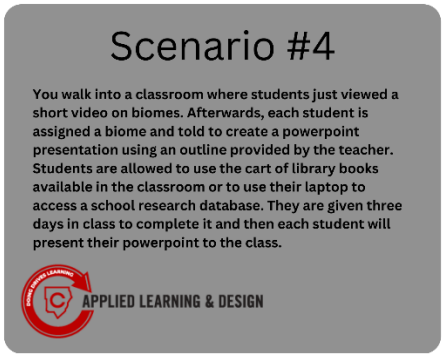
- Station 1: Elementary poetry slam *with facilitator, Jessica Espinoza*
- Station 2: a) Middle school project moving pallet of bricks onto the bed of a truck, b) Kindergartners problem-solving, and c) elementary school students building circuits *with facilitator, Sally Creel*
- Station 3: High school gallery project *with facilitator, Janell McClure*
- Station 4: a) Middle school roller coaster project, b) math projects for graphing linear functions and using the Pythagorean theorem, and c) elementary students creating and singing the blues *with facilitator, Laura LaQuaglia*
- Station 5: a) High school chemistry and cosmetology, b) bird house project, and c) pyramids and prisms *with facilitator, Art O'Neill*

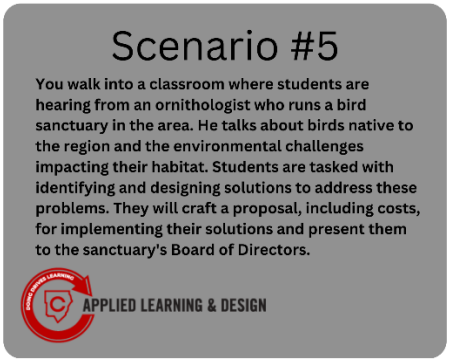
Appendix L: Applied Learning for Principals Professional Learning Session Scenarios Cards

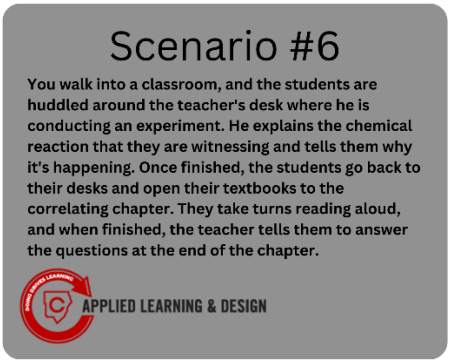


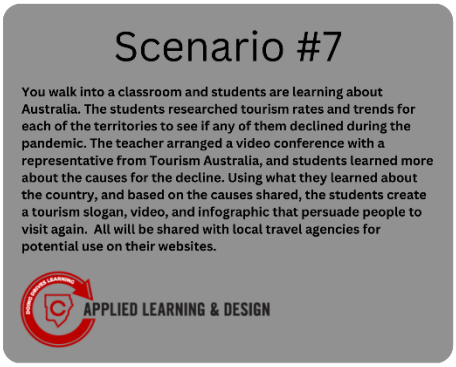


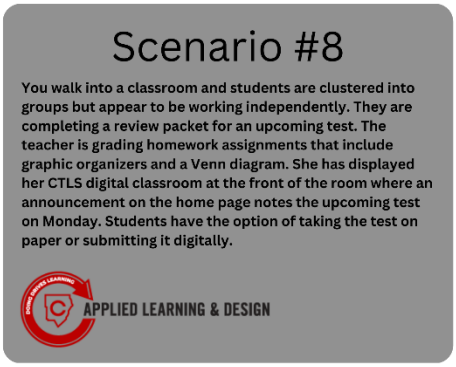












Appendix M: Consent Email for Evaluation

To Cobb County School District principals participating in the Applied Learning for Principals PL:

As a Doctoral Candidate conducting research at the University of Kentucky, I am inviting you to allow your post-survey responses to the Applied Learning for Principals PL to be included in my research study. The purpose of my research is to investigate principals' knowledge and recognition of applied learning strategies that align with the leaders' instructional expectations to develop professional learning resources for leading classroom implementation. This survey will capture principals' perceptions of their knowledge in understanding, recognizing, and implementing applied learning before and after the PL. The survey will also assess the effectiveness of the PL, the impact on principals' instructional expectations and goals, and any recommendations for future PL. You have a choice about whether to allow your survey responses to be included in the research study. **You may complete the survey but choose not to allow your survey results to be included in the research study.**

When completing the survey, you are free to skip any questions or discontinue at any time. You will not be penalized in any way for skipping or discontinuing the survey. If you choose to leave the survey early, data collected until that point will not remain in the study database and will be removed. If you do not want to be in the study, there are no other choices except not to take part in the study. Although you may not get personal benefit from taking part in this research study, your responses may help me understand more about principals' knowledge in understanding, recognizing, and implementing applied learning as the result of the PL. Some volunteers experience satisfaction from knowing they have contributed to research that may possibly benefit others in the future.

The survey will take about 10 minutes to complete. There are no known risks to participating in this study. Your responses to the survey will be kept confidential to the extent allowed by law. Individual responses will be kept private, and no one else in the Cobb County School District will be provided with survey responses. When I write about the study, you will not be identified. Any information collected as part of the research will not be used or distributed for future research studies, even if identifiers are removed. We will make every effort to safeguard your data, but as with anything online, we cannot guarantee the security of data obtained via the Internet. Third-party applications used in this study may have Terms of Service and Privacy policies outside of the control of the University of Kentucky.

If you have questions about the study, please feel free to ask; my contact information is given below. If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the University of Kentucky Office of Research Integrity staff at 859-257-9428 or 1-866-400-9428.

Thank you in advance for your assistance with this important project. Please submit your completed survey by **6:00 p.m. on Tuesday, March 21, 2023**.

Click here to access the survey. **You may complete the survey but choose not to allow your survey results to be included in my research study.** Thank you!

Sincerely,
Principal Investigator, Janell McClure, Department of Educational Leadership Studies, College of Education, University of Kentucky
PHONE: 678-431-0037 E-MAIL: janell.mcclure@uky.edu

Faculty Advisor, Dr. Beth Rous, Department of Educational Leadership Studies, College of Education, University of Kentucky
PHONE: 859-257-6389 E-MAIL: brous@uky.edu

Appendix N: Applied Learning for Principals **Professional Learning Post-Survey for Evaluation Phase**

Applied Learning for Principals PL Survey: Spring 2023

Start of Block: Consent

Consent To Cobb County School District principals participating in the Applied Learning for Principals PL:

As a Doctoral Candidate conducting research at the University of Kentucky, I am inviting you to allow your post-survey responses to the Applied Learning for Principals PL to be included in my research study. The purpose of my research is to investigate principals' knowledge and recognition of applied learning strategies that align with the leaders' instructional expectations to develop professional learning resources for leading classroom implementation. This survey will capture principals' perceptions of their knowledge in understanding, recognizing, and implementing applied learning before and after the PL. The survey will also assess the effectiveness of the PL, the impact on principals' instructional expectations and goals, and any recommendations for future PL. You have a choice about whether to allow your survey responses to be included in the research study. **You may complete the survey but choose not to allow your survey results to be included in the research study.**

When completing the survey, you are free to skip any questions or discontinue at any time. You will not be penalized in any way for skipping or discontinuing the survey. If you choose to leave the survey early, data collected until that point will not remain in the study database and will be removed. If you do not want to be in the study, there are no other choices except not to take part in the study. Although you may not get personal benefit from taking part in this research study, your responses may help me understand more about principals' knowledge in understanding, recognizing, and implementing applied learning as the result of the PL. Some volunteers experience satisfaction from knowing they have contributed to research that may possibly benefit others in the future.

The survey will take about 10 minutes to complete. There are no known risks to participating in this study. Your responses to the survey will be kept confidential to the extent allowed by law. Individual responses will be kept private, and no one else in the Cobb County School District will be provided with survey responses. When I write about the study, you will not be identified. Any information collected as part of the research will not be used or distributed for future research studies, even if identifiers are removed. We will make every effort to safeguard your data, but as with anything online, we cannot guarantee the security of data obtained via the Internet. Third-party applications used in this study may have Terms of Service and Privacy policies outside of the control of the University of Kentucky.

If you have questions about the study, please feel free to ask; my contact information is

given below. If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the University of Kentucky Office of Research Integrity staff at 859-257-9428 or 1-866-400-9428.

Thank you in advance for your assistance with this important project. Please submit your completed survey by **6:00 p.m. on Tuesday, March 21, 2023**.

You may complete the survey but choose not to allow your survey results to be included in my research study. Thank you!

Sincerely,
Principal Investigator, Janell McClure, Department of Educational Leadership Studies, College of Education, University of Kentucky
PHONE: 678-431-0037 E-MAIL: janell.mcclure@uky.edu

Faculty Advisor, Dr. Beth Rous, Department of Educational Leadership Studies, College of Education, University of Kentucky
PHONE: 859-257-6389 E-MAIL: brous@uky.edu

○ I have read the cover letter and details of the study and give consent to use my survey responses as part of the study.

○ I have read the cover letter and details of the study and DO NOT give consent to use my survey responses as part of the study.

End of Block: Consent

Start of Block: Participant Background

PB1 How long have you been a school administrator (This includes time as an SLI, Assistant Principal, and Principal)?

- ○ 1-5 years
- ○ 6-10 years
- ○ 11-15 years
- ○ 16-20 years
- ○ 21-25 years
- ○ 26-30 years
- ○ More than 30 years

PB3 At what school level do you currently work?

- ○ Elementary
- ○ Middle
- ○ High

PB5 How long have you been a principal at your current school?

- ○ 1-5 years
- ○ 6-10 years
- ○ 11-15 years
- ○ 16-20 years
- ○ 21-25 years
- ○ 26-30 years
- ○ More than 30 years

End of Block: Participant Background

Start of Block: Opening

Intro The intent of this survey is to capture principals' self-assessment of their knowledge in understanding, recognizing, and implementing applied learning before professional learning was delivered and again after participation in professional learning. The data from the survey will inform the effectiveness of the professional learning resources on principals' knowledge of applied learning.

For the purpose of this survey, the definition of applied learning is the development and implementation of **integrated**, **student-driven learning** experiences through **authentic applications** that engage critical thinking and creative exploration.

Each of the 3 bolded components are defined in the following questions.

End of Block: Opening

Start of Block: Intergrative Learning

IL Intro Integrative Learning: Students connect across disciplines and differences in order to create new meaning (Ithaca College, 2022; Pack, 2016)

Students retain and apply information by connecting knowledge and skills to other disciplines, thus building learners' understanding and application of knowledge to diverse settings and problems.

Based on these definitions, respond to the following statements.

IL1 **Before** participating in the applied learning training on integrated learning, how knowledgeable were you in the following areas:

	Not knowledgeable at all	Slightly knowledgeable	Moderately knowledgeable	Very knowledgeable	Extremely knowledgeable
Understanding the meaning of integrated learning	○	○	○	○	○
Recognizing integrated learning in a core classroom	○	○	○	○	○
Leading implementation of integrated learning	○	○	○	○	○

IL2 **After** participating in the applied learning training on integrated learning, how knowledgeable are you in the following areas:

	Not knowledgeable at all	Slightly knowledgeable	Moderately knowledgeable	Very knowledgeable	Extremely knowledgeable
Understanding the meaning of integrated learning	○	○	○	○	○
Recognizing integrated learning in a core classroom	○	○	○	○	○
Leading implementation of integrated learning	○	○	○	○	○

End of Block: Intergrative Learning

Start of Block: Student-Driven Learning

SDL Intro Student-driven learning experiences: Students are given choice, voice, and ownership of their learning.

Student agency can be defined as owning learning and solving real-world problems that engage learners in authentic and relevant work so that they can explore, collaborate, make choices, and self-assess.

Based on these definitions, respond to the following statements and questions.

SDL3 **Before** participating in the applied learning training on student-driven learning, how knowledgeable were you in the following areas:

	Not knowledgeable at all	Slightly knowledgeable	Moderately knowledgeable	Very knowledgeable	Extremely knowledgeable
Understanding the meaning of student-driven learning	○	○	○	○	○
Recognizing student-driven learning in a core classroom	○	○	○	○	○
Leading implementation of student-driven learning	○	○	○	○	○

SDL4 **After** participating in the applied learning training on student-driven learning, how knowledgeable are you in the following areas:

	Not knowledgeable at all	Slightly knowledgeable	Moderately knowledgeable	Very knowledgeable	Extremely knowledgeable
Understanding the meaning of student-driven learning	○	○	○	○	○
Recognizing student-driven learning in a core classroom	○	○	○	○	○
Leading implementation of student-driven learning	○	○	○	○	○

End of Block: Student-Driven Learning

Start of Block: Authentic Applications

AA Intro Authentic applications: Students build skills through relevant and real-world opportunities that prepare them for college and career such as problem-solving, critical thinking, and creativity.

Connecting new knowledge to prior understandings makes learning active, and authentic assessments, audiences, experiences, and environments make learning relevant.

Based on this definition, respond to the following statements and questions.

AA5 **Before** participating in the applied learning training on authentic applications, how knowledgeable were you in the following areas:

	Not knowledgeable at all	Slightly knowledgeable	Moderately knowledgeable	Very knowledgeable	Extremely knowledgeable
Understanding the meaning of authentic applications	○	○	○	○	○
Recognizing authentic applications in a core classroom	○	○	○	○	○
Leading implementation of authentic applications	○	○	○	○	○

AA6 **After** participating in the applied learning training on authentic applications, how knowledgeable are you in the following areas:

	Not knowledgeable at all	Slightly knowledgeable	Moderately knowledgeable	Very knowledgeable	Extremely knowledgeable
Understanding the meaning of authentic applications	○	○	○	○	○
Recognizing authentic applications in a core classroom	○	○	○	○	○
Leading implementation of authentic applications	○	○	○	○	○

End of Block: Authentic Applications

Start of Block: Instructional Leadership

LS7 After participating in the Applied Learning for Principals PL, what, if any, instructional expectations will you have for applied learning next school year? Please explain.

LS8 After participating in the Applied Learning for Principals PL, what, if any, professional goals will you set for yourself in the area of applied learning? Please explain.

End of Block: Instructional Leadership

Start of Block: Evaluation of Professional Learning

EPL9 The following statements gather information regarding the quality of the Applied Learning for Principals PL. This information will be used to guide future professional

development on applied learning. Your individual responses will be treated as confidential information.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The goals of the professional learning were clear.	○	○	○	○	○
The strategies used by the presenters were engaging and appropriate for the goals of this professional learning.	○	○	○	○	○
I gained knowledge and skills to implement this professional learning into my job.	○	○	○	○	○
The time allotted was appropriate for the information presented.	○	○	○	○	○
I recommend offering this professional learning again in the future.	○	○	○	○	○

EPL10 Which part of the professional learning had the most impact on your knowledge in understanding, recognizing, and implementing applied learning? Please explain.

EPL11 What suggestions, if any, do you have for improving this professional learning?

EPL12 What additional professional learning would you recommend for principals on applied learning? Please explain.

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VITA

Janell Lynn McClure

Education and Certifications

Doctoral candidate, Educational Leadership, University of Kentucky
Leadership coursework for certification, Kennesaw State University, 2014
Specialist in Education, Teaching and Learning, focus on Library Media Technology, Georgia State University, 2009
School Library Media Program coursework, Georgia State University, 2003
Master of Science, English Education, Florida State University, 1997
Bachelor of Science, English Education, Florida State University, 1991
Georgia Teacher Certification for Leadership (P-12, Tier II), Media Specialist (P-12) and English (6-12)

Professional positions held

Director, Applied Learning and Design, Cobb County School District, Marietta, GA, 2019-current
Director, Digital and Multimedia Learning, Cobb County School District, Marietta, GA, 2015-2019
Supervisor, Library Media Education, Cobb County School District, Marietta, GA, 2012-2015
Library Media Specialist, Cobb County School District, Marietta, GA, 2004-2012
Teacher, Cobb County School District, Marietta, GA, 1998-2004
Teacher, Wakulla County School District, Crawfordville, FL, 1994-1998

Scholastic and professional honors

Exemplary Educational Specialist Student Award in Library Media Technology, Georgia State University, 2009

Awards and Recognitions

Learning Counsel's Digital Curriculum Strategy Award, Cobb County School District, 2016
Georgia Department of Education Exemplary Middle School Media Program, 2011-2012
Media Specialist of the Year, Cobb County, 2010-2011
Teacher of the Year, Palmer Middle School, 2007-2008

Professional publications

Published article on public library partnership, *Library Media Connection*, May/June 2014
Co-author of an article on assessment, *Library Media Connection*, August/September 2010