

**WHAT'S THE PROBLEM (AND DOES IT MATTER)?**  
**EXPLORING THE RELATIONSHIP BETWEEN EDUCATORS' PROBLEM-  
FRAMING AND EXTERNAL RESEARCH USE**

by

Katherine Tilley

A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Education

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## **ABSTRACT**

The purpose of this study is to investigate the nature of the relationship between problem-framing and reported engagement with external research evidence in school-based decision-making. This study serves as an important first attempt to explore and describe this potential relationship and its implications for the use of research in schools. Situated within the context of a larger knowledge utilization research center, the current study uses qualitative and quantitative data from 1,343 K-12 educators collected during the large-scale administration of the Survey of Evidence in Education for Schools (SEE-S). The study employed an a priori coding framework to distinguish types of problem-frames, followed by subsequent binary logistic regression analyses to assess the potential relationship between problem-frame type and the likelihood of a respondent indicating that external research was used in a decision-making process. Results suggest that school-based practitioners are facing a wide array of problems and that they understand these problems in diverse ways. Additionally, results of regression analyses provide evidence for the relationship between problem-frame type and reported external research use in decision-making. Specifically, seven problem-frame types were found to have a statistically significant relationship with reported external research use. These findings have implications for how the education research and policy communities understand school-based decision-making and problem-solving and the role that research may play.

## **Chapter 1**

### **INTRODUCTION**

#### **1.1 Importance of the Study**

This study aims to describe educators' framings of school-based problems, and to investigate the nature of the relationship between educators' problem-framing and reported engagement with external research evidence in school-based decision-making. This study serves as an important first attempt to explore and describe this potential relationship and its implications for the use of research in educational decision-making at the school-level.

##### **1.1.1 Policy Context**

Under the assumption that increasing research use in schools will improve student outcomes, there has been a push for increased rigor in education in the United States for many years. Beginning with the No Child Left Behind Act of 2001 (NCLB) and now the Every Student Succeeds Act of 2015 (ESSA), federal policies put in place to hold schools accountable for performance have demanded an increased role for scientific research in improvement efforts (Farley-Ripple, 2012; Hood, 2003). Under these policies, schools and districts are expected to be able to identify problems and their underlying causes, seek out and interpret empirical evidence regarding solutions, and select practices and programs that have demonstrated effectiveness through rigorous scientific research. Despite this push and the policies that attempt to reinforce it, there is little evidence that research use is happening in the way envisioned by

policy. One explanation may be that this model of decision-making implied by policy makes several problematic assumptions: that the decision-making process is linear, that relevant research evidence is available and accessible, and that school-based practitioners have the capacity and bandwidth to engage in this often time-consuming process.

The assumption that decision-making processes are linear is problematic because it fails to account for the realities of school environments. The real world is messy. Rarely do human processes occur within rigid, linear sequences consistently over time and across space. Problem-solving and decision-making processes are no different, especially when occurring within contexts as complex as schools. Despite this, current models of educational decision-making, such as the policy-implicated model described above and staged process models like the six stage model proposed by Knott & Wildasky (1980) for example, assume a linear process in which “steps occur in a sequence, are equally important and cumulative, and require similar effort,” (Davies & Nutley, 2008, p. 15). But this is an oversimplification of a complicated, context-dependent process which overemphasizes instrumental uses of research while neglecting more conceptual uses (Davies & Nutley, 2008). Decision-making does not necessarily begin with problem identification and end with implementation, there are various points in time where decisions are made and opportunities for research use are present. While research on specifically *when* in the process decision-makers employ research evidence is limited, available literature suggests that different types of research may be preferred in different stages (Farley-Ripple, 2008) and that the use of evidence frequently occurs after a decision has been made (Pfeffer & Salancik, 1977, 1978; Staw, 1980). Imagine that a problem has already been identified, the underlying

reasons understood, and multiple potential strategies have been suggested, but the problem the school is facing is how to select the best one. Or perhaps, a strategy has been chosen for the school, mandated by the district or state, but the problem the school is facing is how to best implement it. For example, schools in the Hamilton School District faced the challenge of implementing a new strategic plan based on accountability ratings, something they had never done before (Farley-Ripple, 2012). Sometimes a new strategy/program is brought to a school, by a vendor or program developer for example, rather than the school engaging in a process of problem identification and search for solutions. Simply put, schools are complex environments and no two are the same, making it unrealistic to think that a linear, sequenced model of decision-making will occur in every decision in a school, much less across every school in the country.

A second problematic assumption underlying the current push for research use pertains to the availability of relevant research. Issues surrounding the relevance and accessibility of research have been documented in knowledge utilization literature (Broekkamp & van Hout-Walters, 2007; Hemsley-Brown & Sharp, 2003; Cooper, Levin, & Campbell, 2009; Levin & Qi, 2013; Sá, Li, & Faubert, 2010). If school-based practitioners are to use education research in their decision-making/problem-solving processes, it is imperative that the research produced be grounded in the problems that schools are actually facing. Considering the documentation of the weak ties that exists between the education research and practice communities (Backer, 1993; Broekkamp & van Hout-Walters, 2007; Davies & Nutley, 2008), and the absence of a mechanism through which practice can systematically inform research

(National Research Council, 2003; National Research Council, 2012; Snow, 2015), it is unclear if and how real problems of practice are informing research.

Earlier literature suggests that practitioners are likely to change their practices in light of research when two conditions are met: 1) there is a problem that requires a solution; 2) the research findings are relevant and applicable to their particular situation (Robinson, 1992). Practitioners' judgement of the relevance of research findings will "reflect [their] understanding of the problem, the solution, and their role in each," (Robinson, 1992, p. 4), so research that does not reflect those understandings is likely to be deemed irrelevant. These findings suggest a need for researchers to involve practitioners earlier and more often in research processes, including problem identification, so that findings can reflect those understandings. As Robinson (1992) argues, "if researchers and practitioners or policymakers hold different theories of the problem, then the theories of the latter are likely to be a major source of objection to the research" (p. 7). Rather than considering these objections as challenges to overcome in the dissemination process, Robinson suggests researchers employ a methodology which seeks out such objections and engages with practitioners in their resolution at the onset of the research process.

One possible explanation for this apparent lack of practitioner input is the tendency for the research-practice relationship to be examined unidirectionally, with the research community steering the relationship and the practice community taking up what is put out (Lavis, Robertson, Woodside, McLeod, & Abelson 2003). This is not to suggest that research is completely out of touch with the realities of the classroom. Certainly, there is some overlap between the problems being faced by schools and the problems that researchers choose to investigate, but relevance could

potentially be improved by incorporating practitioner perspectives more systematically and consistently.

Even when relevant research is produced, accessibility can be another barrier to its use by school-based education practitioners. For practitioners to use research evidence they must be able to find it and access it. The most common method of dissemination for most education research findings is peer-reviewed academic journals, which are not widely accessed by practitioners (Penuel, Farrell, Allen, Toyama, & Coburn, 2018). While most peer-reviewed materials are available online, they are typically are placed behind a paywall (Gershenson, Polikoff, & Wang, 2020). Individual teachers should not have to, and may not be willing/able to, pay a fee to access information that federal policies mandate they use. Similarly, financially stressed schools and districts may not be able to allocate funds to journal subscriptions or database access. And considering what they would get for their money, simply access to information which they then must sift through, evaluate, interpret, and apply, they may feel that their financial resources would be better used on a ready-made solution (e.g., pre-packaged curriculum, intervention, program) which may or may not have a solid research base.

On the other hand, for some issues there is an extensive amount of research available and accessible which may present its own set of challenges for practitioners. For each piece of research considered in a decision-making process, decision-makers must engage in the process of interpretation and sensemaking, including evaluating the quality of the study and the validity of the results, considering alignment with their particular school context, and determining feasibility of implementation based on available resources (Hemsley-Brown & Sharp, 2003; Supovitz & Klein, 2003). When



there are numerous pieces of research evidence available, not only do decision-makers need to engage in this process multiple times, but they also must reconcile any contradictions in the literature. In each empirical literature base, there can be a multitude of divergent findings and an apparent lack of consensus. Fields of study rarely achieve consensus on what is the “right” strategy, or what works in all contexts. In other words, the process of using research to make decisions is far from straightforward. If trained scientific researchers within a given field grapple with reconciling divergent findings and contradictory theories, how can practitioners without the same explicit training and expertise be expected to do the same?

This leads to the third problematic assumption of the policy-implicated model described above: that research use is as simple as adopting what the research says. In reality it is far less straightforward, especially when considering the lack of consensus within fields of study. School-based practitioners have very demanding jobs. They are constantly juggling multiple responsibilities and obligations to various stakeholders simultaneously. Schools and the practitioners that work in them have obligations to and face scrutiny from students, families, communities, districts, and state and federal government. Research is often less than straightforward, to locate and to use. Even for academics, who have received extensive training specifically related to the production and consumption of research, the process of searching, interpreting, and applying research findings can be difficult and time-consuming. Generally speaking, education practitioners do not typically receive extensive training on critical consumption of research, yet they are expected to engage in it each time they make a decision about improvement efforts.

Aside from issues of relevance, accessibility, and practitioner capacity for research use, current models of decision-making implied by policy also assume that the relationship between the problem at hand and research is obviously and unambiguously coupled. While it has not yet been empirically investigated, the relationship between the problem-type and external research use in decision-making may have implications for this expectation. There may be certain types of problems for which the use of external research is not necessary or efficient. Or maybe there are certain types of problems for which there is no external research available. It could also be possible that for certain problems there is “too much” external research available, and overwhelmed practitioners struggle to sift through it. It is logical that for certain types of problems the use of external research in the decision-making process may be particularly easy, and for others it may be particularly difficult. It is important to understand the potential relationship between the types of problems schools face, how those problems are understood by decision-makers, and the level of engagement with external research during the problem-solving process. Perhaps by gaining a better understanding of how problem-framing relates to external research use in education specifically, levers for increasing external research use in decision-making can be identified. In this paper I propose a study to explore this relationship.

### **1.1.2 Theory**

In developing a working theory of the potential relationship between the problems schools face and their use of research in the decision-making process, both the type of problem and the way that practitioners understand, or frame problems are important. While it is certainly possible to categorize “types of problems,” and that will be done in the proposed study, it is imperative to recognize that the “type” will be

contingent upon how individuals involved in the process understand and frame the problem. The way that people understand or frame a problem is dependent on their interpretations of information related to the problem (e.g., symptoms, causes, aggravating and mitigating factors). Interpretation, as organizational learning theory points out, is impacted by a variety of factors: individual factors such as foundational knowledge, previous experience, and personal biases (Levitt & March, 1988), as well as the factors related to the organizational context. Lessons learned through personal experience are valuable, but “are drawn primarily from a small number of observations in a complex, changing ecology of [the school/organization],” (Huber, 1991, p. 91). In the next chapter I review the available literature on problem-framing and the factors that may shape it. Additionally, I present a proposed framework for thinking about educational decision-making that considers the potential relationship between problem-framing and research use.

### **1.1.3 Proposed Research**

While over the years there have been numerous studies undertaken to try to understand the barriers to research use in schools, this dissertation proposes to focus specifically on the relationship between problem-framing and reported engagement with external research evidence in the decision-making process in order to identify potential levers for improvement. Using data from the field trial of the Survey of Evidence in Education for Schools (SEE-S), this study explores this relationship by developing a set of problem-frames and examining whether patterns exist relating to the reported use of external research in the decision-making process. The study is guided by the following research questions:

*RQ1: What are the problems schools addressed in recent decisions, as understood by individuals working within those schools?*

*RQ2: What is the relationship between individuals' problem-framing and the likelihood of the respondent indicating that external research was used in the decision-making process?*

## **1.2 Definitions of Key Terms and Concepts**

The following section will introduce and define key terms and concepts which will be appear throughout the remainder of this paper. This section aims to aid understanding and situate the current study within the existing empirical literature base.

### **1.2.1 Practitioner**

In general, the term practitioner refers to a person actively engaged in a profession, discipline, or art (Merriam Webster, n.d.). In the context of the current study the term practitioner refers to individuals actively employed in a P-12 education context, whose work involves the instruction and/or support of students. Practitioners in this study include classroom teachers, school administrators (e.g., principals, vice principals), instructional coaches, school-based interventionists, school librarians, arts or electives teachers (e.g., music, physical education), school technology/media specialists, school psychologists, school-based educational diagnosticians, guidance counselors, school-based health professional (e.g., school nurse), district administrators, and school-based physical, occupational, and speech therapists.

### **1.2.2 Organizational Decision**

For the context of the current study, organizational decisions are defined as decisions about policy and practice made at the school or district level that affect a significant number of teachers and/or students. For example, some organizational decisions a school or district might make include (a) adopting, implementing, or discontinuing a program or intervention, (b) making a structural change to the schedule or school day, or (c) providing specific professional development training to teachers (SEE-S, 2019).

### **1.2.3 External Research Evidence**

There is a substantial body of empirical literature with findings to suggest that education practitioners use a broad range of types of information as “evidence” to inform decision-making (Corcoran, McKay, & Riordan, 2003; Coburn & Talbert, 2006; Farley-Ripple, 2008; Finnegan, Daly, & Che, 2012; Kennedy, 1982; Ingram, Seashore Louis, & Schroeder, 2004; Supovitz & Klein, 2003). From local data to decision-makers own “working knowledge,” which includes an “array of beliefs, assumptions, interests, and experiences that influence the behavior of individuals at work,” (Kennedy, 1982, p. 1), there are a variety of sources of evidence which may influence any school-based organizational decision. Acknowledging this, it is important to define what constitutes *external research evidence* in the context of the current study. In this study, external research evidence refers to scientific findings, based on data external to the school or district, derived from “systematic data collection and analysis driven by research questions,” (SEE-S, 2019). Specifically, examples of evidence that would fit this definition include articles, books, or summaries based on external research or program evaluation.

The reason for this narrow focus on external research evidence is in response to the policy demands presented above. To be clear, this focus on external research does not suggest that it is the only valid or valuable form of evidence. By no means does the absence of reported external research use equate to poor decision-making. It is well documented that education practitioners rely on a wide range of types of evidence in decision-making processes, and, in fact, when external research is used it is most often used alongside local data (Coburn & Talbert, 2006; Farley-Ripple, 2008; May, et al., 2022). By focusing on external research evidence only, the current study provides a limited window into what is happening in school-based decision-making. Despite not producing a complete picture of the complicated nature of evidence use in schools, by adopting this focus the study serves as a first step at examining this particular relationship in response to policies calling for increased external research use. Recommendations for future research that is more inclusive of multiple forms of evidence will be discussed in Chapter 5.

#### **1.2.4 Problem**

Problems can be understood as “one or more facts that show a discrepancy between what is and what ought to be,” (Cuban, 1990, p. 2). This definition implies that “what ought to be” is defined and understood, and that a problem occurs when evidence that that expectation is not being met is recognized. For the context of the current study, *problem* refers to a specific challenge that a school is facing, a discrepancy between what should occur and what is actually occurring within the school. For example, a school’s standardized test scores in math falling below what is expected may be evidence that there is a problem impacting students’ mathematical learning.

### **1.2.5 Problem-framing**

Problem-framing refers to how a problem is understood by decision-makers, what they see as the causes and possible solutions (Weiss, 1989). This subjective process depends upon “one or more facts that show a discrepancy between what is and what ought to be,” (Cuban, 1990, p. 2) and the perceptions of the individual or individuals tasked with interpreting those facts and identifying and defining the problem (Cuban, 1990). The resulting problem-frame, or as Weiss (1989) refers to it, “package of ideas” (p. 1), includes an explanation of the underlying cause(s) of the discrepancy as well as a proposed theory of how to address them, all shaped by the perceptions of the decision-maker. What decision-makers view as the cause of the problem will lead them to solutions that address that cause; and will lead their search for evidence to similarly be tied to the cause, while unrelated solutions may be dismissed (Benford & Snow, 2000; Weiss, 1989).

### **1.3 Summary**

In summary, the proposed research introduced here seeks to explore and describe the potential relationship between school-based practitioners’ problem-framing and reported engagement with external research evidence in school-based organizational decisions. Considering current educational policy context of the United States, and the gap in the literature in this particular area, this study is poised to make a significant contribution to the knowledge utilization literature base. The study hopes to uncover new knowledge about this relationship that will ultimately lead to the identification of levers for improving school-based decision-making and student outcomes.

In the following chapters I will first present a review of the literature. Specifically, I will present a brief summary of the existing empirical work on research use and decision-making in schools and present a guiding theory for thinking about decision-making which highlights the role of varied practitioner understandings. In the third chapter, I will present the methodology employed in the study, which uses a combination of qualitative and quantitative data from the Survey of Evidence in Education (SEE-S). Chapter four presents the results of the analyses, followed by a chapter focused on a discussion of the implications of the results and limitations of this study.



## **Chapter 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction & Policy Context**

As discussed in the previous chapter, there is a clear and growing expectation that educators use scientific research evidence in their practice. Specifically, policy demands that research be used instrumentally to inform decisions about teaching and learning. However, it has become clear that research use is not as simple as dissemination and uptake.

There are numerous other factors that may impact research use in schools. Some of these factors fit a linear model of research use, and if addressed, could increase research use. Factors such as access and relevance, for example, are seemingly fairly straightforward to address: produce research that addresses the problems practitioners face and make that research easily accessible. In fact, investments have been made at the federal level through initiatives such as the What Works Clearinghouse and Regional Education Laboratories, to address the factor of accessibility. So why is it that there is still a lack of instrumental research use in schools?

One reason may be that the role of evidence in decision-making often does not fit a linear model. While instrumental use is thought to involve a direct translation from research to practice, research suggests that problem-solving is often much more adaptive, requiring experimentation and improvisation rather than a prescriptive solution (Heifetz & Linsky, 2002). Furthermore, research is often used conceptually as

evidence is incorporated into educators' mental schemas, changing the way that they understand and conduct their practice (Penuel, Davidson, Herlihy, Sherer, Hill, & Farrell, 2017). The technical rational model of decision-making implied by policies surrounding research use in education emphasize, almost exclusively, instrumental uses of research, ignoring valuable conceptual use.

Relatedly, the current model fails to take into account the fact that research is often considered alongside other evidence. There is a substantial body of research which suggests that decision-makers draw on a range of evidence sources in problem-solving processes (Corcoran, McVay, & Riordan, 2003; Farley-Ripple, 2008; Kennedy, 1982; Ingram, Seashore Louis, & Schroeder, 2004; Supovitz & Klein, 2003; Honig & Venekatswaran, 2012; Asen, Gurke, Connors, Solomon, & Gumm, 2013). One study, for example, found substantially less use of research in schools relative to use of data (Finnegan, Daly, & Che, 2012). In addition to other types of evidence, decision-makers "working knowledge," defined as "the organized body of knowledge that administrators and policymakers use spontaneously and routinely in the context of their work" (Kennedy, 1982, p. 1-2), is also considered. According to this definition, a decision-makers "working knowledge" would be impacted by previous training and experiences, including any previous conceptual uses of research.

Even in situations where research evidence is used instrumentally, there are still components of individual and collective sensemaking that will impact that use. There is evidence that teachers often "interpret, adapt, and even transform reforms as they put them into place," (Coburn, 2001, p. 145; Jennings & Spillane, 1997). In undertaking reform efforts, teachers are often left to make sense of policy messages in order to implement them in their classrooms. As Coburn (2001) explains, "Action is

based on how people notice or select information from the environment, make meaning of that information, and then act on those interpretations,” (p. 147). Jennings & Spillane (1997) found that when policy texts surrounding a reform initiative were elaborate and specific, there was more uniformity in classroom implementation, suggesting more uniformity in educators sensemaking. On the other hand, when policy texts were less elaborate there was “considerable variability among classrooms in what teachers made out of these goals,” (Jennings & Spillane, 1997, p. 476). The researchers posit that this occurs due to teachers constructing different understandings of reform messages based on their own background knowledge, experiences, and dispositions (Jennings & Spillane, 1997). In addition to individual sensemaking processes, educators may engage in collective sensemaking activities through grade-level or content-area meetings, professional learning communities, staff meetings, and informal conversations (Coburn, 2001; Coburn, 2005; Spillane, Shirrell, & Sweet, 2017). In a case study of the implementation of a new reading initiative in one school, researchers found that teachers brought their preexisting beliefs, practices, and worldviews into their interactions with colleagues but “as teachers worked together over time, they developed shared understandings,” (Coburn, 2001, p. 152). Another study, concerned specifically with the role of school leaders in shaping sensemaking, found that principals influence teachers’ understanding and action by “shaping access to policy ideas, participating in the social process of interpretation and adaptation, and creating substantially different conditions for teacher learning in schools,” (Coburn, 2005, p. 476).

Considering this literature, it is clear that research use is more complex than implied by current policy. Most of the literature seems to focus on the complex, social,

cognitive nature of engagement with research as part of decision-making and policy implementation. But what about *before* educators engage with evidence? What factors shape whether research is even considered?

Specifically, how do the problems at hand, and how they are understood by decision-makers, shape evidence use? In this chapter I present a proposed conceptual framework of school-based decision-making, which highlights problem-framing as a key part of the process. The framework and supporting literature reviewed in this chapter suggest that the types of problems educators face, and how educators understand those problems, will shape the choices they make to solve them, including the kinds of information that are relevant to influence decision-making.

## **2.2 Guiding Framework**

The current work is motivated by a larger conceptual framework informed by the literature on educational decision-making, organizational learning, and research use. In reviewing this literature, I began to conceptualize a framework for thinking about evidence use in practice, and specifically organizational decisions made in school settings. Based on the existing work in the field it was clear that the elements of search, interpretation, and implementation are significant in these decision-making processes, but there are also factors that play a role prior to the search for evidence. Research in organizational learning theory suggests that the background experiences, knowledge, and biases of individuals within organizations lead to varied understandings of information related to problems, decisions, new initiatives, etc. (Huber, 1991). Following this line of thought, focusing on its relation to problem-solving and decision-making specifically, it is evident that varied practitioner understandings impact how problems are identified and defined. Existing literature on

problem-framing emphasizes that how a problem is defined will inevitably impact the rest of the decision-making process, including what information is used to inform the decision (Benford & Snow, 2000; Weiss, 1989). Despite the consequentiality of problem-framing, and its susceptibility to varied practitioner understandings, there is a lack of existing literature on this aspect of the process, especially in schools specifically. Discovering this understudied area motivated the current study, which is focused on how problem-framing may impact research use in school-based decision-making.

The figure below provides a visualization of my proposed framework for thinking about organizational decision-making. Since the current study is concerned with the relationship between problem-frame and reported engagement with external research evidence in the decision-making process, only literature related to components of the framework through “Search for evidence” have been included in this review. The study seeks to answer the question: are decision-makers more likely to use external research evidence when framing problems in certain ways? “Interpretation of collected evidence,” “adaptation,” and “implementation” are beyond the scope of the current work and therefore will not be reviewed in this paper. It is also important to note that, although the framework suggests that problem-framing impacts the “search for evidence,” the current study is not interested in assessing practitioners search activities. Rather, this study is concerned with the end result of search, specifically which types of evidence ultimately influenced the decision. While the literature on search will be reviewed, and it is hypothesized that search activities may be impacted by problem-framing leading to varied levels of engagement with research, this study attempts to first establish the relationship between the problem-framing and

reported evidence use. If a relationship is detected, future research could investigate more specifically how search activities are impacted by how the problem is framed. In order to answer the question at hand it is not necessary to evaluate the search process itself (e.g., *how* practitioners access, collect, organize, and filter information), but rather the types of information that ultimately influence the decision as a result of the process.

The conceptual framework below attempts to visualize a very complex, multi-phase, context-dependent process. While the visual appears rather linear, this is for the sake of comprehension and is not meant to suggest that the process itself is or should occur in a sequential, linear manner. Rather, the various arrows in the figure represent the numerous potential relationships between the different elements and different phases of the decision-making process. The arrows also reflect the possible bidirectional relationship between elements, such as “varied practitioner understandings” and “interpretation of collected evidence,” for example. Varied practitioner understandings will undoubtedly impact the interpretation of information, but interpretation also has the capacity to shape practitioner understandings. For the purpose of this study, I focus on the proposed relationships represented by the solid, black arrows in the framework. Specifically, the influence of “varied practitioner understandings” on “problem-framing” which then shapes the “search for evidence.”

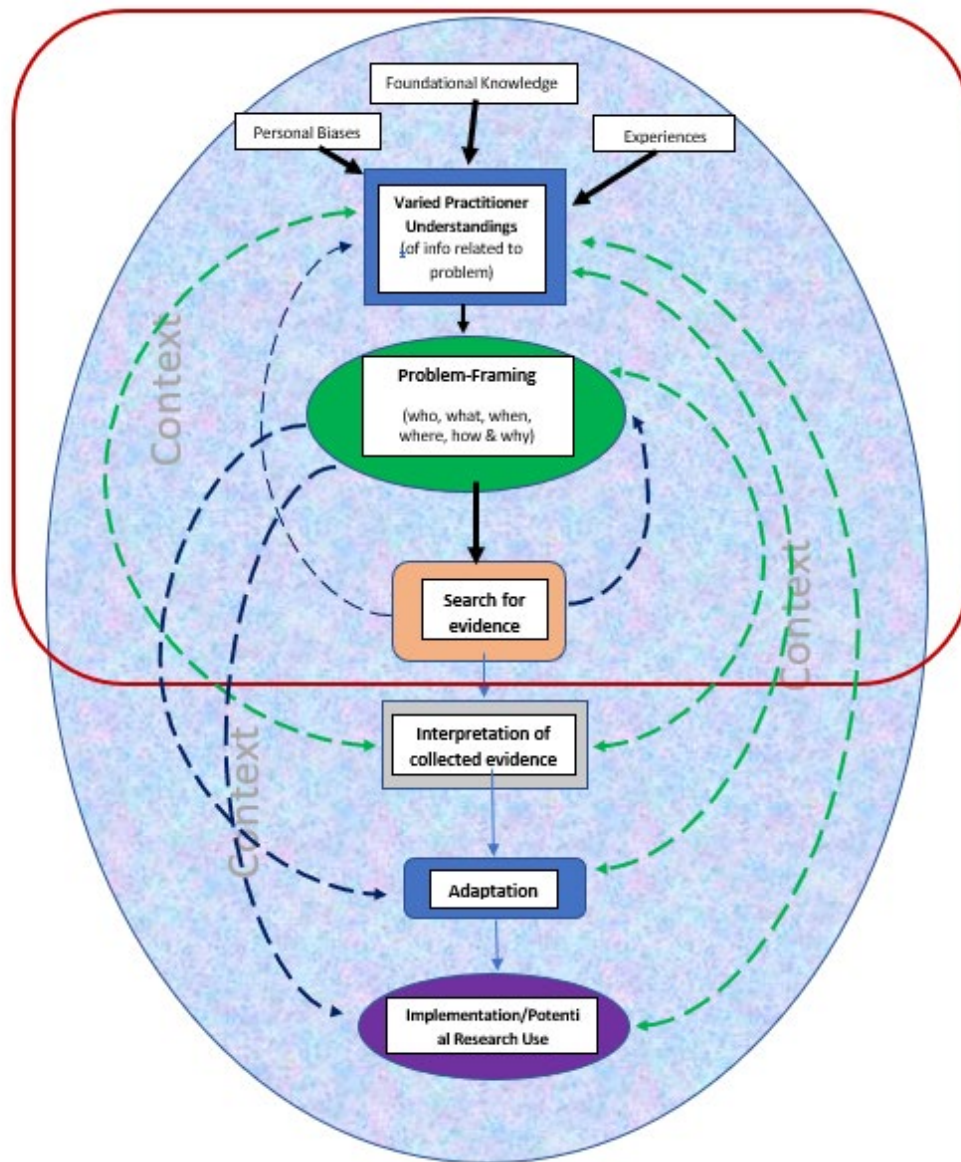


Figure 1. Conceptual Framework of School-Based Decision-Making

Practitioners’ “varied understandings” of information (influenced by their personal biases, foundational knowledge, and experiences) will influence their problem-framing (their understanding of how people, places, things, times relate to the

problem; grain size of the problem). This framing of the problem in turn affects the search for solutions (what types of information are sought and where searches are conducted); and ultimately what information gets used in decision-making (research use or not).

### **2.3 Problems and Problem Framing in Schools**

Despite the investments in knowledge utilization research and the large body of empirical work that exists, there are topics within the field which remain understudied. Research on the types of problems that schools face is one of those areas. While studies investigating decision-making processes in schools and districts (Coburn, Toure, & Yamashita, 2009; Farley-Ripple, 2012), or the resources practitioners find useful for informing practice (Penuel, Farrell, Allen, Toyama, & Coburn, 2018) can provide some insight into the kinds of issues schools are working to solve, they do not investigate this question directly.

Researchers at the National Center for Research in Policy and Practice (NCRPP), one of two knowledge utilization centers funded by the Institute of Education Sciences (IES), have published several studies which provide evidence regarding the types of problems schools and districts face. In a study of research use among school and district leaders, researchers collected survey data from more than 700 school principals and district leaders to investigate their attitudes toward research, efforts to acquire it, and the culture of research use in their organizations (Penuel, et al., 2016). While the study did not directly inquire about the types of problems these respondents were facing in their schools, findings related to the resources practitioners find most useful, with inference, can provide some indication. Specifically, school leaders cited research focused on “instructional practices and learning in the



classroom” and “learning in specific subject matter content areas” as the most useful. While vague, these findings may suggest that the most prevalent problems these schools are facing relate to effective instruction and student achievement in certain content areas. Penuel et al. (2016) also report that leaders’ “professed use of research to select curriculum materials and other programs” throughout the survey (p. 2). This finding may further support the inference that student achievement in certain content areas may be a common problem because it highlights school leaders’ efforts to find more effective materials in order to improve student learning in subjects. Finally, data from another item in the survey reveal that the most commonly reported use of research was “designing professional development for teachers and administrators,” (Penuel et al., 2016, p. 2), further supporting the inference that the school may be dealing with problems related to effective instructional practices.

Coburn, Touré, and Yamashita (2009), conducted a longitudinal case study of one urban school district which also provides indirect insight into the types of problems the district faced. The study, which investigated instructional decision making at the district level through observation, document analysis, and in-depth interviewing, identified 23 decisions related to instruction that occurred over a three-year period, and for which the researchers had at least three independent sources of information. As with the Penuel et al. (2016) study, the types of problems schools face were not directly explored by the researchers, but by examining the decisions that occurred in the district some inferences can be made. As the study was concerned with the decision-making processes generally and not in relation to specific types of decisions, limited information was provided regarding the content of the decisions. However, the report does specify that the identified decisions included those about

“curriculum adoptions, the design of coaching, the focus of professional development, the structure of compensation for professional development, homework policy, and the development of curriculum frameworks in math and literacy,” (Coburn, Touré, & Yamashita, 2009, p. 1122). Once again, one must rely on inference in order to draw any conclusions related to problem types from this information but considering that most decisions are made in response to a challenge or need the two are related.

Consistent with the inferences made from the Penuel et al. (2016) study, the decisions discovered in this study may suggest the district is facing problems surrounding instructional practices and student achievement in specific content areas. The focus of these decisions is primarily related either to professional development of teaching staff (e.g., “design of coaching”, “focus of professional development”), which we can deduce is intended to improve instructional practices, or selection of curricular materials that will improve student achievement in certain subjects (e.g., “curriculum adoptions”, “development of curriculum frameworks in math and literacy”). It is important to note that this study limited decisions to those about instruction, other types of decisions, such as those regarding human resources or financial matters for example, are not reflected here and so problems in these areas that may exist are also not reflected.

Considering the nature and purpose of schools, it is logical that many of the problems and challenges they face are directly related to instruction and student learning; but schools are also organizations operating within complex social and political contexts and so other types of problems inevitably occur as well. While research available on the types of instructional problems schools face is limited and indirect, evidence regarding organizational problems in schools is even more scarce.

In his work on developing the problem-framing skills of prospective principals, Copland (2000) recognizes the “complexity of dilemmas encountered... and the vast array of snarls that are present in leading a school,” (p. 5), but does not investigate or discuss them in detail. Rather, the study emphasizes the importance of developing principals’ ability to identify and define problems. Another study provides a, perhaps oversimplified, way of distinguishing types of problems: academic problems and practical problems (Wagner, 1993). This distinction may be a useful first step in differentiating between problems related to instruction and student learning and problems related to the school as an organization, but on its own does not provide much insight into the specific issues schools face. One study from the Netherlands, which employed an explorative case study design, focused on the problem-framing of two early-career school leaders (Sleegers, Wassink, van Veen, & Imants, 2009). While this study focused on the framing of the problem (which will be discussed in greater detail in a later section of this paper) and not problem types, it does provide concrete examples of two organizational problems faced by schools: drastic decrease in student enrollment and the consequences of a recently finished merger process.

Only two studies directly investigate and provide a classification of the types of problems faced by schools and districts. Leithwood and Steinbach (1995), in their book on thinking and problem-solving processes of expert education leaders, present the findings from a qualitative study of 52 elementary and secondary school principals and vice principals in Canada. The study involved developing and refining a classification of principals’ problems, then conducting content analysis of all interview data using the developed system. Initially problems were classified as routine or non-routine. Routine problems were those that were “structured” while non-routine

problems were those that were “ill-structured”, with these terms indicating the “amount of relevant knowledge and skill principals possess when encountering a problem and, as a consequence, the degree of certainty they have concerning a successful solution,” (Leithwood & Steinbach, 1995, p. 22). When facing routine problems, there is little cognitive demand placed on the principal as solutions are well-developed and responses seem automatic. Non-routine problems on the other hand, demand “conscious attention and reflection, often bring fundamental values into play, and create a significant role for information collection skills,” (Leithwood & Steinbach, 1995, p. 23). Classification was then further refined, and an analysis of all problems encountered over the course of the study resulted in the identification of 16 problem types: community at large, ministry of education, nonteaching staff, other principals, outside agencies, parents, plant, principal, school routines, senior administration, special events, students, system partners, teachers, trustees, and vice principals/department heads (Leithwood & Steinbach, 1995, p. 29).

The other study that directly investigates and defines the types of problems schools and districts face comes from research on school autonomy conducted in the Netherlands (Neeleman, 2019). This mixed methods study presents an empirically based classification of problems in schools based on the responses of 196 school leaders to a set of open-ended questions administered via digital questionnaire. Responses to the open-ended questionnaire were grouped together based on themes to form domains and subdomains, which were given labels and definitions. This preliminary classification system was then validated and further refined through a series of semi-structured interviews with four school leaders at different stages of the drafting process. Ultimately this method resulted in a classification system that

includes three domains (education, organization, and staff) and sixteen subdomains. The “education” domain includes four subdomains: pedagogical approaches, educational programs, systemic pathways, and learning environments and methods for teaching, learning, and assessment. The “organization” domain includes eight subdomains: school culture, organizational structures, organization of education, quality assurance, student care and support, stakeholder relationships, financial resources, facilities and accommodation. The “staff” domain includes four subdomains: professional autonomy and culture, teaching- and school- related assignments, staffing policy assessment and payment, and recruitment and employment (Neeleman, 2019).

Despite the dearth of empirical inquiry into the topic, it would seem logical that understanding the problems that schools are facing is an important aspect of improving educational practices and outcomes. However, in exploring the available literature related to problems, and research use more generally, it becomes evident that what may be more consequential than the *type* of problem a school is facing is how that problem is understood by decisionmakers.

### **2.3.1 Problem-framing**

Problem-framing refers to how a problem is understood by decision-makers, what they see as the causes and possible solutions (Weiss, 1989). A subjective process, problem-framing depends upon “one or more facts that show a discrepancy between what is and what ought to be,” (Cuban, 1990, p. 2) and the perceptions of the individual or individuals tasked with interpreting those facts and identifying and defining the problem (Cuban, 1990). As briefly mentioned earlier, individuals’ perceptions are shaped by numerous factors including foundational knowledge,

personal biases, previous experiences, the organization within which the individual works, and their position in that organization (Coburn, 2005; Cuban, 1990; Slegers, Wassink, van Veen, & Imants, 2009; Spillane, 1999). The resulting definition, or as Weiss (1989) refers to it, “package of ideas” (p. 1), includes an explanation of the underlying cause(s) of the discrepancy as well as a proposed theory of how to address them, all shaped by the perceptions of the decision-maker. What decision-makers view as the cause of the problem will lead them to solutions that address that cause; and will lead their search for evidence to similarly be tied to the cause, while unrelated solutions may be dismissed (Benford & Snow, 2000; Weiss, 1989). For example, imagine a school is attempting to solve the problem of low student achievement in math and decision-makers understand the problem as being curricular in nature. Their search for solutions and evidence to inform the decision will be focused on curriculum, while other solutions are dismissed.

### **2.3.2 Problem-frame Types**

Empirical literature on problem frames in education are sparse, much of the literature on this topic comes from research in the field of organizational leadership. The landmark work of Heifetz (Heifetz & Heifetz, 1994; Heifetz & Laurie, 1997; Heifetz & Laurie, 2001), whose influence can still be seen in current literature, proposed a model that distinguishes problems as adaptive challenges or technical problems. Technical problems are those that call for appropriate procedures and expertise, they are solved with knowledge already in hand (Heifetz & Heifetz, 1994; Parks, 2005). In organizations, technical problems can be solved by leadership as they simply “prescribe” a solution and their authoritative expertise is accepted. Adaptive challenges, on the other hand, involve situations where there is no clear answer and

experimentation and improvisation are often required (Wasserman, Gallegos, & Ferdman, 2008). These types of problems often challenge individuals' deeply held beliefs and so "are not amenable to authoritative fiat or standard operating procedures, but rather require exploration, new discoveries, and adjustments," (Uhl-Bien, Marion, & McKelvey, 2007, p. 3). Unlike technical problems, these challenges cannot be solved by leadership alone, but require an investment in change from everyone involved. Heifetz and Linsky (2002) offer an analogy rooted in medicine to demonstrate the distinction:

*When you give someone penicillin for an infection, she is cured. She doesn't have to change how she lives. But when you unclog the plumbing in someone's heart, that plumbing will stay open only if he changes his life – changes how he eats; stops smoking; gets more exercise; learns to manage stress. (p. 1)*

In the same article, the authors also point out that most problems organizations face are a combination of technical and adaptive challenges and, since adaptive challenges are seen as more difficult to solve, "the easiest way to avoid the adaptive challenges is to simply focus on the technical ones," (Heifetz & Linsky, 2002, p. 28). This suggests that decision-makers may be more likely to adopt technical problem-frames. Earlier work of Getzels (Getzels & Csikszentmihalyi, 1976; Getzels, 1979) differentiated problems in a similar way, although labeled differently, "presented problems, those with a known formulation, and discovered or created problems, those that must be formulated or invented by the problem-solver," (Copland, 2000, p. 6).

Empirical research on types of problem frames is very limited. The work discussed above ultimately offers only two problem-frame types and recognizes that most problems are a combination of both types. Additionally, the literature cited above comes from the field of organizational leadership so the frame types suggested may not fully represent the potential problem-frame types present in the education context.

With the lack of relevant literature in education research, this current study will develop problem-frame types based on analysis of qualitative data (to be discussed in chapter 3) rather than attempting to apply the technical/adaptive problem-frame types offered by the work of Heifetz & Linsky (2002).

### **2.3.3 Factors Shaping Problem-framing**

Problem-framing is largely shaped by individual sensemaking processes and the organizational context within which they unfold. In other words, these processes are shaped by preexisting working knowledge (individual factors) and practices that guide how people come to understand the nature of problems and possible avenues for solutions (organizational factors) (Coburn, Toure, Yamashita, 2009). The following sections will describe the empirical literature supporting these ideas and provide examples from research demonstrating these relationships.

#### **2.3.3.1 Varied Practitioner Understanding**

Sensemaking, or how individuals construct meaning out of information, is an important part of the problem-framing process. In everyday life individuals must continually use their “prior knowledge and experience to notice, make sense of, interpret, and react to incoming stimuli – all while actively constructing meaning from their interactions with the environment,” (Spillane, Reiser, & Reimer, 2002, p. 394). This truth remains when individuals are faced with organizational problems and decisions. As described earlier, the act of problem-framing relies upon observation of a discrepancy between what is and what should be (Cuban, 1990), and subsequent interpretation of the information surrounding that discrepancy (e.g., symptoms, underlying causes, aggravating and mitigating factors). Sensemaking is not as simple



as identifying that a problem exists; rather, it is an active process of comprehension and interpretation that draws an individual's knowledge base of understandings, beliefs, and attitudes (Spillane, Reiser, & Reimer, 2002). For example, in a 2009 study of instructional decision-making in a school district, researchers found that "low math scores in the middle school served as a signal that something was amiss," (Coburn, Toure, & Yamashita, 2009, p. 1126) but deciding *what* was amiss was mediated by individual interpretation and negotiation processes. Individuals interpreted the information (low test scores) in different ways, leading to different framings of the problem. While some understood the low test scores to be the result of an inadequate middle school math curriculum, others saw it as evidence of ineffective instructional practices, and still others interpreted them as an indication of the lack of basic skills in the elementary curriculum. Each unique problem frame, influenced by individuals' foundational knowledge and experiences, would lead to a different approach to solving the problem.

#### **2.3.3.2 Organizational Context**

While practitioners' understandings will inevitably be varied as they are influenced by personal knowledge and beliefs, individuals do not make sense of their worlds in a vacuum. Rather, "sensemaking is situated in particular 'thought communities', including, but not limited to, nations, political parties, religions, and organizations," (Spillane, Reiser, & Reimer, 2002, p. 393). School-based practitioners are embedded in complex organizational contexts that will certainly impact their perspectives and sensemaking processes. Numerous organizational factors have the potential to impact problem-framing and subsequent decision-making processes, especially in organizations as multifaceted and localized as schools. Schools vary

considerably in organizational culture, structure, resources, access, internal communications, and procedures, among other dimensions, resulting in each having its own organizational learning style (Cousins & Leithwood, 1993, p. 329). There is evidence that problem-framing, and therefore decision-making, is shaped by the organizational context within which it unfolds. Research has found that the structure of an organization can shape the working knowledge of individuals within the organization, as well as shared understandings by influencing patterns of social interaction (Coburn & Talbert, 2006). In a study of decision-making at the school district level, Penuel and colleagues (2016) found “highly complex and departmentalized organizational structures” which stretched decision-making across multiple units and levels of the system (p. 8). They found significant variance in opportunities to engage with and attitudes about research based on the division level which they attributed to the different units having individuals with “different disciplinary backgrounds and connections to external sources of research,” (Penuel et al., 2016, p. 8).

In addition to the organizational structure itself, patterns of interaction both within- and across-levels can impact the problem-framing process. How many, who, and to what extent individuals are involved in decision-making varies from school to school and can have significant implications (Spillane, 2005; Harris & Spillane, 2008). In some organizations decision-making processes may welcome participation from any interested member, while others may leave decision-making in the hands of one individual (Spillane, 2005; Harris & Spillane, 2008). An organization may have designated individuals who are involved in all decisions, while in another the individuals involved may change from decision to decision (Heller & Firestone, 1995).

Who participates in the problem-framing and decision-making processes is important because, as detailed above, each individual inevitably brings their own set of knowledge and beliefs to the process. In a longitudinal case study of one mid-sized urban district, for example, researchers described a decision-making process in which one individual was responsible for defining the problem (Coburn, Toure, & Yamashita, 2009). When faced with the problem of unsatisfactory math scores on a state test, the district held a series of meetings in which district leaders with varied understandings of the underlying cause of the problem (e.g., ineffective curriculum, limited professional development) made arguments for their particular problem-frame. Ultimately though, it was the superintendent who defined the problem. “This definition of the problem subsequently guided future decision making. Talk about issues related to middle school curriculum or instruction were off the table. Instead, discussion turned to the adoption of supplementary curriculum at the elementary level,” (Coburn, Toure, & Yamashita, 2009, p. 1126).

Coburn (2005) provides an example of a model of decision-making involving multiple practitioners. In this example the principal of an elementary school struggling with reading achievement attended a four-day professional development workshop with four of her teaching staff. After attending the workshop, the team had to decide which aspects of the professional development to bring back to the faculty. Even though the most prominent material covered in the workshop was related to decoding instruction, the team chose to emphasize content on reading comprehension strategies with the faculty. This decision was directly shaped by the team members perspectives and understandings surrounding reading instruction. In this way the principal and her team acted as gatekeepers of information by providing “access to those policy

messages about reading that were congruent with her vision of high-quality instruction,” and not providing access to others (Coburn, 2005, p. 490).

These examples highlight another important consideration related to organizational context, the role of power dynamics and authority relations. While there has been some research on the role of social interaction in sensemaking and problem-framing (Coburn, 2001; Hill, 2001; Spillane, 1999), there has been little direct investigation into what happens when differences in understanding emerge among individuals with different positions of authority. An ethnographic study of one school’s response to the California Reading Initiative offers some of the first insights into the role of authority relations in problem-framing (Coburn, 2006). Findings suggest that, although in this school the problem-framing process involved multiple actors with various roles, interactions were shaped by relations of authority. Specifically, “school leaders with greater authority and greater access to resources have more influence in efforts to define problems in a particular manner. These problem frames, in turn, create powerful frameworks within which teachers and others make sense of new policy initiatives and practices,” (Coburn, 2006, p. 373).

Unfortunately, current models of decision-making and research use often fail to take into account the complexity of this framing process. Weiss describes the image of instrumental use, which is embedded in recent legislation such as the Every Student Succeeds Act (ESSA), in the following way: “A problem exists; information or understanding is lacking either to generate a solution to the problem or to select among alternative solutions; research [or other forms of evidence] provides the missing knowledge; a solution is reached,” (Weiss, 1989, p.11). This model ignores problem-framing all together, assuming that there is a common understanding or

definition of the problem and its underlying causes, moving right to the search for evidence.

## **2.4 Search for Evidence**

Empirical literature on problem-framing suggests it has an impact on the evidence that practitioners use in decision-making. In order to use research evidence in decision-making, practitioners must first search for and obtain relevant research sources, a task that can be far less straightforward than it may sound. Empirical literature on the nature and extent of search, drawn primarily from organizational research, finds that the search for a solution is frequently compromised by several factors. In a study of school district uses of evaluation and test data which collected interview and observation data from practitioners in 16 school districts, Kennedy (1982) found that participants search efforts could be characterized as “active, continual, and unsystematic,” (p. 19). While practitioners in the study did actively seek information, and incorporated new evidence that continually became available, they also “tended to look indiscriminately at everything that came their way, and in that they could not describe exactly what it was they were looking for,” (Kennedy, 1982, p. 19). This sort of haphazard examination results in a compromised search. Several studies have revealed a preference for internal sources evidence (Fillos & Bailey, 1978; Finnigan, Daly, & Che, 2012; Kean, 1980; Massell, Goertz, & Barnes, 2012; Williams & Cole, 2007), seriously limiting the potential use of empirical research. In their study of patent citation patterns in the semiconductor industry, Rosenkopf & Almeida (2003) discuss geographical and technological localization of knowledge, but also suggest that there is often a desire to leave the work of the organization intact. Even in situations where new information with the potential to

improve operations is found, if that information suggests a drastic change to the work of the organization it will likely be dismissed. Other research highlights the impact of cognitive dissonance, suggesting that decision-makers will select evidence that fits what they already believe or know (Birkeland, Murphy-Graham, & Weiss, 2005; Corcoran, Fuhrman, & Belcher, 2001; David, 1981).

In addition to the factors that frequently compromise the search for solutions, there may also be barriers related to the production and dissemination of research that can affect practitioners' search. Considering the lack of research on the types of problems schools face discussed earlier in this section, it may not be surprising that the relevance of research can be an issue impacting search. Without an established mechanism for practice to inform research, how can researchers ensure that they are studying real problems of practice that educators are trying to solve? Even if such a mechanism did exist, relevant problems evolve over time, are both complex and context-dependent, and require an accumulation of evidence before any solution can be posed (Maynard, 2006). Relatedly, the timeliness of research can present a challenge which results in relevant research on a topic simply not being available. When researchers do investigate problems that practitioners are dealing with, the turnaround time from study design to dissemination of findings is often too long. The research and practice communities operate on very different timelines, where the pace of research is often incredibly slow compared to the fast-paced nature of working in schools. Practitioners often need solutions now, and the stakes are too high to wait for relevant research to become available. In one survey, district and school leaders reported having limited access to research findings that address their immediate needs, indicating that, although they believe research can be relevant to practice, "the time

lag between conducting research and publication of research can decrease its usefulness to them,” (Penuel, et al., 2016, p. 3). Additionally, due to the fact that the primary dissemination outlet for most research findings is peer-reviewed academic journals, access to evidence can be a barrier in the search process (Corcoran, McVay, & Riordan, 2003; Gross, Kirst, Holland, & Luschei, 2005; Honig, 2003; West & Rhoton, 1994). Most peer-reviewed publications require a paid subscription or, when accessed online, are placed behind a pay wall (Gershenson, Polikoff, & Wang, 2020). Preliminary interview and survey data from a multi-year study of research use identify cost of accessing peer-reviewed materials as a significant obstacle (Tilley, Wang, & Blackman, 2019).

Finally, the very nature of empirical research can be a barrier to its effective use by practitioners. Empirical research can be contentious as it may rely on controversial theories, employ multiple, sometimes disputed, methodologies, and often leads to “contestable and ambiguous findings,” (Davies & Nutley, 2008, p. 7). Multiple studies are necessary to build an evidence base, but studies often have findings that compete or diverge rather than offering clear answers to questions (Davies & Nutley, 2008; March, 1994). “When those of us who produce much of the evidence intended to guide education policy cannot agree on the answers, is it any wonder that decision makers do not routinely turn to us as the source of truly reliable information?” (Maynard, 2006, p. 251).

#### **2.4.1 Problem-framing Impacts Search**

There is significant evidence that the way a problem is framed or defined will have implications for the rest of the decision-making process, including the search for evidence to inform the decision. As discussed earlier, problem-framing refers to the

way decision-makers understand a problem, what they see as the cause(s) and potential solution(s). Any representation of the cause will consequently lead some aspects of the situation to be highlighted while others are deemphasized (Weiss, 1989). By focusing attention to certain aspects of the problem, problem-framing inevitably leads to certain avenues for solutions to be cut off (Benford & Snow, 2000; Stone, 1988; Weiss, 1989). Recall the example discussed earlier in which a superintendent was charged with framing the problem of low middle school math achievement in his district. Once the problem was defined as being an ineffective elementary math curriculum, “talk about issues related to middle school curriculum or instruction were off the table. Instead, discussion turned to the adoption of supplementary curriculum at the elementary level,” (Coburn, Toure, & Yamashita, 2009, p. 1126). The study from which this example is taken, a longitudinal case study of a school district in which 23 different decisions were identified, found problem-framing to be inextricably tied to search because it “created parameters within which information was sought and solutions were deliberated,” (Coburn, Toure, & Yamashita, 2009, p. 1124).

## **2.5 Problem Framing and Research Use: An Open Question**

If problem-framing can influence how and what information is sought in response to a challenge or need, then a natural extension is that problem framing relates to evidence ultimately used to inform decision-making. While there are no studies of this direct relationship to date – a gap addressed by this dissertation – prior literature suggests that problem-framing may impact practitioners’ research use (Coburn, 2006; Coburn & Talbert, 2006). In their 2009 study of instructional decision making in a midsize urban school district, Coburn, Touré, and Yamashita found that



individuals framed problems in strategic ways in order to shape others' interpretations and mobilize them to take action. Overall, the study concluded that "how the problem was framed was crucial for how the decision process unfolded. It pointed toward and legitimized some responses and not others, thus shaping the direction of future action," (Coburn, Toure, & Yamashita, 2009, p. 1129). This finding is consistent with other work related to problem-framing. For instance, a study of one school's response to a statewide reading initiative found that the response was dependent upon the staff's constructions of their understanding of the problem to be solved (Coburn, 2006). A similar study which investigated the implementation of standards-based mathematics reforms in four school districts found that, even after several years of the standards being in place, educators' understandings of the reform varied greatly, "ranging from interpreting the state reform as a curricular checklist to understanding it as involving fundamental change in classroom practice," (Spillane, Reiser, & Reimer, 2002, p. 397). More importantly, these different framings were predictive of implementation levels in these districts. From these findings it is clear that problem-framing has far-reaching implications, for the decision-making process and beyond.

## **2.6 Purpose and Research Questions**

Considering the identified gaps in the literature base regarding the types of problems schools face and how problem-framing may impact evidence use in decision-making, there is a clear opportunity to investigate this potential relationship. This dissertation seeks to explore the relationship between problem-framing and the use of research evidence in decision-making by assessing the end result of search (i.e., what types of evidence ultimately influenced the decision). In this way, the study serves as a preliminary step, by establishing the existence of the relationship between

problem-framing and evidence use first, before attempting to investigate exactly how or why this relationship may exist. Specifically, the study is guided by two research questions:

*RQ1: What are the problems schools addressed in recent decisions, as understood by individuals working within those schools?*

*RQ2: What is the relationship between individuals' problem-framing and the likelihood of the respondent indicating that external research was used in the decision-making process?*

By investigating these questions, I will be able to describe the relationship between the way that members of a school understand a problem and the reported level of engagement with research evidence that occurs in the decision-making process. In the next chapter I describe the methodology I will use to answer these research questions.

## Chapter 3

### METHODOLOGY

The present study employs a convergent mixed methods design to investigate the potential correlational relationship between individuals' problem-framing and the use of external research evidence in school-based decision-making using cross-sectional survey data. By using a combination of qualitative and quantitative data and methods, the study attempts to establish this relationship and describe its possible implications. Specifically, this study asks the following research questions:

*RQ1: What are the problems schools addressed in recent decisions, as understood by individuals working within those schools?*

*RQ2: What is the relationship between individuals' problem-framing and the likelihood of the respondent indicating that external research was used in the decision-making process?*

By investigating these questions, I will be able to describe the relationship between the way that members of a school understand and frame a problem and the reported level of engagement with external research evidence that occurs in the decision-making process.

#### **3.1 Context for Current Study**

This dissertation documents results from the Research for Schools (R4S) project conducted by the Center for Research Use in Education (CRUE), an Institute of Education Sciences (IES) funded knowledge utilization center tasked with

investigating when and how practitioners use research in decisions about policy and practice. To motivate new approaches to increasing research use and data-driven decision making in schools, the center conducted a series of research studies, the first of which involved the development and validation of a set of surveys measuring: 1) the breadth and depth of research use; and 2) dissemination strategies of research products. A key goal of the R4S project is to understand the barriers to research use in education from the perspective of both practitioners and researchers, and so a survey has been developed for each community (i.e., Survey of Evidence in Education-Schools or SEE-S, and Survey of Evidence in Education-Researcher or SEE-R). The current study is focused on school-based education practitioners and uses data from the first large-scale administration of the Survey of Evidence in Education (SEE-S), conducted with a sample of educators from 154 schools across the United States. Specifically, the current study reports on the relationship between the types of problems a school is facing, and particularly how those problems are framed, and the extent to which external research is used in the decision-making process.

### **3.2 Instrument Development**

The R4S team took a very intentional approach to instrument development, which included the use of both quantitative and qualitative methods, in order to produce the most psychometrically sound instruments possible. The instrument development process occurred in multiple phases over a three-year period from Fall 2015 through Fall 2018. The phases included were blueprinting, exploratory interviews, cognitive interviews, and pilot testing.

### **3.2.1 Blueprinting**

The first phase of instrument development involved creating a blueprint for each survey. The blueprint was based on the conceptual framework which guides the work of the Center for Research Use in Education and feedback from the center's advisory board. The conceptual framework is motivated by two interconnected perspectives (see Appendix A for framework and/or Farley-Ripple, May, Karpyn, Tilley, & McDonough, 2018). First, the perspective that research use is a type of evidence-based practice (EBP). Literature on evidence-based practice typically offers two definitions a) the extent to which schools implement programs based on scientific research (e.g. are implementing a "proven" curriculum), or b) the practice of incorporating evidence, broadly construed, into decision-making processes (Hood, 2003). While both definitions are legitimate and significant, our framework employs the latter, with particular interest in instrumental uses of research (i.e., situations in which practitioners can cite specific ways that research evidence was used in decision-making). The second perspective driving the framework is that the relationship between research and practice is bidirectional in nature. Increasing research use in school-based decision-making is not solely a matter of improving dissemination of research or increasing practitioner motivation, but rather aspects of both the research and practice communities must be addressed to enhance the influence of education research on decision-making.

Driven by these perspectives, the framework includes two major dimensions represented visually by two arrows, one vertical and one horizontal. The horizontal arrow represents the dimension "depth of use", which is our approach to understanding research use. "Depth" is illustrated as a continuum inclusive of essential elements of the practice of research use such as evidence, search, interpretation,

participation, frequency, and decision stage. The vertical arrow in the framework represents our conceptualization of the factors influencing use, labeled as “gaps in perspectives and assumptions”. Factors included in this dimension include “usefulness of research products”, “nature and quality of research”, “problems research addresses”, “structures, processes, and incentives for research use”, and “relationships between communities” (Farley-Ripple, et al., 2018).

To create a blueprint for the survey instruments, the team worked to organize the various components of the framework (e.g., evidence, search, participation, usefulness of research products) into an excel spreadsheet and provide definitions of constructs, then identify and define elements of constructs. This blueprint was then used to guide the general ordering of the survey and to ensure that during the item drafting process all team members have a common understanding of each construct the items are intended to measure.

### **3.2.2 Exploratory Interviews**

To ensure that the survey instruments produced covered relevant content and used appropriate vocabulary, the R4S instrument development process included a series of exploratory interviews with members of the communities of interest. The practitioners and researchers who participated in these interviews were actively employed at a public K-12 institution (practitioners) or a research university (researchers) in one of three states: North Carolina, Delaware, and Minnesota. Participants varied in their level of experience and their area of expertise. Interviews lasted approximately one hour, were conducted over the phone, were audio recorded and transcribed. The interviews followed a semi-structured protocol, developed by the principal investigator, and piloted with another researcher prior to administration,

which provided a general guide for conversations without being overly rigid or restrictive. The practitioner interview protocol focused on three major areas of inquiry, “problems and decisions”, “resources”, and “research”. The researcher interview protocol focused on two major areas of inquiry, “research problems” and “dissemination and connection to practice.” The broker interview protocol focused on three major areas of inquiry, “mission and problems”, “research”, and “connecting research and practice.”

For analysis, interview transcripts were uploaded into the qualitative analysis software Dedoose Version 7.0.23 (SocioCultural Research Consultants, 2016). A coding framework was developed based on the R4S survey blueprint, and transcripts were then coded through an iterative process by the research team. Common themes and language were identified, and summaries of relevant information were developed. Based on these analysis summaries, a report was produced for each construct of the blueprint using a template that included three primary questions, “what are the most important issues related to [construct name] from the qualitative data?”, “what needs to be captured on a survey about [construct name]?”, “what vocabulary would be important to use in asking researchers or practitioners about [construct name]?”. The instrument development team was then able to use these reports to inform item development.

### **3.2.3 Cognitive Interviews**

The next phase of instrument development involved conducting a series of cognitive interviews to further improve and refine the instruments. Once draft versions of each survey were completed and created in the online survey platform Qualtrics ([www.qualtrics.com](http://www.qualtrics.com)), cognitive interviews were conducted with convenience samples

of education researchers and practitioners. During the cognitive interview, the interviewee completed the online survey while talking to an interviewer on the phone. The interviews were audio recorded. The interviewee was asked to “think aloud” as they completed the survey, sharing their interpretations of and reactions to the items. Depending on the survey being tested, interviewers also asked specific questions at certain points to provide answers to R4S team member questions that arose during item writing. Cognitive interviews were completed in rounds, with each round including five interviews and at least three rounds of interviewing conducted per instrument. After each round of five interviews was completed, a research associate reviewed the audio recordings and synthesized the data by item. The instrument development team then met to review the synthesis, make decisions on which pieces of feedback to implement, and revise the survey in Qualtrics to be tested again in the next round of cognitive interviews. After the third round of cognitive interviews for an instrument, if the instrument had changed significantly or interviewees were still providing a considerable amount of feedback, more rounds of interviews were completed until cognitive interviews no longer provided critical, useable feedback.

#### **3.2.4 Pilot Testing**

Once the cognitive interview phase of instrument development was completed and final revisions to the instruments were completed in Qualtrics, pilot testing began. Two pilot tests of the practitioner instrument were completed: the first in the Fall of 2018 with 628 respondents and the second in the Spring 2019 with over 908 respondents. For the pilot tests of the practitioner instruments a consultant with a history of successfully recruiting large, nationally representative samples of schools for research was hired. The recruitment strategy involved multiple modes of



communication (e.g. email, telephone, print mail) and the criteria were school-based practitioners working in the public K-12 system in the United States. After data collection for each pilot was complete, statistical analyses including descriptive statistics, exploratory factor analyses, and profile analyses were conducted, and results were used to further refine the instruments. After two rounds of pilot testing and revisions, a field trial of the final SEE-S instrument was conducted with a nationally representative sample of education practitioners. For the current study, the practitioner field trial data will be analyzed.

### **3.3 Data**

#### **3.3.1 Field Trial Sample**

As with the pilot tests, in order to recruit participants for the field trial of the SEE-S, a consultant with a history of successfully recruiting large, nationally representative samples of schools for research was hired. The recruitment strategy involved multiple modes of communication (e.g., email, telephone, print mail). As an incentive for participation, schools were compensated up to \$1,000, depending on their school's response rate (i.e., 90% of eligible participants respond = \$1,000, 10% = \$200, etc.). In total, 4890 school-based practitioners responded to the survey during the 2018-2019 and 2019-2020 school years. Respondents included all instructional staff in 134 schools across 18 states, including elementary, middle, and high schools as well as schools in urban, suburban, and rural areas. Schools served a mean of 680 students, of which the mean proportion of students of color was 54% and 80% were eligible for Title 1 services. Within schools response rates ranged from 1% to 100%, with a mean of 56% or 23 responses per school. Sixty percent of respondents were

classroom teachers, 9% special educators, 4% administrators, and the remaining held other instructional positions, such as coaches.

A total of 1,343 practitioners responded to the survey items of interest for this current study (described in the following sections). After accounting for responses coded for usability issues (a process described in the Qualitative Analysis Plan section), the total number of usable responses for the current analysis was 1,229.

### **3.4 Survey of Evidence in Education- Schools**

Described earlier, the instrument used to collect data in the current study is the SEE-S, which is administered in an online format through the Qualtrics platform. This instrument was designed to capture various aspects of research use in schools including depth of use, perspectives and assumptions surrounding research, social networks, capacity, and brokerage activities. The current study focuses on data from the portion of the survey designed to capture depth of use. A unique feature of the “depth of use” measure is that it is anchored in a concrete decision rather than general perceptions of practice. The respondent is asked to think of an organizational decision that was made in their school over the last two years, as well as the problem that decision was intended to address. They are then asked to respond to a series of questions about how that decision was made (e.g., who was involved? How long did it take? What evidence informed the decision?). Since there may be practitioners who are not intimately familiar with the details of an organizational decision made in their school, a second path (path B) of the survey was created. This path focuses instead on an individual decision made at the classroom level. A filter question regarding the respondent’s familiarity with various aspects of the decision-making process was used to determine which path each respondent ultimately completed.

### **3.4.1 Problems and Decisions**

In order to identify and classify problem-framing in schools I analyzed data from a two-part open-ended survey item from path A of the SEE-S (item Q9). The open-ended item starts with a prompt that defines and provides examples of organizational decisions, then directs participants to think of an organizational decision related to student outcomes that was made by their school or district this year or the previous year (see Appendix B for full survey item). They are then asked to respond to the following open-ended items:

*What decision was made (i.e., what was changed or introduced/what actions were taken)?*

*Why was the decision necessary (i.e., what challenge/problem did it address, what was the goal)?*

A total of 1,343 practitioners have responded to this item and indicated that they are familiar enough with the decision-making process to complete path A of the survey (as determined by a filter question immediately following the open-ended item of interest, see Appendix C for item). Cases were selected if they had provided a useable response (i.e. complete, coherent, relevant) to this item as determined through the coding process detailed below (i.e., responses coded as “unusable” will not be included in the analysis), and they also responded to the item on research use discussed in the next section. Based on these criteria, the final sample for the current analysis is 1,229 responses.

### **3.4.2 External Research Use**

In order to assess the reported level of engagement with research evidence in the decision-making process I analyzed data from a matrix-style item with a Likert-

type response scale. The item provides a broad list of various types of evidence, ranging from peer-reviewed publications to advice from other practitioners, and asks respondents to indicate the extent to which each type influenced the decision. The scale is as follows: had little or no influence, had some influence, heavily influenced, and I don't know/remember (see Appendix D for full survey item). For the current analysis, I am particularly interested in the items within the matrix that are intended to constitute external research evidence as defined in Chapter 1. In survey development the research team defined scientific research evidence as “systematic data collection and analysis driven by research questions,” (SEE-S, 2019). There is one evidence type intended to constitute external research included in the survey item analyzed in this study. Specifically, I assessed the reported level of engagement with “articles, reports, books, or summaries based on external research or program evaluation.” It is important to note that this item included a clickable definition to specify that we define research or program evaluation as “systematic data collection and analysis driven by research questions.” Data from this survey item served as the dependent variable in this study in order to determine whether the problem-frame (independent variable described above) is related to reported external research use in decision-making.

In an effort to reduce the impact of social-desirability response bias, a validity filter question was included as follow-up item for the external research evidence option in this item (see Appendix E for full item). If a respondent indicated that “articles, reports, books, or summaries from external research or program evaluation” were influential in the decision, they were presented with a follow-up item as a validity check. This item stated, “*You indicated that articles, reports, books, or*

*summaries based on independent research or program evaluation influenced the decision: Please tell us about a research or evaluation study that influenced the decision, including as much information as possible about the study author, title, or web URL,”* followed by an open-ended text response box. If a respondent was not able to provide basic details about the evidence they claimed was used in the decision, their indication of external research use was considered invalid and was coded accordingly for analysis (e.g., the binary 0,1 indicator of reported external research use was coded as 0 indicating external research was not used).

### **3.5 Analysis**

This study included a combination of quantitative and qualitative analyses. First, qualitative data regarding organizational problems and decisions from the open-ended survey item described above was coded and categorized. Problem category codes applied during the qualitative analysis constitute problem-frames. This coding provides a descriptive analysis (i.e., frequencies) of the various problem-frames (i.e., problem-frame codes). Once qualitative data analysis was complete, I employed quantitative analysis methods to examine the descriptive and predictive relationships between individuals' problem-framing and reported engagement with external research evidence in decision-making. Finally, the qualitative data was reanalyzed, with the quantitative results in mind, in order to fully integrate the two types of data and further describe the relationships discovered (see Appendix F for the mixed methods diagram guiding analysis).

### **3.5.1 Qualitative Analysis**

The qualitative data gathered by the open-ended survey item was analyzed using an a priori coding framework developed and refined by the R4S team using the two rounds of pilot data from the SEE-S survey. After the first round of pilot data collection was complete, members of the R4S team collaborated to develop a coding framework. With an absence of empirical literature specifically related to the types of problems that schools face and the types of decisions that schools make, the team established an iterative process for coding the data using an emergent thematic approach. Initially individual responses were reviewed and the need to distinguish between the content of “problems” and “decisions” was recognized. Next, the research team engaged in categorizing the content and types through an iterative discussion in which different themes were created, tested with sample responses, and modified. Through this process we were able to identify multiple categories of problems and decisions. We found that problems could be classified as pertaining to academic performance, non-academic issues, instruction, curriculum, community, system issues, student characteristics/populations, and federal/state/local mandates. Decisions observed fell into eight categories. As decisions are not central to the current study and analysis, further explanation of decisions is not provided (see Appendix G for table of decision codes). We then continued this process of iterative discussion, testing, and modification to identify subcategories (or child codes) within each problem and decision category. Examples of the parent and child codes related to problems are provided in the table below.

In addition to the problem and decision codes, the need for another coding category emerged as the team analyzed the data: the “usability” category. As can be expected with most data, and particularly with open-ended survey data collected

online, not all the responses were useable. Issues ranged from completely missing data (when a respondent did not type a response or typed something like “I don’t know”) to irrelevant data that did not respond to the question asked. Under the “usability” code group the following child codes were created: “no problem/decision provided,” “incomplete response,” and “don’t understand the response.”

When data collection for the second pilot of the SEE-S was complete in Spring 2019 the coding framework was further tested and refined by applying it to the new data. A subsample of responses to the open-ended item from the full round two pilot data were organized in a spreadsheet and uploaded to Dedoose. Two independent coders applied the existing codes to categorize content and type of problem and decision. Interrater reliability was reviewed by examining code applications to identify disagreements, and subsequent meetings were held to discuss and resolve disagreements. Through these discussions definitions of codes were further refined and coding procedures were developed to minimize ambiguity and improve reliability. Additionally, through this coding process three new problem-frame codes were added to the problem-frame coding framework. Specifically, under the parent-level problem-frame code *Academic Performance*, the team recognized the need for the child-level codes *General Student Performance* and *Other Academic Subject*, which were not included in the framework based on the first round of pilot data. Similarly, under the parent-level problem-frame code *Community-centered Issues*, there was a need to add a child-level problem-frame code to capture *Parent/community Concern/request*. While there were a few instances of these problem-frames in the first round of pilot data, after coding the second set and considering the frequency across the larger combined sample, it was recognized that these new codes were necessary. These codes

have been included in the table below but were not added to the framework until the coding of the second round of pilot data was complete.

Table 1. Problem Codes and Illustrative Examples

Code	Child Codes	Definition	Example Problems
Systemic Issue	<ul style="list-style-type: none"> <li>-Budget</li> <li>-Schedule</li> <li>-Transportation</li> <li>-Enrollment</li> <li>-Access (to resources, etc.)</li> <li>-Grade reporting</li> <li>-Staffing</li> <li>-Internal Communications</li> </ul>	Focuses on issues related to finances, space, time, staffing, organizational structure, etc.	<ul style="list-style-type: none"> <li>"Finding time for staff to meet for PLC."</li> <li>"Grades were not standardized across the district."</li> <li>"Orchestra teacher had to go to 9 schools."</li> <li>"Congestion with traffic in front of the school."</li> </ul>
Academic Performance	<ul style="list-style-type: none"> <li>-Math</li> <li>-Language Arts</li> <li>-General Student Performance</li> <li>-Other Academic Subject</li> <li>-Tracking/grouping students</li> <li>-Life skills</li> <li>-Social-emotional skills</li> </ul>	Focuses specifically on issues related to student learning & performance.	<ul style="list-style-type: none"> <li>"...problem of low reading achievement by students."</li> <li>"Low math scores."</li> <li>"High failure rate and retention of 9<sup>th</sup> graders."</li> <li>"Reading test scores were lower than district wanted."</li> <li>"Lack of student leadership skills."</li> </ul>
Non-academic Issue	<ul style="list-style-type: none"> <li>-Behavior</li> <li>-Drop-out</li> <li>-Attendance</li> <li>-Engagement</li> <li>-School culture</li> <li>-Mental health</li> <li>-Physical health</li> <li>-Safety</li> </ul>	Focuses on issues of school climate & culture, including school discipline, engagement, & mental health.	<ul style="list-style-type: none"> <li>"...surveys that indicated that students did not feel connected with the staff or school."</li> <li>"Our 9<sup>th</sup> grade students have an extremely high failure &amp; dropout rate."</li> <li>"School attendance &amp; tardiness."</li> <li>"Misbehaving students."</li> </ul>



Table 1. continued.

Community-centered Issue	<ul style="list-style-type: none"> <li>-Parental engagement</li> <li>-Community engagement</li> <li>-Communications</li> <li>-Parent/community Concern/request</li> </ul>	Focuses on issues related to community, including building trust, gaining parent and community engagement.	<p>“Meeting the needs of ESL students and parents.”</p> <p>“No longer Team concept which caused breakdown of communication between parents and teachers.”</p> <p>“...give parents more frequent feedback on their child’s progress.”</p>
Curricular, Program, & Intervention Problem	<ul style="list-style-type: none"> <li>-Standards Alignment</li> <li>-Curriculum Problem</li> <li>-Assessment Problem</li> <li>-Intervention Problem</li> </ul>	Focuses on issues related to curriculums, programs, interventions, and assessments including alignment with common core standards, use of interventions, etc.	<p>“Our reading curriculum didn’t address the CCSS adequately or appropriately.”</p> <p>“Curriculum not being uniform across elementary levels.”</p> <p>“Lack of a unified writing program for the district.”</p> <p>“Common assessments needed to be updated to reflect CCSS.”</p>
Instructional Issue	<ul style="list-style-type: none"> <li>-Instructional Improvement</li> <li>-Professional Development</li> <li>-Professional Practice</li> <li>-Technology Integration</li> <li>-Intervention Implementation</li> </ul>	Focuses on issues related to educators’ professional practice.	<p>“[need for] Professional development collaboration &amp; application in the class.”</p> <p>“PD is still not meaningful enough.”</p> <p>“Hold teachers accountable.”</p> <p>“Document compliance for DESE.”</p>
Federal/state/local mandate	N/A	Focuses on, or frames the problem as being related to the implementation of a federal, state, or local mandate.	<p>“Marjory Stoneman Douglas Act”</p> <p>“District mandated all schools implement a one-size-fits-all assessment schedule.”</p> <p>“District mandated.”</p> <p>“It was mandated by the state.”</p>
Student characteristics/populations	N/A	Focuses on, or frames the problem as being related to student characteristics or special populations such as low-SES, English Language learners, etc.	<p>“Our students of color and low socioeconomic backgrounds are not achieving.”</p> <p>“Address a racial gap.”</p> <p>“...serve at-risk students and students with high levels of ACEs (adverse childhood experiences).”</p> <p>“...reaching students with disabilities.”</p> <p>“...increase the level of support we give our Gifted &amp; Talented scholars.”</p>

In my study, I used this coding framework to categorize problems and decisions in the field trial data. The frequency and distribution of the various problem-framing categories will be presented in the next chapter, answering RQ1 *What are the problems schools addressed in recent decisions, as understood by individuals working within those schools?*

### **3.5.2 Quantitative Analysis**

In order to answer RQ2, *what is the relationship between problem-frame and the likelihood of the respondent indicating that research was used in the decision-making process?* I used problem-frame codes to predict reported engagement with external research evidence in decision-making.

#### **3.5.2.1 Independent variables**

Problem-frame codes derived from qualitative analysis were turned into indicator variables. Each response was coded by a 0 or 1, with 1 indicating the selection was coded for that problem-frame and 0 indicating the response was not coded with that problem-frame. A total of eight, nominal independent variables were included in the analysis: *Academic Performance, Non-academic Issue, Curricular, Program, & Intervention Problem, Systemic Issue, Community-centered Issue, Instructional Issue, Federal/state/local Mandate, and Student Characteristics/populations.*

#### **3.5.2.2 Dependent variables**

The reported external research use item was be recoded into a binary variable. For the purpose of this analysis, I collapsed the response categories “I don’t know/remember” and “had little or no influence” and coded them 0 to indicate that

external research use was not used. If a respondent does not know of or does not remember a particular type of evidence being used in a decision-making process that they are familiar with, we have no evidence that that particular type of evidence was used. I also collapsed the response categories “had some influence” and “heavily influenced” and coded them as 1 to indicate that external research was used. The dependent variable for analysis was the value assigned to the external research item from Q9.

### **3.5.2.3 Analytical procedures**

I conducted a binary logistic regression analysis to calculate the probability of reporting engagement with external research (e.g., 0, 1) based on the problem-frame code, first at the parent code level and then at the child code level. Binary logistic regression can be used to determine the relationship of multiple factors influencing any classification where there are only two possible outcomes (in this case, reported external research use or not). The current study satisfies the assumptions of this analysis as it includes a binary dependent variable (reported external research use) and eight independent variables (eight parent-level problem-frame codes) in the first analysis, and 38 independent variables (36 child-level problem-frame codes and 2 parent-level problem-frame codes without children). By conducting a binary logistic regression analysis, I was able to determine which of the eight parent-level problem-frames and which of the 36 child-level problem-frames have a statistically significant relationship with reported engagement with external research evidence in decision-making, presented in the next chapter. With this analysis, I was able to answer RQ2 and determine whether a relationship between problem-frame code and reported engagement with external research evidence exists.

#### **3.5.2.4 Assessing the extent of variance at the school level**

Since the unit of analysis for the current study is at the individual respondent-level, there was no need to account for school-level variance with a multi-level statistical model. However, in order to confirm this is the case, I ran the binary logistic regression analysis twice, once with the variable “School ID” included in the analysis and once without. In the analysis which includes the “School ID” variable I confirmed a non-significant p value in the Fixed Effect table (Laerd Statistics, 2015) providing evidence that there is no significant effect of “School ID.”

#### **3.5.2.5 Testing for Collinearity**

When conducting a binary logistic regression analysis one of the assumptions that needs to be tested is the absence of collinearity. In order to ensure that problem-frame codes were in fact distinct, I included collinearity diagnostics in the regression analysis. First, I examined parent-level problem-frame codes and confirmed that the variance inflation factor (VIF) was not higher than 10 for any of the parent-level problem-frame codes (Snee, 1983). Next, I examined child-level problem-frame codes with the same parent (e.g., all child codes of Non-academic Issue, Systemic Issue, etc.) and again confirmed variance inflation factors under 10 for each related child-code. Finally, I ran the analysis with all of the child-level problem-frame codes, regardless of parent, and again confirmed VIFs under 10 for each child-level problem-frame code. Additionally, for each of these analyses, I looked to the Condition Index to ensure values under 15 (IBM, n.d.).

#### **3.5.2.6 Interpreting the results**

The output derived from the binary logistic regression allowed me to assess the overall model fit and make predictions regarding the likelihood of reporting usage of

external research evidence based on the problem-frame. There are two goodness-of-fit-tests, the Deviance goodness-of-fit test and the Pearson goodness-of-fit test, which provide an overall measure of whether or not the model fits the data well (Laerd Statistics, 2015). In order to determine the relationship between problem-frame and reported engagement with external research I interpreted the tables produced to identify which problem-frames have the highest probability of reporting engagement with research evidence. This interpretation allowed me to answer RQ2.

### **3.5.3 Code Co-occurrence Examination**

Upon completion of the binary logistic regression analysis, I engaged in additional analyses to further investigate the relationships it revealed. It was important to ensure that statistical significance in the regression analysis was not being driven by a particular type of decision rather than the problem-frame types. In order to investigate this possibility, I created a code co-occurrence matrix (a table indicating the how often a combination of two codes was applied to the same response). I examined this matrix to identify any patterns in the significant and non-significant problem-frame codes (see Appendix F for mixed methods diagram guiding analysis). Specifically, I verified that it was not the case that significant codes were associated with more adoption decisions than non-significant codes (see Appendix G for description of adoption decisions and Appendix F for mixed methods diagram guiding analysis). Results of this analysis are presented in the next chapter.

### **3.5.4 Qualitative Reanalysis**

The final step in this analysis involved additional qualitative review of the open-ended survey data. This analysis was conducted in order to further investigate

and explain the relationships identified in the regression analysis. Specifically, I reanalyzed the qualitative data for problem-frame codes that were found to have a statistically significant relationship with reported external research use in order to identify common themes and patterns. I also revisited the open-ended survey responses of problem-frame codes that were not found to have a statistically significant relationship with reported external research use in order to look for patterns and also to confirm that patterns identified in the significant codes were not present in the non-significant codes. Identified patterns are presented and discussed in the next chapter.

### **3.6 Summary**

The current study employed qualitative and quantitative data and analysis methods to address the two research questions of interest. First, open-ended survey data was qualitatively analyzed and coded for problem-frame type. This analysis provides the answer to RQ1 and resulted in the creation of the problem-frames that serve as independent variables in the analysis for RQ2. Next, a binary logistic regression analysis was conducted using the problem-frame codes from phase one as independent variables and an indicator of external research use as the dependent variable. Additional analyses were conducted to ensure that a multilevel model to account for school-level variance was not necessary and that decision type does not explain the regression analysis results. Finally, qualitative reanalysis of open-ended survey data related to problems and decisions was conducted to gain insight into the regression analysis results. The results of these analyses are shared in the next chapter.

## Chapter 4

### RESULTS

#### 4.1 Frequency of Problem-frame Code Application

In order to answer the research question, *what are the problems schools addressed in recent decisions, as understood by individuals working within those schools*, qualitative analysis of open-ended survey data was conducted. According to surveyed school members, schools addressed a variety of different problems in recent decisions. Analysis of open-ended responses to Q9 of the SEE-S (see figure X), resulted in eight different problem-frame codes, with a combined total of 32 sub-codes differentiating more specifically different problem-frames. A total of 1,486 parent-level problem codes were applied to the responses of 1343 educators (some responses included the description of more than one problem-frame). The most frequent problems described by respondents were those relating to *Academic Performance* (37%), *Non-academic Issues* (18%), and *Systemic Issues* (15%). Approximately eight percent of parent-level problem code applications were of the code *Usability-Problem*, indicating that those responses do not provide a usable description of a problem (see Appendix H for full codebook with definitions and examples of how this code was applied).

Data within each parent-level problem-frame code were then further analyzed, resulting in the development of child-level problem-frame codes for six of the eight parent-level codes. These child-level problem-frame codes serve to further specify the framing of the problems being reported. A total of 36 child-level problem-frame codes

were identified and applied to the data. Table X provides the frequency of each parent-level and child-level problem-frame code. When problems were framed as being related to *Academic Performance*, they were most frequently also framed as being related to *English Language Arts* or offered vague descriptions of problems absent any particular content-area (coded as *General Student Performance*). Half of all *Non-academic Issues* related to *Behavior/discipline*, but problems related to *School Culture* and *Student Engagement* were also prevalent. Respondents often described *Systemic Issues* relating to the *Schedule* and *Access* (to materials, technologies, resources). *Curricular Problems* made up more than half of the problems under the parent code *Curriculum, Programs, & Interventions* and issues related to *Instructional Improvement* made up more than half of the problems under the *Instructional Issue* parent code.

Table 2. Frequency of problem-frame code application

<b>Problem Code</b>	<b>Child Code</b>	<b>n</b>	<b>%</b>
Academic Performance	Language Arts	553	37.2%
	General Student Performance	215	38.9%
	Math	202	36.5%
	Social-emotional Skills	83	15.0%
	Tracking/grouping Students	41	7.4%
	Life Skills	30	5.4%
	Other Academic Subject	17	3.1%
		6	1.1%
		282	18.9%
Non-academic Issues	Behavior/discipline	141	50.0%
	School culture/environment	70	24.8%
	Student Engagement	46	16.3%
	Attendance	27	9.6%
	Mental Health	16	5.7%
	Physical Health	11	3.9%
	Safety	6	2.1%



Table 2. Continued

Systemic Issues	Drop-out	2	0.7%
		224	15.1%
	Schedule	80	35.7%
	Access	47	20.9%
	Enrollment	33	14.7%
	Budget	32	14.3%
	Staffing	22	9.8%
	Grade Reporting	17	7.6%
Instructional Issue	Internal Communication	9	4.0%
	Transportation	4	1.8%
		126	8.5%
	Instructional Improvement	74	58.7%
	Professional Practice	30	23.8%
	Intervention Implementation	15	11.9%
	Professional Development	8	6.3%
	Technology Integration	5	3.9%
Curricular, Program, & Intervention Problem		100	6.7%
	Curricular Problem	56	56%
	Standards Alignment	19	19%
	Assessment Problem	18	18%
	Intervention Problem	7	7%
Student Characteristics/populations		35	2.4%
Federal/state/local Mandate		23	1.5%
Community-centered Issue		17	1.1%
	Parental Engagement	7	41.2%
	External Communications	6	35.3%
	Community/parental Concern/request	3	17.6%
	Community Engagement	1	5.9%
Usability-Problem		125	8.4%

#### 4.2 Relationship Between Problem-framing & External Research Use

To answer the research question, *what is the relationship between problem-framing and the likelihood of the respondent indicating that external research was used in the decision-making process*, binary logistic regression was conducted. The eight parent-level problem-frame codes served as the independent variables and a binary variable indicating the use of external research (0,1/yes, no) served as the dependent variable. Next, the binary logistic regression analysis was repeated using

the child-level problem-frame codes as independent variables. Based on the results of the child code level analysis, I returned to the qualitative data, examining the code co-occurrence matrix in order to look for a pattern to explain the results. When no meaningful pattern was identified in the code co-occurrence, the child code level data were explored qualitatively to determine if a pattern may exist to explain the results.

#### **4.2.1 Descriptive Results – Relationship Between Problem-frame & External Research Use**

In order to descriptively examine the relationship between problem-frame code and reported external research use, crosstabs were calculated. Table Y displays the results of this analysis, including an indicator of the percent of respondents using external research when facing certain problems (i.e., when a certain problem-frame code was applied to their response) and the chi-square value. The percent using external research ranges from 0% (*Other Academic Subject, Budget, Physical Health, Community Engagement, and Professional Development*) to 52.94% (*Grade Reporting*). On average, external research was used in 21.43% of decisions.

This calculation also revealed the relative prevalence of problem-frame codes. The most common problem-frame codes were *Academic Performance* (n=553), specifically it's child codes *English Language Arts* (n=215) and *General Student Performance* (n=202). On the other hand, there are two instances of the *Drop-out* problem-frame code being applied (under the parent-level problem-frame code *Non-academic Issue*), *Safety* (under the parent-level problem-frame code *Non-academic Issue*) occurs six times, and *Transportation* (under the parent-level problem-frame code *Systemic Issue*) only occurs four times throughout the data. While the prevalence of particular problem codes provides insight about the work of schools, frequencies have implications for power to detect differences in the probability of using external research.

Table 3. Crosstabulations of Child-Level Problem-Frame Codes and External Research Use

Problem-frame Code	Code yes (=1)			Code no (=0)			ChiSq
	Used Research	Does not use research	% using research	Used Research	Does not use Research	% using Research	
Academic Performance	130	416	23.81%	162	630	20.45%	.144
academic/ELA	53	159	25.00%	239	887	21.23%	.222
academic/Math	16	66	19.51%	276	980	21.97%	.601
academic/SEL Skills	21	19	52.50%	271	1027	20.88%	<.001
academic/Tracking	5	25	16.67%	287	1021	21.94%	.489
academic/Life Skills	6	11	35.29%	286	1035	21.65%	.176
academic/General Perform	36	164	18.00%	256	882	22.50%	.156
academic/Other Subject	0	6	0.00%	292	1040	21.92%	.195
Nonacademic Issue	71	206	25.63%	221	840	20.83%	.085
nonacademic/Behavior	45	93	32.61%	247	953	20.58%	.001
nonacademic/Attendance	4	23	14.81%	288	1023	21.97%	.373
nonacademic/Engagement	8	37	17.78%	284	1009	21.96%	.504
nonacademic/Sch Culture	21	48	30.43%	271	998	21.36%	.075

Table 3. continued.

nonacademic/ Safety	1	5	16.67%	291	1041	21.85%	.759
nonacademic/ Physical Health	0	11	0.00%	292	1035	22.00%	.078
nonacademic/ Mental Health	8	8	50.00%	284	1038	21.48%	.006
nonacademic/ Drop-out	1	1	50.00%	291	1045	21.78%	.334
Systemic Issue	28	195	12.56%	264	851	23.68%	<.001
system/Staffing	2	20	9.09%	290	1026	22.04%	.145
system/Transportation	1	3	25.00%	291	1043	21.81%	.878
system/Budget	0	32	0.00%	292	1014	22.36%	.002
system/Access	6	41	12.77%	286	1005	22.15%	.126
system/Grade Reporting	9	8	52.94%	283	1038	21.42%	.002
system/Internal Comm.	0	9	0.00%	292	1037	21.97%	.112
system/Enrollment	5	28	15.15%	287	1018	21.99%	.347
system/Schedule	7	79	8.14%	285	974	22.64%	.004
Curricular, Program, Intervention Issue	21	79	21.00%	271	967	21.89%	.836

Table 3. continued.

CPI/Curriculum Prob	9	47	16.07%	283	999	22.07%	.287
CPI/Assessment Prob	7	11	38.89%	285	1035	21.59%	.078
CPI/Intervention Prob	1	6	14.29%	291	1040	21.86%	.628
CPI/Standards Alignment	4	15	21.05%	288	1031	21.83%	.935
Community-centered Issue	3	14	17.65%	289	1032	21.88%	.675
community/Parental Engagement	1	6	14.29%	291	1040	21.86%	.628
comm/Community Engagement	0	1	0.00%	292	1045	21.84%	.597
comm/External Comm.	1	5	16.67%	291	1041	21.85%	.759
comm/Comm/Parent Request/concern	1	2	33.33%	291	1044	21.80%	.629
Instruction Issue	36	88	29.03%	256	958	21.09%	.041
instruction/Instructional Improvement	24	50	32.43%	268	996	21.20%	.023
instruction/Tech Integration	1	4	20.00%	291	1042	21.83%	.921
instruction/Professional Development	0	7	0.00%	292	1039	21.94%	.161
instruction/Professional Practice	10	20	33.33%	282	1026	21.56%	.123

Table 3. continued.

instruction/Intervention Implementation	3	12	20.00%	289	1034	21.84%	.863
Student Characteristics/pop	10	25	28.57%	282	1021	21.64%	.327
Federal/state/local Mandate	5	18	21.74%	287	1028	21.83%	.992

#### 4.2.2 Logistic Regression Analysis Results – Parent Code Level

A binary logistic regression was performed to ascertain the effects of problem-frame on the likelihood of using external research in the decision-making process. There were eight predictor variables (the eight parent-level problem-frame codes) and one dependent variable (reported external research use) included in this analysis. The logistic regression model was statistically significant,  $\chi^2(8) = 21.701, p = .006$ . The model explained 2.5% (Nagelkerke  $R^2$ ) of the variance in reported external research use. Of the eight predictor variables two had a statistically significant relationship with reported external research use: *Systemic Issue* and *Instructional Issues*. Specifically, results indicate that when problems are framed as *Instructional Issues*, reports of external research use in the decision-making process are 1.6 times more likely to occur. When problems are framed as being *Systemic Issues*, the reported use of external research is 46% less likely to occur. In some cases, the lack of statistically significant relationships with problem-frame code may be an issue of power. As is displayed by Table Y, problem-frame codes such as *Community-centered Issues* and *Student Characteristics/populations* are much less prevalent and may be underpowered. The low prevalence of the codes in the data may reduce the ability to detect significant differences.

Table 4. Logistic Regression Predicting Likelihood of External Research Use Based on Problem-Frame (Parent Code Level)

Problem-frame Code	<i>B</i>	SE	Wald	<i>df</i>	<i>p</i>	Odds Ratio	95% CI for Odds Ratio	
							Lower	Upper
Academic Performance	.203	.164	1.527	1	.217	1.225	.888	1.691
Non-academic Issues	.330	.187	3.093	1	.079	1.390	.963	2.008
Systemic Issues	-.572	.241	5.619	1	.018**	.564	.352	.906
Instructional Issues	.469	.229	4.194	1	.041**	1.599	1.020	2.504
Curricular (incl programs & interventions)	.002	.274	.006	1	.936	1.022	.598	1.749
Student Characteristics/pop	.342	.384	.796	1	.372	1.408	.664	2.987
Federal/state/local Mandate	.004	.517	.000	1	.993	1.004	.365	2.765
Community-centered Issues	-.169	.649	.068	1	.795	.845	.237	3.011

\*\**p* < .05.

#### 4.2.3 Logistic Regression Results – Child Code Level

A possible explanation for the limited significant results in the initial regression analysis is the great variability within each parent-level problem-frame code. Of the eight parent-level problem-frame codes, six have a set of child codes further specifying problem-frame type (see Appendix H for full codebook). There are substantive differences in these child codes which could lead to greater or lesser research use. For example, under the parent-level problem-frame code Systemic Issue, there are child codes such as Transportation and Grade Reporting. While these are related in that they are systemic in nature, the problems reported are different. The approach to calculating and reporting student grades has significant and direct impacts on student outcomes. For example, whether a school uses a standards-based grading system or not impacts what student grades reflect (e.g., traditional computation methods may reflect behaviors such as assignment completion as opposed to

proficiency or mastery of a subject) (Scriffiny, 2008). There is a substantial amount of research and literature related to grade reporting (e.g. Muñoz & Guskey, 2015; Iamarino, 2014; Tierny, Simon, & Charland, 2011; Marzano, 2011). Transportation related problems on the other hand (e.g., traffic congestion at the school, shortage of buses, timeliness of buses) may still have impacts on student learning, but in an indirect way (e.g., students miss class time due to buses arriving late). For these types of problems, there is considerably less empirical research available. Accordingly, considering these differences between child codes, combining all of the data together under broad parent-level problem-frame codes may result in too much “noise” to detect meaningful differences in the parent-level relationships to reported external research use.

To explore this possible explanation, I conducted a binary logistic regression analysis using the child-level problem-frame codes to determine if a relationship with reported external research use exists. The model included all 38 predictor variables (36 child-level problem-frame codes and two parent-level problem-frame codes without child-level codes) as the independent variables and reported external research use as the dependent variable. This model allows for the comparison of each child-level problem-frame code to all other cases. Results indicate the binary logistic regression model is statistically significant  $\chi^2(38) = 108.128, p < .001$ . the model explained 11.9% (Nagelkerke R) of the variance in reported external research use. Of the 38 predictor variables, seven had a statistically significant relationship with reported external research use: *Social emotional Skills* (under the parent-level problem-frame code *Academic Performance*), *Grade Reporting* and *Scheduling* (under the parent-level problem-frame code *Systemic Issue*), *Mental Health* and *Behavior/discipline* (under the parent-level problem-frame code *Non-academic Issue*), *Instructional Improvement* (under the parent-level problem-frame code *Instruction Issue*), and *Assessment Problem* (under the parent-level problem-frame code *Curriculum, Program & Intervention Problem*).



Of the significant relationships, six out of seven were more likely to report using external research than not. When problems were framed as relating to *Social Emotional Skills* (under the *Academic Performance* parent code) reported engagement with external research in the decision-making process was 3.6 times more likely, *Grade Reporting* (under *Systemic Issue* parent code) 5.4 times more likely, *Mental Health* (under the *Non-academic Issue* parent code) 4 times more likely, *Behavior/discipline* (under the *Non-academic Issue* parent code) 1.7 times more likely, *Assessment Problem* (under the *Curricular* parent code) 2.9 times more likely, and *Instructional Improvement* (under the *Instruction* parent code) twice as likely to report using external research. Only decisions made when facing a *Scheduling* problem (under the *Systemic Issue* parent code) were significantly less likely to report using external research in the decision-making process. Specifically, when problems are framed in this way, decision-makers are approximately 60% less likely to report using external research in the decision-making process.

Table 5. Logistic Regression Predicting the Likelihood of External Research Use Based on Problem-Frame Code (Child Code Level)

Parent Code	Child Code	<i>B</i>	SE	Wald	<i>df</i>	<i>p</i>	Odds Ratio	95% CI for Odds Ratio	
								Lower	Upper
Academic Performance	Language Arts	.370	.208	3.164	1	.075	1.447	.963	2.176
	Math	-.158	.301	.274	1	.601	.854	.473	1.541
	Life Skills	.727	.539	1.815	1	.178	2.068	.719	5.954
	Tracking/grouping	-.203	.505	.162	1	.688	.816	.303	2.197
	Social-emotional Skills	1.287	.345	13.915	1	**.000	3.621	1.842	7.121
	General Student Performance	-.128	.222	.335	1	.563	.880	.569	1.359
	Other Academic Subject	-20.208	16038.106	.000	1	.999	.000		.000

Table 5. Continued

Non-academic Issue	Behavior/discipline	.523	.225	5.374	1	**.020	1.686	1.084	2.623
	Attendance	-.361	.561	.413	1	.520	.697	.232	2.094
	Drop-out	1.450	1.422	1.040	1	.308	4.265	.263	69.264
	Student Engagement	-.159	.411	.149	1	.699	.853	.381	1.909
	School Culture/environment	.392	.295	1.764	1	.184	1.480	.830	2.641
	Mental Health	1.387	.567	5.980	1	**.014	4.001	1.317	12.159
	Physical Health	-20.102	11758.416	.000	1	.999	.000		.000
	Safety	-.259	1.107	.055	1	.815	.772	.088	6.759
Systemic Issue	Budget	-19.719	7062.625	.000	1	.998	.000		.000
	Transportation	1.217	1.219	.997	1	.318	3.377	.310	36.822
	Staffing	-.673	.762	.779	1	.378	.510	.115	2.273
	Internal Communications	-20.223	13029.275	.000	1	.999	.000		.000
	Access	-.395	.474	.694	1	.405	.674	.266	1.706
	Enrollment	-.368	.518	.507	1	.476	.692	.251	1.908
	Grade Reporting	1.702	.526	10.471	1	**.001	5.484	1.956	15.373
	Schedule	-.933	.427	4.776	1	**.029	.393	.170	.908

Table 5. Continued

Instructional Issue	Instructional Improvement	.726	.277	6.848	1	**.009	2.006	1.200	3.557
	Professional Development	-19.826	15122.464	.000	1	.999	.000		.000
	Intervention Implementation	-.040	.659	.004	1	.951	.961	.264	3.497
	Professional Practice	.770	.409	3.549	1	.060	2.159	.969	4.810
	Technology Integration	-.083	1.147	.005	1	.942	.920	.097	8.708
Curricular, Program, & Program Problem	Curriculum Problem	-.294	.384	.587	1	.444	.745	.351	1.582
	Assessment Problem	1.070	.513	4.350	1	.037	2.916	1.067	7.973
	Intervention Problem	-.341	1.091	.098	1	.754	.711	.084	6.026
	Standards Alignment	.094	.577	.026	1	.871	1.098	.354	3.406
Community-centered Problem	Parental Engagement	-.275	1.090	.064	1	.801	.759	.090	6.435
	Community Engagement	-19.752	40192.970	.000	1	1.000	.000		.000
	External Communications	.026	1.122	.001	1	.982	1.026	.114	9.245
	Community/parent Concern/request	.807	1.501	.289	1	.591	2.241	.118	42.439

Table 5. Continued

Student Characteristics/populations	Federal/state/local Mandate									
N/A	N/A	.023	.523	.002	1	.965	1.023	.367	2.853	
N/A		.342	.393	.757	1	.384	1.407	.652	3.039	

\*\* $p < .05$ .

#### 4.2.4 Code Co-occurrence Examination

After the regression analyses were complete, further qualitative analysis was conducted in order to better understand the characteristics/conditions that result in problem-frames that are more or less likely to use research. One strategy for using the qualitative data to explore the quantitative patterns more deeply is to look at whether those patterns ultimately reflect *types of decisions*. Recall from the chapter on Methods, the survey item used to collect qualitative data related to problem-framing started by asking respondents to identify an organizational decision (see Appendix B for the item). A coding framework was developed to classify problem-frames as well as types of decisions (for full codebook see Appendix G for decisions and Appendix H for problem-frames). The possibility that statistical significance in the regression analysis is being by decisions rather than problem-frames was considered. Specifically, it may be that decisions that resulted in program adoption are more likely to have used external research in the decision-making process. In order to explore this possibility, I examined the problem-frame/decision code co-occurrence matrix to look for patterns. If it is the case that patterns seen in the quantitative data are reflective of adoption decisions being made, we would expect to see a significantly higher prevalence of adoption decisions for problem-frame codes that have a statistically significant relationship with reported external research use.

As you can see from Tables 6 through 12 below, code co-occurrence (and therefore the type of decision made) alone does not seem to account for the differences in the relationships. For example, decisions made in response to problems framed as relating to *Academic Performance* were as likely to have adoptions (311 out of 542, 57.3%) as decisions that were made in response to problems framed as *Federal/state/local Mandate* (13 out of 23, 56.5%). This is true when examining code co-occurrence at the child code level as well, as displayed in Tables P through U. To illustrate, for *Mental Health* (under the parent-level problem-frame code *Non-academic Issue*), which has a statistically significant relationship with reported

external research use, only 25% of decisions were adoption decisions. Meanwhile, for *Technology Integration* (under the parent-level problem-frame code *Instructional Issue*), which does not have a statistically significant relationship with reported external research, 66.67% of decisions were adoption decisions. While the prevalence of adoption decisions is high in those problem-frame codes with a significant relationship to reported external research use, adoption decisions are also highly prevalent across many of the problem-frame codes with no significant relationship to reported external research use.

Table 6. Proportion of Types of Decisions Responding to Problem-Frames – Parent-Level Problem-Frame Codes

	Academic Performan ce (n=542)	Non- academi c Issue (n=294)	Systemi c Issue (n=235)	Curricul ar (n=103)	Instructio n (n=129)	Communit y-centered Issue (n=15)	Student characteristics/p op (n=41)	Federal/state/loca l Mandate (n=23)
Adoption	57.38%	47.96%	12.34%	67.33%	37.98%	33.33%	35.71%	56.52%
Implementati on	10.33%	6.80%	6.38%	17.82%	10.08%	6.66%	9.52%	13.04%
Human Resources	2.77%	3.06%	11.06%	0.00%	5.43%	0.00%	14.29%	4.35%
Structural	10.33%	9.86%	43.83%	1.98%	9.30%	6.66%	9.52%	8.70%
PD	10.33%	10.20%	5.96%	4.95%	30.23%	13.33%	19.05%	13.04%
Creating/mod Policy	4.24%	11.56%	8.51%	1.98%	3.88%	0.00%	2.38%	0.00%
Designing Solution	2.95%	6.80%	4.26%	3.96%	3.10%	6.66%	2.38%	0.00%
External	0.00%	1.70%	0.43%	0.00%	0.00%	33.33%	7.14%	0.00%
Discontinuing Policy	0.37%	1.36%	5.53%	0.99%	0.00%	0.00%	0.00%	0.00%
No Action	1.29%	0.68%	1.70%	0.99%	0.00%	0.00%	0.00%	4.35%

Note: Shaded columns are ones previously identified as having statistically significantly greater or lesser use of research. N's reflect usable decisions and may differ from number of problem-frame applications



Table 7. Proportion of Types of Decisions Responding to Problem-Frames – Child-Level Academic Performance Problem-Frame Codes

	English Language Arts (n=217)	Math (n=82)	Social- emotional Skills (n=42)	Tracking/ grouping (n=31)	Life Skills (n=20)	General Student Performance (n=191)	Other Academic Subject (n=4)
Adoption	68.20%	62.20%	78.57%	58.06%	55.00%	41.88%	50.00%
Implementati on	7.37%	12.20%	4.76%	19.35%	0.00%	10.99%	25.00%
Human Resources	2.76%	2.44%	0.00%	6.45%	0.00%	3.14%	25.00%
Structural	6.45%	10.98%	4.76%	0.00%	10.00%	16.75%	0.00%
PD	11.06%	7.32%	9.52%	3.23%	25.00%	10.99%	0.00%
Creating/mod Policy	0.92%	1.22%	0.00%	6.45%	0.00%	9.95%	0.00%
Designing Solution	1.84%	3.66%	0.00%	0.00%	5.00%	4.71%	0.00%
External	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Discontinuing Policy	0.46%	0.00%	0.00%	3.23%	0.00%	0.52%	0.00%
No Action	0.92%	0.00%	2.38%	3.23%	5.00%	1.05%	0.00%

Note: Shaded columns are ones previously identified as having statistically significantly greater or lesser use of research. N's reflect usable decisions and may differ from number of problem-frame applications

Table 8. Proportion of Types of Decisions Responding to Problem-Frames – Child-Level Non-Academic Issue Problem-Frame Codes

	Behavior (n=143)	Attendance (n=29)	Mental Health (n=20)	Physical Health (n=11)	School Culture (n=75)	Student Engagement (n=49)	Safety (n=6)	Drop-out (n=2)
Adoption	64.34%	17.24%	25.00%	9.09%	49.33%	48.98%	16.67%	0.00%
Implementation	7.69%	0.00%	0.00%	0.00%	10.67%	6.12%	0.00%	0.00%
Human Resources	2.10%	0.00%	20.00%	0.00%	5.33%	0.00%	16.67%	0.00%
Structural	4.90%	10.34%	20.00%	36.36%	8.00%	12.24%	0.00%	100.0%
PD	7.69%	10.34%	20.00%	0.00%	13.33%	16.33%	0.00%	0.00%
Creating/mod Policy	6.29%	44.83%	0.00%	18.18%	4.00%	10.20%	50.00%	0.00%
Designing Solution	3.50%	10.34%	10.00%	18.18%	6.67%	6.12%	16.67%	0.00%
External	0.70%	6.90%	0.00%	0.00%	2.67%	0.00%	0.00%	0.00%
Discontinuing Policy	1.40%	0.00%	0.00%	18.18%	0.00%	0.00%	0.00%	0.00%
No Action	1.40%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Note: Shaded columns are ones previously identified as having statistically significantly greater or lesser use of research. N's reflect usable decisions and may differ from number of problem-frame applications

Table 9. Proportion of Types of Decisions Responding to Problem-Frames – Child-Level Systemic Issue Problem-Frame Codes

	Access (n=49)	Grade Reporti ng (n=18)	Staffing (n=22)	Transpor tation (n=6)	Budget (n=32)	Schedule (n=87)	Enrollment (n=38)	Internal Comm. (n=8)
Adoption	34.69%	11.11%	0.00%	16.67%	3.13%	3.45%	13.16%	25.00%
Implementati on	4.08%	11.11%	4.55%	16.67%	6.25%	5.75%	7.89%	25.00%
Human Resources	2.04%	0.00%	63.64%	0.00%	25.00%	3.45%	7.89%	0.00%
Structural	38.78%	0.00%	13.64%	33.33%	12.50%	72.41%	52.63%	0.00%
PD	2.04%	27.78%	9.09%	0.00%	6.25%	3.45%	5.26%	12.50%
Creating/mod Policy	10.20%	44.44%	4.55%	0.00%	6.25%	1.15%	7.89%	25.00%
Designing Solution	4.08%	5.56%	4.55%	16.67%	3.13%	4.60%	0.00%	12.50%
External	2.04%	0.00%	0.00%	16.67%	0.00%	0.00%	2.63%	0.00%
Discontinuing Policy	2.04%	0.00%	0.00%	0.00%	31.25%	2.30%	0.00%	0.00%
No Action	0.00%	0.00%	0.00%	0.00%	6.25%	3.45%	2.63%	0.00%

Note: Shaded columns are ones previously identified as having statistically significantly greater or lesser use of research. N's reflect usable decisions and may differ from number of problem-frame applications

Table 10. Proportion of Types of Decisions Responding to Problem-Frames – Child-Level Community-Centered Problem-Frame Codes

	Parental Engagement (n=6)	Community Engagement (n=1)	Parent/Communit y Concern (n=2)	External Communications (n=6)
Adoption	16.67%	100.00%	0.00%	50.00%
Implementati on	0.00%	0.00%	50.00%	0.00%
Human Resources	0.00%	0.00%	0.00%	0.00%
Structural	0.00%	0.00%	50.00%	0.00%
PD	16.67%	0.00%	0.00%	16.67%
Creating/mod Policy	0.00%	0.00%	0.00%	0.00%
Designing Solution	0.00%	0.00%	0.00%	16.67%
External	66.67%	0.00%	0.00%	16.67%
Discontinuing Policy	0.00%	0.00%	0.00%	0.00%
No Action	0.00%	0.00%	0.00%	0.00%

Note: Shaded columns are ones previously identified as having statistically significantly greater or lesser use of research. N's reflect usable decisions and may differ from number of problem-frame applications

Table 11. Proportion of Types of Decisions Responding to Problem-Frames – Child-Level Instructional Issue Problem-Frame Codes

	Instructional Improvement (n=74)	Intervention Implementation (n=18)	Professional Practice (n=33)	Prof. Development (n=8)	Tech Integration (n=6)
Adoption	47.30%	16.67%	30.30%	25.00%	66.67%
Implementation	5.41%	33.33%	9.09%	12.50%	0.00%
Human Resources	5.41%	0.00%	6.06%	12.50%	0.00%
Structural	5.41%	22.22%	15.15%	0.00%	0.00%
PD	28.38%	11.11%	36.36%	50.00%	33.33%
Creating/mod Policy	4.05%	5.56%	3.03%	0.00%	0.00%
Designing Solution	4.05%	11.11%	0.00%	0.00%	0.00%
External	0.00%	0.00%	0.00%	0.00%	0.00%
Discontinuing Policy	0.00%	0.00%	0.00%	0.00%	0.00%
No Action	0.00%	0.00%	0.00%	0.00%	0.00%

Note: Shaded columns are ones previously identified as having statistically significantly greater or lesser use of research. N's reflect usable decisions and may differ from number of problem-frame applications

Table 12. Proportion of Types of Decisions Responding to Problem-Frames – Child-Level Curricular Problem-Frame Codes

	Curriculum Problem (n=59)	Assessment Problem (n=16)	Intervention Problem (n=7)	Standards Alignment (n=20)
Adoption	76.27%	31.25%	28.57%	80.00%
Implementation	13.56%	25.00%	57.14%	10.00%
Human Resources	0.00%	0.00%	0.00%	0.00%
Structural	3.39%	0.00%	0.00%	0.00%
PD	3.39%	6.25%	0.00%	5.00%
Creating/mod Policy	1.69%	12.50%	0.00%	5.00%
Designing Solution	0.00%	18.75%	14.29%	0.00%
External	0.00%	0.00%	0.00%	0.00%
Discontinuing Policy	1.69%	0.00%	0.00%	0.00%
No Action	0.00%	6.25%	0.00%	0.00%

Note: Shaded columns are ones previously identified as having statistically significantly greater or lesser use of research. N's reflect usable decisions and may differ from number of problem-frame applications

#### **4.2.5 Qualitative Reanalysis of Child Code Level Data**

Examination of code co-occurrence did not offer specific insights about why some problems are more likely to be associated with research use than others. Consequently, additional qualitative analysis of the data at the child code level was conducted. First, data for those child codes for which a statistically significant relationship with reported external research use exists were re-read in an attempt to identify any common pattern(s) or theme(s). Next, data for those child codes for which a statistically significant relationship with external research does not exist were re-read to identify any common pattern(s); and also, to confirm that any pattern seen in the significant codes is not also present in the non-significant codes.

The code *Scheduling* (under the parent-level problem-frame code *Systemic Issue*) was unique in that it was the only significant code where reporting engagement with external research was actually *less* likely to occur. In reviewing responses where the problem-frame code *Scheduling* was applied, the majority of decisions described in response to the problem were practical, logistical decisions where the use of external research may not be intuitive or expected. For example, the decision to switch from a rotating schedule to a daily schedule for science and social studies due to students having trouble with continuity, changing a teacher planning/PD day to a regular school day due to a hurricane causing students to miss too much class time, or adding an intervention block during the school day to accommodate students whose transportation limitations prevent them from coming before or staying after school. While these problems still have substantive implications for teaching and learning, the importance of the local context in these cases might limit the usefulness of external research. This will be discussed in more depth in the next chapter.

In qualitatively reviewing the child codes for which a significant relationship with reported external research use does exist, a pattern in which adoption of the same few widely known, popular programs or practices that are viewed as evidence-based was observed. When looking at those child codes where no significant relationship

with reported external research use existed, this pattern was not observed. While adoption decisions are still being frequently being made in response to these problems, there is a much broader range of solutions being adopted.

As an example of this pattern of adopting popular programs, responses with the problem-frame codes *Social-emotional skills* (under *Academic Performance*) and *Behavior/discipline* (under *Non-academic Issue*) referred to decisions to adopt a handful of programs including Positive Behavioral Interventions and Supports (PBIS), Second Step, and Responsive Classroom. Across the 41 responses with the problem-frame code *Social-emotional skills* applied, six mention decisions to adopt PBIS, five mention Second Step, and seven mention Responsive Classroom. To ensure no single decision or school was responsible for these patterns, I looked at original responses and determined these common adoption decisions come from respondents across *many* schools. For example, mentions of PBIS come from respondents from six schools, mentions of Second Step come from respondents from five schools, and mentions of Responsive Classroom come from seven schools. Across the 141 responses with the problem-frame code *Behavior/discipline* applied, 68 mention decisions to adopt PBIS, three mention Second Step, and six mention Responsive Classroom. While some of the 68 mentions of decisions to adopt PBIS were from respondents from the same schools, again, multiple schools are represented. In addition to program adoptions, the decision to read and apply lessons from the book *The Leader in Me* by Covey (2014) was present in response to problems framed as *Social-emotional skills*, *Behavior/discipline*, and *Mental Health* (under the parent-level problem-frame code *Non-academic Issue*).

In addition to packaged programs like those mentioned above, decisions to adopt popular pedagogical practices were also observed among the problem-frame codes more likely to report using external research. When exploring data with the problem-frame code *Mental Health* (under the parent-level problem-frame code *Non-academic Issue*) applied, there were common decisions to adopt a widely-known evidence-based practice, trauma-informed teaching. Decisions to provide training on



and/or implement trauma-informed teaching were observed in eight out of sixteen responses. When examining decisions made in response to *Instructional Improvement* problems (under parent-level problem-frame code *Instruction Issue*), again we see the decision to implement popular trauma-informed teaching practices (eight out of 74 responses), among other topics. In general, decisions made in response to problems framed as *Instructional Improvement* are often focused on another common practice, standardizing instruction. Approaches to standardization include the use of common formative assessments, lesson planning rubrics, professional learning communities and other designated meetings, and even through program adoptions. The adoption of programs like Bookworms, Orton Gillingham, and Exact Path are mentioned as being adopted with the specific goal of “streamlining” instruction.

Problems framed as *Grade Reporting* (under the parent-level problem-frame code *Systemic Issue*) and *Assessment Problem* (under the parent-level problem-frame code *Curricular, Program, & Intervention*) also often resulted in efforts to standardize instruction. Decisions to shift to standards-based grading and to adopt common assessments were present under both of these problem-frame codes. Eight of the eighteen responses with the code *Assessment Problem* applied, and two of the seventeen responses with the code *Grade Reporting* applied, reference decisions to adopt practices intended to standardize assessments. Thirteen of the seventeen responses with the code *Grade Reporting* applied, and two of the eighteen responses with the code *Assessment Problem* applied, reference decisions to adopt the practice of standards-based grading.

In order to determine if this theme was present in codes that do not have a statistically significant relationship with reported external research use, I selected a few codes for which we might expect to see similar levels of research use to examine qualitatively. Based on the similarly high rates of adoption decisions in this study and the amount of empirical literature available on the topic, we might anticipate similar patterns of research use for codes like *Math* (under the parent-level problem-frame code *Academic Issue*) and *Tracking/grouping* (under the parent-level problem-frame

code *Academic Performance*). In these cases, as described below, the pattern of adopting the same few popular programs and/or practices was not observed. Rather, while adoption decisions were prevalent across these codes, a much broader range of solutions were adopted, and descriptions of adopted programs/practices were not as well defined.

For example, the problem-frame code *Math* (under the parent-level problem-frame code *Academic Performance*) is a type of problem for which we may expect (or hope to see) high levels of reported engagement with external research in the decision making process due to the amount of research available on the topic. In reviewing the data, the pattern of repeated decisions to adopt the same few programs is missing. While there are a couple of programs mentioned by name, like Do the Math and Eureka Math, the majority of responses do not identify a common adoption decision. Decisions made in relation to *Math* problems are broad and include things such as hiring a math coach, changing the schedule, adding a new class, providing after school tutoring, and creating a new resource program. When adoption decisions are made in response to this type of problem, unlike what was observed in the significant child codes, the programs/practices adopted are typically not well defined with countless vague descriptions of adopting “a new math program,” “an online assessment,” or “math intervention.”

Another problem-frame code for which we may expect to see high levels of reported engagement with external research in the decision making process due to the amount of research available on the topic is *Tracking/grouping Students* (under the *Academic Performance* parent code). However, regression analyses indicate that there is no significant relationship between this problem-frame code and reported external research use. As with *Math*, decisions made in response to problems framed as *Tracking/grouping Students* were broad and varied. Unlike problem-frame codes with a significant relationship to research use, a pattern of common decisions was not observed. While many decisions related to *how* students should be grouped and what criteria grouping is based on, approaches ranged from implementing inclusive

classrooms (i.e., general education classroom where students with and without learning differences learn together), discontinuing inclusive classrooms, modifying inclusive classrooms (e.g., creating a policy that these classrooms will have no more than 20% special education students), creating new tracking tools (e.g., Mastery Checklist, Learning Targets), adopting programs that facilitate tracking (e.g., Exact Path, iReady, Reading Edge), using different assessments, and even ensuring behavioral interventions are used with fidelity to prevent over-identifying students for special education.

### 4.3 Summary

This study sought to answer the research question, *what are the problems schools addressed in recent decisions, as understood by individuals working within those schools?* Analysis of open-ended survey data reveal that recent decisions schools addressed a wide range of problems, and those problems were framed in a variety of ways by the individuals working in those schools. Problems were most frequently framed as relating to *Academic Performance* (n= 546, 37.3%). *Non-academic Issues* (n= 272, 18.6%) and *Systemic Issues* (n= 223, 15.4%) were frequently reported as well. Problems framed as *Student characteristics/populations* (n= 35, 2.4%), *Federal/state/local Mandate* (n= 23, 1.6%), or *Community-centered Issues* were least common (n= 17, 1.2%).

Further analysis of the data within each problem-frame code led to the development of child-level problem-frame codes for six of the eight parent-level codes. These child-level problem-frame codes serve to further specify the framing of the problems being reported. A total of 36 child-level problem-frame codes were identified and applied to the data.

Binary logistic regression analysis was conducted in order to answer the research question, *what is the relationship between individuals' problem-framing and the likelihood of the respondent indicating that external research was used in the decision-making process?* Results assessing the relationship between parent-level

problem-frame codes and reported external research use revealed few significant results. While two problem-frame codes, *Systemic Issues* and *Instructional Issues*, do have a statistically significant relationship with reported external research use ( $p < .05$ ), the overall regression model was not statistically significant. Next, a binary logistic regression analysis at the child-code level was conducted and resulted in a statistically significant model. A statistically significant relationship with reported external research use exists for six child-level problem-frame codes: *Social-emotional Skills* (under the *Academic Performance* parent code), *Instructional Improvement* (under the *Instructional Issue* parent code), *Grade Reporting* and *Schedule* (under the *Systemic Issue* parent code), and *Behavior/discipline* and *Mental Health* (under the *Non-academic Issue* parent code). With the exception of *Schedule*, for each statistically significant child-level problem-frame code reported engagement with external research was more likely to occur than not. For problems framed as *Schedule*, reported engagement with external research use was actually less likely to occur. In order to explore the quantitative patterns more deeply, code co-occurrence was examined to determine if certain types of decisions, adoption decisions specifically, were ultimately driving the results for the significant problem-frame child codes. While adoption decisions are prevalent across the significant codes, they are also prevalent across insignificant codes, and decision type alone may not explain the quantitative results. Reexamination of the qualitative data was undertaken in an attempt to identify patterns in the significant and non-significant child-level problem-frame codes. A pattern identified in the significant problem-frame codes, that is absent from the non-significant problem-frame codes, is the adoption of the well-known, popular programs and practices viewed as evidence-based. The potential implications of this finding, as well as limitations of this study and suggestions for future research, will be discussed in the next chapter.

## Chapter 5

### DISCUSSION

#### 5.1 Problem and Research Questions

There are increasing expectations and requirements for schools to use scientific research evidence instrumentally in problem-solving and decision-making. While these expectations have existed for some time, going back to No Child Left Behind (2001) and earlier, there is little evidence that research use is happening in this way. While the field of knowledge utilization literature has grown over the last two decades, and countless studies have explored various factors at play, there is a lack of research on the impact that problem-framing may have on evidence used in decision-making. If schools are to use research instrumentally, specifically to solve problems and make decisions, it seems important to understand the problems that exist and how school-based practitioners understand them. The current study attempts to address this problem by answering the research question, *what are the problems schools addressed in recent decisions, as understood by the individuals working within those schools?* with data from the Survey of Evidence in Education for Schools (SEE-S).

Based on existing literature from the fields of knowledge utilization and organizational learning regarding problem-framing and decision-making, this study proposed a conceptual framework highlighting the potential role of problem-framing in shaping the search for evidence and ultimately the final decision. Using data from the SEE-S indicating individual respondents' problem-framing and reported use of external research in the decision-making process, this relationship was statistically tested to answer the research question, *what is the relationship between individuals'*

*problem-framing and the likelihood of the respondent indicating that external research was used in the decision-making process?*

## **5.2 Discussion**

### **5.2.1 Diversity of Problem-frame & Decisions**

Although there have been significant investments in the study of educational research use and a large body of empirical literature on the topic exists, there is a gap in the literature when it comes to investigating the types of problems that schools and school-based practitioners face and how they understand them. As detailed in the Literature Review chapter of this paper, while existing research on school and district decision-making can provide some insight into the kinds of issues schools are working to solve (Coburn, Toure, & Yamashita, 2009; Farley-Ripple, 2012; Penuel, Farrell, Allen, Toyama, & Coburn, 2018), direct investigations and attempts to classify types of problems are limited.

A key finding of this work is the volume and diversity of challenges schools report facing. Challenges cited include low student test scores, inadequate curriculums, lack of parent/family involvement, school safety concerns, ineffective professional development, and alignment with standards, just to name a few. Problem-frames varied not only between content areas (parent-level problem-frame codes), but also within categories. For example, when respondents describe problems with academic outcomes (coded at the parent-level with problem-frame code *Academic Performance*), there are seven different child codes to further distinguish and specify particular content areas or topics. Even when examining data with the same child-level problem-frame code applied, differences can be identified. Responses coded for *Technology Integration*, for instance, could describe something as simple as providing training for teachers on a new web-based platform to something as complex as providing each student with an electronic device to access the Internet and digital course materials.

In addition to problem-framing, this finding reflects the diversity of decisions being made to address the challenges. The normative model of research use underlying policy expectations highly corresponds with instrumental uses of research, suggesting that educators evaluate evidence of effectiveness and often ultimately make adoption decisions. However, analyses from the current study reveal that schools engage in at least ten different types of decisions, including those related to implementation, human resources, and creating/modifying policies for example (see Appendix G for full codebook of decision types). The broad range of types of decisions made in schools may suggest that a wider range of evidence, beyond just scientific research, may be useful to schools engaged in improvement efforts (Farley-Ripple, Tilley, Sheridan, & Gallimore, 2020). For example, schools engaging in implementation decisions (i.e., decisions to modify how a program, practice, or intervention is being implemented) may rely heavily on internal, local data to identify where modifications are necessary. Schools engaged in certain human resources decisions (i.e., hiring or reducing staff) may be more concerned with evidence related to organizational factors (e.g., budget, school/district processes) than external research evidence.

In light of the wide range of problem-frames and decision types identified, it is important to consider the availability of relevant research. As discussed in the Literature Review section, many factors may influence educators use of research evidence (or lack of), including the extent to which quality research on a particular topic exists and is accessible to practitioners. Taking into account the lack of research on the types of problems schools face, the absence of a standardized mechanism for practice to inform research, and the current finding of diverse problem-framings, availability may be a significant barrier to research use. When schools engage in curriculum or program adoption decisions, which align with policy conceptions of research-based decision-making, they may be more likely to find an available research base to inform decision-making. In contrast, it may be the case that when making other types of decisions (related to structural changes, human resources, or

implementation, for example) that there is little empirical evidence available to inform decision-making.

In the current study, problems related to *Academic Performance* were the most prevalent. These were problems framed as being with student performance, test scores, or proficiency in various academic content areas including English language arts, math, life skills, and social-emotional skills. This is perhaps unsurprising. Considering the nature and purpose of schools, it is logical that a majority of problems relate to student learning and achievement. Penuel et al. (2018) found that the resources practitioners find most useful are those focused on “instructional practices and learning in the classroom” and “learning in specific subject matter content areas,” suggesting that, consistent with the findings of the current study, there is a focus on improving students’ academic performance in subject matter content areas.

### **5.2.2 Classification of Problem-frames**

In making sense of the current study’s findings, I looked to draw comparisons with the two prior studies identified that directly investigate and classify the types of problems schools face. First, it is worth noting that both studies use data from outside of the United States. Steinbach & Leithwood’s (1995) research comes from Canada and Neeleman’s (2019) comes from the Netherlands. Additionally, both studies focused exclusively on principals and school leaders, while the current study includes data from all instructional staff in sampled schools and is composed heavily of classroom teachers. Finally, the survey item from the SEE-S used in the current study limits problems to those directly related to teaching and learning (see Appendix B for item) while the other two studies were not limited in this way and included an even broader variety of issues. These differences in context, sample, and data should be considered when examining the comparability of the findings regarding types of problems schools face.

While the Canadian study identified sixteen problem categories in total, “four categories were reported much more frequently than the rest,” (Leithwood &



Steinbach, 1995, p. 24): teachers, students, parents, and school routines. Each of these categories was further specified by a set of subcategories (see Table \_ for details). While the researchers conducting this study took a different approach to classifying problems than the current study, parallels can be drawn between the two frameworks. In the Leithwood & Steinbach (1995) study, the category Teacher was further specified by a set of 16 subcategories. Of the 16 subcategories identified in the study, eight map onto the problem-frame codes developed in the current study (see Table S). Six of the eight parallel categories map onto the *Instructional Issue* problem-frame code and two map onto the *Systemic Issue* problem-frame code. The problem category Parents from the Leithwood & Steinbach (1995) study very closely resembles *Community-centered Issues* in the current study, with three of the five subcategories having direct parallels with child-level problem-frame codes under *Community-centered Issues*. Leithwood & Steinbach's (1995) category Students seems to coincide with the current study's parent-level problem-frame code Non-academic Issue, with parallels drawn between six of the fourteen subcategories. School Routines had the least amount of overlap (four out of 21 subcategories) but was most closely aligned with the parent-level problem-frame code *Systemic Issue*.

Neeleman (2019) identified three domains, Education, Organization, and Staff, each with a set of subdomains. Table \_ shows the connections between the Neeleman (2019) framework and the problem-frame code framework developed for the current study. Three of the four subdomains for Education have parallels to the problem-frame codes in the current study, specifically *Instructional Issues* and *Curriculum, Program, & Intervention Problems*. Six of the eight subdomains for Organization have parallels to the problem-frame codes in the current study, some even direct such as *School Culture* (which is present in both frameworks) and *Budget* (under the parent-level problem-frame code *System*) which corresponds to Neeleman's subdomain Financial Resources. Three of the four subdomains for Staffing are comparable to problem-frame codes present in the current study. Two of the Staffing subdomains align with issues related to *Professional Practice* (under the parent-level problem-frame code

*Instruction Issue*) and one aligns with issues related to *Staffing* and *Enrollment* (both under the parent-level problem-frame code *Systemic Issue*).

Table 13. Comparison of Problem Categories Between Leithwood & Steinbach (1995) & Current Study

<b>Leithwood &amp; Steinbach (1995) – Problem Category</b>	<b>Leithwood &amp; Steinbach (1995) – Problem subcategory</b>	<b>Current Study Parallel Problem-frame category – Parent-level (child-level)</b>
Teacher	Assignment of teaching duties	Systemic Issue (Staffing)
	Conflicts among teachers	
	Conflicts between teachers/students/admin	
	Curriculum review, development, implementation	Instruction Issue (Intervention Implementation); Curriculum, Program, & Intervention
	Dereliction of duty	Instruction Issue (Professional Practice)
	Dress code	Instruction Issue (Professional Practice)
	Extra-curricular	
	Judgement of teacher proposed ideas	
	Level of competency	Instruction Issue (Instructional Improvement)
	New teachers	
	Personal problems	
	Professional Development	Instruction Issue (Professional Development)
	Staff/dept meetings	
	Teacher coverage	Systemic Issue (Staffing)
	Teacher evaluation	Instruction Issue (Professional practice)
	Teacher exchange	
School Routines	Assemblies	
	Attendance	Non-academic Issue (Attendance)
	Budget	Systemic Issue (Budget)
	Commencement planning	
	Dances	
	Drills and routine for students	

Table 13. continued.

	Feeder school visit	
	Field trips	
	Fire drills	
	Fund raisers	
	Graduation awards	
	Home room visits	
	IPRC & Special Ed Meetings	
	PA Announcements meeting	
	Retimetabling of classes	Systemic Issue (Schedule)
	Report cards	Systemic Issue (Grade Reporting)
	Sept. Report	
	Student council meetings	
	Teacher routines/plans	
	Timetabling	
	University night	
Students	Abuse	Non-academic Issue (Physical Health, Mental Health)
	Adult students	
	Attendance	Non-academic Issue (Attendance)
	Cafeteria	
	Commendation	
	Complaints	
	Discipline	Non-academic Issue (Behavior/discipline)
	Evaluation	
	Injuries	Non-academic Issue (Physical Health)
	Placement	
	Special requests	
	Student council	
	Student problems	Non-academic Issue (Safety, Mental Health, Physical Health)
	vandalism	Non-academic Issue (Behavior/discipline)
Parents	Communication	Community-centered Issue (External Communications)
	Complaints	Community-centered Issue (Parent/community Complaint/request)
	Parent council/groups	
	Parent's night	
	Parental involvement or lack of	Community-centered Issue (Parental Engagement)

Table 14. Comparison of Problem Categories Between Neeleman (2019) & Current Study

<b>Neeleman (2019) Problem Domain</b>	<b>Neeleman (2019) Problem subdomain</b>	<b>Current Study Parallel Problem-frame category – Parent-level (child-level)</b>
Education	Pedagogical approaches	Instruction Issue
	Educational programs	Curriculum, Program, & Intervention
	Systemic pathways	
	Learning environments & methods for teaching, learning, & assessment	Curriculum, Program, & Intervention, Non-academic Issue (School Culture), Instruction Issue
Organization	School culture	Non-academic (School Culture)
	Org structures	Systemic Issue
	Org of education	
	Quality assurance	
	Student care & support	Non-academic (Mental Health, Physical Health, School Culture)
	Stakeholder relationships	Community (Community Engagement)
	Financial resources	Systemic Issue (Budget)
	Facilities & accommodation	Systemic Issue (Access, Budget, Enrollment)
Staff	Professional autonomy & culture	Instruction Issue (Professional Practice)
	Teaching and school related assignments	
	Staffing policy assessment & payment	Instruction Issue (Professional Practice)
	Recruitment and employment	Systemic Issue (Staffing, Enrollment)

### 5.2.3 Using Problem-frames to Evaluate Extent of External Research Use

Across problem-frame types the use of external research in decision-making processes ranges from 0%-52.94% with an average usage rate of 21.43%. The CRUE project, and the SEE-S developed by its researchers, serves as one of the first attempts to measure the depth of research use in school-based decision-making. Accordingly,

there is no existing standard of external research use against which to compare the findings from the current study. While policy has mandated the use of scientific research evidence in educational decision-making, the issue of when and how often research should be used has not been addressed in the discourse. Considering the significant efforts and investments made to encourage and even require schools' use of rigorous external research, the average usage rate of 21.43%, subjectively, feels disappointing. This is especially true when considering the fact that the SEE-S' focuses on instrumental research use, the type of use privileged in evidence use policy. Schools are complex organizations that engage in a multitude of decision-making processes, including decisions about day-to-day logistics or routines that may not necessarily require the use of external research evidence. If these types of problems and decisions were frequently reported in the data, this might help to explain the generally low usage of external research. However, the survey item used to classify problem-frame types in this study attempted to exclude these types of processes by specifically asking for reports of problems and decisions related to student outcomes, where we would expect to see more reports of engagement with external research evidence. And evidence suggests this approach was largely successful as the most frequently reported problem-frame was *Academic Performance*. The finding that external research, on average, is being used in 21.43% of organizational decisions related to student outcomes suggests that there is room for improvement. Recommendations for changes and future research will be offered later in this section.

Previous research has not directly investigated the relationship between individuals' problem-framing and reports of external research use in the decision-making process. There are, however, studies of research use in educational decision-making that can provide insight into aspects of the relationship (Coburn, Touré, & Yamashita, 2009; Farley-Ripple, 2012; Penuel, Briggs, Davidson, Herlihy, Sherer, Hill, Farrell, & Allen, 2016; Penuel, Farrell, Allen, Toyama, & Coburn, 2018). While these studies are focused on decisions rather than problems, we can make inferences regarding the types of challenges schools are facing based on the decision-making

processes they engage in. For example, if a decision-making process is focused on adopting a new math curriculum, we can infer that the school is facing an issue with the adequacy of their current curriculum and/or is experiencing poor student outcomes in math. Further, by understanding in which decision-making processes external research use is considered useful, we are able to not only identify types of problems but also how they may relate to the use of external research. For example, Penuel et al. (2016) reports that leaders' in their study "professed use of research to select curriculum materials and other programs throughout the survey," (p. 3). While the prevalence of adoption decisions was high across problem-frame types in this study, most problem-frame codes were not found to have a statistically significant relationship with reported external research use. Specifically, problems framed as being related to *Curriculum, Programs, & Interventions* did not have a statistically significant relationship with reported external research use despite resulting in the highest number of adoption decisions (67.33%). Interestingly, regression results find that external use of research is significantly more likely to occur when problems are understood to be about assessment, which resulted in adoptions less than a third of the time. Compare this to curricular problems, which result in adoptions 76.27% of the time but which are not significantly more likely to use external research. These findings suggest some possible divergence with this Penuel et al. (2016) finding. It is possible that some of the difference in the findings of the two studies could be related to the difference in the samples. The Penuel et al. (2016) study focused exclusively on school leaders while the current study includes instructional staff at all levels of the school. Future research could extend the analysis of the current study to explore differences at the level of respondent role.

Findings from previous research have also suggested that schools engage in external research use when developing professional development for teachers and administrators (Penuel, et al., 2016; Matherson & Windle, 2017; Cordingley, 2015). Results of analyses in the current study, however, do not provide evidence for this assertion. The coding framework for this study included a child-level problem-frame

code for *Professional Development* (under the parent-level problem-frame code *Instructional Issue*). Responses with this code applied described issues of incomplete, ineffective, or absent professional development; for example, “*PLC’s were not data driven*” or “*Decision: More relevant professional learning was introduced; Problem: To make professional learning more useful for staff.*” As may be expected, the majority of problems framed in this way resulted in decisions to provide some form of professional development (50%). Despite the high prevalence of decisions to provide professional development, the problem-frame code *Professional Development* does not have a statistically significant relationship with reported external research use, as findings from previous research may suggest.

Another code for which we may expect to see a high frequency of decisions to provide professional development is *Instructional Improvement* (under the parent-level problem-frame code *Instructional Issue*). While analyses indicate that problems framed as *Instructional Improvement* are significantly more likely to use external research in the decision-making process, the majority of decisions made in response to these problems were actually adoption decisions (47.3%) not decisions to provide professional development (28.38%). While not the focus of the current study, which is concerned with problems and problem-framing, a future study could potentially use similar regression analyses to determine whether a relationship exists between reported external research use and the type of decision that is ultimately made. It would be interesting to determine whether or not the decision code *Professional Development* has a statistically significant relationship with reported external research use, as another approach to testing the findings of earlier research.

#### **5.2.4 Local Nature of Problem Context**

As alluded to in the *Qualitative Reanalysis of Child Code Level Data* section of the Results chapter, there may be certain problem-framings where the highly localized context may limit the usefulness of external research. This is a possible explanation for the significant, but negative, result identified for the parent-level problem-frame

code *Systemic Issue* and its child-level problem-frame code *Scheduling*. Results of the binary logistic regression analysis show that when problems are framed as relating to a *Systemic Issue*, specifically *Scheduling*, reported engagement with external research use in the decision-making process is significantly less likely to occur. In examining the decisions made in response to problems framed as *Scheduling*, many were responses to logistical demands. For example, the decision to add an intervention block to the school day in order to accommodate students who are unable to attend before or after school due to transportation limitations, or the decision to forego a planned teacher professional learning day in order to make up for instruction time missed due to a hurricane. Although research may exist that could potentially be informative or useful in addressing these problems, it may not be intuitive for educators to look to external research in these cases considering very specific nature of the challenge.

While not statistically significant, binary logistic regression analysis at the child-level suggest an inverse relationship with reported external research use for six of the eight child-level codes under the *Systemic Issue* parent-level problem-frame code. *Budget*, *Staffing*, *Enrollment*, *Access*, and *Internal Communications* were not found to have a statistically significant relationship with reported external research use, but the negative *B* values suggest that if a relationship did exist with these codes that reported external research use would be less likely to occur. Like *Scheduling*, it may be the case that problems framed in these ways are inextricably tied to local contextual factors, therefore limiting perceptions of the usefulness of external research in informing solutions. When examining the decisions made in response to problems with these codes applied, again we see responses to logistical demands. Under *Budget* and *Staffing*, for example, there are numerous decisions to discontinue particular programs/interventions, reduce staff, and eliminate staff positions in response to insufficient funding. Educators engaged in decision-making to address these problems may struggle to see the relevance of external research. Problems framed as *Enrollment* typically related to high enrollment, for example the problem and decision



combination “*Decision: Rezoning; Problem: Overcrowding,*” or low enrollment, “*Decision: Change the number of Fine Arts days on the schedule; Problem: We did not have enough students to justify having all of the teaching positions at our school.*”

While it is certainly possible that useful external research related to these types of problems may exist, seeking external evidence to inform decision-making in these types of situations may not be intuitive to decision-makers.

It is important for researchers and policymakers to know that instrumental use of external research might not make sense for every type of problem schools face. In these scenarios it may be the case that locally generated evidence (whether central office, school, youth-led research, or local data analyses) is the most valuable and it may not be appropriate for researchers to try to generate universally useful research on these topics. Experiential knowledge, like professional judgement, experience, expertise of others, and stakeholder input, might be more helpful than any external research. Additionally, policymakers may want to consider broadening the scope of purposes of research. While current policy does not exclude non-instrumental uses of research, it does not emphasize them in the same way as instrumental use. External research might not be very useful instrumentally in response to certain problems, but perhaps deeper engagement with external research conceptually shaping educators understandings of their practice would lead to improved decision-making, even in those decisions that are made in response to logistical demands. For example, if a school is experiencing a budgetary problem that requires cutting costs, decision-makers with research-based understandings of the importance of culturally responsive pedagogy may make different decisions about what to cut than decision-makers without that understanding. These research-informed decision-makers may advocate to retain certain programs or curricula, diverse books/materials, or certain cultural events/activities that without that knowledge would potentially be discontinued.

### 5.2.5 Adoption of Popular, Widely-known Programs & Practices

One of the primary findings from the integration of the quantitative and qualitative data in this study relates to a commonality observed among the child-level problem-frame codes that are statistically significantly more likely to use external research. Through reanalysis of the qualitative data a pattern was identified suggesting that, for these significant codes, there are common decisions to adopt the same few popular, widely-known programs/practices that are viewed as evidence-based. Detailed in the Results chapter, common decisions to adopt programs like PBIS and Second Step in response to problems framed as *Social-emotional Skills* or *Behavior/discipline* were observed. Similarly, common decisions to adopt practices like trauma-informed teaching and standards-based grading in response to problems framed as *Instructional Improvement* or *Grade Reporting* were observed. For problem-frame codes that did not have a statistically significant relationship with reported external research use, although adoption decisions were prevalent, the pattern of common decisions to adopt popular programs/practices was not observed.

There are findings from other studies that connect with the findings from the current study. For example, analyses of other items from the SEE-S reveal a preference for what the study's researchers refer to as "practitioner-oriented professional resources" (May, et al., 2022). Specifically, an item in the SEE-S provided a list of multiple different products and asked respondents to indicate how many they had used in the last year "with the intention of informing practice." Exploratory and confirmatory factor analysis of the data from this item suggest evidence for three latent variables for the types of products consumed by school-based practitioners: research products, professional resources, and media products. Findings point to a preference for professional resources, inclusive of professional development materials and conferences/presentations and their associated materials, compared to research and media products. This finding seems consistent with the current finding regarding adoption of popular programs/practices. Popular programs like PBIS and Second Step are research based, and there are traditional research products (e.g., peer-

reviewed journal articles, research and evaluation reports) associated with them (Frey, Hirschstein, & Guzzo, 2000; Bradshaw, Koth, Bevans, Ialongo, & Leaf, 2008; Horner & Sugai, 2015). However, these programs are also available in more practitioner-oriented formats, such as packaged curricula, trainings, and conferences. As also suggested by prior research, perhaps this format is the attractive feature of these programs/practices, beyond being research-based (Cordingley, 2008; Penuel, et al., 2018; Lawlor, Mills, Neal, Neal, Wilson, & McAlindon, 2019). Research products, inclusive of peer-reviewed journal articles and program/evaluation reports, were the least frequently utilized products in the May, et al. (2022) study. These types of products often lack the “pick-up-and-use” quality that may be attractive in professional resources (Carrier, 2017; Cordingley, 2008). The finding regarding the popularity of media products in the May, et al. (2022) study is also interesting. Data indicate high use of media products, inclusive of news, podcasts, videos, blogs, and social media posts, as well. It may be the case that these types of media products contribute to popular, widely-known programs/practices becoming widely-known.

Case study findings from four schools identified as “deep users” of research also provide support for the finding of the current study related to the adoption of popular programs/practices (Farley-Ripple, Tilley, & Mead, 2022). First, analysis of case study interview data reveals that the practitioners in these schools equate the use of evidence-based programs (e.g., Bookworms, Orton Gillingham, PBIS) with research use. In the current study, if we frame the findings differently, respondents were more likely to report and cite verifiable external research being used in the decision-making process when their school engaged in the adoption of a popular program/practice. This would suggest that maybe rather than problem-framing itself, the availability of a popular evidence-based program/practice in response to a particular problem-frame, influences whether or not research use is more likely to occur. If this is the case, it raises some important questions and considerations for the research community. For problem-frame types for which no widely-known, popular program/practice exists, is there less research available on the topic in general? Or is it

that the research does exist, but it is not in a practitioner-oriented format that leads to its popularity?

#### **5.2.6 Salience of Social-emotional Related Issues**

The emergent coding process used to develop the problem-frame coding framework employed in this study identified three distinct codes related to students' social-emotional wellbeing and learning. While these problem-frame codes are distinct<sup>1</sup>, this suggests an umbrella of social-emotional related issues that are salient and increasingly prevalent in schools. The fact that three separate codes were needed to capture challenges related to social-emotional skills and learning is an indicator of how frequently school-based practitioners are faced with problems they frame in this way. Overall, across the three codes, there were 198 applications of problem-frame codes related to social-emotional skills and learning. Additionally, for each school in the sample there was at least one application of either *Social-emotional Skills*, *Mental Health*, or *Behavior/discipline*. This provides evidence that these types of problems are not specific to schools with particular demographics or contextual characteristics but rather are experienced by a wide range of schools across the United States. The high prevalence of these problem-framings in the SEE-S data means that practitioners are actively seeking solutions to social-emotional related challenges. This type of demand may create conditions for external research use to occur. All three codes related to social-emotional topics were found to be statistically significantly more likely to engage with external research in the decision-making process.

One potential explanation for this relationship could be related to the amount of relevant literature on these topics. While research focused on students' social-emotional development is not a new field of study, compared to other topic areas

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<sup>1</sup> See Codebook in Appendix H for distinction between codes. Tests of collinearity and multi-collinearity were conducted in SPSS to confirm collinearity does not exist at the parent or child code level, see Section 3.5.2.5 for details.

(literacy for example) the current empirical literature base is younger and narrower. It may be the case that these characteristics facilitate practitioners use of external research on the topic because there is less relevant evidence available to sift through. As discussed in the Literature Review section, earlier research from organizational learning found when practitioners search for evidence, they “tended to look indiscriminately at everything that came their way, and in that they could not described exactly what it was they were looking for,” (Kennedy, 1982, p. 19) and that the very nature of empirical research may lead to “contestable and ambiguous findings,” (Davies & Nutley, 2008, p. 7). It may be that the more research that has been conducted on a topic, the more likely it may be to find inconclusive or contradictory findings to interpret. This may help to explain why the problem-frame code *Language Arts* (under the parent-level problem-frame code *Academic Performance*) did not have a statistically significant relationship with reported external research use despite the decades of research and expansive literature on literacy.

### **5.3 Limitations & Recommendations**

The empirical results reported herein should be considered in light of some limitations. As with the majority of studies, the design of the current study is subject to limitations. First, the study relies on self-reported survey data. Self-reported data must be taken at face value despite the fact that it is subject to issues of selective memory, telescoping, attribution, and exaggeration (Bowen & DeLucia, 1992). The CRUE research team attempted to address this limitation for the data from one of the survey items used in this analysis by subjecting responses to a validation process (i.e., the item measuring reported external research use, see Methods section for description of validation process). As this study is the first of its kind, this validation process is novel and could be further tested and potentially improved. The other survey item used in the analysis for this study relies on open-ended self-report data, which presents additional challenges. The clarity and quality of responses vary greatly. Some responses provide descriptions of multiple problems, some do not provide any, and

some are unintelligible. The research team attempted to address this limitation by creating a code called *Usability* (see Appendix H for codebook) and excluding responses that are either unreadable or do not provide an answer to the question asked. Another challenge with this open-ended data relates to the design of the survey item capturing it. Due to the original purpose of the larger study within which this study takes place, the open-ended item that captures problem-frame data is a two-part item that actually emphasizes the decision, rather than the problem. Rather than directly asking respondents to provide a description of a problem and the decision that was made to address it, the item asks respondents to identify an organizational decision and then asks, “*Why was the decision necessary (i.e., what challenge/problem did it address, what was the goal?*” Accordingly, the resulting data used to identify problem-frames are reports of why a decision was made. While the difference is subtle, and problem-framing can still be determined with the available data, future studies focused on problem type and/or problem-framing may benefit from shifting the focus of the item to be more directly on a description of the problem. Relatedly, it is also important to acknowledge that there are likely other ways of coding problem-frames. For example, in their work on leadership Heifetz & Laurie (1997) distinguish between “technical challenges,” which are responsive to technical expertise and support, and “adaptive challenges,” which require challenging deeply held beliefs. Adopting a different approach to coding problem-frames might yield additional insights about how they relate to reported external research use.

It is important to keep in mind that, ultimately, this study provides insight into the degree to which an individual’s reported problem-framing coincides with their ability to report and cite external research being used in an organizational-level decision-making process. While respondents from the same school often report on the same decision, each respondent may have their own understanding of the problems motivating the decision. In organization-level decisions it is unlikely that all members of the staff are equally involved and familiar with the details of the decision-making process (May, et al., 2022). These differences in familiarity with the process could

lead to different understandings and reports of what occurred. The current study did attempt to address this issue by including a filtering question to determine a respondents' level of familiarity with the organizational decision (see Methods for a description, see Appendix C for item, see May, et al., 2022 for details) and filtering out respondents who were not familiar enough with the decision-making process to respond to the subsequent survey items. While this measure certainly helped to reduce the impact of this issue, differences in individuals' understandings of what occurred could still exist and may be worth exploring further in future research. Further investigation of organizational-level decisions could consider the impact, and potentially assess, the level of collective understanding of the problem-frame. The conceptual framework guiding this study highlights the idea that "varied practitioner understandings" (based on foundational knowledge, personal biases, and experiences) impact problem-framing (Huber, 1991). Within a school, opportunities to build shared problem-frames or collective understanding of a problem may help to moderate the effects of "varied understandings" and lead school members to frame problems in more similar ways, which may in turn lead to improved decision-making processes (Penuel & Fishman, 2012).

Another limitation of the current study is that the relationship between research use and particular problem-frames could not be fully explored due to the low frequency of reporting. While a sample of 1,343 responses is sizeable and compelling, it was not large enough to ensure adequate statistical power for each problem-frame type. For example, there are only 23 instances of the parent-level problem-frame code *Federal/state/local Mandate* and only 17 instances of the parent-level problem-frame code *Community-centered Issues* (meaning even smaller sample sizes for its associated child codes). Child-level problem frame codes *Safety* (n=6), *Drop-out* (n=2), *Professional Development* (n=8), *Technology Integration* (n=5), *Intervention Problem* (n=7), and *Transportation* (n=4) lack the statistical power to determine if meaningful differences in reported external research use exist. It should be noted that just because a problem-frame was not mentioned frequently in the data does not mean

that most schools are not working on those issues, but rather that they were not top of mind for practitioners responding to our survey.

This presents a tension in the analysis: the larger sample sizes for parent-level problem-frame codes offer more statistical power, but masks important variability in the nature of child coded problems and likely the role of research in addressing those problems. But, at the same time, analysis at the child code level is likely to be underpowered because disaggregation to child codes reduces the sample size in any category. Future studies could address this limitation by applying the problem-frame coding framework to a larger sample of data, or by designing a study which directs groups of respondents to identify a particular type of problem in order to ensure that each problem-frame type of interest is adequately represented. Additionally, future research could come in the form of targeted qualitative case studies to help unpack nuances.

Relatedly, in considering the problem-frame coding framework that emerged from this data, there is a notable absence of direct discussions of problems related to race and equity. This is unexpected considering the well-documented pervasiveness of issues related to race and equity in the United States generally, and in schools specifically (Pigott, Tocci, Ryan, & Galliher, 2021). Even in the early exploratory interviews conducted for the CRUE project, school-based practitioners often discussed challenges related to racial disparities and inequity. The qualitative data in the current study was analyzed using an emergent thematic approach, so while we may have expected to see issues related to race and equity emerge explicitly, they did not. It is likely the case that issues of race and equity underlie many of the problems reported in the data, but the way responses were framed by respondents did not explicitly make that connection. For example, responses coded for *Student Characteristics/populations* often referred to challenges with student achievement or disparities for particular student groups (e.g., racial/ethnic, English Language Learners, low socioeconomic status, etc.). Therefore, while typically not explicit, issues relating to race and equity are subtly present throughout the data. Future research could adopt an alternative



qualitative analysis approach that specifically looks to identify underlying racial and equity related problems that may be implicit in the data. Future research could take a more explicit focus on the use of research to address problems of equity, but it might be hard to do that in a survey because of the difference in how educators *talk* about these issues compared to how they report them in an open-ended survey item. As mentioned, in early exploratory interviews conducted by the CRUE researchers, educators explicitly mention challenges related to issues of race and equity, but those explicit descriptions were not present in the open-ended survey data gathered by the SEE-S. It may be the case that these complicated, often sensitive topics are more difficult to clearly communicate in an open-ended text box than in a conversation with an interviewer.

Lastly, the current study focused exclusively on the reported use of external research evidence, defined as “articles, books, or summaries based on external research or program evaluation” (with *research* being specified even further with the definition “systematic data collection and analysis driven by research questions”) (SEE-S, 2019). While this focus was intentional in order to respond to current policy demands, I acknowledge that it provides a narrow window into what is happening in school-based decision-making. Future research should consider the use of other types of evidence such as formal and informal local data analyses, local research conducted by schools and districts, advice from local and national experts, or practitioners own experiential knowledge to get a more complete picture of the complicated nature of evidence use in school-based decision-making.

#### **5.4 Conclusion**

Despite its limitations, the findings from this study contribute new insights to the field of knowledge utilization in education. We now have a better understanding of the types of problems school-based practitioners face and how they understand them, an under-researched field of study. In order for the research community to be responsive to the needs of practitioners, it is important that we have evidence from practitioners

regarding the challenges that they face. Problem-frames give us insight into which problems practitioners perceive that research is available/useful, which means that we might improve research use in other areas by ensuring research is available/useful. Problem-frame code development in this study was open and totally data driven. While the developed framework does not claim to represent all possible problems schools may face, it does provide data from a significant, diverse sample of real, school-based practitioners and their reports of problems. While problems in schools are ever-evolving and the current study captures an assessment from a particular point in time, it serves as an important first step to understanding and classifying problem-frames and offers a methodological approach to do so.

A second contribution is that this study provides the first examination of the relationship between individual educators' problem-framing and the extent to which external research use is reported in organizational-level decisions. Findings from this analysis highlight the relevance of the highly localized problem context in which decision-making unfolds and suggests that it may limit the usefulness of external research for certain decision-making processes. When problems were framed as relating to *Scheduling*, for example, regression analyses revealed that the use of external research was significantly less likely to occur. As was detailed earlier in this section, codes like *Budget*, *Staffing*, or *Federal/state/local Mandate* for example, while not found to have a statistically significant relationship with reported external research use in the current analysis, may also be examples of problems that are less conducive to external research use. This finding has implications for how researchers and policymakers understand and evaluate external research use in school-based decision-making; bringing awareness to the fact that seeking external sources of evidence may not be efficient in all situations.

Additionally, this study documents the increasing prevalence and salience of problems related to social-emotional wellbeing and learning in schools. Across all of the schools included in the study there are reports of problems related to students' social-emotional skills, mental health, and/or behavior, suggesting that these issues are

diverse and wide-reaching. The study identified three distinct problem-frame codes related to social-emotional issues, and all three were found to have a statistically significant relationship with reported external research use. Results indicate that when problems are framed as relating to social-emotional development topics, decision-makers are significantly more likely to report using external research than not. This suggests that perhaps the increased demand for solutions related to these issues creates conditions that facilitate external research use.

Finally, this study provides new evidence for the existence of the relationship between problem-framing and reported external research use in decision-making. Regression analysis results indicate that certain problem-framings are associated with greater reported engagement with external research. For those codes associated with greater reports of external research use, a pattern of adopting the same few popular programs was observed. Although adoption decisions were prevalent across all problem-frame codes, whether or not they had a statistically significant relationship with reported external research use, non-significant problem-frame codes were observed to be adopting a much broader range of solutions. This finding may have implications for how research findings are disseminated. While it is not possible to simply *make* a program or practice popular and widely-known, future research could be conducted to examine how some of the popular programs and practices identified in the data were disseminated. How did they become popular and widely-known? What types of research products did they produce? What dissemination outlets did they rely on? By investigating these questions and focusing on programs/practices that have been successfully spread, we may be able to identify recommendations more actionable than simply, broaden dissemination efforts.

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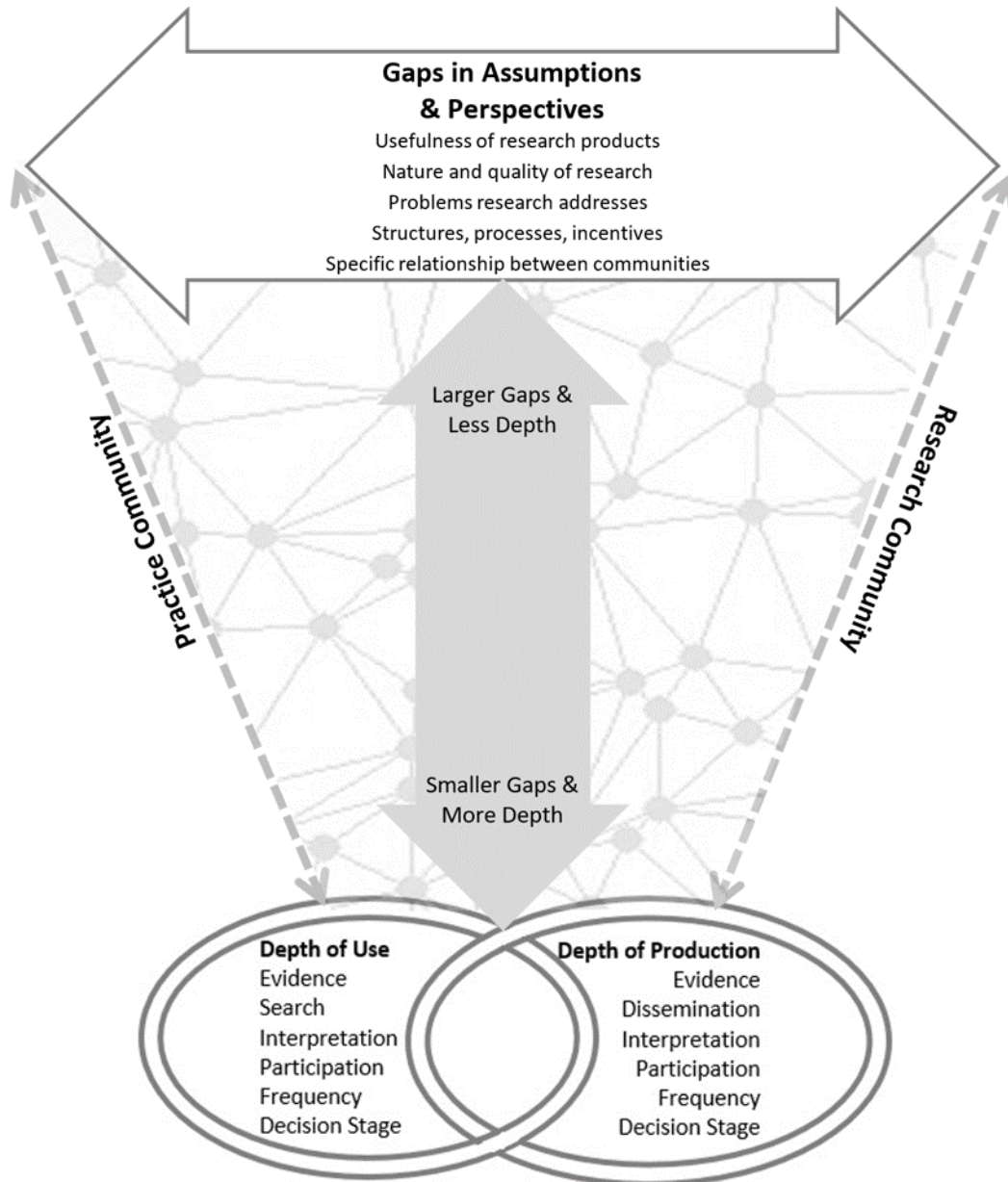
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## Appendix A

### CENTER FOR RESEARCH USE IN EDUCATION CONCEPTUAL FRAMEWORK



## Appendix B

### SEE-S ITEM – SCREENSHOT OF ITEM CAPTURING PROBLEMS AND DECISIONS

Please think of an organizational decision related to student outcomes that was made by your school or district this year or the previous year. If you cannot think of a school or district decision, please leave the following items blank and continue.

What decision was made (i.e., what was changed or introduced/what actions were taken)?

Why was the decision necessary (i.e., what challenge/problem did it address, what was the goal)?

## Appendix C

### SEE-S ITEM – SCREENSHOT OF ITEM USED TO DETERMINE FAMILIARITY WITH AND ORGANIZATIONAL DECISION

Although you may or may not have been involved in the decision you described above, how familiar are you with each of the following aspects of the decision process?

	Not Familiar	Somewhat Familiar	Mostly Familiar	Very Familiar
The information used to inform the decision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The process for gathering the information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Who was involved in gathering information and/or making the decision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix D

### SEE-S ITEM – PARTIAL SCREENSHOT OF ITEM USED TO CAPTURE EXTERNAL RESEARCH USE

To what extent did the following types of information influence the decision? Please check a response for every row.

Note: Click on underlined text for a definition of the word or phrase.

	Had little or no influence	Had some influence	Heavily influenced	I Don't Know/Remember
Articles, reports, books, or summaries based on external <u>research</u> or program evaluation (paper or web-based)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Research</u> or program evaluation conducted by central office staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Research</u> or program evaluation conducted by teacher(s) or principal(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Research</u> or program evaluation led by students or local youth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other formal analysis of school-wide or district-wide data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informal data collected by school/district staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>




## Appendix E

### SEE-S ITEM – SCREENSHOT OF EXTERNAL RESEARCH VALIDATION ITEM

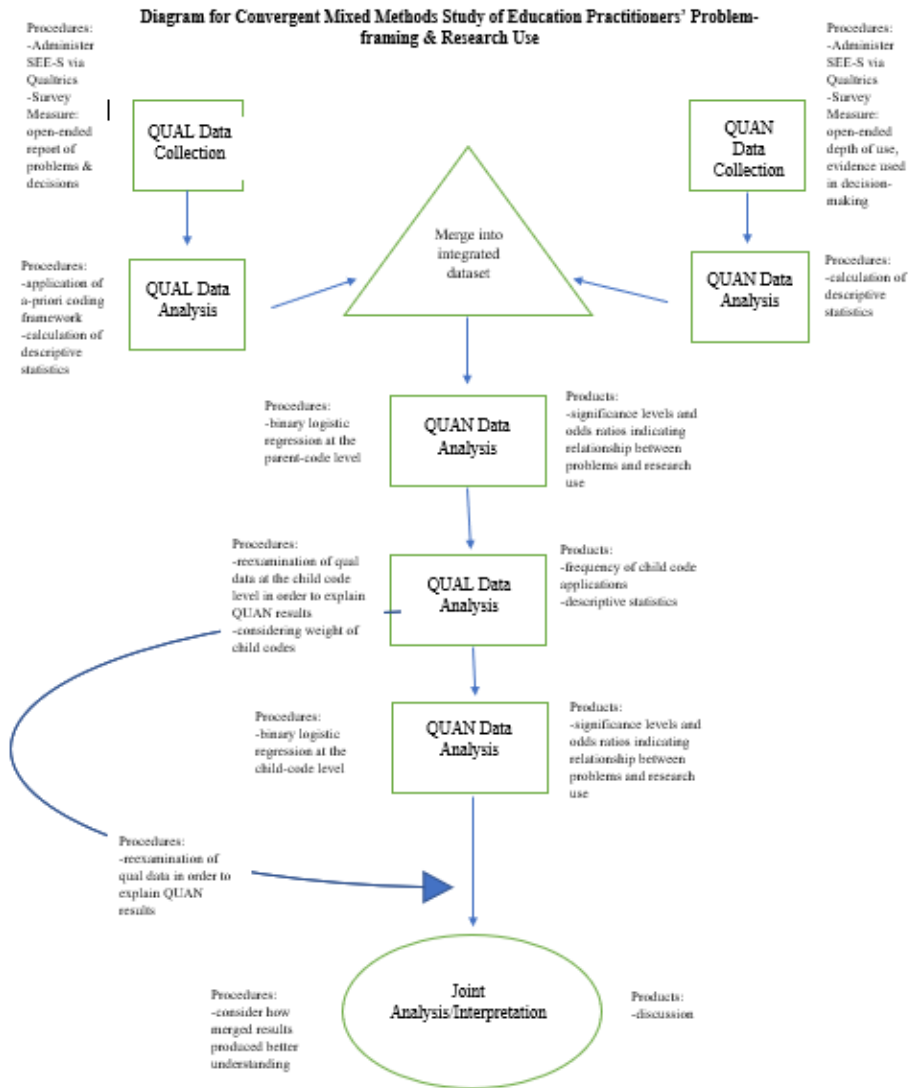
You indicated that ***articles, reports, books, or summaries based on independent research or program evaluation*** influenced the decision:

Please tell us about a research or evaluation study that influenced the decision, including as much information as possible about the study author, title, or web URL.



## Appendix F

### MIXED METHODS DIAGRAM



## Appendix G

### DECISION TYPE CODEBOOK

Code	Child Codes	Definition	Example Problems
Adoption	<ul style="list-style-type: none"> <li>-New curriculum</li> <li>-New intervention</li> <li>-New program</li> <li>-New assessment</li> <li>-New technology/resource</li> <li>-New strategy/approach</li> </ul>	Decision focuses on adopting a <b>new</b> program, intervention, strategy, etc. (Not if they designed/created their own new program/strategy/etc.)	<p>“Instituted a positive behavioral intervention and support.”</p> <p>“We are starting a new reading program—Bookworms.”</p> <p>“Begin using Schoology for classroom grades/instruction.”</p>
Structural	<ul style="list-style-type: none"> <li>-Schedule change</li> <li>-Change to physical structure or use of space</li> <li>-New academic program/structure</li> </ul>	Decision focuses on adding, or changing, a structure within the school.	<p>“Full-day kindergarten for all students entering the district.”</p> <p>“A writing block was added to the daily curriculum.”</p>
Implementation	<ul style="list-style-type: none"> <li>-Modify intervention implementation</li> <li>-Modify use of tools/resources</li> <li>-Standardize instruction</li> <li>-Standardize assessments</li> </ul>	Decision focuses on reinforcing, standardizing, monitoring, supporting, or modifying implementation of an earlier adopted program.	<p>“Use Google Apps and Schoology.”</p> <p>“A decision was made to standardize grading ratios across the building and eventually across the district.”</p> <p>“Mandatory [response to instruction] instruction using a specific manual and script.”</p>

Human Resources	<ul style="list-style-type: none"> <li>-Hiring staff</li> <li>-Reducing staff</li> <li>-Redistribution of staff</li> <li>-Changing staff role/responsibilities</li> </ul>	Decision focuses on a change to staffing.	<p>“An [Scientific Research-Based Intervention] coordinator was hired.”</p> <p>“Hire a tech integrator position to assist teachers.”</p> <p>“Reading interventionist and technology teachers were cut from the budget.”</p> <p>“Staff was shuffled within and among buildings to accommodate the vacancy left when the principal resigned.”</p>
Professional Development	<ul style="list-style-type: none"> <li>-Provide specific professional development workshop/training</li> <li>-Establishing/creating professional learning communities/grade-level/content-area teams</li> <li>-Leveraging teams for educator learning</li> </ul>	Decision focuses on professional development and training of educators.	<p>“A small group of teachers were trained in notice and note for a year or so, and then those teachers trained the rest of the staff through morning meetings, book study, and a professional development day with the authors.”</p> <p>“Districtwide in-service on recognizing warning signs and activating our suicide protocol.”</p>
External	<ul style="list-style-type: none"> <li>-Communication forms and frequency</li> <li>-Community partnerships and resource</li> </ul>	Decision focuses on communications or engagement with the community or individuals outside of the school.	<p>“To make parents feel more welcome to our school . . . a decision was made to have a Sneak Peek night before school started rather than Back to School Night in September.”</p> <p>“The district decided to move from an ‘A, B, C’ grading system to a standard grading scale 4, 3, 2, 1.”</p>

Creating/modifying Policy	N/A	An in-house policy is created, or an existing policy modified, to address the problem. Grading and report cards are included in this category as well, because they are tied to policy.	“Change of policy, including [professional development] for all staff, that a student or student's belongings (bookbags, etc.) will not be searched with prior parent notice.”
Designing/creating Solutions	N/A	The decision is to create/design their own, in-house solution to the problem. <b>Must be explicit language</b> indicating that this solution was designed/created in house.	<p>“A committee was created to review the students who were having difficulty either coming to school on time or attending at all. Each student was given a contract based on individual needs.”</p> <p>“A committee was created to put strategies in place before testing.”</p>
Discontinuing Policy/practice	N/A	This code is to be used when the decision is to discontinue or stop a particular program, policy, practice, etc. This should be explicit in the response that the primary decision was to get rid of something.	<p>“Elimination of art at the elementary level.”</p> <p>“The district decided not to bus 6th graders to after-school band/orchestra.”</p> <p>“Our school decided to not hold intervention classes during the first semester.”</p>
No Action Taken	N/A	The decision is to maintain the status quo despite an identified problem; often a decision to continue using a curriculum, intervention, or program.	<p>“To <b>continue</b> using the Eureka Math curriculum.”</p> <p>“Teachers tried to ask for support for admin, but the teachers were just told to write less referrals. No real help or support was given.”</p>

Usability-Decision	<ul style="list-style-type: none"> <li>-Don't understand response</li> <li>-Incomplete response</li> <li>-No decision specified</li> </ul>	This code should be used to capture responses that are unusable due to being incomplete, incoherent, or lack sufficient detail to identify a problem.	<p>"Continuity"</p> <p>"We constantly have new programs"</p> <p>"I don't know"</p> <p>Answer left blank</p>
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## Appendix H

### PROBLEM-FRAME CODEBOOK

Code	Child Codes	Definition	Example Problems
Systemic Issue	<ul style="list-style-type: none"> <li>-Budget</li> <li>-Schedule</li> <li>-Transportation</li> <li>-Enrollment</li> <li>-Access (to resources, etc.)</li> <li>-Grade reporting</li> <li>-Staffing</li> <li>-Internal Communications</li> </ul>	Focuses on issues related to finances, space, time, staffing, organizational structure, etc.	<p>"Finding time for staff to meet for PLC."</p> <p>"Grades were not standardized across the district."</p> <p>"Orchestra teacher had to go to 9 schools."</p> <p>"Congestion with traffic in front of the school."</p>
Academic Performance	<ul style="list-style-type: none"> <li>-Math</li> <li>-Language Arts</li> <li>-General Student Performance</li> <li>-Other Academic Subject</li> <li>-Tracking/grouping students</li> <li>-Life skills</li> <li>-Social-emotional skills</li> </ul>	Focuses specifically on issues related to student learning & performance.	<p>"...problem of low reading achievement by students."</p> <p>"Low math scores."</p> <p>"High failure rate and retention of 9<sup>th</sup> graders."</p> <p>"Reading test scores were lower than district wanted."</p> <p>"Lack of student leadership skills."</p>
Non-academic Issue	<ul style="list-style-type: none"> <li>-Behavior</li> <li>-Drop-out</li> <li>-Attendance</li> <li>-Engagement</li> <li>-School culture</li> <li>-Mental health</li> <li>-Physical health</li> <li>-Safety</li> </ul>	Focuses on issues of school climate & culture, including school discipline, engagement, & mental health.	<p>"...surveys that indicated that students did not feel connected with the staff or school."</p> <p>"Our 9<sup>th</sup> grade students have an extremely high failure &amp; dropout rate."</p> <p>"School attendance &amp; tardiness."</p> <p>"Misbehaving students."</p>
Community-centered Issue	<ul style="list-style-type: none"> <li>-Parental engagement</li> <li>-Community engagement</li> <li>-Communications</li> <li>-Parent/community Concern/request</li> </ul>	Focuses on issues related to community, including building trust, gaining parent and community engagement.	<p>"Meeting the needs of ESL students and parents."</p> <p>"No longer Team concept which caused breakdown of communication between parents and teachers."</p> <p>"...give parents more frequent feedback on their child's progress."</p>

Curricular, Program, & Intervention Problem	<ul style="list-style-type: none"> <li>-Standards Alignment</li> <li>-Curriculum Problem</li> <li>-Assessment Problem</li> <li>-Intervention Problem</li> </ul>	Focuses on issues related to curriculums, programs, interventions, and assessments including alignment with common core standards, use of interventions, etc.	<p>“Our reading curriculum didn’t address the CCSS adequately or appropriately.”</p> <p>“Curriculum not being uniform across elementary levels.”</p> <p>“Lack of a unified writing program for the district.”</p> <p>“Common assessments needed to be updated to reflect CCSS.”</p>
Instructional Issue	<ul style="list-style-type: none"> <li>-Instructional Improvement</li> <li>-Professional Development</li> <li>-Professional Practice</li> <li>-Technology Integration</li> <li>-Intervention Implementation</li> </ul>	Focuses on issues related to educators’ professional practice.	<p>“[need for] Professional development collaboration &amp; application in the class.”</p> <p>“PD is still not meaningful enough.”</p> <p>“Hold teachers accountable.”</p> <p>“Document compliance for DESE.”</p>
Federal/state/local mandate	N/A	Focuses on, or frames the problem as being related to the implementation of a federal, state, or local mandate.	<p>“Marjory Stoneman Douglas Act”</p> <p>“District mandated all schools implement a one-size-fits-all assessment schedule.”</p> <p>“District mandated.”</p> <p>“It was mandated by the state.”</p>
Student characteristics/populations	N/A	Focuses on, or frames the problem as being related to student characteristics or special populations such as low-SES, English Language learners, etc.	<p>“Our students of color and low socioeconomic backgrounds are not achieving.”</p> <p>“Address a racial gap.”</p> <p>“...serve at-risk students and students with high levels of ACEs (adverse childhood experiences).”</p> <p>“...reaching students with disabilities.”</p> <p>“...increase the level of support we give our Gifted &amp; Talented scholars.”</p>
Usability-Problem	<ul style="list-style-type: none"> <li>-Don’t understand response</li> <li>-No problem specified</li> <li>-Incomplete response</li> </ul>	This code should be used to capture responses that are unusable due to being incomplete, incoherent, or lack sufficient detail to identify a problem.	<p>“Middle level philosophy”</p> <p>“IDK”</p> <p>“RTI”</p> <p>Answer left blank</p>