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Balanced Artistry: Describing and Explaining Expert Teacher Practice as Adaptive Expertise

Nina Graham
University of South Florida, nmbgraham@gmail.com

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by

Nina Graham

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Co-Major Professor: Jane Applegate, Ph.D.
Co-Major Professor: Diane Yendol-Hoppey, Ph.D.
Pat Jones, Ph.D.
Patricia Alvarez McHatton, Ph.D.

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ABSTRACT

The purpose of this study was to understand how adaptive expertise describes expert teacher practice, which speaks to the call for sharpening the construct of adaptive expertise. Participants included practicing secondary English language arts teachers who hold a National Board Certification and have at least seven years experience. Data was collected within a narrative inquiry methodology and examined through a conceptual framework for adaptive expertise via the Critical Decision Method of Cognitive Task Analysis. Resulting narratives displayed agreement with supporting literature regarding adaptive expertise and offered refinement to the construct through examples of how teachers balance efficiency and adaptability in practice. Research of this kind is timely considering the flexibility required of teachers today to support learning needs in a fluid context. Such work to the construct of adaptive expertise will increase how it can be used to support ongoing teacher development, current secondary classrooms, and future expertise research.

CHAPTER ONE: INTRODUCTION

"What moves me most about teaching is the extent to which it is, in the end, a creative act" (Burke, 2008, p. 2).

Creative is a term that captures the practice of teaching, for it articulates teaching as an artistic, generative motion rather than a static position. The practice of teaching requires perpetual generation of individualized guidance for students through flexible consideration of many possible interpretations of their understanding. Teaching is productive motion, creative activity—a quality of movement I have been familiar with as an artist.

I entered the English classroom as a classically trained artist in theatre and dance. From plies to the pas de deux, as a dancer I learned to balance the strength built through the routines of barre exercises within the sensitive performance of the main act of a ballet. From monologues to improv, as an actor I learned to hinge memorized thought with live interaction before an audience. From lesson plans to interactive instruction, as a teacher I learned to poise myself between planned objectives and diverse learning needs during instruction.

Even though I made a vocational change to teaching, I have always seen myself as an artist, and I continue to see a theme in my teaching that mirrors the skills I have honed in learning art making. The theme is that performance-like moves do not constitute artistic performance; there must be a perpetually sensitive assessment of the present actions against the goal of the performance. Such assessment informs the moment-to-moment, nuanced steps of the artist in creating art that realizes its purpose, which is the creative act of teaching.

As a teacher, this artistic assessment continued to grow with my experience in the English language arts classroom; I sought to create moment-to-moment, artistic instruction to reach the goal of moving students toward learning. Due to the idiosyncratic nature of students' learning processes, the more intentionally nuanced—the more artistic—my teaching, the more my students seemed to truly learn. Leading students to learning requires sensitivity to their momentary, subtle cues about the extent to which they understand—a sensitivity that, for me, was honed in the studios of artistic development. It was through such development that I learned to approach a moment reflectively and make intentional decisions for a specific objective. As I began to recognize the appropriateness of my artistic philosophy in the classroom-- an instructional stance that scholarship describes as *adaptive expertise*, I began to wonder how other teachers enact this pedagogical stance. Hence, the focus of this present study is how other English language arts teachers describe their instruction and how such descriptions relate to the construct of adaptive expertise.

Chapter one includes a summary of the timeliness, significance, and design for the present study focused on understanding adaptive expertise in teacher practice. What follows are descriptions of the background, purpose, and context of the study, as well as the research questions, definitions, conceptual framework, and methodology that have been used to compose the design.

Background of the Study

Extant research on adaptive expertise descends from the work of Hatano and Inagaki (1986) that described two kinds of experts: routine and adaptive. A routine expert is one who builds knowledge through experience. As such knowledge is confirmed through its application to

new problems, the routine expert begins to trust that existing knowledge is sufficient for all future problems, thus the expert develops a core competency to be expressed through routine application. In elaborating what may be termed a routine expert, Bereiter & Scardamalia (1993) use the example of physicians who seemed to cease knowledge growth in the midst assessing diagnostic and treatment procedures of non-routine, challenging medical cases. Such doctors deemed routine treatment to be sufficient when, in actuality, routine treatment may have been incorrect. This echoes the findings of Feltovich et al. 1984 (as cited in Feltovich et al. 1997) whose study of expert physicians determined that non-flexible experts accounted for most of the symptoms related to the medical problem, but it was the account of all the –perhaps hard to recognize—symptoms that lead to a correct diagnosis. The non-flexible expert accounting for most of the symptoms came up with an incorrect diagnosis. The non-flexible expert's core competencies did not facilitate recognition of all symptoms related to the medical problem; however, the flexible expert may have approached the same problem with similar core competencies but perhaps was willing to examine the adequacy of core competencies while addressing a puzzling set of symptoms. The automaticity that is characteristic of core competencies in expertise has been found to serve detrimental when the expert enters atypical situations (Crawford & Brophy, 2006).

Similar to the routine expert, the adaptive expert builds knowledge through experience; however, once core competencies are established, the adaptive expert continually questions the appropriateness of existing knowledge for novel problems of practice (Hatano & Inagaki, 1986). More specifically the adaptive expert is able to intentionally balance routine action and knowledge discovery during experience (Bereiter & Scardamalia, 1993). Darling-Hammond and Bransford (2005) share an example of such an expert. The authors describe a classroom scenario

where a second-grade student, Jimmy, solves the problem 3+3 with the answer of 8. Through suspension of the belief that Jimmy's answer was wrong, the teacher discovered Jimmy's reasoning behind his answer. Jimmy was picturing the 3s coming together to form an 8, thus 3+3 equals 8 in Jimmy's rationale. The adaptive expertise of the teacher led to a more appropriate assessment of Jimmy's thinking and an opportunity for clearer instruction. The routine expert in the scenario may have relied on the automatic response that Jimmy was wrong and focused on addressing the majority of the symptoms of Jimmy's response, which could have led to an incorrect assessment of Jimmy's learning needs.

Measuring Expertise

Research in expertise has primarily followed a neat design that accommodates the routine, rehearsed display of competency but not the illusive, generative action of adaptiveness. For example, seminal expertise research focused on expert chess players. The work of Chase and Simon (1973) and deGroot (2008) describe how players' expertise was confirmed through formal assessments like tournaments. These systematic assessments provide little room for understanding adaptiveness within expertise. Similarly, a major critique of teaching expertise research is that it neglects the context-laden classroom moments—an assumption that Berliner (2001) speaks to as well. He articulates the mismatch between the tournament measures of old and the expertise required of "good," "successful" teachers today (Fenstermacher & Richardson, 2005)—teachers who largely operate in the restrictive environment where standardized testing is the suggested means of measuring a teacher's expertise and where scripted curricula is adopted in the hope of ensuring standardized assessment success (Demko, 2010). The argument is made that this uniformity creates a sort of "tournament of teaching" (Berliner, 2001) from which to

measure teacher expertise. Berliner makes the case that some teachers might teach well, yet their students demonstrate lower levels of proficiency on a standardized test. Therefore, such teachers—who may very well be experts—would fail to be assessed as expert if their teacher performance was only measured by student performance on such a test.

Movement toward more appropriate assessments of teaching exists in the form of simulated tasks designed to target adaptive expertise. This shift in the study of teaching expertise suggests an inference of adaptive expertise being an explanatory construct of teacher expertise because the research designs used with adaptive expertise and teaching are constructed with the expectation of adaptation. Crawford and Brophy (2006) suggest that in studying adaptive expertise, researchers must employ experiments designed to target the phenomenon of adaptive expertise. Examples include simulated tasks laced with novel content (e.g. Wineburg, 1998; Crawford, Schlager, Toyama, Riel, & Vahey, 2005). The inferred assertion is that this embedded opportunity for the expert to learn novel content through a simulated task provides the opportunity for the researcher to document adaptive expertise (or adaptive thinking) in action. Crawford et al.'s task involved teachers reviewing documentation of a class (e.g. grade book and lesson materials). Wineburg's study also uses a document analysis to examine adaptive thinking. Although his work does not describe the participants as teachers, his participants have been teachers in their careers, and Wineburg draws implications for teaching based on his work. The next plausible step in the research line of adaptive expertise and teaching would be to extend the findings of the previous work through examination of the processes within teachers' actual classroom practice, which is the focus of the present study.

Another evident gap in the cited research is the appropriation of efficient responses in the study of adaptive expertise. Literature documenting the characteristics of adaptive expertise

articulates a balance of efficiency and innovation that constitutes adaptive expertise (Schwartz, Bransford, Sears, 2005). As such, adaptive expertise may be displayed in simulated tasks where the expert displays an efficient response if the expert is able to articulate the reason why the efficient response would be the most appropriate. The present design captures the actual activity of the teacher's classroom and provides opportunity for the teacher to articulate his/her decision process. This study extends work with simulated task design in the study of adaptive expertise, for it takes the cognitive actions of adaptive expertise that have been affirmed in such studies and continues the examination in classroom practice. This design addresses the adaptive expertise construct in the way Hatano envisioned. He preferred research that included the authentic context (Inagaki & Miyake, 2007). The present design synthesizes the most relevant aspects of the reviewed approaches: tournament-style assessment and simulated tasks. The tournament approach attempts to exercise proximity to the real classroom while the simulated tasks try to methodically capture the cognitive attributes of knowledge generation that is characteristic of adaptive expertise.

Researchers have been focusing on ways to contribute to and confirm scholarship regarding the adaptive expertise construct (e.g. Berliner, 2004; Crawford et al., 2005). This study will focus on understanding adaptive expertise through teachers' descriptions and explanations of their reasoning within instruction and how such descriptions and explanations align with the construct of adaptive expertise. This approach provides insight needed to develop more distinct understanding of how teachers exercise adaptive expertise under current conditions of actual practice.

Purpose of the Study

The purpose of this study is to understand how adaptive expertise exists within teacher practice. English language arts teachers will serve as the participants. Focusing on English teachers in this study stems from my experience in English education. It seems pertinent that researching teaching expertise should include researchers with knowledge adequate for selecting appropriate participants and analyzing data that is specific to teaching. This belief is built upon Shulman's construct of "pedagogical content knowledge" (1987), which describes the extent to which a teacher is able to synthesize deep content knowledge with appropriate instructional methods for the purpose of differentiating instruction for individual students' learning needs. In my belief that I possess this level of understanding regarding English teaching, I am positioned to make sense of teacher descriptions and explanations relative to the English language arts classroom.

Context of the Study

As a classroom teacher, I have worked in environments that provide professional freedom in the choice of materials and instructional approach. However, the reality that many teachers face today is one of standardized dictation of how one should teach day-in and day-out. For a teacher to engage in adaptive expertise requires fine attunement to the context of practice. It is often that I talk with my peers, whose practice occurs in more confining environments, and discover a meaning-making process within their instruction that mirrors my own. It is a process that I have come to understand as reflective of adaptive expertise.

Examining adaptive practice in expert teaching is a timely pursuit in today's educational climate where desired outcomes in students' learning (e.g. flexible command of content and

nimble thinking skills) contrast the administrative directives for how instruction should take place: scripted curricula and standardized assessment (Darling-Hammond & Bransford, 2005; Payor, Boney, & Graham, 2012). Adaptive expertise in teaching may serve as the lynch pin of good, successful practice within such contextualized restrictions. Good practice is the evidence of solid teaching content and decisions, and successful practice is the evidence of adequate student performance on assessments (Fenstermacher & Richardson, 2005). Bond, Smith, Baker, and Hattie (2000) found expert teachers exhibiting both. Such findings suggest instruction where one elicits students' adequate performance on assessment (success) through solid teaching methods and materials (good). Scholarship on adaptive expertise seems a possible explanation regarding how good, successful teaching takes place in the midst of the current educational context.

Overview of Conceptual Framework

This study speaks to the call for "refinement and elaboration of the construct of adaptive expertise" (Crawford & Brophy, 2006). Such work to the construct, Crawford and Brophy note, will assist the empirical evaluation of the construct. The present study builds on previous research in teaching offering operationalized terms that describe the different cognitive features in adaptive expertise. Such terms help extend research beyond task oriented designs to application to classroom instruction. These terms also help constitute the illustration of adaptive expertise via a conceptual framework.

Adaptive expertise, as defined by Schwartz et al. (2005), will serve as the conceptual framework for this study. They conceptualize adaptive expertise as a balance between innovation and efficiency, where innovation can be likened to adaptiveness. Adaptiveness is the feature of

adaptive expertise that characterizes an expert's response to atypical elements in a problem. The adaptive expert evaluates an element's influence on the desired outcome and makes appropriate shifts in his/her response. Efficiency represents the aspect of adaptive expertise when an expert exercises the same level of evaluation as in adaptiveness but deems the appropriate response to be one he/she has applied and sharpened in prior experience. In adaptive expertise, a conceptual understanding of why a response is or is not effective, whether resulting in an efficient or adaptive response, supports each evaluative cycle. This conceptual understanding creates the balance of these two processes that defines adaptive expertise.

Research Questions

In order to understand how expert teachers exhibit adaptive expertise within their practice, the following research questions will be used:

> How do secondary English language arts teachers who have been identified as experts describe and explain their reasoning and reasoning processes behind decisions within instruction?
>
> To what extents do expert secondary English language arts teachers' descriptions and explanations of their reasoning and reasoning processes behind decisions within instruction align with the conceptual framework of adaptive expertise?

Significance of the Study

Debate swirls regarding what constitutes expert teaching, and efforts aimed at establishing measures of expertise are conducted, many times, through means that contradict acceptable practice. Hatano & Inagaki (1986) elaborate how restrictive

measures of practice serve to counteract the development of instruction that supports learning outcomes the current world demands, a point Berliner (2001) also mentioned. Restrictive measures are illustrated today through initiatives like scripted curricula and standardized testing which subvert the conceptual understanding that is a key feature of masterful instruction (Bond et al., 2000). Presently there stands a need for more robust descriptions and explanations of teacher practice that serve to encourage the continuance of conceptual understanding in practice. Recent research with the construct of adaptive expertise and its relevance to teaching represent an initial response to this need (Crawford et al., 2005). However, a gap remains between initial work to explain the construct of adaptive expertise (e.g. Crawford, 2007; Wineburg, 1998) and actual classroom instruction.

Definition of Terms

- *Secondary English language arts* - Secondary English language arts is defined as English language arts curriculum taught during grades 6-12.
- *Expert* - Expert will be defined as a teacher holding a National Board Certification or advanced training in education theory and practice. In addition, the teacher has been teaching for at least 7 years at the start of this study. This definition stems from the research of Bond et al. (2000), Crawford et al. (2005), and Crawford (2007). Bond et al. sought to discover the extent to which National Board Certified teachers exhibited expert teaching. Conclusions affirmed that National Board Certified teachers demonstrated attributes that constitute expert teaching and that align with adaptive expertise. The teachers in Crawford et al.

and Crawford's work confirmed the expertise of teachers who where chosen through the criteria of advanced training and years of experience. Berliner (2004) also supports this definition by positing that it takes approximately five to seven years to acquire expertise in teaching.

- *Adaptive expertise* - Adaptive expertise will be defined as proficiency in teaching where one is able to recognize when problems within teaching may exceed his/her existing, proficient knowledge, develop new knowledge to address such problems, and balance a blend of existing and new knowledge in solving such problems (Schwartz et al., 2005; Soslau, 2012).
- *Reasoning* - Reasoning will be defined as teachers' descriptions of decisions made within instruction and why they made certain decisions within instruction.
- *Reasoning processes* – Reasoning process will be defined as teachers' explanations as to how they arrived at certain decisions within instruction.

Overview of Methodology

Narrative inquiry informs the research design for this study focused on understanding adaptive expertise in teacher practice. Narrative inquiry is enacted for the purpose of understanding individual experience (Clandinin & Connelly, 2000; Ollerenshaw & Creswell, 2002). Methodological choices for this research stem from an interpretivist theoretical perspective and a constructivist epistemological stance. Interpretivism and narrative inquiry share the pursuit of understanding (Clandinin & Connelly, 2000; Crotty, 1998). Moreover, constructivism supports the belief that knowledge is built at the individual level (Crotty, 1998; Paul et al., 2005). Narratives within this study will include the descriptions and explanations

teachers offer during review of instructional decisions. Data collection and analysis will be conducted via the Critical Decision Method of Cognitive Task Analysis (Jonassen, Tessner, and Hannum, 1999; Schraagen, Chipman, and Shalin, 2000) and attend to credibility within research as explained through the concepts of *coherence*, *consensus*, and *utility* (Eisner, 1991). Storied findings will be shared within the conceptual framework of adaptive expertise.

Assumptions

The first assumption in this study is that adaptive expertise is a construct that describes expertise in teaching. Using Darling-Hammond and Bransford's (2005) assertion, adaptive expertise constitutes the quality of teaching necessary for the present state of our changing world. Also, Berliner (2001) alludes to the appropriateness of adaptive expertise in describing expert teaching. Knowledge must be continually re-assessed and generated when addressing a problem in teaching. Such scholarship supports the previous assertion and clarifies the assumption that adaptive expertise may be the key in connecting research regarding expertise in teaching.

Assumption is also included in the assertion that adaptive expertise is a researchable construct. I felt confident moving forward in this assumption based on the formal research conducted in this domain and the teaching scholars who are giving attention to adaptive expertise (e.g. John Bransford, Linda Darling-Hammond).

Potential for assumption to influence this study was greatest in the selection of participants, for there was an element of assumption that the selected participants would exhibit adaptive expertise. Confidence in moving forward with this assumption was built upon the use of

selection methods from previous research in expertise and adaptive expertise (Bond et al., 2000; Crawford et al. 2005).

Effort has been made to make assumptions explicit. However, to continually manage assumptions, I kept reflective notes and consulted participants in data collection and data analysis (Ollerenshaw & Creswell, 2002).

Limitations

With assumptions, there are also evident limitations to this study. A limitation is the specificity of the research. The data within this study are meant to serve as points of interpretation for understanding adaptive expertise in specific expert teachers' lived experiences. They are not meant to be wholly generalizable.

The data collection methods may hold limits within this study as well. Data collection took place within one semester of a school year with a small number of teachers. Given the expert designation of the participants, it is believed that data collected serve to describe and explain adaptive expertise in a particular context. Also, data collection hinged on the researcher's ability to determine observation and questioning techniques that would identify evidence to the research questions while refraining from influencing the participants' responses. Established tools for research have been infused within the conceptual framework to help structure data collection and analysis, serving to provide confident direction to my study techniques. I have made every effort to practice reflexivity throughout the study and illustrate these efforts through reflective notes (Creswell, 2007).

Chapter Summary

My artistic philosophy began at the ballet barre and was strengthened in performance through the edge of the stage, beyond my classroom, to this present study. The stance of this study embodies a similar essence as the construct under examination: adaptive expertise. For, intentional sensitivity must be perpetually employed to account for the unknown and facilitate an appropriate response to a particular problem. The preceding chapter included a rationale for a study of teacher adaptive expertise that reaches from the researcher's personal experience, back into historical scholarship and research of expertise, and forward to the appropriateness of this construct for the educational climate of today.

Reasoning was illustrated through review of expertise scholarship that distinguished types of expertise such as routine and adaptive expertise. From there, gaps were revealed regarding the extent to which extant research has been conducted that attends to actual teachers' experiences enacting adaptive expertise in the midst of classroom practice. It was determined that such an approach is scant, thus bringing strength to the case for this approach in the current study. A purpose for this study was identified as understanding adaptive expertise within expert teacher practice including the identification of limitations and assumptions that detail the extent to which the researcher is comfortable moving forward with acknowledged concerns. Overall, it is believed that a reasonable vision was cast for a next step forward in the examination of adaptive expertise in teaching.

Chapter two includes review of teacher expertise literature that points to adaptiveness in instruction. Adaptive expertise will be outlined to explain how this construct can serve to advance our current understanding regarding teaching expertise. Additionally, characteristics of

adaptive expertise are explained in construction of the conceptual framework that will inform the proposed study.

CHAPTER TWO: LITERATURE REVIEW

Adaptive expertise characterizes qualities of expert practice that are hinged on attending to the nuanced, ever-changing complexities of a problem (Crawford & Brophy, 2006; Crawford et al., 2005; Hatano & Inagaki, 1986), and the goal of the present study is to understand the degree to which adaptive expertise describes what teachers do in responding to such problems. Understanding adaptive expertise is critical for the field of teaching because the nature of the profession includes perpetually fluid contexts, resources, knowledge, and needs (Crawford et al., 2005). Therefore, refining descriptions of adaptive expertise related to teaching will inform current and future methods of teacher development and practice. Literature on teacher expertise points to the appropriateness of the construct of adaptive expertise in describing masterful teaching (Borko & Livingston, 1989; Crawford, 2007; Crawford et al., 2005; Sawyer, 2004; Tsui, 2009; Wineburg, 1998), but a gap remains in articulating how this construct synthesizes the literature related to teacher expertise. Through such synthesis, adaptive expertise may become a more accessible construct for interpreting teacher practice in a manner that contributes to continuous growth of expertise—growth that is a necessary feature of expert instruction (Bereiter & Scardamalia, 1993; Darling-Hammond & Bransford, 2005).

What follows is a review of literature related to teacher expertise that in combination illustrates a conceptual theme of adaptiveness in instruction. Additionally, research on adaptive expertise is outlined to explain how this construct can serve to advance our current understanding regarding teaching expertise. Finally, components of adaptive expertise are described to

construct the conceptual framework that will inform the proposed study designed to advance understanding of adaptive expertise in teaching through descriptions and explanations of expert teacher practice.

Table 2.1 illustrates the scope of literature included in the following review. Given the enigmatic path of the line of inquiry regarding adaptive expertise, the table organizes the reviewed sources by the manner in which they contribute to the present understanding of adaptive expertise. Specific details regarding how each source contributes to explaining what is known about adaptive expertise relative to teaching will be shared in the following sections.

Table 2.1: Literature Relevant to Studying Adaptive Expertise

Source	Text Type	Contributions to Understanding Adaptive Expertise	Review Section
Berliner, 1988	Theory	The author suggests a developmental trajectory for teacher expertise that illustrates a gap in how teacher expertise is conceptualized once it is achieved. Adaptive expertise may fill this gap.	Adaptiveness in Instruction
Bond, Smith, Baker, & Hattie, 2000	Research	In this construct validity study, the researchers developed a list of expert teaching practices that support the reflective, adaptability theme within expert teaching research. National Board Certified teachers were found to display higher evidence of such practices than those that pursued National Board Certification and did not achieve it. (N=65).	
Borko & Livingston, 1989	Research	Researchers examined novice and expert teacher planning, teaching, and post lesson reflections using a conceptual framework of "improvisation" which aligns with features of adaptiveness. Aspects of expert teacher practice were seen as explainable through the construct of improvisation. (N=7).	
Carter, Sabers, Cushing, Pinnegar, & Berliner, 1987	Research	In a sample comprised of expert (N=8), novice (N=6), and postulant teachers (N=6), the researchers used an experimental task design to describe features of expert practice that support a reflective, adaptability theme among literature regarding teacher expertise.	
Dreyfus & Dreyfus, 1988	Theory	The authors explain a theory of expertise development that Berliner (1988) built upon when explaining a theory for the development of expert teaching. This theory illustrates a gap similar to Berliner (1988).	
Sabers, Cushing, & Berliner, 1991	Research	This study included teachers classified as novices, advanced beginners, and experts for the purpose of explaining how each interpreted classroom events. Findings support the belief that experts possess a reflective ability that is distinct from less experienced teachers, and this ability enables adaptations to understanding. (N=16)	

Table 2.1 (Continued)

Source	Text Type	Contributions to Understanding Adaptive Expertise	Review Section
Tsui, 2009	Research	The goal of this study was to describe attributes of expert teachers. Findings support the authors' assertion that the feature of reflection believed to be the impetus of adaptation distinguishes expert practice. (N=4)	Adaptiveness in Instruction (cont.)
Berliner, 2001, 2004	Theory	Adaptive expertise is offered as an explanation of the performance of top experts.	Adaptiveness to Advance Understanding
Crawford, Schlager, Toyama, Riel, and Vahey, 2005	Research	In this theory elaboration study, the researchers constructed operational terms for an adaptive orientation and an efficiency orientation to problem solving using expert and novice teacher-participant responses. Findings support the notion that adaptiveness is a distinction between levels of practice (N=13).	
Crawford, 2007	Research	Using data from the Crawford et al., 2005 study, Crawford examined the extent to which veteran and novice teachers display knowledge-building and efficiency orientations in problem solving. Her findings revealed that adaptive veteran teachers displayed a balance of the two orientations, which supports the Schwartz et al. (2005) conception of adaptive expertise.	
Hatano & Inagaki, 1986	Theory	The authors distinguish between two types of expertise: routine and adaptive. This source is used frequently to anchor writing related to adaptive expertise including research on teaching and adaptive expertise.	
Sawyer, 2004	Theory	The author elaborates a metaphor for teaching related to improvisation. This metaphor implies adaptiveness as a means for understanding the teaching act.	
Shulman, 1987	Theory	The author explains theories of what comprises a teacher's knowledge, and these explanations supports the belief that teaching cannot be explained apart from reflective adaptation.	
Wineburg, 1998	Research	With a sample of two expert historians (who were also professors), the researcher sought to illustrate the thinking processes associated with Patel and Groen's (1991)— *generic* and *specific* expertise, where generic expertise may be akin to adaptive expertise (Crawford, 2007). This study is frequently cited in writing related to adaptive expertise including research on teaching and adaptive expertise.	
Crawford, 2007	Research	This study helps illustrate the balance of innovation and efficiency that seems evident in expert practice.	Conceptual Framework
Sabers, Cushing, & Berliner, 1991	Research	This study helps illustrate the degree of efficiency that an expert teacher displays.	
Schwartz, Bransford, & Sears, 2005	Theory	The authors assert a construct of adaptive expertise that is a balance of innovation (adaptability) and efficiency in practice. Their construct serves as the foundation for the conceptual framework in this study.	
Tsui, 2009	Research	This study helps illustrate the degree of efficiency that an expert teacher displays.	

Adaptiveness in Instruction

Teaching occurs at an intersection of numerous features that must be interpreted through elaborate pedagogical sensitivity (Bond et al., 2000); therefore, it is not surprising that it has been difficult to reach operationalized terms for instructional expertise (Bond et al., 2000; Shulman, 1987). Theory and research denote key characteristics of expert practice that center around an expert's repertoire: domain knowledge, established routines, and pattern recognition (Berliner, 1988; Dreyfus & Dreyfus, 1988). However, as efforts continue in articulating expertise, a theme emerges that alludes to adaptiveness being a distinction of expert practice. This theme can be characterized as a reflective stance that serves in evaluating one's repertoire within new experiences; consequently such reflection may prompt adaptations to facilitate more appropriate instruction.

Extended engagement within a domain facilitates the development of a repertoire, which is a common distinction of expert status (Bereiter & Scardamalia, 1993; Crawford & Brophy, 2006; Dreyfus & Dreyfus, 1988). Berliner (1988) also outlines the feature of accumulated experience when discussing teaching expertise. In his work *The Development of Expertise in Pedagogy*, Berliner explained a theory, which was informed by his own research with expert, novice, and student teachers engaged in examining classroom experiences (Sabers, Cushing, & Berliner, 1991). His work supports features of expert practice that include routine application, pattern recognition, and dynamic understanding; each is facilitated by an expert's repertoire. However, continued investigation of these elements reveals a reflective quality that bridges the characteristics and alludes to a deeper dimension of what constitutes expert practice. Scholars define this reflective quality as the continual evaluation of present action, which may require adaptations in one's response (Dewey, 1910; Schön, 1983). Research alludes to the absence of

reflection as a possible explanation for participants' narrow-minded application of past experience that leads to incorrect understanding of a problem space (e.g. Feltovich et al. 1984 as cited in Feltovich et al. 1997). This reflective dimension points to the construct of adaptive expertise and how it may characterize expert teaching more appropriately, for expert teachers do more than apply their repertoires; they reflect on their past understanding against present learning needs and adapt where their repertoires fall short. Next, descriptions from research and scholarship are organized to reveal how expert teachers reflectively adapt when engaging their repertoires through routine application, pattern recognition, and dynamic understanding.

Reflective Adaptation within Routine Application

Expert teachers' repertoires facilitate efficiency in practice through routines (Berliner, 1988, 2001 as cited in 2004). Core knowledge of a domain creates efficiency in practice that distinguishes the work of an expert from a novice; such efficiency is built through extended engagement within a domain (Bereiter & Scardamalia, 1993; Chi, Glaser, & Farr, 1988; Crawford & Brophy, 2006; Dreyfus & Dreyfus, 1988; Hatano & Inagaki, 1986). Expert teachers reflectively adapt routines to fit a meaningful instructional plan. As an expert teacher in Tsui's (2009) work illustrates, routines of classroom management were communicated amidst instructional objectives. Rather than listing rules and procedures in an isolated way, the teacher with more experience (8 years of experience) shared expectations for classroom behavior as they related to learning experiences. Similarly, the expert teachers in Berliner's work demonstrated reflectiveness about classroom routines when sharing comments about the research task (1988 as cited in Berliner, 1988). In response to the task of teaching a short lesson to 15 high school students, the expert displayed a measure of reflective thought regarding the routines he/she

normally employs to make his/her classroom run with efficiency, as well as, reflecting on the extent to which he/she was unaware of the routines the students normally followed. Reflecting on the routines in their repertoires helped these expert teachers adapt their expectations of the students. The routines of an expert teacher, as characterized here, suggest a quality of expertise that is continually perceptive to the appropriateness of routine application. When, through reflection, routines are deemed out-of-step with the present needs of learners, expert teachers adapt how they utilize their instructional repertoires.

Reflective Adaptation within Pattern Recognition

Expert teachers' repertoires also facilitate pattern recognition, where patterns illustrate a conceptual connection between observable features. In research, determining patterns of instruction at the expert level has been shown to imply reflective efforts. Sabers, Cushing, and Berliner (1991) noticed characteristics that display reflective pattern-recognition features of expert teachers. In a study using classroom video to elicit novice and expert responses to teaching events, experts were more adept at visually scanning a majority of a taped lesson and listening for language that would help them investigate assumptions based on their visual scans. Experts used the auditory cues as a tool for reflecting upon observed events when determining patterns within instruction; whereas, the less-experienced teachers were not able to reach interpretation of what they saw and heard. Experts' comments seemed to reveal an openness to adapting their interpretations of the classroom patterns should the information therein have supported such a change. Novices offered summarized, rather than interpretive statements that may have been due to their shallow repertoires (Berliner, 1988). Expert teachers were able to

reflect on past knowledge through present experience to postulate interpretive patterns of observed instruction.

Expert teachers also prepare to employ reflective use of their repertoires when determining a pattern in the planning stages of instruction—planning that provides space for anticipated adaptations. The work of Carter, Sabers, Cushing, Pinnegar, and Berliner (1987) implies this reflective stance. Expert, novice, and student teachers were given an experimental task to design lessons for a secondary science or math class of which they were taking over in the absence of the regular teacher. The expert teachers revealed a reflective mindset prior to collecting information that would inform their interpretation of student learning patterns. Rather than attend to the absent teacher's beliefs about the students, the expert teachers aspired to collect their own understanding of the learners. This suspension of assumption regarding student ability implies that expert teachers approach the classroom prepared to adapt instruction to the students needs.

Reflective adaptation of planning patterns was also revealed in Tsui's (2009) case study research focused on articulating qualities of expert teachers. Teaching goals and student interests were adaptively patterned together in an expert teacher's instructional plans; whereas, the non-expert teachers admittedly attended to one at the expense of the other, and they were willing or unable to adapt the two aims to fit into a single instructional agenda. Borko and Livingston's (1989) work coalesces with Tsui's findings. Through data collected from student and expert teachers via classroom observation and interview, Borko & Livingston's study revealed how experts anticipated patterns that would occur during live instruction and planned in such a way that created room for variations of patterns to emerge, which would then require their adaptive

response. Similar to routine application, pattern recognition within teaching expertise—as characterized here—includes reflecting on patterns of instruction, which may prompt adaptation.

Reflective Adaptation through Dynamic Understanding

A dynamic understanding of a circumstance supports the reflective adaptations of an expert teacher's repertoire. Theory suggests that an expert is able to reflectively process a situation to determine a plausible explanation of an unfamiliar outcome, which may occur when routines fall short and pattern recognition reveals unanticipated contingencies (Hatano & Inagaki, 1986). Some theorists suggest that this dynamic understanding is an illusive feature of expert practice (Berliner, 1988; Dreyfus & Dreyfus, 1988); therefore, trying to articulate what experts do at this level of practice has been difficult. However, researchers are moving toward the thought that the ability to describe what one does in expert practice is the distinguishing feature between experts and experienced non-experts (Bereiter & Scardamalia, 1993; Tsui, 2009). Tsui's (2009) case studies revealed a difference between experts and experienced non-expert teachers: "…their [experts'] capability to engage in conscious deliberation and reflection. Such engagement involves making explicit the tacit knowledge that is gained from experience" (p. 429). Bereiter and Scardamalia (1993) affirm Tsui's assertion. In their work*, Surpassing Ourselves: an Inquiry into the Nature and Implications of Expertise*, the authors theorize expertise as a process, rather than a static label, and this process is exercised through continual, deliberate discovery of new dimensions of experience. The authors illustrate this expert process through an anecdote about a teacher. They describe an expert teacher who is twenty years into her career. The expert teacher "…does not simply try out new ideas…she is continually experimenting and refining. When she takes up a new idea from elsewhere, she plans carefully

how to harmonize it with her teaching, so as not to undo what she has already accomplished" (p. 79). Experimenting, refining, and harmonizing are processes that illustrate the reflective adaptions facilitated by dynamic understanding. Dynamic understanding characterizes expert teachers' ability to articulate the tacit processes involved in their instructional decision-making processes.

As illustrated here, literature related to teacher expertise alludes to a conceptual theme of adaptiveness in instruction, where a reflective stance seems to be the prevalent means for enacting adaptive instruction. What follows is a closer examination of the few studies that have addressed the construct of adaptive expertise as a tool for explaining teacher practice. It is believed that more work in this vein of research will serve to advance understanding regarding teaching expertise in a way that supports the continual development of masterful instruction.

Adaptive Expertise to Advance Understanding

Expert teaching is best characterized as adaptive expertise. Previous research to support this claim has been conservative, which is believed to be because of the illusive nature of the construct. However, the few relevant studies in this line of research serve as a foundation for future research focused on the relationship of this construct to classroom practice. It is believed that understanding the connection between teaching expertise and adaptive expertise will advance understanding regarding teaching expertise in a way that more adequately supports the continual development of current teachers and the initial development of future teachers. Next, relevant work is outlined to explain how scholarship and research regarding adaptive expertise can help advance our current understanding of teaching expertise.

Adaptive Expertise and Routine Expertise

Extant research on adaptive expertise descends from the work of Hatano & Inagaki (1986) that articulates two theories of expertise: adaptive expertise and routine expertise. Adaptive expertise is characterized as, "performing procedural skills efficiently, but also understanding the meaning and the nature of their object" (p. 263). This understanding is additionally characterized as the ability to explain why a procedure is effective, which aligns with theoretical assertions and research findings distinguishing expert teachers as those who can explain *why* they do what they do (Bereiter & Scardamalia, 1993; Tsui, 2009). On the other hand, Hatano & Inagaki (1986) describe routine expertise as the efficient exercise of effective procedures; however, effectiveness is contingent upon a stable context because the routine expert does not understand *why* a procedure is effective. In other words, a routine expert lacks conceptual knowledge of the domain; therefore, if features of the context were to change, he/she would not be able to adapt responses to create effective outcomes. Hatano and Inagaki comment that routine experts are called "experts" because they demonstrate effective practice—as long as the environment remains constant. Bereiter & Scardamalia (1993) posit that upon the cessation of knowledge growth beyond initial expert status, expertise also ceases; therefore, it may be argued that routine experts are no longer experts.

It is imperative that teaching expertise be conceptualized as adaptive expertise because as Crawford et al. (2005) comment in framing their study characterizing adaptive expertise in science teaching, "…tools, practices, domain content, and the characteristics of learners are no longer static over the course [of] a teaching professional's career. Teachers must learn continuously in order to handle this complex, rapidly changing learning environment" (p. 6). Cochran-Smith & Lytle (2009) support this assertion in their work *Inquiry as Stance,* where

inquiry as stance echoes the reflective theme emerging in teacher expertise research. The authors explain how the knowledge needed for problems of today may not even exist presently but "must be invented in the course of working on the problem itself" (p. 146***).*** Moreover, Darling-Hammond and Bransford (2005) frame their text, *Preparing Teachers for a Changing World: What Teachers Should Learn and Be Able to Do,* with the goal of "help[ing] teachers become 'adaptive experts' who are prepared for effective lifelong learning that allows them continuously to add to their knowledge and skills" (p. 3). Studies focused on eliciting more salient descriptions of adaptive expertise within expert teacher practice are discussed next, highlighting how they advance understanding about teacher expertise. Finally, explanations will be offered regarding how the present study extends such work.

Wineburg's Work

Wineburg's (1998) work contributes understanding regarding teacher expertise through findings that point to operationalized features of the adaptive expertise of teaching professionals. Wineburg's study utilized a task for volunteer expert participants in the field of American history. Expert status was denoted by attainment of a doctoral degree from a top ranked history department and full professor status at top ranked history departments; however, one participant had more distinct knowledge of Abraham Lincoln and the Civil War than the second participant, which served as the topic of the research task. The goal of the study was to "explore how interpretations are formed when experts draw on different kinds of cognitive resources," and the task was to read select documents to determine "… the light they shed on Lincoln's views on race." (para. 9). Participants engaged in think-aloud procedures to reveal their thinking.

Data analysis revealed processes within the second expert historian's responses that align with adaptive expertise: moving back and forth between tentative interpretation of the documents and addressing factual details of the documents. By task's end, the second expert was able to reach the level of understanding that first expert possessed at the beginning of the task. The second expert exercised adaptive expertise to reach new conceptual understanding through construction of an interpretive structure that explained a through-line of the selected task texts. To be effective in the task that addressed areas that were not his specialization in history, the second expert had to employ his knowledge flexibly while maintaining a willingness to learn from the new situation. Key features of this ability were described as a way of "asking questions, of reserving judgment, of monitoring affective responses and revisiting earlier assessments, his ability to stick with confusion long enough to let an interpretation emerge" (para. 88). Such features offer operationalized definitions of the processes employed within what is believed to be adaptive expertise. Operationalizing reasoning processes of adaptive expertise serves to demystify the construct to a degree that future research can advance understanding regarding this construct.

Crawford's Work

The work of Crawford, Schlager, Toyama, Riel, and Vahey (2005) built upon Wineburg's (1998) research, yet they engaged participants in a task more closely related to a classroom teacher's day-to-day. In a theory-elaboration study of adaptive expertise, Crawford et al. (2005) sought to characterize features of adaptive expertise specific to reasoning processes and problem-solving orientations related to efficiency and adaptiveness. They also sought evidence that pointed to a connection between adaptiveness and diagnosis of student misunderstanding, as well as a

connection between teachers' adaptiveness and a motivation to learn new information in the scope of solving a problem. The researchers employed an authentic task design in their work with 13 high school biology teachers classified as routine veterans (5), adaptive veterans (4), and novices (4). In a scenario where participants were hypothetically assuming the class of a 10th-grade biology teacher (22 students) who was going on maternity leave, study participants were asked "…to understand, as best you can, what your students have and have not learned in the genetics unit so far" (p. 12-13). Initial analysis revealed that the task was successful in eliciting adaptive and efficient orientations within problem solving to the extent that the researchers felt the data supported operationalized descriptions of each. The descriptions are detailed in Table 2.2. The table also illustrates points where these features of an adaptive orientation to problem solving seem to be in agreement with Wineburg's (1998) findings; each are denoted with a checkmark and shaded boxes. Table cells were left blank if the agreement was not apparent. The descriptions of adaptive reasoning from Crawford et al. (2005) support and extend Wineburg's (1998) discoveries regarding teachers' adaptive reasoning processes, which together serve to further our understanding regarding how adaptive expertise is displayed within expert teacher practice.

Crawford (2007) conducted additional analysis of the Crawford et al. (2005) study data, which revealed that adaptive veteran teachers balanced the features of these orientations when completing the research task. This finding supports the conceptualization of adaptive expertise as a balance of innovation and efficiency offered by Schwartz, Bransford, and Sears (2005) and also alludes to Bereiter and Scardamalia's (1993) assertion that efficiency paves the way for adaptive practice through the reinvestment of energy preserved through appropriation of efficient

Table 2.2: Alignment Between Crawford et al. (2005), Wineburg (1998), and Reflection

Synonymous with Features of Reflection		**Agreement with Wineburg (1998)**	**Adaptive Orientation (Crawford et al. 2005, p.18)**	**Efficiency (or Routine) Orientation (Crawford et al. 2005, p.18)**
Theory	**Research**	**Research**	**Research**	
Dewey, 1910; Schon, 1983	Sabers et al., 1989;	✔	"Slow to draw conclusions, building mental model of situation from evidence"	"Quick to draw conclusions from one aspect of the problem space"
Schon, 1983	Carter et al., 1987	✔	"Thorough, systematic exploration of data"	"Limited, unsystemic exploration of data"
Schon, 1983		✔	"Tentativeness, posing questions to self"	"Certainty, satisficing to complete the task"
Schon, 1983			"Test hypotheses and judgments against new data"	"Retain hypotheses based on prior knowledge"
Dewey, 1910		✔	"Build understanding of situation through data"	"Interpret situation in terms of prior experience, assumptions"
		✔	"Explicit statements about not-knowing novel content"	"No statements about not-knowing novel content"
			"Explicit testing of model with nonconfirming information"	"Avoidance or discounting of nonconfirming information"
		✔	"Shows interest, curiosity about novel content"	"Shows no interest in novel content"

practice (e.g. routine application). However, Crawford's report reveals a space in research to be explored: what kind of practice makes balance? The present study built on the reviewed research describing teacher expertise via the construct of adaptive expertise by employing a conceptual framework similar to that of Crawford (2007) to explain how such balance exists in practice.

Conceptual Framework

Adaptive expertise will serve as the conceptual framework for this study. Conceptualizing teaching expertise as adaptive expertise provides a framework for describing masterful instruction as it was characterized in the reviewed literature. Essential features of this framework are the constructs of adaptability and efficiency and how they are balanced within displays of adaptive expertise (Schwartz, Bransford, and Sears 2005). The researched operationalized terms found to characterize adaptive and efficient problem-solving orientations in teacher reasoning served to guide the identification of adaptability and efficiency orientations within the present study (Crawford et al., 2005; Crawford, 2007; Wineburg, 1998). This section proceeds with an explanation of the constructs of adaptability and efficiency and how they form the conceptual framework of adaptive expertise, as well as the descriptions that were used to guide identification of these constructs in the present study.

Adaptability

Adaptability is the invention of new knowledge within problem solving; in expert practice, previous knowledge is believed to facilitate the construction of new knowledge (Bereiter & Scardamalia, 1993; Hatano & Inagaki, 1986; Schwartz et al., 2005). Adaptability plays a role in the novice's discovery of core knowledge to reach initial expert status, but it is the continuance of adaptive thinking beyond the establishment of efficient routines of expertise that serves as a distinguishing feature of adaptive expertise (Bereiter & Scardamalia, 1993; Schwartz et al., 2005). Adaptability is also discussed in tandem with innovation (Schwartz et al. 2005). Informed by their study of writers and students across academic disciplines, Bereiter and

Scardamalia (1993) describe how experts continue learning by working at the edge of their competence to create adaptations, or innovations, of knowledge. Adaptability might also be described through the term *creativity,* which Berliner (2001) describes as "noticing opportunities for change" and Sawyer (2004) explains as *disciplined improvisation*. Within adaptive expert practice, conceptual understanding frames such creativity (Hatano & Inagaki, 1986), as the expert teacher in Tsui's (2009) study illustrated. The expert teacher evaluated "opportunities for change" within instruction through the frame of learning needs and contextual features.

Crawford et al. (2005) identified features of an adaptive orientation in problem solving. These characterizations guided the identification of the construct of adaptability in the present study. Such descriptions also subsume the theme of a reflective stance that was prevalent in the reviewed research related to this study, where a reflective stance facilitates adaptations in instruction. Table 2.2 illustrates how Crawford et al. (2005) characterizations of an adaptive orientation to problem solving subsume the theme of reflection in the reviewed literature that alludes to adaptiveness. The citations listed in the left columns denote features of theory that explain the process of reflection and past teacher expertise research that has illustrated such features within teacher practice. By absorbing the features of the reflective theme in teacher expertise literature within the characteristics of an adaptive problem solving orientation, the present study was able to offer a degree of synthesis between past research regarding teacher expertise that alludes to adaptive practice and emerging research regarding adaptive expertise as a construct for explaining teacher expertise. Overall, adaptability characterizes the continual innovative thinking within adaptive expertise; such thinking is necessary to consistently enact successful practice within an ever-changing context, and teaching is a professional that is forever fluid.

Efficiency

Efficiency is the application of acquired knowledge in a fast and accurate way (Schwartz et al. 2005). In fact, some have defined efficiency as evidence of expertise (Crawford & Brophy, 2006); Berliner (1988) and Dreyfus and Dreyfus (1988) theorize that expert levels of efficiency are exercised without conscious thought; however, Tsui (2009) found a distinction of expert teacher practice to be the ability to remain conscious through decision making, which implies consciousness during efficient practice. It was previously noted how teacher-expertise literature alludes to a reflective adaptive stance in expert instruction—a stance that implies a deliberate attention to decision making.

Efficiency facilitates the recognition of patterns within experience that support accurate, and sometimes prompt, decisions. Expert teachers can identify patterns within classroom activity that help interpret instruction, as in Sabers et al. (1991) where expert teachers articulated patterns within live classroom and in Tsui (2009) where the expert teacher could recognize patterns within plans for instruction. Both routine and adaptive experts express high degrees of efficiency (Hatano & Inagaki, 1986). In fact, Crawford (2007) found that routine and adaptive experts displayed equal amounts of efficiency. However, efficiency serves as only one dimension of the knowledge considered when solving problems within adaptive expertise (Schwartz et al. 2005). When an adaptive expert exhibits efficiency, he/she is aware of the underlying reasons why the efficient response is or is not effective. However, a routine expert may enact the same level of efficiency as an adaptive expert, yet he/she is unable to diagnose why an efficient response may prove ineffective (Hatano & Inagaki, 1986).

Crawford et al. (2005) organized their findings related to efficiency through characteristics that illustrate an efficiency orientation to problem solving (See Table 2.2.). These

characterizations helped guide how efficiency was identified within teacher practice in the present study. By using the operationalized terms, data from participant commentaries were organized to illustrate the extent to which their reasoning and reasoning processes exhibit an efficiency orientation to problem solving.

Balance of Adaptability and Efficiency

Adaptive expertise is a balance of efficiency and adaptability within practice (Schwartz et al., 2005). Similar to topics discussed in the reviewed literature, a dynamic, conceptual understanding of domain knowledge facilitates this balance. When experts understand why an efficient response is effective in certain contexts, they are able to adaptively operate beyond efficient responses when efficiency proves insufficient for present problems (Hatano, & Inagaki, 1986). However, as Schwartz et al. (2005) comment, "A major theoretical challenge is to understand how efficiency and adaptability can coexist most effectively" (p. 30). Their construct illustrating a potential explanation of this coexistence has served to help researchers respond to the challenge. Figure 2.1 comes from the work Schwartz et al. (2005) and illustrates the *optimal adaptability corridor*. They posit that the corridor is the space where adaptive expertise is developed and continues. Bereiter and Scardamalia's (1993) conceptions of expertise support this theory. They assert that the expression of expertise alludes to the manner in which one's expertise was developed. Supported by research within the fields of writing, music, and medicine, Bereiter and Scardamalia suggest that expertise exists to the extent that people continue learning at the "edge of their competence" (p. xi). Interestingly, the experts in their research were the ones that continued learning, while the weaker participants did not seize learning opportunities. Therefore, if one exhibits adaptive expertise, it may be reflective of an

adaptive orientation to learning that was present before reaching expert levels of performance. Crawford et al. (2005) found that when participants revealed an adaptive orientation during the first phase of the research task, most maintained that orientation during the researcher-prompted phase of the task, where researchers would cue participants to reconsider aspects of task material. Crawford et al. found the same to be true of participants' exhibiting an efficiency orientation. These findings build on Bereiter and Scardamalia's (1993) inferred connection between the development and maintenance of expertise.

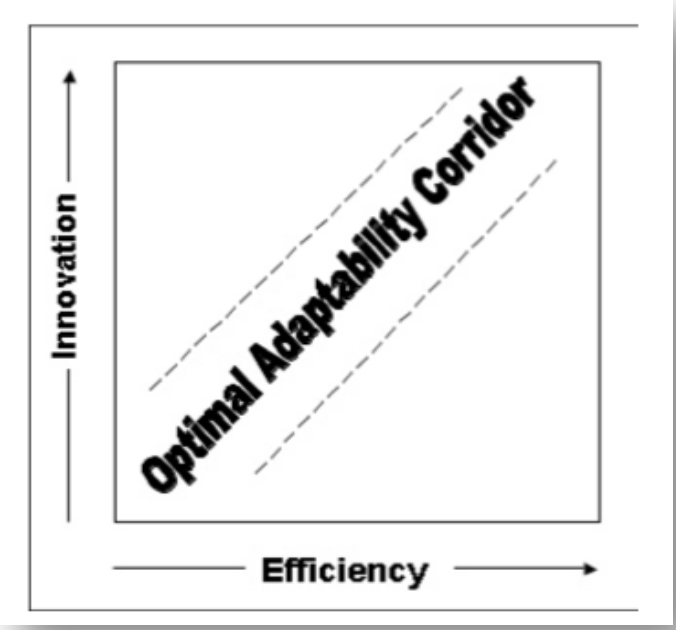

Figure 2.1. Schwartz et al. (2005) Optimal Adaptability Corridor to explain the balance of efficiency and innovation (adaptability) in adaptive expertise.

Considering the suggested connection between how adaptive expertise may be acquired and how it is continually enacted, the construct of the optimal adaptability corridor provides a way to describe and explain how expert teachers strike a balance of adaptability and efficiency

that constitutes adaptive expertise. Crawford (2007) found that adaptive veteran teachers displayed a balance between efficiency-oriented and knowledge-building-oriented comments within problem solving which supports the Schwartz et al. (2005) conception of adaptive expertise. The calculated means of data related to adaptive veterans indicated a balance of adaptability and efficiency. However, there is no clear explanation regarding how this balance was achieved. Therefore, the present study builds on Crawford's (2007) findings with adjustments to data collection and analysis in order to illustrate how the balance of adaptability and efficiency is achieved in teaching to demonstrate adaptive expertise.

To advance our understanding of how such balance is achieved within instruction, it is important to collect explanatory pictures of expert instruction. Figures 4.1 through 4.6 were inspired by the Schwartz et al. (2005) figure and created an approach to charting data within the present study with the goal of describing how adaptive expertise is exercised within expert teacher practice. Similar to the analysis techniques of Crawford (2007), data indicating adaptive and efficiency orientations in problem solving were charted in correspondence with the time the data occurred within the lesson. This method extends the findings from previous research using quantitative measures by offering illustrations of when adaptive and efficient orientations to problem solving occur during instruction to create a balance that is indicative of adaptive expertise.

The purpose for using Figures 4.1 through 4.6 were to describe when adaptive and efficiency reasoning processes were present within expert instruction; it was not to chart numerical sums of data coded for adaptive and efficiency orientations because that may have given the false impression that a certain number denotes exercise of adaptive expertise. Case narratives from classroom data are shared in addition to the charted data to further explain how

the balance between adaptability and efficiency was achieved in expert instruction that constituted adaptive expertise.

Chapter Summary

Conceptions of teaching expertise need to take into account the fluid contexts of instruction. Adaptive expertise is believed to be a concept that advances understanding regarding how teachers enact expert practice within perpetually changing conditions. The present chapter was organized to illustrate how teaching expertise literature displays a theme of adaptiveness in instruction, how adaptive expertise extends understanding regarding teaching expertise, and how adaptive expertise is conceptualized in a manner that supports further research of teaching expertise.

Reflective adaptation emerged as a theme in teaching expertise theory and research. It was explained how this feature facilitates the use of an expert's repertoire as expressed through routine application, pattern recognition, and dynamic understanding. Expert teachers apply routines yet remain perceptive to times when routines may fall short of the needs of the current students. When determining patterns within practice, expert teachers question the appropriateness of the emerging patterns against classroom data. Additionally, dynamic understanding supports adaptations of practice that meet the needs of the learners. Ongoing perceptiveness, continual questioning, and dynamic understanding are features within literature that support reflective adaptation as a key feature of teaching expertise.

Since teacher expertise literature points to adaptiveness, it seemed plausible that adaptiveness is an appropriate and necessary component of revised conceptions of teaching expertise. This assertion is supported by a few studies focused on the use of adaptive expertise as an explanatory construct of teacher expertise. Relevant research was summarized to denote how

the above approach has advanced understanding regarding how expert teacher practice occurs. The most significant contributions were in the form of operationalized terms for describing problem-solving processes that support adaptive expertise. Such terms support the employment of a conceptual framework for adaptive expertise. This framework subsumes the reflection theme in previous literature related to teaching expertise, employs researched terms for identifying processes that facilitate adaptive expertise, and provides a descriptive means for explaining how adaptive expertise is achieved within teaching. Through a synthesis of relevant literature and a framework for extending such work, this chapter served to provide scholarly grounding for the present study focused on describing and explaining how adaptive expertise exists in expert teacher practice.

Chapter three will detail methods for the present study that have been organized through an interpretivist theoretical perspective and a constructivist epistemological stance. Narrative research methodology informs the processes for participant selection, data collection, and data analysis. Each effort is enacted for the purpose of understanding how adaptive expertise can advance understanding regarding teaching expertise.

CHAPTER THREE: RESEARCH METHODS

Chapter Two outlined how previous research regarding the relationship between adaptive expertise and teaching has advanced current understanding about how the construct exists in simulated teaching tasks; however, a gap remains regarding how the findings connect to actual classroom practice. The purpose of this study was to understand how adaptive expertise describes expert teaching because teaching takes place at the intersection of changing conditions; therefore, adaptive expertise serves as a plausible construct for advancing descriptions of teaching expertise due to how it conceptualizes expert practice that occurs within fluid contexts. The present study borrowed elements from past research and repositioned them amidst a research design that serves to fill in gaps in the description and explanation of adaptive expertise in expert teacher practice. This chapter presents the research plan used for understanding adaptive expertise in teacher practice including explication of the theoretical perspective informing the study and the epistemological stance from which the research will be conducted. Additionally, participant selection, data collection, and data analysis methods are explained within the theoretical and epistemological frame to justify the design choices.

Theoretical Perspective: Interpretivism

Theoretical perspective in research explains how a researcher views the purpose of a study (Paul, 2005). The present study was constructed for the purpose of understanding adaptive expertise, which is supported by an interpretivist theoretical perspective (Crotty, 1998). In

interpretivist research, it is believed that individuals construct knowledge (constructivism), which has implications for the way findings will be revealed in the research. The present study was designed to elicit descriptions and explanations—constructions of knowledge.

In interpretivism, understanding is pursued through recognition of similar and different qualities between experiences. When engaged in experience amidst an interpretivist perspective, one is suspended in a state of creative tension where sameness is gathered and difference is explored (Adorno 1973 as cited in Crotty, 1998). An interpretivist would see any revelation of difference between experiences as an opportunity for greater understanding; thus, the interpretivist perspective also embodies the signature of adaptive expertise: embracing the atypical to enhance greater understanding.

Epistemological Stance: Constructivism

An epistemological stance illustrates how the researcher believes knowledge is known (Paul, 2005). Constructivism describes the epistemological stance of this study. Constructivism describes a way one may come to understand within interpretivist research, for constructivism characterizes making sense of the world at an individual level by the assembly of existing knowledge to create new understandings (Crotty, 1998; Paul et al., 2005). Conceptually, constructivism can help us understand the heartbeat of reflective adaptation, which was the theme that emerged in the reviewed teacher-expertise literature that supports this study. The reflective adaptation theme in teaching was fleshed out in adaptive expertise research through the identification of an adaptive orientation to problem solving (Crawford et al., 2005). Reasonably, the pulse of this adaptive orientation can be characterized as the epistemological stance of constructivism.

Adaptive Balance in Theory and Epistemology

Understanding is created in interpretivism via creative tension that embraces similarities and differences between experiences (Adorno 1973 as cited in Crotty, 1998). In constructivism, this creative space is poised between the objective world and the subjective life (Eisner, 1991). This position echoes the balance between efficiency and innovation in the conceptual framework of adaptive expertise (Schwartz et al., 2005), where the similarities with the objective world are analogous to the established patterns of practice and the differences in the subjective life are representative of the transformations in pattern created through new experience. Knowledge made from the perspective of interpretivism presents understanding that is a synthesis of similar and different attributes of experience (Adorno, 1973 as cited in Crotty, 1998). What emerges from constructivist experience is new, constructed knowledge that is reflective of the synthesis of "subjective life" and the "objective world" (Eisner, 1991; Crotty, 1998). Each result shares the spirit of adaptive understanding.

Methodological Framework

The design of this study serves to fill in gaps of previous research that utilized task simulation methods to show connections between the construct of adaptive expertise and expert teaching. Although advancements have been made in the understanding of this connection through such methods, next steps in this study were built on the need to include connections to teachers' actual classrooms. Additionally, attention to such advancements may be best initiated at the level of individual experience. What follows is an explanation of the research design that pursued this individual level of understanding that was framed in narrative inquiry and exercised via Cognitive Task Analysis.

Narrative Inquiry

Narrative methodology comprises the means for working with data in this study. In narrative research one seeks to make sense of experience, understand experience (Clandinin & Connelly, 2000; Creswell, 2007)—more specifically, learning from individuals' stories (Ollerenshaw & Creswell, 2002). Such individual stories are shared through expert teacher descriptions and explanations of their reasoning within their own instruction. This approach differs from past research where participants were given material from classrooms that were not their own and focus was on the generalization of data. Through a narrative design, this study offers individualized examples that illuminate the generalized findings of past studies through the examination of material by teachers of their actual classrooms. Since this study was focused on understanding at the individual level, it is believed that narrative methods appropriately contributed to such findings through enacting the following procedures in participant selection, data collection, and data analysis.

Research Questions

For the purpose of understanding how expert teachers exhibit adaptive expertise within their practice the following research questions formed the inquiry frame:

- How do secondary English language arts teachers who have been identified as experts describe and explain their reasoning and reasoning processes behind decisions within instruction?
- To what extents do expert secondary English language arts teachers' descriptions and explanations of their reasoning and reasoning processes behind decisions within instruction align with the conceptual framework of adaptive expertise?

These questions speak to the gap in research regarding adaptive expertise and its appropriateness for explaining expert teacher practice. Previous research stops short of the investigation of this construct in the live classroom but provides foundation for such an inquiry (Wineburg, 1998; Crawford, et al., 2005; Crawford, 2007). The research questions are born out of the structure of past research by using similar focal points of teacher reasoning and the adaptive expertise framework; however, the questions help advance the understanding of adaptive expertise in expert teaching by focusing the responses on the material of live lessons of the participants' classrooms rather than simulated teaching tasks.

Participant Selection

The following criteria guided the selection of participants; the aim was for each participant to exhibit all the these criteria:

- National Board Certified teacher whose certification is in English language arts and/or advanced training in educational theory and practice (e.g. masters degree)
- current secondary English language arts teacher,
- seven years (at least) teaching experience, and
- teacher's location is in same or near by school districts where I live.

Although the above list represents the final elements used to guide the participant selection process, reaching this list was an evolution. The process of securing teachers for this study included contextual challenges that necessitated revising the selection criteria.

First steps. During the first attempts in participant selection for this study, the following list of criteria were used:

- National Board Certified teacher whose certification is in English Language Arts/Early Adolescence (age 11-15),
- current secondary English language arts teacher,
- seven years (at least) teaching experience, and
- teacher's location is in same or adjacent school districts where I live.

National Board Certification. For the purpose of understanding adaptive expertise through expert teachers' descriptions and explanations of their reasoning and reasoning processes in their practice, the selection process followed a purposeful sampling strategy. In this approach to participant selection, a researcher chooses participants for their potential to speak to the research query (Creswell, 2007). This approach is supported by the work of Bond et al. (2005) who validated qualities of teacher expertise in their study with a sample of teachers who pursued National Board certification in the area of English Language Arts/Early Adolescence or Generalist areas. The teachers who achieved certification demonstrated higher mean scores on each domain of expertise than teachers who pursued the certification but did not achieve certification. Domains of teaching expertise were articulated through an extant literature review and validated through extensive data collection, including classroom observation by other experienced teachers. The qualities of teacher expertise outlined by Bond et al. align with the characteristics of an adaptive orientation to problem solving that was outlined in Chapter two (Crawford et al., 2005). Table 3.1 illustrates the alignment between the qualities used in the Bond et al. (2000) study and the characteristics of an adaptive orientation in problem solving; it

also illustrates alignment between an adaptive orientation and the five core propositions of the National Board for Professional Teaching Standards. Illustrating such connections helps communicate the rationale for use of National Board Certification as a key feature in the participant selection process for this study. Since the features that Bond et al. found in their research involving National Board Certified teachers and the core propositions of the National Board have an apparent alignment with the

Table 3.1. Alignment between Adaptive Reasoning, Teacher Expertise, and National Board Core Propositions

Adaptive Orientation (Crawford et al., 2005, p.18)	**Teaching Expertise Qualities (Bond et al. 2000).**	**National Board Core Propositions (National Board for Professional Teaching Standards, 2013, "The Five Core Propositions," *para*. 2)**
"Slow to draw conclusions, building mental model of situation from evidence"	Experts use their repertoires and student response in ongoing interpretation of instruction.	"Teachers are committed to students and their learning."
"Thorough, systematic exploration of data"	Expert teachers process the multiplicity of classroom events in a simultaneous, efficient way.	"Teachers know the subjects they teach and how to teach those subjects to students." "Teachers think systematically about their practice and learn from experience."
"Tentativeness, posing questions to self; Test hypotheses and judgments against new data"	Expert teachers continually create and test hypotheses within and after instruction; each cycle of questioning impacts the next iterations of instruction. Expert teachers adjust course content to meet the needs of students and offer feedback to guide students toward accurate understanding.	
"Explicit statements about not-knowing novel content"		
"Explicit testing of model with nonconfirming information"	Experts develop problem solutions that account for a wider scope of information than knowledgeable teachers. Expert teachers also anticipate challenges and diverse responses and create instruction that includes space for exploring such features.	"Teachers are responsible for managing and monitoring student learning."
"Shows interest, curiosity about novel content"	Expert teachers fuse new information with their prior knowledge and student knowledge.	"Teachers are members of learning communities."

adaptive orientation associated with adaptive expertise in research involving teachers (National Board for Professional Teaching Standards, 2013), confidence emerged regarding the extent to which National Board Certified teachers would demonstrate adaptive expertise within the present study.

"Proposition one: teachers are committed to students and their learning." According to the National Board, "accomplished teachers" (those who meet the standards of National Board Certification) teach through the belief that learning is accessible to all students. Such teachers recognize that helping students learn might require them to adapt their methods, which may include the consideration of contextual and cognitive factors relative to each student. This implies that teachers are continually attending to relevant evidence in making instructional decisions, which alludes to an adaptive orientation. Such continual assessment of the appropriateness of instruction reveals a teacher's commitment to students and how they learn.

"Proposition two: teachers know the subjects they teach and how to teach those subjects to students." Similar to the characteristics of Shulman's *pedagogical content knowledge* (1987), this core proposition explains how accomplished teachers are able to synthesize students' prior knowledge with their deep instructional experience to create instruction that motivates students toward challenging objectives. Creating such synthesis requires a systematic approach that is characteristic of an adaptive orientation.

"Proposition three: teachers are responsible for managing and monitoring student learning." Accomplished teachers attend to their students' progress in the learning event at an individual and collective level. They know how to wield the features of the environment to create the most productive context for learning, and when learning occurs, accomplished teachers can explain how and why it happened. This level of understanding instruction aligns with the

understanding facilitated by adaptive expertise (Hatano & Inagaki, 1986). An inferential connection with an adaptive orientation is that to accomplish management and monitoring at this level includes testing of one's interpretations of the learning environment.

"Proposition four: teachers think systematically about their practice and learn from experience." Accomplished teachers never stop refining their practice through examination of past methods, pursuit of better understanding, and adaptation of current strategies, which implies a methodical thoroughness to one's practice. This systematic examination is a feature of an adaptive orientation.

"Proposition five: teachers are members of learning communities." Accomplished teachers' participation in learning communities is for the overall effectiveness of the learning experience at school. This proposition may echo the intentionality of accomplished teachers: "commitment to students and their learning" (National Board, 2001, p. vi). Such involvement may take shape through policy and curriculum construction and professional development. This activity also extends to ways to engage parents in the effective growth of the school experience. Commitment, as it is characterized here, implies an embracing of new and atypical features in the teaching experience to continually promote and improve student learning. Such a stance aligns with an adaptive way of thinking.

The rationale for choosing National Board Certified teachers with a certification in English Language Arts was based on my experience as a secondary English language arts teacher and secondary English-language-arts teacher educator. Since the purpose of this study was to understand adaptive expertise in practice, it was necessary that I have knowledge of the experience of the English teacher as demonstrated in pedagogical content knowledge in order to facilitate the interpretation of the collected data (Shulman, 1987). Positioned in a narrative

framework, I am also afforded the opportunity to participate in the meaning making process (Clandinin & Connelly, 2000). Therefore, by focusing this study on secondary English language arts teachers, I was positioned better to interpret data based on my experience as a secondary English-language-arts teacher and English-language-arts teacher educator.

Years of experience. An additional criterion for participant selection was years of teaching experience. Previous research of adaptive expertise in teaching used this feature for participant selection (Crawford et al., 2005), and Berliner comments on years of experience as a possible feature of expertise in teaching (2004). Based on the work of Crawford et al., (2005) and Crawford (2007), seven years of experience was the minimum length of experience consideration for potential participants Therefore, in addition to a National Board Certification (English Language Arts/Early Adolescence), I looked for teachers with at least seven years of experience. Also, given the data collection methods and the depth of data to be collected, the search was limited to districts adjacent to my location.

The target number of participants for this study was three. This sample size was based on sampling recommendations of Creswell (2007). It is also informed by the purpose of narrative for this study where narrative is not only the text used and but also the text pursued through this inquiry (Chase 2005 as cited in Creswell, 2007): teacher interview narratives inform the construction of narrative syntheses describing their stories of adaptive expertise. Narrative is focused on individual meaning as represented in story. Therefore, it may have been plausible that one participant could have met the purpose for this study.

Initial search. The initial phase of selection was conducted via a search for National Board Certified teachers with English Language Arts/Early Adolescence certification in my local and neighboring districts. In attempting to build justification for the expert status of participating

teachers, I attempted to stay as close as possible to the selection criteria in the supporting research. Bond et al. (2000) used language arts teachers with this specific certification and found them to exhibit characteristics of expertise. The website for the National Board includes a search feature that facilitated locating such teachers and the cities where they practice. Once potential participants were identified, I used Internet search tools with public access to confirm where each teacher was employed, and the Internal Review Board approved such searching procedures.

After identifying teachers and their places of employment, I contacted the principals at the respective schools, identified the teachers by name, and asked for permission to present the research opportunity to the teacher(s). Principals pointed me to additional district approval protocol, which I promptly completed and submitted to each school to confirm district and principal approval.

After securing district and principal approval, I began reaching out to the qualified teachers to request their consideration of participation in the study. A theme emerged as I received responses from potential teacher participants—one of enthusiasm for the study couched in expressions of the inability to commit. Several took time to articulate specifics regarding their position. For example, "I am flattered that you have requested assistance from me. I love teaching…however, this year I am struggling to keep myself organized and on track with all the new mandates being given on a daily and weekly basis." (Potential Teacher Participant J, personal communication, October 31, 2012). As I reached the end of my list of qualified teachers based on my initial selection criteria, my search yielded only one participant. Therefore, I revisited my selection criteria to consider adjustments and plan next steps.

Next steps in participation search. After meeting challenges in the initial participant search, the following elements of the selection criteria were reconsidered and expanded:

- National Board Certified teacher whose certification is in English Language Arts/Early Adolescence (age 11-15),
    - Expanded to include: National Board Certified teacher whose certification is in English Language Arts (any secondary level) and/or advanced training in educational theory and practice (e.g. masters degree)
- teacher's location is in same or adjacent school districts where I live.
    - Expanded to include: teacher's location is in the same or *near by* school districts where I live.

In addition to selection criteria, I also reevaluated the data collection requirements that seemed to be a factor in teachers' challenges in committing to the study. I will explain these adjustments in the following sections along with the additions above.

National Board Certification additions. Based on the previous research framing this study, I expanded the selection element of National Board Certification to include any English language arts certification at the secondary level. The work of Bond et al. (2005) continued to support this choice in that they saw a trend in expressions of expertise in more than one type of National Board certification. Also, this addition was supported by the alignment of the core propositions of the National Board and the expertise characteristics in the Bond et al. study with the features of an adaptive orientation (see Table 3.1). Therefore, it was reasonable to assume that teachers with other National Board certifications in the language arts would have a similar expert status.

Advance training addition. Based on the work of Crawford et al., (2005) and Crawford (2007), advanced training became another criterion used for selection—specifically, advanced training in educational theory and practice. A potential participant could have had advanced training and no National Board Certification and still have qualified for consideration in the study. These selection elements were based on Crawford's work, which confirmed the adaptive expertise of participants chosen through years of experience and advanced training.

Location reconsideration. I also expanded my search to include districts that were within a wider radius from where I live. My initial search area included districts that were in my own or neighboring districts. However, as participant location became more challenging, I began to take referrals for teachers who might consider participating even if their working locations were farther distances that I had originally planned to travel.

Data collection reconsidered. I also re-evaluated terms of the study that seemed to be common reasons for teachers to decline—mostly centered on the topic of time. I could not change the dynamics of their professional expectations that seemed to be influencing their inclination to decline, but perhaps the change in the time commitment for the study would create a greater potential for their participation. Although my initial projection for data collection was six weeks, I remained open to what teachers preferred regarding a time frame for data collection.

Another feature of data collection that required a considerable amount of time was the use of coding software. Initially, my plan involved having teachers utilize a video coding software to identify decisions within their videotaped lessons. As I re-examined the use of the tool, I realized that I could accomplish the same goal that the tool was selected to perform but within a smaller amount of time. Rather than have teachers learn the software program and set aside additional time to code their classroom videos before our interviews each time, I blended

the coding process with the reflective interviews. Teachers would verbally note decision points during each interview to accomplish the coding process, which is explained further in the data collection section of this chapter.

Second search. With my widened criteria list, more flexible time table, and approval from the Internal Review Board regarding my study adjustments, I circled back to teachers I had previously contacted to see if the adjustments were such that they could commit to participation in the study, as well as contacting new potential participants who met the additional selection criteria. Unfortunately, I was met with similar rejections. For example, "In the past I would have gladly participated - anything to help another educator. At the moment, giving up any more time is out of the question for me… The nature of teaching has changed a great deal in the past few years and time has become a super-premium commodity." (Potential Teacher Participant R, personal communication, November 7, 2012). Another wrote, "Thank you [for] your interest in including me in your study; however, I do not have the amount of time indicated to devote to your research given the current demands of my schedule." (Potential Teacher Participant T, personal communication, November 7, 2012).

I moved forward from this place by asking peers and advisors for names of potential teacher participants. During this time, another potential candidate emerged who fit the selection criteria. After sharing the details of the study and requirements for participation, the referred teacher agreed to participate.

As each of the two participants expressed interest in the study, I requested a time to meet with each face-to-face to further explain the study and answer any questions she might have before committing to participate. This measure aligns with the rapport with participants that is critical to research practice (Creswell, 2007). During the face-to-face

conversation, the potential participants were able to assess their comfort level in working with me as a researcher as I explained the study, including consent and confidentiality processes of the study (Creswell, 2007). At this stage, teacher participants were asked to complete an Teacher Participant Informed Consent Form (Appendix A). Since the data collection methods involved video of each participant's instruction, consent forms were also collected from parents of students who would appear on the classroom videos (Appendix B). Additionally, student assent was collected from students who would appear on classroom videos (Appendix C). This effort was conducted through protocol approved by the Internal Review Board for requesting such permission. If a student did not give or was not given permission to participate, the camera angle during filming was positioned to avoid capturing such students on video. This approach was also described in the permission form. Each teacher participant was also informed that she could withdraw from participation at any time.

At that point, I consulted my advisory committee regarding the target number of participants. Although the initial projection was three teachers, I requested their support in moving forward with two participants based on the rationale of the study design and the complications in securing participants. They supported completing the study with two participants. Overall, the journey of participant selection was challenging; however, I believe the process revealed telling insight regarding the demands of teachers today and yielded participants that were rich sources of information for this timely research.

Placing Teacher Narratives

Since narrative is hinged on individual experiences, each teacher's context is explained next to establish the placement of her teaching story. This location was discovered through recognizing intersections of their experiences within the three-dimensional narrative inquiry space of personal/social, temporal, and situational dimensions (Clandinin & Connelly, 2000). My position as a researcher amidst the participants is also explained.

Adele. Adele received a National Board Certification for English Language Arts/Early Adolescence in 2007 and has been teaching secondary English for twelve years. She has been teaching at her current school for ten years, which is a Title I middle school is the southeastern United States with an enrollment of approximately 1100 students. Her current schedule hosts an average class size of 22 students, and she teaches six out of seven periods a day that range from 46 to 50 minutes. Prior to her assignment in sixth grade, she taught reading for two years. The class that participated in the video recordings for this study was Adele's seventh period advanced sixth grade English class, which runs 50 min. each day and has 24 students.

Curricular shifts. Recent curriculum shifts at Adele's school include the adoption of a scripted curriculum, where her school is tasked with piloting the material before implementation in the entire district. Ways to establish rational connections between curriculum trends and past and current materials occupy Adele's thoughts. Although she is familiar with curricular shifts in her career, the most recent transition has had a more pronounced influence on her instruction, "I feel like I'm a new teacher on some days, in terms of curriculum" (Interview 1, p. 11). She is finding it challenging to discern the authorial aim of the materials when establishing her instructional approach. A theme in her commentary was how to make the material and prescribed approaches make sense to the students. Adele described the synthesis of past and present aims as

a process of reflection, which she struggles to find time for in the midst of administrative tasks that seem, at times, perfunctory. Teachers are required to adhere to the curriculum materials in a certain order, time, and manner, where in the past they were given various materials with the freedom to pick and choose. Required training sessions are held to explain the prescribed procedures to teachers as well. Adele noted that this approach is the, "most prescribed I've ever had" (Interview 1, p. 3).

Overall, she is not entirely opposed the idea of having teachers working in a similar instructional pattern; however, she notes that, "you can't dictate how a teacher interacts with the lesson" (Interview 1, p. 4-5). Through all the mandated moves, Adele continues to demonstrate a confidence that her struggle is not about a lack of content knowledge or instructional experience, but rather a struggle with the design of the material. She persists in demystifying the material out of a personal concern for student progress; although, her efforts to reveal that connective curriculum elements are still in the shadow of the pressure to be in step with the rest of her department.

Administrative oversight. Already evident through the implementation of the recent curriculum, the administrative oversight at Adele's school is a point of uncertainty for faculty. She has personally observed a negative trickle down effect of administrative direction over the past few years. For example, Adele describes the district placing an emphasis on reading over writing to where students are missing or neglecting to display key features of writing fluency that are important and basic for students in middle school. When she assesses these deficits in students' written work, she continually feels squeezed between curriculum timing demands and the conviction to remediate. She infers that the pressure placed on standardized test scores in her district motivates such decisions.

The divide in the reading/writing focus is just one sign of a disconnect between administrative and instructive visions for the classroom at Adele's school. Administrative presence in the classroom communicates a surface understanding of instruction. When Adele has prior notice of administrative visits, she sometimes has to change the direction of her lessons to show administrative staff a particular tool or strategy—which may be out of step with a logical progression of learning for her students. She referred to checklist style reports generated through such visits, and that although many visits from the district were projected, few have actually occurred. The sporadic nature of administrative presence gives Adele space to work as she sees best in her classroom; although, she maintains an adaptive confidence even during evaluative visits. She describes the value of student learning as having a place over the pressure to adjust for an evaluative checklist to be completed. Student independence in the learning journey is her continual focus, and she seems unwilling to perpetually sacrifice instructional time to display a disjointed skill for administration in place of responding to the needs of her students. Because of their limited view, she even wonders if administration is able to assess the effectiveness of her instruction at times.

Adele's perception is that administration is focused more on the synchronicity between classes than a teacher's rationale for his/her instructional approach. If classes are not in step with one another, teachers perceive a punitive action rather than being given the opportunity for reflective conversation; however, at the departmental level, Adele's perspective is sometimes welcomed during the formulation of the weekly prescribed lesson plans. Foundationally, Adele's allegiance is to student learning even in the midst of administrative direction that seems to contradict how to achieve such progress.

Collegial connections. Connecting with colleagues is a way Adele navigates her environment. She frequently commented on times she would consult with a peer teacher either during the day or after school hours. These conversations helped to develop ideas, validate decisions, and create materials. This kinship was furthered by Adele's comments on the support of a peer teacher in working out the lessons that were the subject of the video analysis for this study. She also grieved the fact that professional learning communities at her school were missing opportunities to connect in such ways. She felt the community time should be spent on collective reflection and sharing ideas. Instead, there is the notion that district directives will become more pronounced in this time as well. It seemed that professional partnerships were a vital touch point throughout her day.

Ongoing optimism. Collegial connection may be one way Adele is able to continually display an ongoing optimism underneath the curricular challenges and administrative oversight at her school. This positive perspective is inferred from her reference to continual reflection, student independence, and detailed understanding. In constant reflection she wrestles with the prescribed lessons and the desire to feel connected to what she is teaching. To feel success instructionally, she desires to find a touch point that is authentic, and her persistence communicates that she believes she will find one. Throughout each turn of analysis of her video lessons she commented on her personal goal of bringing students to a place of being independent learners. She wants them to find value beyond the class activity, which may require her to push them beyond their comfort zone. However, each challenge she presents to a student is scaffolded through her knowledge of each as an individual learner. At one point in our review, she was able to describe specific needs of students on the screen and why she took the specific actions during the lesson. Although her environment is challenging the validity of her professional experience

with confining directives, she still keeps students' learning at the forefront through a reflective stance.

Bethany. Bethany received a National Board Certification for English Language Arts/Adolescence Young Adulthood in 2009 and has been teaching secondary English for nine and a half years. She has been teaching at her current school for five years, which is a private Christian school in the southeastern United States with an enrollment of approximately 1100 in grades K4-12th. Her current schedule hosts an average class size of 22 10th grade students, and she teaches six out of seven periods a day that range from 40 to 50 minutes. Prior to teaching at her current school, Bethany taught in a public school district at the high school level for five and a half years. The class that participated in the video recordings for this study was Bethany's seventh period English II Honors class, which runs 50 min. each day and has 21 students.

Relational focus. Relationships are a focal point of the culture at Bethany's current school. She sees this as the primary vehicle for instruction. This point was illustrated even in her approach to teaching the meaning of the word "didactic" in one of the reviewed lessons for this study. In her explanation of the word to students, she contrasted the tone of the word by explaining how a teacher at the school might talk to a student versus one of their parents when reviewing a recent assignment. Not only was her exposition grounded in understanding of the global instructional approach at her school but individualized knowledge of parenting styles her students have experienced.

Bethany's knowledge of her students' home-life situation is demonstrative of her focus on one-to-one relationship building with the students. During our interviews, she frequently detailed information of students at the individual level. For example, she explained her approach with a student with documented learning challenges as a need to help him feel safe in trying the

current activity because of his learning patterns in her class. She also articulated detailed knowledge of students and their younger siblings—distinguishing the different ways she motivates students from the same family. She also expressed experience with growing through challenging moments with a particular student to where she was able to draw on them later for instructional emphasis. In this particular situation, she was pulling from a moment where the student expressed anger toward her. During a lesson practicing tone, she welcomed the student to revisit the idea of that expressive quality to show him his ability to exercise more tones with the particular poem he selected for oral reading.

Modeling is another feature of relationship building in Bethany's classroom. She focuses on showing the students that she will not ask them to do anything that she is not willing to try herself in the scope of learning. Behaviorally, Bethany exhibits a deep conviction to modeling as well. Even in a fire drill during one of the lesson recordings for this study, she explained her rationale for maintaining a particular example for the students. Overall, in demonstrating expectations, Bethany maintains a realistic understanding of students where she is able to flex instruction to meet their daily needs.

Instructional through-line. Bethany's instructional approach has a consistent through-line comprised of clarifying expectations, content connections, and critical thinking. Her explanations of class moments frequently rested on the design of an activity's set up. The purpose usually began with making explicit the practical expectations for the assignment. For example, with a poetry lesson, she spent time making sure students understood the progression of steps that would lead to the school wide, poetry competition and how that process would be graded in class. With clear expectations, Bethany is better positioned to make pedagogical adjustments that cater to helping students see connections between classroom content and the world around them.

Her comments seemed to highlight how this approach helps students offload questions about the practical aspects of an assignment to focus on the conceptual meaning. This was illustrated as the class turned toward a conversation about the recent death of Nelson Mandela after a student's recitation of "Invictus." By taking time to expound such curricular connections, Bethany believes students' attention is drawn to consider literary pieces as representative of real people, situations, and challenges rather than "just the English teacher spouting off what she learned in a book" (Interview 3, p. 10). Moreover, she stencils in the connections in conversation in an effort to draw students toward critically thinking about the content. By drawing students beyond their comfort zones of thought she hopes to lead them to the realization that learning is a life long pursuit and that a letter grade does not encapsulate what one truly knows. Bethany recounted her own journey as a high school student in an International Baccalaureate program where she questioned why certain aspects of curriculum were important. She sites this realization journey as the impetus for her pushing students to pursue the relevance of content in her classroom.

Contrasting environments. Bethany's two working environments during her career create contrasting pictures of teacher autonomy. In each atmosphere, she felt a measure of accountability, but her interpretation of how each enacted such expectations differed. She described her first school as one where standardized testing drove the instructional scope. Teachers were expected to display prescribed instructional features in each lesson. However, Bethany clarified her personal belief that student learning needs supersede teaching directives. Her conviction is tempered with respect for her administration, "I would rather sit there with an administrator and explain to them why I am doing something to benefit the students than try and explain to them why the students aren't succeeding at something. I'd rather sacrifice personal time for that than make me feel like they are sacrificing part of their education" (Interview 1, p.

21). She described administration as being supportive of her adaptations to the prescribed instructional progression, which was expressed through their acknowledgment of high test scores and happy students. Although Bethany inferred that her evaluators could make sense of what was taking place during her teaching, they did not express a concern to know why she was doing was she was doing.

At her current school, she has complete freedom to sculpt the instructional period how she sees fit with the guiding expectation that she fill the time from "bell to bell" with instruction that prepares students for college (Interview 1, p. 21). Although the aim of college readiness could still have been a focus at her first school, the inferred stress was on test scores without the discussion of how they connect to academic advancement beyond secondary school. Upon hire at her current school Bethany was even told, "We have a lot more flexibility, there is no [state standardized test] here" (Interview, p. 23-24). Although with more freedom, administration still enacts measures of accountability at her current school; however, the approach expresses a tone of wanting to understand her instructional choices.

Bethany feels liberty to interpret her objectives daily as she meets the students where they are each day. She finds that instructional progress is not always defined in an activity attached to a school designated text, but rather in remaining sensitive to the needs of the whole student. For example, she explained moments where she allowed the beginning of class to be given to discussion of something that was frustrating the students from earlier in the day. She knew that content focused instruction was not going to go anywhere if students were not first given the opportunity to work through a mental distraction. Such moments also provide Bethany the opportunity to model the behavior she continually points her students to—carrying oneself with

responsibility. In discussing frustrations in these particular moments, she can circle back to teachable elements about how to work through such feelings in the midst of school expectations.

Professional freedom is even expressed in teachers' access to adapting curriculum choices to suit instructional goals that extend beyond the classroom. One of the main focal points of the lessons analyzed for this study was a poetry contest. Through this collection of lessons, students select and recite a piece of poetry focusing on interpretation and tone. The senior English teacher introduced this curricular unit five years ago as she noticed students' inability to prepare for interviews that were becoming more common in the college admission process. The more global aim of this instructional objective was to help students develop the ability to speak confidently for a variety of purposes that they would meet in life beyond the classroom walls.

Understanding the intersections that define each teacher's place helps illuminate the fluid contexts in which they teach. This understanding also lays a foundation for interpreting their practice through the lens of adaptive expertise. Moreover, since I served as the vehicle for such story building, and I share my position as a research in the following section.

My place as the researcher. Through a narrative study design, I define my role as the researcher as one "nested" "in the midst" of the study content (Clandinin and Connelly, 2000). More specifically, I must locate my place within the three-dimensional narrative inquiry space that defines the context of my participants (Clandinin and Connelly, 2000). To share in the creation of the stories of their experiences, and for such stories to carry relevance and credibility, I must articulate my position in relation to theirs as a step of reflexivity (Creswell, 2007). As the researcher, I stand at the intersection of my personal journey with the construct of adaptive expertise and the examination of the participants' experience through the lens of adaptive expertise. This crossroads is the culmination of the paths of my artistic and classroom

experiences, my development as a teacher-educator through the doctoral program, and my current position as a teacher-coach at my current school.

As a teacher, I found resonance with my classroom approach and the preparatory and performance methods I have used as an artist. For example, it was not uncommon to see opportunities for teaching moments through the principles of improvisation. As an artist engaged in improvisation, whether in acting or dance, one is perpetually sensing the frame of the action and discerning the most appropriate response. With my high school students, this principle was an intentional exchange that made teaching seem more effective and enjoyable. This alignment of performance and pedagogy continually intrigued me to where I questioned if there were documented explanations. My hope was that such explanations could offer confidence and advancement to my classroom practice. When artist-friends would ask me what I was doing professionally, I would explain how the classroom had become one of the best stages I had ever experienced. Artistry was new every day, and the audience was more interactive.

The curiosity of the teaching/artistry alignment led me to a doctoral program for curriculum and instruction, where I knew from the start that I wanted to explore this pedagogical/artistic connection. As I grew in the doctoral program, my role began to shift to that of a teacher-educator. In this position, I was challenged to interrogate my artistic philosophy while being tasked with fostering the development of current and future teachers. Through such personal examination, I discovered the construct of adaptive expertise and began using it as a lens to explain the work of the classroom. This lens helped me interpret the emerging practice of student teachers and encourage the practice of experienced teachers. I could better understand the purpose for adaptiveness among experienced teachers, and I could define the struggle of emerging teachers who felt free to adapt but were without a developed instructional rationale.

Such interpretive practice led me to formally study the construct of adaptive expertise, inquiry that began as I took on another role as a teacher-coach at my current school. My current position at a private, Christian school comes after a dynamic journey as a university supervisor and professional development instructor in local public school districts. Combined with my university teaching experiences, I was privileged to work in these capacities with close to one hundred teachers across three school districts and eleven secondary schools. Having worked in both public and private environments, I felt positioned to understand and interpret the experiences of the teachers in this study. My journey to this current intersection of experience has been over seven years.

Data Collection

In kind with the methodological framework of narrative inquiry, data collection procedures were constructed to pursue understanding of expert teachers' individual experiences through the lens of adaptive expertise (Clandinin and Connelly, 2000). Data collection also stemmed from the through-line of Hatano's research, the one credited with identification of adaptive expertise as a construct. Hatano preferred the examination of authentic action rather than response to experimental, controlled factors (Inagaki & Miyake, 2007). Therefore, the focus of understanding expert teachers' experiences in their actual classrooms was important to advancing research on adaptive expertise. Berliner (1988) also supports this approach to studying teaching expertise; for the expert teacher participants in Berliner's study commented that their expertise was hindered through a simulated task design. This hindrance was due to limited planning time and students' lack of familiarity with the teachers' instructional routines. The present study's

design also embodied the spirit of discussions held at the Adaptive Expertise Symposium. A recurring element of such talks included the extent to which learning environments provide for practices that foster adaptive expertise: citing narrow curriculum focus as a stifling factor (Crawford & Brophy, 2006)—a factor that seems to mirror the task simulation ideas of previous studies of adaptive expertise. Although controlling for fluid factors is considered good practice in many forms of research, the subject of the present study required a research design that embraced the fluid features. However, it should be noted that advancement in understanding regarding teacher expertise has been revealed through previous research that utilized tasks with controlled features (Carter, et al., 1987; Crawford et al., 2005; Crawford 2007; Wineburg, 1998). The present study sought to extend such understanding by applying findings from past research regarding adaptive expertise in teaching in analysis of data from participants' actual classrooms. Materials constituting data in this study were materials collected through and supporting the Critical Decision Method of Cognitive Task Analysis: classroom recordings, interview sessions, and reflective memos..

Cognitive Task Analysis: Critical Decision Method. Cognitive Task Analysis (CTA) is used to elicit understanding regarding expert knowledge in fluid fields where actions are usually facilitated by tacit knowledge (Schraagen et al., 2000). Clark, Feldon, Merrienboer, Yates, and Early (2006) explain CTA as a way to understand the thinking occurring during the execution of a particular task where special focus is brought to the analysis of the task. Moreover, CTA focuses on examining non-routine events within practice that stretch one's expertise (Klein, Calderwood, and Macgregor, 1989 as cited in Jonassen et al., 1999). Additionally, use of CTA may create more dependability in expert

self-report—a problem Feldon (2006) articulates as being present in research using expert self-report, and CTA is a method employed within the previous research on adaptive expertise in teaching (Crawford et al., 2005). The particular focus I used was the version of CTA called Critical Decision Method. This method is driven by the story behind an experience (Jonassen et al., 1999; Schraagen et al., 2000), where story refers to the narrated and sequenced tacit knowledge an expert shares within a specific experience case that includes attention to atypical features. The Critical Decision Method helped plot and describe the typical and atypical features of experts' critical decisions in a linear way (Ollerenshaw & Creswell, 2002).

Crawford et al. (2005) and Feltovich et al. (1984 as cited in Feltovich et al. 1997) help illustrate the rationale for the Critical Decision Method of CTA in this study. Crawford's work utilized CTA in examining how expert and novice teachers addressed novel content within a research task, where novel content would constitute the atypical aspect of the examined incident. The process described by Feltovich et al. (1984 as cited in citing Feltovich et al. 1997) includes an "unusual" case, where the case is examined and determined distinct from other experts' responses to an atypical situation in medical diagnosis. The authors describe the correct diagnosis through identification of a "critical incident" (1997, p. 132-133). Feltovich et al. (1997) elaborate a process of the expert's discovery of the correct diagnosis that mirrors the steps of the Critical Decision Method of CTA: identification of an "unusual" incident and articulating critical decisions throughout the examination of the unusual circumstance. Table 3.3 illustrates how the present study will enact each step of the Critical Decision Method of CTA.

Table 3.2. Critical Decision Method Application

Critical Decision Method Step	Present Study Method	Supporting Source
Identify incident	One lesson for one class period	Clark et al., 2006; Jonassen, 1999
Recount incident	Recorded footage of each lesson	Clark et al., 2006; Jonassen, 1999
Develop timeline	Recorded footage of each lesson	Clark et al., 2006; Jonassen, 1999
Identify decisions	Semi-structured interview	Clark et al., 2006; Jonassen, 1999; Schraagen, 2000
Probe for specifics	Semi-structured interview; reflective memos	Clark et al., 2006; Jonassen, 1999; Schraagen, 2000

Step one: identify incident. Defining an incident as one lesson for one class period is based on Hattie's analysis of research to identify characteristics of expert teachers (1995 as cited in Bond et al., 2000). In this analysis, it was determined that the teacher controls the most critical features of student learning in schools. Therefore, any classroom lesson might be defined as a "critical incident."

Step two: recount incident. It is common in the Critical Decision Method to have the participant recount the event through a general prompt and in an unstructured, uninterrupted way (Clark et al, 2006; Jonassen, 1999). Video and audio recordings were used to recount the incidents used in the present study. This choice was based on previous use of video as a tool for reflection in teacher research (Rosaen, Lundeberg, Cooper, Fritzen, & Terpstra., 2008; Sabers et al., 1999). Recordings may have helped sift assumption when reviewing the incidents under analysis.

Step three: develop timeline. Typically, researchers use the participants' retelling of an incident to create a timeline of events within the incident. Jonassen et al. (1999) describe how this process involved an extensive checking process to ensure that researcher and participants have a similar view of the event. Video and audio recordings were used to fulfill this step in the

present study with the belief that such footage would create a greater degree of certainty regarding the sequence of events and the quality of events within each critical incident. Conducting this step of the Critical Decision Method via recording also helped redistribute time usually afforded to formulating a timeline via participant retellings.

Step four: identify decisions. Decisions within a critical incident are defined as moments where several different actions are considered as plausible responses (Clark et al., 2006; Jonassen et al., 1999). Originally, this step was to be conducted via coding software; however, as noted through the descriptions of participant selection for this study, the decision identification process was blended with the interview process. To accomplish this blended step, at the start of the interview process I shared the definition for "decisions" in this study with each teacher. For example:

> "As you review the recorded footage from your classroom, please stop the tape as you notice a decision point in your instruction. For this study, a "decision" will be defined as a time when multiple, plausible actions could occur during instruction. Then, please indicate if the decision is "routine" or "adaptive." For this research project, "routine" is defined as moments that proceed in a manner that you expect, and "adaptive" is defined as moments that include unexpected elements. With each label, please explain a few thoughts as to why you labeled certain moments as either "routine" or "adaptive."

The use of the labels "adaptive" and "routine" stemmed from supporting literature regarding adaptive expertise in teaching (Crawford, 2007; Crawford et al, 2005; Hatano & Inagaki, 1986). The label "routine" was used interchangeably with "efficiency" later in data analysis, for "efficiency" is used to expound on the nature of routine expertise in literature

(Crawford, 2007). After this introduction, I shared examples of each type of decision with the teachers. Table 3.3 includes the table I used to describe the example decisions.

Table 3.3. Example Decisions

:32 – Label: Adaptive
Class Action: I noticed that a certain student was absent who is rarely absent when a major project is due in my class.
Why: I coded this time in the lesson as adaptive because this was unexpected—especially since the student chose to go first in the group presentations for this day. In this moment, I'm thinking more about my concern for the student given the unexpected absence while at the same time trying to give notice to the second group to begin their presentation without rushing the group.
5:32 – Adaptive
Class Action: As I walked around the room, I noticed that a student did not completely write out the written example I modeled for the peer evaluation sheet used with the group presentations.
Why: I coded this moment in the lesson as adaptive because it was odd that this particular student did not write anything down at all. Especially after I prompted her once to write down the first few features of the example.
6:10 – Routine
Class Action: As the first group presentation started, a student raised her hand to ask if she could give a score between two numbers on the peer evaluation sheet for the group presentations.
Why: I coded this moment in the lesson as routine because this is a common question I get when using this peer evaluation rubric. I anticipated a student asking this question.

Rather than reviewing their lesson videos prior to each interview and labeling decisions through the software, teachers cued me to stop the tapes when they noticed a decision point in the recording. Rather than write their labels and explanations, they offered their commentary audibly instead. Again, this adjustment was made to accommodate the teachers' available time for data collection. I am confident that this adjustment did not compromise the quality of the data collected and still honored the process of the Critical Decision Method of CTA. In fact, this revision of data collection is a more literal interpretation of the process as it is described in literature.

Step five: probe for specifics. At this stage in critical decision method, I used each participant's comments about instructional decisions as a guide for probing questions within each semi-structured interview. This step in the interview was designed to elicit more detail regarding the labels the teachers assigned to class moments such as guiding features of their decision-

making, options for responding, goals for instruction, and any other influential factors (Clark et al., 2006; Jonassen, 1999; Schraagen et al., 2000). Table 3.4 includes examples of probing questions from the teacher interviews.

Table 3.4. Probing Questions

Adele, Interview 1	
Adele:	They could have seen it the way I did it, but if they were having a hard time grasping that they could have at least had something to grasp like, "OK, that one word. I get that." That was my thought process.
Interviewer:	What was giving you the cue that the main idea/thesis concepts might get mixed up for them?
Bethany, Interview 3	
Bethany:	I wanted them to make sure they understood that, but that's a routine. It's going to come up. Just go ahead and address it.
Interviewer:	Now, are you waiting for them to go there, or kind of anticipating and saying this information before [the students] pop out those questions?

Classroom recordings. Classroom recordings facilitated the steps of recounting the incident and identifying decisions within the Critical Decision Method of Cognitive Task Analysis. Such recordings illustrate the difference in the present study from the task simulation designs previously employed in research regarding adaptive expertise. In this study, data collection focused on each teacher's action in her classroom with her students. The recordings constituted a source of data because they were used to guide the interviewing procedures. Without the recordings, the content of the transcripts would have been qualitatively different. Rosaen et al. (2008) found that the use of video recordings of classroom instruction helped to facilitate detailed self-examination of the taped teaching. Moreover, they posited that the videos of instruction created "dissonance" between what a teacher remembers about the instructional experience and what he/she sees through video playback. They further explain that this dissonance does not necessarily carry a negative connotation but serves to potentially "jar complacency" which leads to learning (p. 358). Additionally, the concept of dissonance in the Rosaen et

al. (2008) study mirrors the creative tension that characterizes the space where understanding is reached from an interpretivist theoretical perspective (Adorno 1973 as cited in Crotty, 1998).

After participants were identified, I talked with each to set a time to record three classroom lessons. It was at this time that the administration from one school requested that I refrain from video footage. As a substitute, I suggested audio recording the class sessions instead, and the school approved this approach. Reviewing audio footage of the class would still provide the structured recollection of the class session that aligned with the previous use of video in teacher reflections and the selected analysis method of the Critical Decision Method.

For the purpose of this study, recordings of classroom lessons focused on one course section of each teacher's schedule: for example, Adele's seventh period. Selecting one course section helped concentrate the data collection for detailed material. Each course section was recorded three times over a two- week time span. After each recording was created, the teachers and I immediately reviewed the footage during a semi-structured interview focused on eliciting reasoning and reasoning process behind instructional decisions. It seemed like the shorter time frame between recorded sessions and follow-up interviews served to capture detailed explanations of participants' reasoning. There were times when teachers jokingly commented on the difficulty trying remember what happened a few days prior in their classes; therefore, keeping the data collection time points close together seemed to help preserve recollections of class action and reasoning.

Interview transcripts. Transcripts from teacher interviews formed another element of data in this study. The interviews were also conducted through the Critical Decision Method of Cognitive Task Analysis (CTA). CTA was used to collect and begin analysis of the data, which is a way of *restorying* the data in this narrative study (Ollerenshaw & Creswell, 2002). In restorying data, the information is examined and organized to tell of experience that answered the purpose of the inquiry: to understand how expert teachers exhibit adaptive expertise within their actual practice. This purpose was facilitated by the following research questions:

- How do secondary English language arts teachers who have been identified as experts describe and explain their reasoning and reasoning processes behind decisions within instruction?
- To what extents do expert secondary English language arts teachers descriptions and explanations of their reasoning and reasoning processes behind decisions within instruction align with the conceptual framework of adaptive expertise?

Screening questionnaire. Originally, the study design included the use of a participant screening questionnaire to narrow the potential participant pool to the target number of participants. The rationale for the use of the questionnaire was informed by previous research regarding adaptive expertise in teaching (Crawford et al., 2005). The Crawford et al. study found trends in problem solving orientations throughout the different phases of data collection. Participants displaying an adaptive orientation during a first think-aloud session with research task materials continued to exhibit an adaptive orientation when responding to follow-up questions from the research team. The same was reported of participants displaying an efficiency orientation. Therefore, if a potential participant's questionnaire responses indicated an adaptive orientation through

questionnaire responses, it was believed the participant would also display an adaptive orientation during data collection for the study. Similar to Crawford et al. (2005), it was believed that teachers' responses to the questionnaire in this study would help reveal the extent to which they might exhibit adaptiveness due to the way they thought about their overall reasoning processes within their practice. However, given my challenges with securing participants for this study, there was no need to narrow the participant selection pool; therefore, with the counsel of my doctoral committee, I moved forward with eliminating the questionnaire from the study. I am confident that this decision does not compromise the extent to which the data in this study responded to the research questions. I base this confidence on the other participant selection measures supported by previous research: National Board Certification, advanced training in educational theory and practice, and at least seven years of experience. Since the selection of participants held the most potential for criticism of the findings in this study, I attempted to exercise several, research-based layers in my selection process to affirm the expert status of participating teachers. The questionnaire served as another dimension to this process; although, its absence did not compromise affirmation of the expert status of the teacher participants.

Researcher reflective memos. My reflective memos were also considered data in this study. Corbin and Strauss (2008) articulated that memos are pictures of analysis—along with diagrams. Such graphic organizers help sift data for the story to be told (Ollerenshaw & Creswell, 2002). In the scope of the Critical Decision Method of CTA, my reflective memos served as another dimension of probing for specifics within decision points of the recorded lessons. In narrative inquiry, one may participate in the story making process. Clandinin and

Connelly describe such stories as being "nested" "in the midst" of narratives of participants and researcher (2000, pp. 144-145). My reflective memos constitute continued dialogue I had with the data to probe for specifics of the teachers' experiences through the lens of adaptive expertise.

Data Analysis

Analysis in narrative inquiry is focused on telling the story of experience. The analysis steps of this study were focused on telling the story of adaptive expertise from the actual classrooms of expert teachers. The Critical Decision Method of CTA that includes overlapping procedures of data collection and analysis facilitated such story building. The data from which these stories were constructed was comprised of classroom recordings, interview transcripts, and my reflective memos. Each transcript was created through a transcription service. (See Appendix A for details on this service and how it was communicated to participants.) I reviewed each transcript with the original class recordings to verify the accuracy of each, making minor corrections where necessary. Also, each story is told using pseudonyms for each participant. The following section explains how data were used to craft the stories of adaptive expertise.

Placing the narratives. In conducting narrative inquiry, it was important to establish the context of the narratives of each participant. This process could be likened to establishing the place of a narrative within a "three-dimensional narrative inquiry space" (Clandinin and Connelly, 2000), where the three dimensions are comprised of the temporal, the personal and social, and the situational. Given that adaptive expertise is seen as an explanation of expert teacher practice that encompasses the multidimensional reality of masterful instruction, it seemed important to begin data analysis with the story

of each teacher's place along these dimensions. To establish this placement, I analyzed the interview transcripts for indications of intersections of these dimensions. Clandinin and Connelly discuss the use of intersections to articulate place. I read each transcript several times noting excerpts that defined the teachers context—also noting trends as they emerged. For example, in explaining the place of the participant named Adele, time is spent on the intersection of the dimensions of the personal/social, temporal, and situational through describing curriculum shifts in her school. The placement for the participant named Bethany began with the intersection of the personal and situational dimensions through explanation of the relational focus in her classroom. By detailing the placement of each teacher's story, the story of adaptive expertise in each of her lived classroom experiences could be more easily understood. This placement helps craft a contribution to the teaching field, for past research in adaptive expertise is absent the specifics of a teacher's place in the fluid context of teaching. The narratives describing each teacher's placement, including my own, were shared previously in the chapter as a way to introduce the participants in this study.

Pictures of adaptive expertise. After establishing each participant's place, I worked to detail descriptions and explanations of the teachers' reasoning and reasoning process within instruction in response to the first research question:

- How do secondary English language arts teachers who have been identified as experts describe and explain their reasoning and reasoning processes behind decisions within instruction?

To accomplish this, I utilized the steps of the Critical Decision Method to identify instructional moments for which to investigate expert teacher reasoning. I also engaged in an iterative process of developing "interim texts" of analysis (Clandinin & Connelly, 2000), which served as an extension of "probing for specifics" within the Critical Decision Method (Clark et al., 2006; Jonassen, 1999; Schraagen, 2000). Such texts comprise the ways that narrative researchers move with field texts to research texts. These iterations included the many coding rounds to be described, the illustrative charts and graphs, and my reflective memos. The more "re-searching" of the documents I enacted, the more the different text forms presented themselves as tools for understanding the teachers' experiences.

To begin this stage of analysis, I read each transcript several more times and marked where each time a teacher self-identified a decision point in a lesson. From there, I coded the explanation of each decision by using descriptions of orientations present in literature on adaptive expertise in teaching as outlined in Chapter Two (Crawford, 2007; Crawford et al., 2005; Schwartz et al., 2005; Wineburg, 1998). (See Table 3.5 for a list of these codes). The coding chart has been organized to show the alignment between different pieces of literature and operational codes. Blank cells indicate no alignment with other sources. To sift initial impressions of the transcripts and establish some sense of consistency, I conducted this step in analysis three times. During the second coding round, I put away my first coding notes and marked the transcript through the same process I used in the first coding round. During the third round, I compared my coding notes from the first two rounds to determine similarities and differences. Where codes were similar, I maintained the code; where codes differed, I reviewed the text once more

to determine the most appropriate code to carry into the final picture of analysis. To document the codes in each round of analysis, I used the comment feature of a word processor. During this process, I also noted reflective thoughts through memos to describe my coding rationale as a step in reflexivity (Creswell, 2007).

To help illustrate teachers reasoning and reasoning processes behind decisions within instruction, I created a visual timeline of each lesson and depicted the timing and description of each decision point during instruction by using the code that aligned with adaptive expertise literature (efficiency or adaptability). Additionally, I created a chart listing the time stamp for each teacher-identified decision, teachers' explanations of their decisions, description alignment with the research literature, teacher descriptions of the decision (routine or adaptive), and reflective memos regarding evidence of adaptive expertise. (See Appendices D-I.) To summarize each teacher's expert action within each lesson, I also included short charts of operational statements. These steps were taken to bring further clarity to a construct that can be difficult to describe in practice.

There are moments where the teacher labeled a decision point with the opposite code than that of the literature. For the purpose of this study, attention was given to the alignment of the teachers' descriptions and explanations with the research literature. The short codes of "adaptive" and "routine" during each interview were used to initiate the descriptive and explanatory process. Further research, as discussed in Chapter Five, could focus on interviewing the participants and sharing the alignment with the literature to see how to explain the differences in operational labels from literature and those of the teachers. This understanding would help further understanding regarding expert teachers' orientations to decision-making.

Table 3.5. Operation Coding Chart

Wineburg (1998, *para*.90)	**Crawford et al. (2005, p. 18)**	**Crawford (2007, *para*. 23)**	**Schwartz, Bransford, & Sears (2005, p.32)**
Adaptive			
"Reserving judgment; monitoring affective responses"	"Slow to draw conclusions, building material of situation from evidence"		
"Revisiting earlier assessments"	"Thorough systematic, exploration of data"	"Examination of artifacts"	
"Asking questions, reserving judgment"	"Tentativeness, posing questions to self"	"Questions or statements to self about what one would like to know or find out. Example: 'I wonder how pedigree is taught.'"	
"Revisit earlier assessments"	"Test hypotheses and judgments against new data"		
	"Build understanding of situation through data"	"Draw conclusions based on examination of artifacts"	
"Asking questions"	"Explicit statements about not knowing novel content"	"Metacognitive or self-regulative statements about the participant's own knowledge state or understanding with respect to understanding what students know and don't know. Example: 'Okay, I have some idea about what students know"; "As I look at this, I am a little confused about student thinking.'"	"Disequilibrium that signals that certain processes or ways of thinking (e.g. previously learned routines) are not quite working properly."
"Stick with confusion long enough to let interpretation emerge"	"Explicit testing of model with nonconfirming information"		
"Stick with confusion to let interpretation emerge"	"Shows interest, curiosity, about novel content"	"Indications of interest, curiosity. Example: "I am curious why students did not get this.'"	"New ideas may simply emerge from interactions with tools and people without a prior sense that something was wrong or needed to be fixed"
Wineburg(1998, *para*. 90)	**Crawford et al. (2005, p.18)**	**Crawford (2007, *para*. 24-25)**	**Schwartz, Bransford, & Sears (2005, p.29)**
Efficient			
	"Quick to draw conclusions from one aspect of the problem space"	"Simplification of the task or problem space"	"problem elimination" rather than… in-depth, sustained problem solving"

Table 3.5 (Continued)

Wineburg (1998)	Crawford et al. (2005)	Crawford (2007)	Schwartz, Bransford, & Sears (2005)
Efficiency (continued)			
	"Limited, unsystematic exploration of data	"Intention to find out something for the purpose of planning a lesson for the remaining days before the final test, or completing the task"	
	"Certainty, satisficing to complete the task"	"Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. "	
	"Retain hypotheses based on prior knowledge"		
	"Interpret situation in terms of prior experience, assumptions"		
	"No statements about not knowing novel content"		
	"Avoidance or discounting of nonconfirming information"		
	"Shows no interest in novel content"		

My rationale for each of these illustrations was to create building blocks for telling the stories of adaptive expertise in the teachers' lives, where adaptive expertise is defined as the balance of adaptiveness and efficiency. Through the illustrations, my focus was to show examples of adaptive expertise that are meant to explain a place in time, not a formula for achieving adaptive expertise but rather a description of its essence in live practice. My belief is that such pictures of practice will help teachers recognize this construct as explanatory of moments in their practice, thus advancing understanding of practice.

Stories of adaptive expertise. Finally, a narrative synthesis of each teacher's lessons was composed through transcript coding and reflective memos. I analyzed each chart illustrating

teacher's decisions and reasoning to deduce what might constitute adaptive expertise in each example using the description of Schwartz et al. as a guide: a balance of adaptiveness and efficiency in problem solving (2005). (See Appendices D-I for my memos.) I also held the following description in mind to clarify a definition of balance: "performing procedural skills efficiently, but also understanding the meaning and nature of their object" (Hatano and Inagaki, 1986, p. 263)—the conceptual understanding that sets adaptive expertise apart from routine expertise.

Reflective memos were my attempt to make explicit my rationale for such deductions. To analyze decisions for balance, I read through each transcript and wrote reflective memos to describe how I believed representations of balance were present in the decision points. After analyzing each decision, I analyzed my memos for themes between deductions of balance to create the story of adaptive expertise in each teacher's practice. Therefore, through the stories and illustrations of the data, findings are shared to represent the extent to which each teacher described and explained reasoning and reasoning processes that evidence the signature balance of adaptive expertise.

The goal of this study was not to generalize, but to offer descriptions and explanations of expert teaching that advance understanding regarding teaching expertise. This study employed participant selection methods that have been used in previous research to identify teaching experts and/or adaptive teachers, research from which findings affirm the expert and/or adaptive status of individuals identified as experts prior to data collection (Borko & Livingston, 1989; Crawford, 2007; Crawford et al., 2005). Further, this study builds on the findings of Bond et al. (2000), which articulates how National Board Certified teachers displayed expert teaching practice through descriptions that aligned with the adaptive orientation to problem solving used

to frame research on adaptive expertise in teaching (Crawford, 2007; Crawford et al., 2005; Wineburg, 1998). Additionally, I leaned on evidence of the operationalized terms for an adaptive orientation, which were illustrated via the conceptual framework for adaptive expertise. If a participant displayed a conceptual understanding of instructional decisions—regardless of an efficient or adaptive response—I had confidence asserting that such instruction, descriptions, and explanations illustrated adaptive expertise.

Protection of Participants

Any research endeavor should ensure the safety of participants. Each phase of the study design was reviewed and approved by the university's Internal Review Board, administration of each school, and my advisory committee. Each effort taken to protect participants was documented and shared with participants prior to committing to the study. (See Appendices A-C for copies of these documents.) Also, information shared from the study uses pseudonyms for each teacher and is absent of any demographics that could identify the schools where they work. Moreover, to ensure they were being represented in ways that were true to their experiences, the participants approved the resulting narratives of their classrooms.

Credibility

In any research endeavor, one must substantiate why the work can be trusted. Given the qualitative approach to this study, "credibility" rather than "trustworthiness" was sought, for "credibility" connotes a more naturalistic bent, rather than the quantitative tone commonly associated with "trustworthiness" (Lincoln & Guba, 1985 as cited in Creswell, 2007, p.202). In contrast to the objective stance pursued in quantitative work, qualitative inquiry tends to be conducted from a transactive position (Eisner, 1991). Therefore, establishing credibility within this qualitative work stems from the belief that experience is inherently transactional—a position

that is supported by the constructivist epistemological stance of this study. Eisner suggests three measures with which to construct credibility within transactional accounts: *coherence, consensus,* and *instrumental utility* (1991, p. 53).

Coherence. Eisner describes coherence as the believability of a work, answering the question, "Does the story make sense?" (1991, p. 53). A specific way to communicate coherence is through *structural corroboration*. Structural corroboration is the means by which the "constellation of bits and pieces of evidence" are organized to support findings related to the purpose of the study (p. 55). Multiple elements create the scaffolding within the structural corroboration of this work. The Critical Decision Method of Cognitive Task Analysis facilitated phases of data collection and analysis that required reexamination of initial thoughts of the participants and researcher within an overarching conceptual framework. Through the depth of examination during data collection and analysis and the framework for analysis, it is believed that coherence within the data was achieved to where the representations make sense to the intended audiences.

Consensus. In consensus, agreement is sought between researcher and reader to confirm that the records of experience are appropriately reflective of the participants' experiences (Eisner, 1991). Within the data collection and analysis efforts, participants had opportunities to correct any misunderstandings the researcher might have had about the participants' descriptions of the researched events. Given the levels within the data collection and analysis processes, it is believed that consensus was achieved during this proposed study. Classroom recordings aided the objective retelling of the examined instruction, and each teacher was given the opportunity to review the written analysis and interpretation of her classroom commentary.

Instrumental utility. The feature of instrumental utility as a measure of credibility in qualitative research rings true with the purpose of this study. As Eisner explained, "A good qualitative study can help us understand a situation that would otherwise be enigmatic or confusing" (1991, p. 58). Eisner likened a study's usefulness to its instrumental utility. Eisner furthers how instrumental utility can be expressed in a couple ways: comprehension and anticipation. Comprehension reflects the degree to which a work brings understanding. It is believed that the data presentation methods of this study communicate outcomes on multiple levels through data that are sequenced in a logical manner and synthesize participant data to help the reader have a composite view of the key features reached in the study. Anticipation speaks to the degree to which the findings within a work speak to circumstances beyond the work. Tools used to facilitate this tier of understanding are maps and guides. Maps communicate the multiple dimensions within experience that help direct future readers to similar outcomes expressed in the work. The illustrative figures and charts of the data in this study represent the maps of this work. Guides might be derived from maps within qualitative research. Extending the work of a map, a guide will direct a readers' attention to deepen understanding. The narrative synthesis of the teacher's reasoning constitutes the guides in this study. The data analysis measures of this study create maps and guides of experience within teacher practice that may heighten understanding regarding adaptive expertise. Adaptive expertise is believed to be the conception of expertise that will facilitate the development of practicing and future teachers toward instruction that meets the goals of today's world. Moreover, adaptive expertise is a conception of expertise that has the potential to grow with changes in the needs of the world. Therefore, the understanding brought through this study has the potential to speak to current and future needs of the audiences this work is designed to support.

Chapter Summary

Understanding adaptive expertise in expert teacher practice is a qualitative pursuit that is viewed through an interpretivist perspective and journeyed with a constructivist gait. The preceding chapter explained a plan for research that included theoretical perspective, epistemological stance, methodological framework, participant selection, data collection, and data analysis. Special attention was given to document the adaptive journey of securing participants for this study. Additional efforts were taken to describe credibility within the design.

An interpretivist theoretical perspective informed the constructivist epistemology that set the foundation for this narrative research design. Belief that selected teachers' stories built understanding related to adaptive expertise is predicated on the connections between established expert teacher practice (Bond et al., 2000), the core propositions of National Board Certification for teachers (NBPTS, 2013), previous adaptive expertise research (Crawford, 2007; Crawford et al., 2005;), and the construct of adaptive expertise forwarded in this study (Schwartz et al., 2005).

Data collection and initial analysis methods were organized through the Critical Decision Method of Cognitive Task Analysis (Clark et al., 2006; Jonassen et al., 1999; Schraagen et al., 2000), which served to undergird examination of data through the conceptual framework adaptive expertise. It is believed that the design was constructed in a credible fashion through Eisner's measure of assessing qualitative work (1991).

CHAPTER FOUR: FINDINGS

In this chapter, I present description, analysis, and interpretation of the data from this study. Chapter Three explained how the Critical Decision Method of Cognitive Task Analysis framed the selection of data forms for this narrative inquiry which resulted in classroom recordings and semi-structured interviews. (See Table 3.2.) This study design extends from previous literature that infers an adaptive dimension to how expert teachers operate in the classroom. Pattern recognition, routine application, and dynamic understanding were documented as operations of expert teaching that are enacted through a reflective tone that is synonymous with an adaptive stance. (See Table 2.2.) This chapter is organized to show how the teachers' experiences were interpreted to respond to the research questions and affirm assertions made through the supporting literature.

Reasoning and Reasoning Processes: Decision Points

The first focal point of this study was the following research question:

- How do secondary English language arts teachers who have been identified as experts describe and explain their reasoning and reasoning processes behind decisions within instruction?

To explore this question, the Critical Decision Method of Cognitive Task Analysis was used (Clark et al., 2006; Jonassen, 1999; Schraagen, 2000). In this process, teachers were interviewed while reviewing a recording of their instruction to determine decision points. A

decision point was defined as a moment in the lesson when several responses could have been plausible. As the teachers identified such moments, they were asked to explain the nature of the decisions and their reasoning behind the choices. In telling the stories of each teacher's reasoning and reasoning processes, points of meaning and insight emerged related to the relationship between adaptive and efficient decisions and an embedded nature of adaptiveness within efficient decisions. The illustrations of these findings are built upon the methods in past work on adaptive expertise in teaching. Crawford (2007) used the figure of the optimal adaptability corridor (Schwartz et al., 2005) to quantitatively depict how expert and novice teachers' lesson commentaries aligned with an adaptive or efficiency orientations (See Figure 2.1.). Schwartz et al. forwarded this graphic as an explanation of the balance of adaptive expertise. In Crawford's study, teachers with plot points falling within the optimal adaptability corridor were seen as representative of adaptive experts. The goal of the following pictorial and narrative illustrations is to display what such plot points on a graph look like in the classroom. However, the pictorial explanations offered here are not to provide a quantitative finding but rather an illustration of a place in time—similar to placing the teacher narratives within context through establishing intersections of experience. The illustrations in this section depict the classroom decisions of each teacher as a whole event rather than the summative scoring of adaptive and efficient decisions. Teachers' decisions were coded as operations of efficient reasoning or adaptive reasoning. Table 4.1 lists the code categories of efficiency orientation and adaptive orientation with the a priori codes most common in the teacher narratives. Lesson excerpts were coded as representative as efficient or adaptive for the purpose of understanding how and when teachers enacted these two operations in the exercise of adaptive expertise. The a priori codes helped specify how the particular operations played out in each classroom. The following lesson

narratives detail how these codes relate to each reviewed class period. Transcripts were analyzed for alignment between the teacher's commentary and the operational definitions of each orientation offered in the reviewed literature. Although frequency of codes is discussed, it is not to suggest a quantitative analysis but to communicate more detail about the teachers' experiences. Each illustration also includes a practical summary of the teachers' actions that constituted the plotted points on the graph.

Table 4.1. Operation Codes Noted in Teacher Narratives

Efficiency Orientation	Adaptive Orientation
"Simplification of the task or problem space" (Crawford, 2007, *para*. 24-25).	"Slow to draw conclusions, building material of situation from evidence" (Crawford et al., 2005, p. 18)
"Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. " (Crawford, 2007, *para*. 24-25).	"Tentativeness, posing questions to self" (Crawford et al., 2005, p. 18)
"Retain hypotheses based on prior knowledge" (Crawford et al., 2005, p. 18)	"Test hypotheses and judgments against new data" (Crawford et al., 2005, p. 18)
"Interpret situation in terms of prior experience, assumptions" (Crawford et al., 2005, p.18)	"Build understanding of situation through data" (Crawford et al., 2005, p. 18)

Adele: Lesson One

Many of the paired decisions of adaptability and efficiency were of moments when Adele explained how she managed the content of the lesson to help the students find purpose and focus. Most of the efficient decisions dealt with procedural or time management concerns, whereas the adaptive decisions highlighted an aspect of teacher discovery during the lesson. Illustrative transcript excerpts and operational codes for these decision points can be found in Appendix D. Figure 4.1 depicts Adele's first lesson reviewed for this study. Table 4.2 provides a practical summary of Adele's expert actions during this lesson.

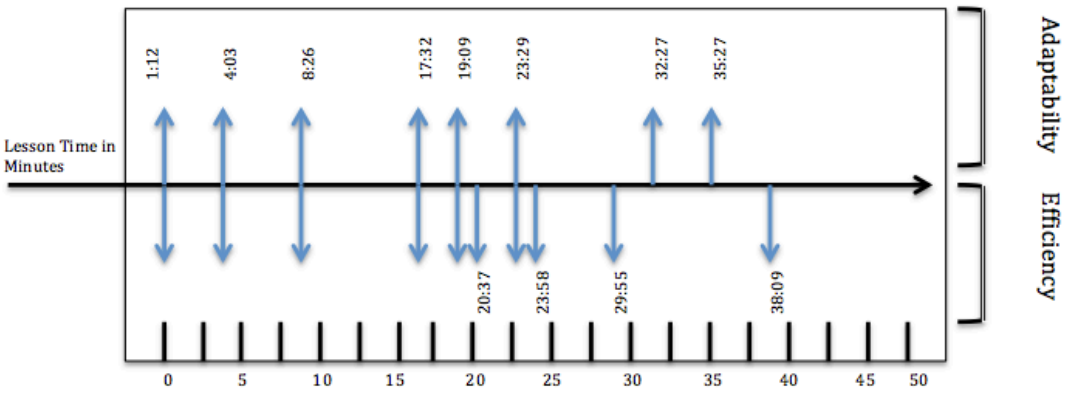

Figure 4.1. Adele - Lesson One Timeline of Efficient and Adaptive Decisions

Table 4.2. Adele – Lesson One Expert Action Summary

The expert teacher…	
acts adaptively by…	**acts efficiently by…**
Asking herself reflective questions.	Helping students find focus within a lesson that may be confusing.
Adapting procedures to fit students' responses.	Beginning a lesson step with a planned procedure.

In this lesson, there was a higher frequency of the code, "Simplification of the task or problem space" from the efficiency orientation (Crawford, 2007). Most of the occurrences of this code center on Adele's explanations of ways she was helping draw focus within a curriculum that she found structurally confusing for herself and her peers. After this code, four others share a trend in frequency. Of the efficiency orientation, these trends are with the codes, "Retain hypotheses based on prior knowledge" and "Interpret situation in terms of prior assumptions" (Crawford, et al., 2005). Of the adaptive orientation, these trends are with the codes, "Slow to draw conclusions, building material of situation from evidence" and "Tentativeness, posing questions to self" (Crawford, et al., 2005). Adele's descriptions that aligned with the retention of hypothesis dealt primarily with procedural aspects addressing the content. Interpretations of the

situation codes included explanations of procedures related to managing students' progress within the lesson objective. For Adele, these procedures usually had an adaptive element built in, where she could adjust to student need. The adaptive code of drawing conclusions slowly occurred during the first moments of class and included explanations of Adele's discoveries during teaching related to what approach seemed to work best with each group of students throughout the day. Questioning oneself was a code of the adaptive orientation that occurred with Adele's explanations of her self-reflective thoughts during the lesson as she thought through the appropriateness of her instruction for a particular group of students.

Adele: Lesson Two

Each adaptive decision in this lesson occurred with an efficiency decision. These paired points seem to move forward from the initial focus of the writing assignment to how to move students to the next steps of the lesson objective. Adele described ways she explored a different technique to see if it would help students grab hold of the conceptual idea of the lesson. The two efficiency decisions in this lesson dealt with administrative classroom management details and monitoring the time left in the class to complete the learning objective. Illustrative transcript excerpts and operational codes for these decision points can be found in Appendix E. Figure 4.2 illustrates Adele's second lesson reviewed for this study. Table 4.3 provides a practical summary of Adele's expert actions during this lesson.

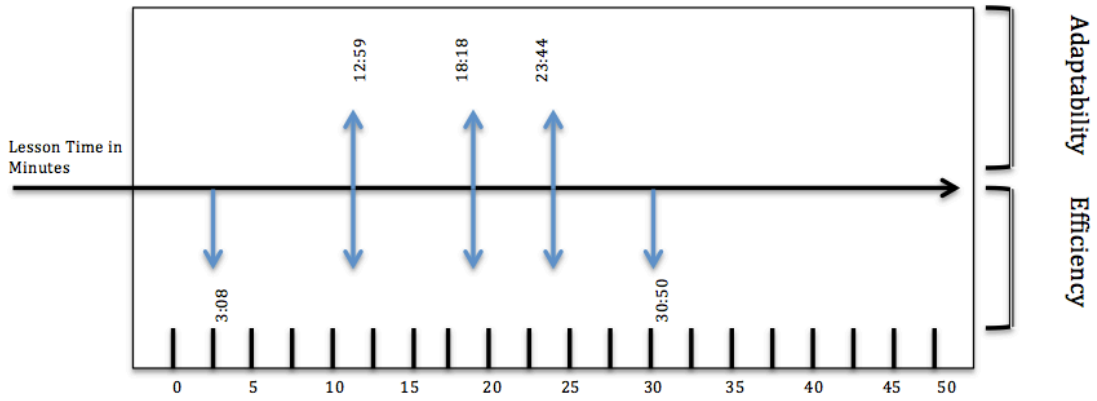

Figure 4.2. Adele – Lesson Two Timeline of Efficient and Adaptive Decisions

Table 4.3. Adele – Lesson Two Expert Action Summary

The expert teacher…	
acts adaptively by…	**acts efficiently by…**
Selecting focal points based on students' needs.	Simplifying a lesson to the most important parts to fit within the allotted time.

In the second lesson, there was a higher amount of codes in the operations of the efficiency orientation related to, "Simplification of the task or problem space" (Crawford, 2007), "Monitoring time spend[t] on or remaining for the task, considering trade offs in time required to accomplish a sub-goal versus time available or value of the results, thinking about what remained to do in the task" (Crawford, 2007), and "Interpret situation in terms of prior experience assumptions" (Crawford et al., 2005). Common aspects of content with a simplification code were connected to explanations regarding the amount of time spent at a particular point in the content. The teacher described an internal pressure to be moving forward with the objective given how much time had already been given to it. However, these statements were usually tempered with comments about what would be most helpful to the students, rather

than simplification at the expense of their learning. Codes related to monitoring time were of the same nature. Codes related to interpretation of the situation centered on predictions of student work that the teacher used to inform the plan for instruction.

Adele: Lesson Three

Most of the adaptive decisions occur with an efficiency decision in this lesson. These paired moments relate Adele reflections on an instructional approach and its appropriateness for the students on this particular day. The two efficiency decisions connected to descriptions of classroom procedures related to content and time management. The stand-alone adaptive decision related to using peer feedback to encourage student progress. Illustrative transcript excerpts and operational codes for these decision points can be found in Appendix F. Figure 4.3 shows the decision points for Adele's third lesson. Table 4.4 provides a practical summary of Adele's expert actions during this lesson.

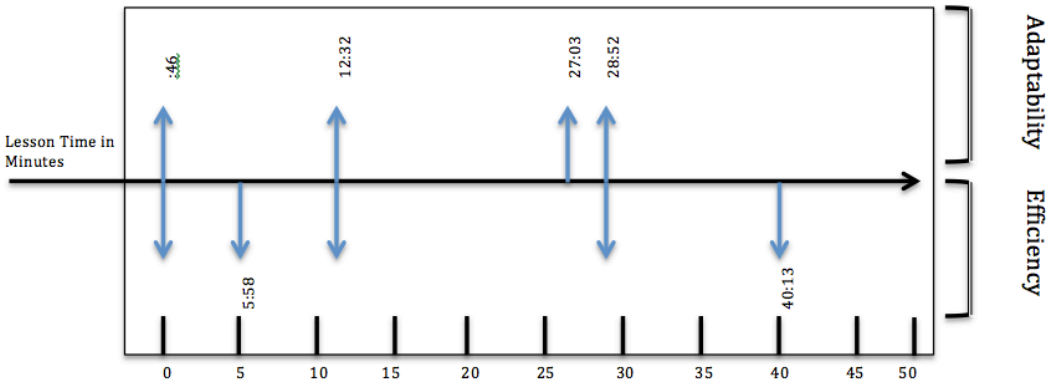

Figure 4.3. Adele – Lesson Three Timeline of Efficient and Adaptive Decisions

Table 4.4. Adele – Lesson Three Expert Action Summary

The expert teacher…	
acts adaptively by…	**acts efficiently by…**
Looking for signs that students can handle a particular task during a particular lesson—regardless of pre-planned assumptions.	Planning lessons based on how students have learned in the past in her class.

In the third lesson, the highest frequency of codes was in the operation of the efficiency orientation, "Interpret situation in terms of prior experience, assumptions" (Crawford et al., 2005). In these moments, Adele describes tendencies of students as they learn. The second most frequent codes were in the efficiency orientation, "Retain hypotheses based on prior knowledge" (Crawford, et al., 2005) and in the adaptive orientation, "Build understanding of situation through data" (Crawford et al., 2005). Adele's explanations that aligned with the retain hypotheses code also dealt with students tendencies when working through a lesson. The adaptive codes related primarily to explanations that about students' readiness for a task and how Adele monitored their progress through an aspect of the task.

Bethany: Lesson One

In this lesson, each efficient decision seemed to involve an explanation of practical aspects of an activity. Each adaptive decision was always paired with an efficient one. The content of these moments centered on opportunities for student independent practice or a response from the teacher to students' independent questions or revelations during a lecture. Illustrative transcript excerpts and operational codes for these decision points can be found in Appendix G. Figure 4.4 depicts how Bethany achieved balance in the first lesson reviewed for this study. Table 4.5 provides a practical summary of Bethany's expert actions during this lesson.

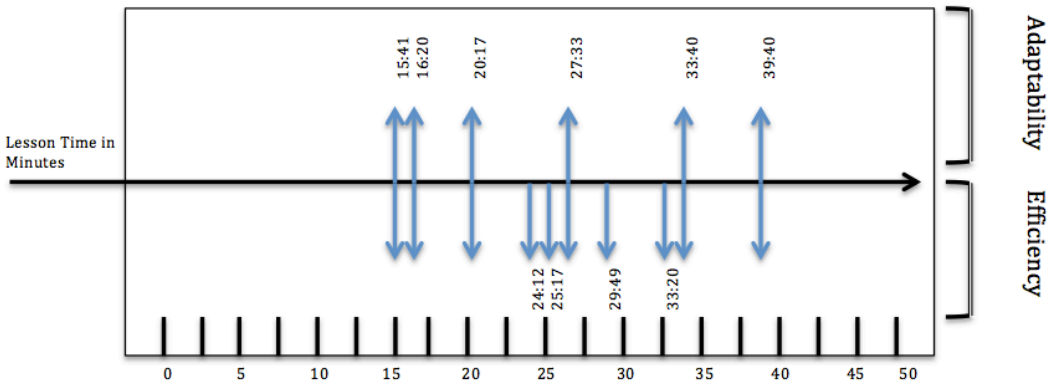

Figure 4.4. Bethany – Lesson One Timeline

Table 4.5. Bethany – Lesson One Expert Action Summary

The expert teacher…	
acts adaptively by…	**acts efficiently by…**
Listening to a student's response for confirmation of or need for adjusting instructional approach.	Beginning work with a student by using previous knowledge of students' learning tendencies individually and collectively.
Exercising confidence with content to select focal points that help students at the individual level.	

Bethany's descriptions and explanations of practice in her first reviewed lesson displayed a frequency in the operation of an adaptive orientation, "Build understanding of situation through data," as well as the operation of an efficiency orientation, "Retain hypothesis based on prior knowledge" (Crawford et al., 2005). Most of the occurrences of the adaptive operation were within decision points where the teacher described a rationale for working with a student that was based on knowledge of the student's tendencies in class; although, a comment attached to many of these moments was that the teacher approached working with such students through a willingness to re-explore these assumptions. Her goal was to discover the most effective

instructional response. Most of the occurrences of the efficiency operation were within decision points where the teacher described knowledge of particular personality dynamic of a student or group of students.

The second most frequent codes used in analyzing Bethany's first lesson were the operation of an efficiency orientation, "Interpret situation in terms of prior experience, assumptions," and the operation of an adaptive orientation, "Test hypotheses and judgments against new data" (Crawford et al., 2005). Similarly, most of the occurrences of the adaptive orientation were in reference to knowledge of a student's learning personality or the nature of a particular group of students. Any other reference dealt with the teacher's familiarity with the content. Most of the occurrences of the efficiency orientation referred to gauging the degree of student need during instruction.

Bethany: Lesson Two

Again, there was a trend in how most adaptive decisions occurred with efficiency decisions. The main focus of these explanations dealt with the toggling of student response with content presentation where the teacher continually listened to student contribution during the lesson progression. During such moments the teacher remained mindful of how to manage the time spent in response to student thought for the goal of the lesson objective. Also, most of the stand-alone efficiency decisions concerned steps of classroom management or explaining practical aspects of the lesson activity. Illustrative transcript excerpts and operational codes for these decision points can be found in Appendix H. Bethany's decision points within the second lesson are depicted in Figure 4.5. Table 4.6 provides a practical summary of Bethany's expert actions during this lesson.

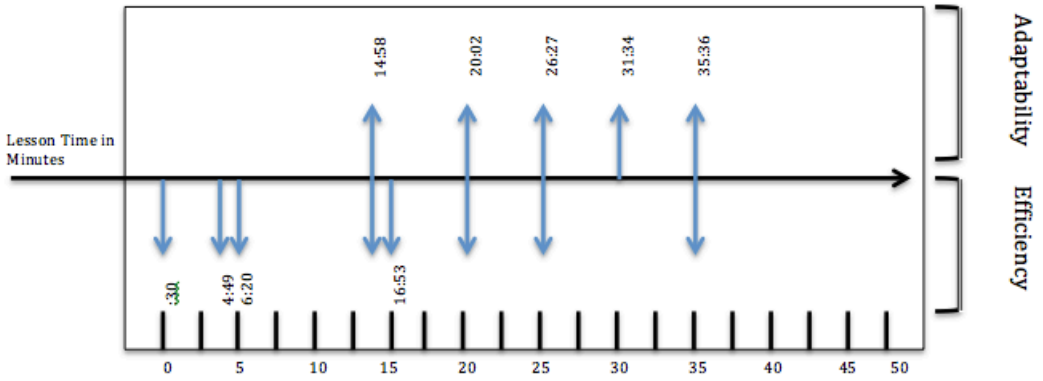

Figure 4.5. Bethany – Lesson Two Timeline of Efficient and Adaptive Decisions

Table 4.6. Bethany – Lesson Two Expert Action Summary

The expert teacher…	
acts adaptively by…	**acts efficiently by**
Listening to student feedback before deciding on a response.	Beginning interactions with students based on previous experience with particular students, content, and procedure.

In this lesson there was a higher frequency of the efficiency operations of, "Interpret situation in terms of prior experience, assumptions," and "Retain hypothesis based on prior knowledge" (Crawford et al., 2005). Occurrences of the first operation centered on Bethany's knowledge of students' tendencies in thinking through the current content. Several times, the two operations mentions above were coded for the same decision point. In each example of this, Bethany seemed to listen to student feedback before following through with her interpretation that then seemed to confirm the retention of her hypothesis. Bethany explained a blend of consideration concerning students, content, and procedure when describing the decision points coded to retaining one's hypothesis.

Bethany: Lesson Three

In this lesson, there remained a trend in the occurrence of stand-alone efficiency decisions and the pairing of adaptive decisions with efficiency decisions. Bethany's reasoning for the efficiency decision points in this lesson aligned with the trends in other lessons where the decision points dealt with practical, procedural aspects of instruction. Her adaptive decisions concerned the affective elements of interacting with students and making connections to content. Each is balanced with the efficiency aspect of managing the class time to address the content appropriately. Illustrative transcript excerpts and operational codes for these decision points can be found in Appendix I. Figure 4.6 illustrates decision points within Bethany's third lesson. Table 4.7 provides a practical summary of Bethany's expert actions during this lesson.

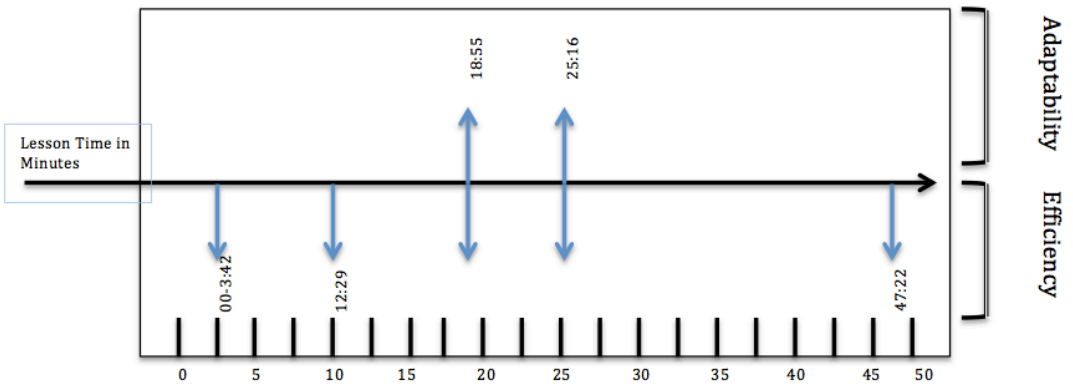

Figure 4.6. Bethany – Lesson Three Timeline of Efficient and Adaptive Decisions

Table 4.7. Bethany – Lesson Three Expert Action Summary

The expert teacher…	
acts adaptively by	acts efficiently by…
Responding to students' affective needs which impact instructional progression	Giving directions rather than student choice to maintain control of lesson
	Changing plan of instruction to fit available class time when interruptions occur

For this lesson, the code used most frequently was the operation of the efficiency orientation, "Simplification of the task or problem space" (Crawford, 2007). The second most common was also of the efficiency orientation, "Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task." In codes related to simplification, Bethany's descriptions highlighted aspects of procedural choices that were a result of a change in available class time or practical considerations dealing with school functions or the instructional activity. Most of the occurrences of the monitoring time code were with a code of simplification when the explanations centered on aspects of classroom management.

Analysis and Interpretation of Decision Points

Most of the teachers' adaptive decisions were paired with efficient decisions. Moreover, a trend in the content of these pairings surfaced during data analysis. In the explanation of these decision points, teachers mentioned how the students were the means for deciding and assessing the instructional approach with the content. Examples included establishing a focal point within an activity that was relevant to student understanding or creating space for students' responses within instruction.

Reasoning coded for efficiency seemed to allude to the possibility of adaptiveness embedded within efficient decisions, which resonates with the theme of paired efficiency and adaptive decisions found in the data. Although the teachers' commentary coded to stand-alone efficient codes dealt with issues of classroom management and procedural details primarily, the

teachers' explanations pointed to the necessity of such thinking with adaptive actions. Examples of this inference can be found in Adele's first lesson and Bethany's second lesson.

Adele offered explanations in her first lesson that had a trend in alignment with the efficiency codes, "Retain hypothesis based on prior knowledge," and "Interpret situation in terms of prior experience, assumptions" (Crawford et al., 2005). Typically, Adele described a sequence of interpretation before the retention of her hypotheses. Such a procedure points to Adele's other comments on how she builds opportunity for adaptations within her procedures, describing this behavior as being "routinely adaptive." Therefore, although her explanations on the surface pair with an efficiency orientation, there is an embedded quality of an adaptive orientation between the space of interpreting and retaining her hypothesis. Adele demonstrated a willingness to forego her prediction if her interpretive efforts revealed new qualities in students' responses. Bethany shared explanations in her second lesson that also showed a trend with the same efficiency codes in Adele's first lesson. Several times these codes were assigned to the same decision point. Bethany demonstrated the same embedded adaptiveness in her responses. Interpretation usually came first, but her hypothesis was suspended while she listened for students needs.

Interestingly, these two efficiency codes, "Retain hypothesis based on prior knowledge" and "Interpret situation in terms of prior experience, assumptions" (Crawford et al., 2005), were the most frequent across all the codes (adaptive and efficient) used to analyze the teachers' descriptions and explanations in the transcripts. The way the teachers' describe their adaptive reasoning around efficient decisions when reviewing classroom events mirrors the interpretive space of balance that is the hallmark of adaptive expertise. Teachers are suspended in interpretation between efficient approaches to instruction while assessing the appropriateness of

the hypotheses they held prior to class—maintaining openness to adaptation. This finding echoes the reflective, adaptive stance that supporting literature implies. Figures 4.7 and 4.8 illustrate the embedded adaptiveness trend in the teachers' experiences and how each aligns with themes in the reviewed literature: Experts enact reflective adaptiveness in routine application, pattern recognition, and dynamic understanding. Teachers' adaptive decisions are situated between efficient operations that all take place amidst a balanced state. In Chapter Five, points from the reviewed literature will be discussed to frame the alignment between the suggested inference of reflective adaptiveness and the findings of this study.

Alignment with Adaptive Expertise: Balanced Action

Each of the interpretations shared above point to the exercise of adaptive expertise as explained in past literature and research (Crawford, 2007; Crawford et al., 2005; Hatano & Inagaki, 1986; Schwartz et al., 2005), which was the focus of the second research question for this study:

- To what extents do expert secondary English language arts teachers' descriptions and explanations of their reasoning and reasoning processes behind decisions within instruction align with the conceptual framework of adaptive expertise?

To respond to this question, data were also collected within the Critical Decision Method of Cognitive Task Analysis (CTA), which was framed by a narrative inquiry design. CTA helped facilitate the identification of reasoning and reasoning processes through classroom recordings and semi-structured interviews. After analyzing each teachers' reasoning and reasoning processes for alignment with the operations of adaptability and efficiency, the following stories were created to display how the teachers' balanced these two processes within instruction, thus

exercising adaptive expertise. These stories were constructed through analysis tools of theoretical coding and reflective memos (see Appendices D-I for examples of each.). In building upon past research through a qualitative design, these stories are offered as another level of understanding the practice of expert teachers through the conceptual framework of adaptive expertise: a balance of adaptiveness and efficiency.

Adele

Content confidence across curriculum. Adele described her place this year in teaching as one amidst challenging curricular demands at her school; however, in each description of her instructional process, she always displayed a confidence in her understanding of the content that she was expected to teach. Through cycles of student misunderstanding and challenges with student motivation and student absences, she continually showed a dedication to reach the content expectations and a confidence that she could do so. Her ability was not in question.

Student misunderstanding was something that was ever-present in Adele's comments about the lessons analyzed for this study. She predicted points of challenge for the students and discovered more in the midst of instruction. The design of the curriculum seemed to be the common feature she cited as being the main contributor to students' misunderstanding.

Reconciling past effective methods for teaching main idea and thesis statements with the current prescriptions in the school curriculum were recurring themes in her commentary. At each point of analysis, she described ways she was continually adapting to identify the method that would help students reach the content objective without sacrificing what she knew to be best

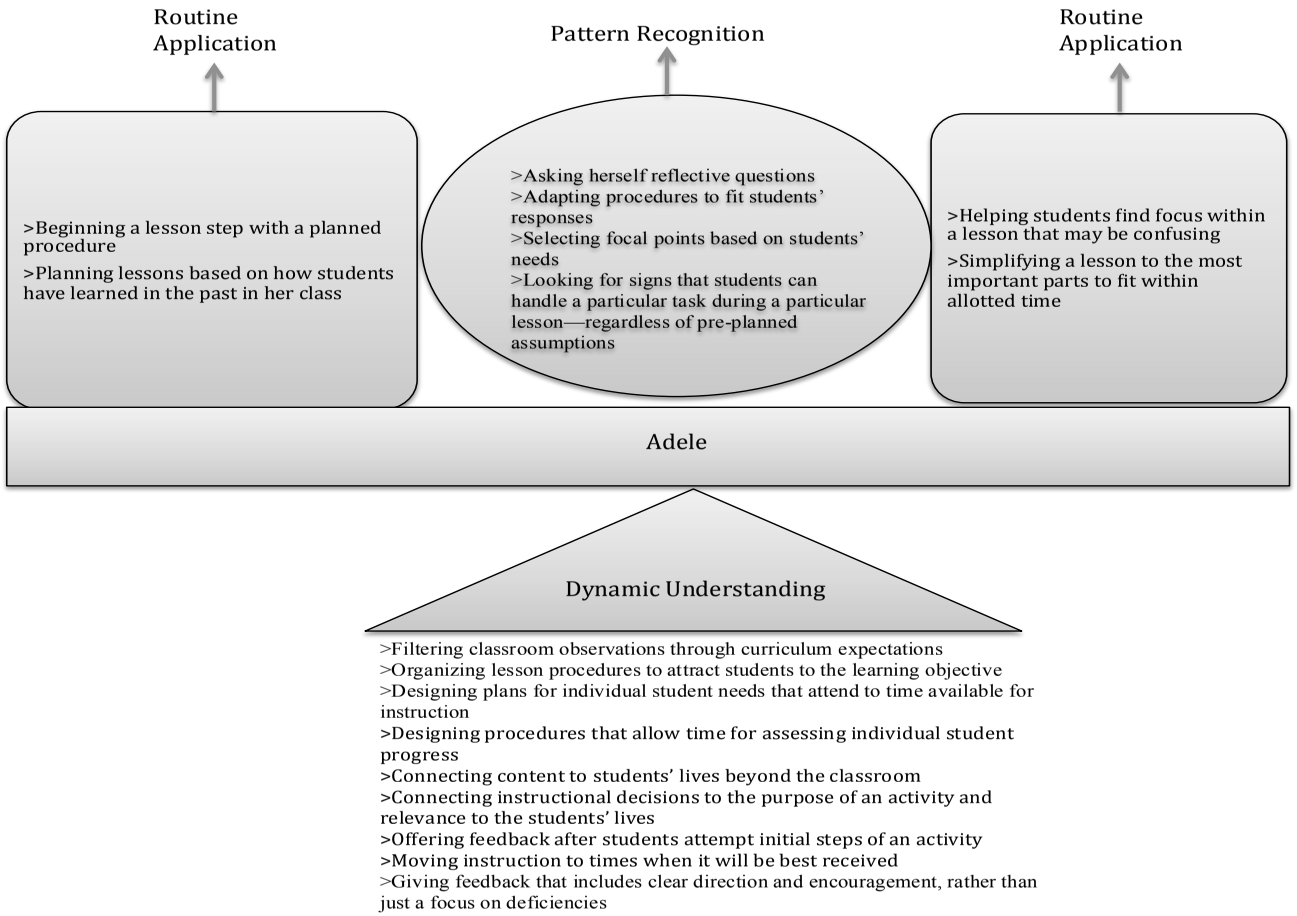

Figure 4.7. Adele - Illustration of the balance of efficiency and adaptability

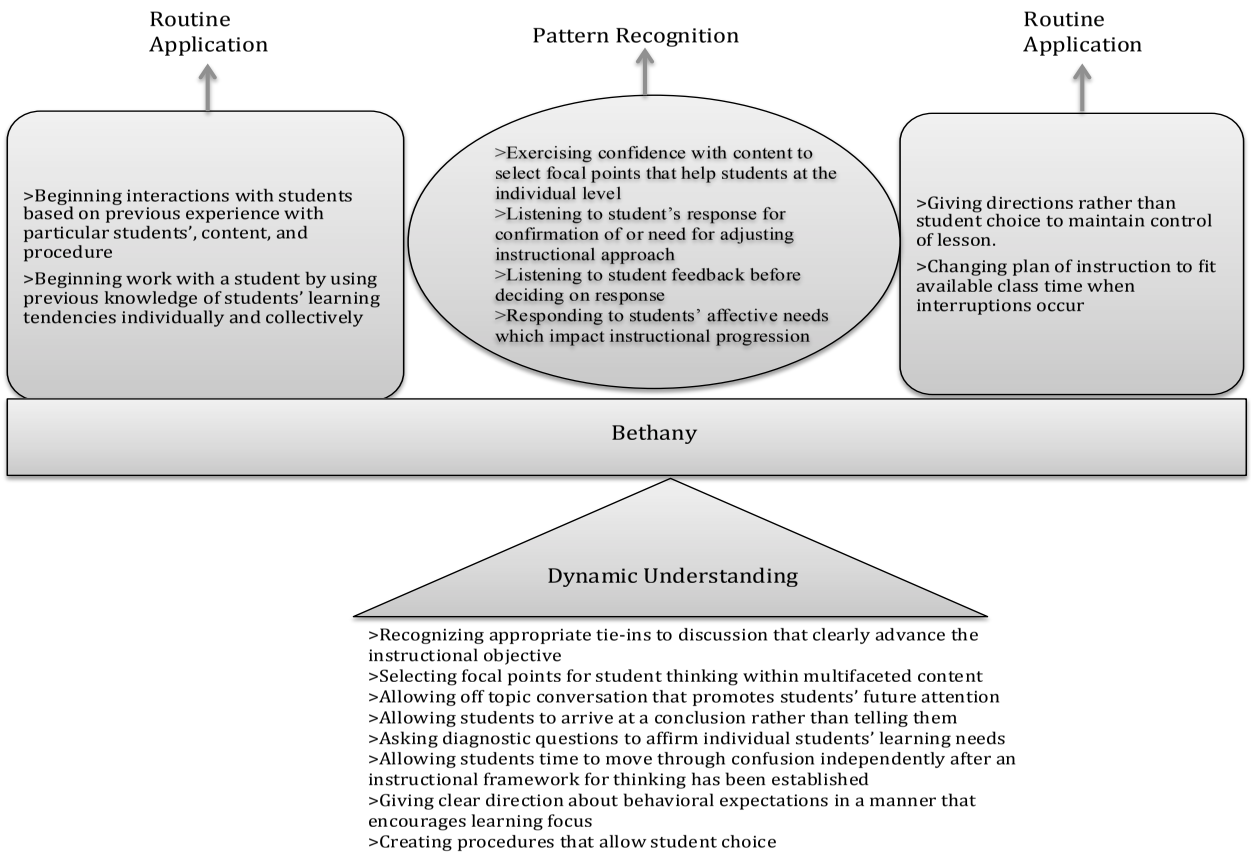

Figure 4.8. Bethany - Illustration of the balance of efficiency and adaptability

practice. Her descriptions were absent expressions of doubt that she understood the content goals or that she could professionally reach them, rather they were full of continual reflection of how much of the misunderstanding she noticed was earnest misunderstanding or a lack of motivation. To be able to focus on these two elements as possible contributors to lack of lesson progress displays Adele's confidence, again, in her understanding of the content goals—to be able to zero in on where the breakdown might be. She balanced a process of reflection with understanding the nature of the content expectations.

Adele continued to demonstrate her confidence in content knowledge through cycles of examining challenges with students' motivation. Even though she ascertained the curricular design challenges, she also sensed the possibility of students not wanting to try or wanting to give up after only trying a little bit. With iterations of students' lack of motivation, she showed confidence in adapting the procedural approach to the activity to draw students to the next step in the learning process. To enact such effective adaptations of practice, Adele balanced her conceptual understanding of the goals of the curriculum with procedures that would help students reach the goals. For example, her description of her directions when students were working in groups highlighted this balance. She kept drawing the students back to completing segments of the writing outline before she would give them feedback on the next steps of their essays. Her rationale was that students would not be able to progress to the next level of the essay writing without these building blocks. Therefore, she illustrated her deep understanding of the curricular goals and the nature of her students, as well as, how to organize the class progression to accomplish the learning objective.

Organizing class progression is even more challenging when students are absent, which was another area where Adele displayed her confidence with the curriculum. Although absences

were a point of frustration, she remained committed to helping students catch up. Perseverance through such logistical challenges displayed her confidence in sifting the content to determine how to organize a strategy for catching up in a way that did not sacrifice learning goals. She described a balance of timing in the make up process, where the timing of how much content to move a student through after an absence is important in the teacher's clarity of instruction. This displays a conceptual understanding of the content and the instructional expectations, the nature of the student, and the logistical demands of her teaching environment. Table 4.8 summarizes how Adele enacted adaptive expertise through confidence with classroom content.

Table 4.8. Adele – Summary of Balanced Action: Content Confidence

The expert teacher balances efficiency and adaptiveness through confidence with classroom content as seen in…
Filtering classroom observations through curriculum expectations.
Organizing lesson procedures to attract students to the learning objective.
Designing plans for individual student needs that attend to time available for instruction.

Procedural guideposts to meaning: "routinely adaptive." A common description Adele used of her practice was "routinely adaptive." This term punctuated her explanations of how she continually enacts procedures that create space for her to effectively adapt within a lesson. Her adaptations were focused on students grasping the underlying meaning of any instructional activity. She gave specific attention to helping students see how an activity had relevance beyond the classroom.

Adele described her routine for adapting through her explanation of giving feedback to students in one of the observed lessons. She created a plan for how she would procedurally organize her time to give students commentary on their work, but at the same time she

commented, “I have to adapt to each student” (Interview 1, p. 27). Adele evaluated her effectiveness on the degree to which she had addressed individual students’ needs through her routine approach. Her descriptions of these moments included a self-questioning procedure that evidenced her reflective stance when making adaptations. This routine process of self-reflection helped Adele assess if students were grasping the meaning of the content goal.

Learning beyond the classroom was a continual focus for Adele. It seems that her professional conviction is to teach in a way that prepares students to continue learning beyond her classroom. In the analyzed lessons for this study focused on thesis statements and main idea, she continually commented on how she was sifting the prescribed curriculum to deduce how the objectives linked to what she knows will be expected of the students in college and beyond. Many procedural shifts she described where centered on how to maintain this relevance. The construction of a new rubric for the writing activity addressing thesis was an example. Adele wanted a tool to help students see the function of thesis statements clearly in their writing so that they would be able to transition well into college writing expectations. This exemplifies her balance of a procedural approach with a deep understanding of the purpose of the content. Table 4.9 summarizes how Adele enacted adaptive expertise through routine adaptive actions.

Table 4.9. Adele – Summary of Balanced Action: Routinely Adaptive

The expert teacher balances efficiency and adaptiveness by being routinely adaptive as seen in…
Designing procedures that allow time for assessing individual student progress.
Connecting content to students’ lives beyond the classroom.

Simplify through “why.” Adele continually expressed a clear internalization of why she was making certain instructional moves; this was especially evident when she would describe different efforts to simplify steps in the lesson to help students progress. This deep

rationale seemed to contribute to her confidence in interpreting the prescribed curriculum, assessing students' readiness for next steps of instruction, and balancing students' make-up work from being absent. Adele's ability to simplify aspects of instruction through a clear "why" for her teaching moves demonstrates her adept procedural skills and deep understanding of the nature of her students and content.

A theme in Adele's descriptions of her rationale for simplifying instruction dealt with interpreting the prescribed curriculum. An example of this rationale in action was her explicit indications of the thesis statement in an example text. She described how the way the example text presented thesis could be confused with common ways to teach main idea; therefore, she justified the simplification of pointing out the thesis in the example believing that this approach would help students internalize the function and purpose of thesis that they would be accountable to demonstrate in a later writing assessment. This simplification helped preserve time students might have spent in discerning a thesis statement that, to the teacher, was not clearly evident in the example text. Therefore, the teacher demonstrated a balance of the procedure for identifying the key element of the text with the understanding of the nature of thesis statement and the learning needs of her students in light of future assessment.

Adele's rational simplifications of instruction were also evident in other descriptions of this assignment through the ways that she used simplification to assess students' readiness for the next steps of instruction. This was also modeled when addressing thesis statements. Adele described how during one lesson she held off reviewing a student's writing in detail until he/she had completed the steps of an outline handout. She explained how this instructional procedure, "forces them [the students] to at least try and see" (Interview 2, p. 16). Given the goals of the upcoming assessment and goals of long term learning, she knew that her help would not be as

impactful if given, in this lesson, prior to a student trying a concept independently first. Adele had again demonstrated her expertise in utilizing procedural steps to lead students toward independent thinking about the content objective.

The use of simplification was also featured in Adele's explanations regarding an absent student and how she approached helping him catch up. To manage the progression of the rest of the class while trying to help this student get current with instruction, she described an understanding of what was reasonable to accomplish in the current day of instruction and what would be received better in subsequent days. She simplified the goal for the returning student in the moment of instruction while mapping out how to arrange the following days to help him catch up. This balance of timing and content is another picture of how she managed the simplification of a goal for one day of instruction through the understanding of how to reach the content goals in an appropriate amount of time. Table 4.10 summarizes how Adele enacted adaptive expertise through simplification.

Table 4.10. Adele - Summary of Balanced Action: Simplification

The expert teacher balances efficiency and adaptiveness by simplifying classroom activity through a clear rationale as seen in…
Connecting instructional decisions to the purpose of an activity and relevance to the students' lives.
Offering feedback after students attempt initial steps of an activity.
Moving instruction to times when it will be best received.

Affective understanding. In understanding the appropriate blend of procedure and content meaning, Adele also described the element of understanding the affective elements of instruction. She explained moments where the management of classroom activity toward the achievement of meaningful content goals was mediated by the students' affective display. This

was particularly demonstrated in her discussion of how she approached giving feedback to the students about their writing. In addition to receiving constructive insight on the composition of their writing, Adele explained an importance that the students walk away with a sense that "they're learning and that they're not being…just picked apart" (Interview 2, p. 27). Beyond understanding the "meaning and nature" of her content (Hatano & Inagaki, 1986), Adele points to the element of content that is her students. Procedures and content must yield to their needs. Table 4.11 summarizes how Adele enacted adaptive expertise through affective understanding.

Table 4.11. Adele – Summary of Expert Action: Affective Understanding

The expert teacher balances efficiency and adaptability by attending to students' affective needs as seen through…
Giving feedback that includes clear direction and encouragement, rather than just a focus on deficiencies.

Bethany

Content confidence. Bethany displayed a confidence with lesson content through explanations of her rationale for instructional adaptations related to culture connections, instructional focus, and lesson timing. In each example she balanced a strategy for reaching the instructional goal with room to adjust the content presentation to fit the needs of the students.

In the lesson focused on preparation for the poetry contest, she explained where she saw an opportunity for a cultural tie-in with the poem *Invictus*. Nelson Mandela's had passed within the week of this particular lesson, and students were commenting on the connection between the poem and the current event. The teacher took time during class to expand the conversation so that students could see how classroom content had relevance to a major event in the world. Prior to explaining this moment in class, Bethany mentioned how she routinely looks for connections to content like this. During the mini-discussion of Mandela, Bethany also realized a point to connect the world event to another class text. However, she chose to hold off on that

conversation tangent due to time. These nuanced shifts in the discussion and the on-the-spot elaboration of the cultural connection display Bethany's confidence with the content of her class, not only with how to tie-in relevant discussion points but how much time to give them in a particular lesson. It was not noticeable during the class time that Bethany was deterring the other connection point to another class text; therefore, the seamless transition shows her balance of the procedure of class with her understanding of the nature of the content and what elaboration was pertinent.

Content confidence was also evident in how Bethany described her selection of focal points for the students within her instruction. For example, during the reading of a section of *Antigone* she directed the students to look for the "loophole" in the section of the text. In describing how she selected this focal point, she explained the importance of having students focus on a purpose while reading. For Bethany, to select one point of emphasis in a text that could have many details to highlight displays her confidence in how she is interpreting the content in her classroom and the tool she is using to help students grasp the interpretation.

Bethany displayed confidence with the various types of content in her classroom and how to synchronize the time spent on them to maximize learning opportunities. Her procedures complimented the content at hand. Beyond academic content, she commented on the pop-cultural content that bubbled up in her class and how to manage the discussion of it in relation to the teaching goals. She displayed a confidence in how much time she would allow students to pursue a certain line of talk related to something that may be a bit off topic in exchange for their fuller attention in the following minutes. Not only was Bethany continually sure of the turns she took with the academic content, she was confident with her address of topics that the students spontaneously brought up during instruction. Her management style and choice of content to

focus on displayed her balance of procedure and the nature of her content area. Table 4.12 summarizes how Bethany enacted adaptive expertise through confidence with classroom content.

Table 4.12. Bethany – Expert Action Summary: Content Confidence

The expert teacher balances efficiency and adaptability through confidence with many forms of content in the classroom as seen through…
Recognizing appropriate tie-ins to discussion that clearly advance the instructional objective.
Selecting focal points for student thinking within multifaceted content.
Allowing off topic conversation that promotes student s' future attention.

Reflective routines. Routines have developed through Bethany's instructional adaptations over the years she has been teaching; although, in the enactment of these routines, she remains reflective. Such routines were evident in Bethany's descriptions of how to draw students to critical thinking about content and her understanding of individual students' learning needs.

Bethany was clear about her focus for students to develop critical thinking in her class. She had distinct goals for where she wants to push their thoughts for each piece of content. When explaining a point in the discussion of *Antigone*, she described how students typically assume the gender of a certain character reference. In explaining her rationale for this routine, she recounted the content focus at the particular point in the reading, "women in this particular society, but also on the perceptions of people and why they we would assume one thing for gender versus another" (Interview 2, p. 5). She articulated how when she was a newer teacher, she would just give the students an explanation for this unexpected element, whereas now she structures the discussion so that students arrive at the realization independently. Although this is a routine approach to the content for her now, Bethany remains poised to adapt her responses to students' individual commentary.

Frequently Bethany would also comment on situations that were "unique" for particular students. These explanations highlighted her reflective stance when enacting procedures that

were for a particular student's learning needs. She outlined two specific instances where she crafted different responses for students in the same activity on using tone in poetry. Each approach was built on the teacher's collected observations of the students from the beginning of the year; however, in the moment of enacting them, she proceeded through some diagnostic questioning to affirm her next steps. This example also displays Bethany's adeptness with developing routines but her maturity in how to manage them for the good of her students and the success of instruction.

In each the draw to critical thinking and the construction of unique responses, Bethany described a comingled confusion that was present in these moments where the goal of critical thinking and the individual learning styles of students informed the silences she let linger. She let the wait time linger knowing that, although perhaps initially confused, the time was necessary for the quality of thought to develop. To be able to effectively execute such a strategy, Bethany had to remain confident in how to adapt to the realizations students came to at the end of such silence—a confidence which seemed to have been developed through Bethany's personal experience working through such developmental, confusing silences. This is an operationalized feature of adaptive expertise, to linger with confusion enough to let an interpretation surface. Therefore, to effectively direct students through such productive confusion, she must be personally comfortable with the process as well. Table 4.13 summarizes how Bethany enacted adaptive expertise through reflective routines.

Table 4.13. Bethany – Summary of Expert Action: Reflective Routines

The expert teacher balances efficiency and adaptability through reflective routines as seen through…
Allowing students to arrive at a conclusion rather than telling them.
Asking diagnostic questions to affirm individual students' learning needs.
Allowing students time to move through confusion independently after an instructional framework for thinking as been established.

Affective understanding. A theme in Bethany's instructional decisions was her understanding of the affective elements of students' learning experiences. This soft understanding is something that qualifies as content in her classroom, for she frequently commented on how she was toggling her understanding of a student's emotional needs with the instructional goal at hand. This was displayed through her explanation of a disciplinary approach during an activity and an instructional approach during a strategy for reading aloud. In each, she approached content as the whole picture of instructional goal and student need.

During the lessons focused on practicing tone with poetry, Bethany described her approach to simultaneously addressing off task behavior and the instructional objective. While she routinely addressed off task behavior with the reminder of "You need to be back on track" (Interview 1, p. 11), she sensed the need to immediately move to content directions; otherwise the students would dwell on the conduct correction and miss the instructional focus. During the class, Bethany demonstrated this approach with clarity and grace to where students could be corrected without a tone of condemnation. She expressed a desire to correct for the students' best interest, which required a balance of how to attend to their behavior and the objective.

During the second lesson with *Antigone* that was reviewed for this study, Bethany described how she arranged the selection of reading roles. Through her assessment of the progress made in the previous day, which included timing and the communication of tone, she arranged a scenario where students could volunteer to read certain roles of the play. This strategy, she explained, allowed students who struggled to read aloud the previous day to lay low if they did not want to read aloud again, while allowing other students who might be motivated because of a comfort in reading aloud to take the stage. The understanding of the social and emotional dynamics of a tenth grade classroom shows Bethany's internalization of what it means

to teach *Antigone* to these students, at this school, this day—a masterful blend of procedure and content understanding. Table 4.14 summarizes how Bethany enacted adaptive expertise through affective understanding.

Table 4.14. Bethany – Summary of Expert Action: Affective Understanding

The expert teacher balances efficiency and adaptability through affective understanding as seen through…
Giving clear direction about behavioral expectations in a manner that encourages learning focus.
Creating procedures that allow student choice.

Each teacher's story of adaptive expertise highlights how she balanced the efficiency of procedural know-how with the adaptability the nature of the content requires. Interestingly, both teachers revealed that "content" in their classrooms was beyond texts used for instruction, but it included the whole experience of their students in their classrooms.

Analysis and Interpretation of Balanced Action

The conceptual idea of balance as the signature of adaptive expertise is echoed throughout this report. This signature is the balance of efficiency and innovation in practice (Schwartz et al., 2005), where innovation is analogous to adaptiveness. Hatano and Inagaki articulate this balance as, "performing procedural skills efficiently, but also understanding the meaning and nature of their object" (1986, p. 263)—which is the distinction between adaptive expertise and routine expertise. This balance in the teachers' practice has already been alluded to in the discussion of their reasoning and reasoning processes. The embedded nature of adaptiveness within their efficient decisions points to a conceptual understanding of content within a procedural know-how. This same balance is illustrated in the narrative syntheses of the teachers' reviewed lessons. Throughout each of their stories this balance was displayed through overlapping themes related to their confidence with all the forms of content in their classrooms,

their rationale for simplification choices within a lesson, and their understanding of the emotional dimension of learning.

A recurring event for Adele was how she systematically broke down a prescribed curriculum through her understanding of students' needs in the current lesson and beyond her classroom. Choices of simplification were guided by a rationale of time management and overall content meaning. Meaning, for Adele, was centered on how the content would serve her students beyond her instruction and what affective environment would encourage their participation in the learning. An example was her commentary on the use of a structured outline within a writing activity addressing thesis statements. By narrowing students' focus within the lesson with such a tool, she felt their confidence would be encouraged and they would produce work with a clear understanding of the concept in a way that would serve them beyond one lesson. Through the whole of reviewed lessons, Adele displayed the efficiency of experience through her deep concern for students' academic and emotional well-being.

Bethany had choice in her curriculum materials. She also explained similar intentions of splicing apart content for the global goal of extending learning beyond the current lesson and beyond her classroom. In exercising the efficiency of experience, Bethany explained how she remained reflective even in the midst of a routine that had been successful previously. Throughout her explanations, she referred to the affective element of instruction that qualified as content, just as much as the text on a page. She attended to the two together to define success in the classroom. This was demonstrated in her descriptions and explanations throughout the lesson on tone. She explained an approach with a student that involved her careful analysis of the student's behavioral patterns combined with individual, simplified guidance that drew the student beyond her (the student's) reservations with the activity. Bethany explained her rationale

for the guidance she gave this student as being familiar enough to seem achievable but challenging enough to show the student her ability beyond what she had experienced. Overall, Bethany showed the balance of procedural skill and conceptual understanding of content and students. These interpretations reveal how the teachers' reasoning processes coalesce to illustrate the balance of adaptive expertise.

Figures 4.7 and 4.8 illustrate how the reasoning processes of each teacher were positioned in the exercise of adaptive expertise. More specifically, the figures depict how the themes from literature and research help interpret the particular qualities of efficient and adaptive decisions the teachers utilized in adaptive expertise: routine application and pattern recognition. Routine application characterized the efficient first steps of the teachers' instructional moves; whereas, pattern recognition characterized the space where adaptations were considered as student feedback was noticed. Dynamic understanding of the classroom content and dynamics facilitated this blended exercise of efficiency and adaptability. Each section of the figures also lists specific actions present in the expert work of the teachers to accomplish the balance adaptive expertise. Such descriptions extend what has been known about the enactment of adaptive expertise in practice. Chapter five articulates the significance of such alignment between these findings and the literary themes. Basically, the results of this work point to affirming the trends in expert teaching scholarship while extending what is known about how such operations are enacted in real classrooms. Although this study was small in scope, the resulting stories suggest worthwhile aims for future work.

Credibility

As described in Chapter Three, this study pursued credibility through Eisner's recommendations of coherence, consensus, and instrumental utility (1991). This approach was based on the qualitative nature of the work, which stems from a constructivist position.

Coherence

Eisner describes coherence as the sense of the story created through strategic arrangement of the data to answer the purpose of the study (1991). The data comprising the above stories were organized through many tiers of data collection and analysis.. This process was facilitated through a researched method for examining expertise that supports a narrative framework (Critical Decision Method of CTA). Further, this process utilized tools such as diagrams, illustrative charts, and reflective memos. At each turn of story construction, my process was made plain to the reader and supported with examples from the teachers' thoughts and research literature.

Consensus

Consensus defines the agreement between the researcher and reader that the accounts of experience are how the teacher sees the truth of the experience (Eisner, 1991). Consensus was sought through the use of classroom recordings to recount the instructional events, clarifying questions during the interview process, and participants' review of the final narratives to confirm the storied findings. At each stage, the participants were able to offer agreement or correction to the ways I was interpreting their experiences. When sharing the resulting classroom narratives with the teachers, both expressed approval.

Instrument Utility

Comprehension and anticipation are ways in which instrument utility is achieved (Eisner, 1991). Comprehension in a qualitative work should bring clarity to an idea that would be confusing otherwise. Anticipation speaks to the way the results have an impact beyond the study. It is believed that confusion was mitigated in this study through the many stories and illustrations of the data. Comprehension of findings is supported by a logical order moving from individual lesson analysis to a composite synthesis of the experiences. Anticipation is achieved through the maps and guides offered through the results. Maps in this work constitute the multiple illustrations and summary statements of expert teachers' experiences in a particular setting, with certain students, and specific content. Guides in this work are comprised of narrative syntheses of the experiences to explain how the lived experiences of expert teachers point to the appropriateness of the construct of adaptive expertise as explanatory of their practice.

Chapter Summary

Stories of individual, contextualized experiences of adaptive expertise have been presented in this chapter to advance previous work with this construct in the field of teaching. The descriptions of expert teachers' lived experiences in their actual classrooms help cast adaptive expertise as a fitting definition of how masterful teaching occurs. This chapter was arranged to share the teachers' stories through pictures of their decisions and decision processes and syntheses of their decision descriptions. At the start of this study, each teacher was believed to be an expert and to exhibit adaptive expertise—based on the justification offered through previous research. Therefore, narratives and images of their decisions help show what the balance efficiency and adaptability looks like within a live class period, thus constituting

adaptive expertise. Each teacher's decisions across all her analyzed lessons were synthesized to tell the story of adaptive expertise. Finally, efforts to establish credibility in this work were shared. Chapter Five will include discussion of the findings shared here, as well as their significance and implications for teacher education, secondary classrooms, and future research.

CHAPTER FIVE: DISCUSSION

In this study, adaptive expertise has been positioned as a construct to explain expert teacher practice. This work builds on literature that infers the appropriateness of such a conceptual framework in teaching (Borko & Livingston, 1989; Crawford, 2007; Crawford et al., 2005; Sawyer, 2004; Tsui, 2009; Wineburg, 1998) and offers explanations of practice that synthesize and extend the inferences. Through such findings, this study responds to the call for "refinement and elaboration of the construct of adaptive expertise" (Crawford & Brophy, 2006). This move in research extends the previous work with this construct in the field of teaching that employed quantitative and qualitative methods (Crawford, 2007; Crawford et al., 2005; Wineburg, 1998); however, the previous qualitative insight did not include content related to articulating what constituted adaptive expertise in the classrooms of the participating teachers. Through a narrative design, this study produced pictures and stories of adaptive expertise in practice to refine the conceptions offered in past research. It is hoped that this work will make the construct more accessible for interpreting teacher practice, thus contributing to the development of teacher practice. This chapter offers a summary of the study, discussion and implications of the findings, commentary on the significance of the work, and questions about lingering curiosities.

Study Summary

Artistry instigated the current study through my curiosity of how it related to the success of my own classroom instruction. I feel like I experienced expertise in artistry when I realized the balance of technique and performance in connection with a specific audience. I feel like I experienced expertise in teaching when I realized the balance of plans and instruction in connection with specific students. The focus of this study was to qualify this balance as explanatory of teaching expertise through an art-inspired conceptual framework and the commentary of expert teachers.

Literature points to an adaptiveness that characterizes the distinction of expert teaching from routine instruction. This adaptiveness is synonymous with Dewey's description of art making (1910) and Hatano and Inagaki's conception of adaptive expertise (1986). Each explanation is hinged on the artist/agent enacting a balance of planned and spontaneous operations through a deep understanding of the purpose of the experience. Relevant scholarship regarding expert teaching described prominent planned operations in expertise as routine application and pattern recognition; additionally, the facilitator of expertise was characterized as dynamic understanding. Schwartz et al. (2005) offered a conception of this balance through their illustration of the optimal adaptability corridor (see Figure 2.1), which has served to interpret the most specific research regarding adaptive expertise in teaching. The Schwartz et al. description also formed the foundation of the conceptual framework for this study.

Narrative methodology framed the research methods of this study that were selected to align with an interpretivist perspective and constructivist epistemology. The intersection of such methodology and thinking patterns combined to cast a space for understanding expert action that attends to the atypical features of experience. The Critical Decision Method of Cognitive Task

Analysis further facilitated this pursuit through specific data collection and analysis procedures centered on eliciting experts' descriptions and explanations of practice around moments that included atypical events. Expert teachers' commentaries were examined for specifics related to the conceptual framework of adaptive expertise.

Discussion of this work relates to the meaning and significance of the expert teachers' experiences (Clandinin & Connelly, 2000). In determining the meaning and significance, the researcher constructs an interpretation that resonates with him or her yet that is clearly rooted in the data (Corbin & Strauss, 2008) and responds to the purpose of the inquiry. The goal of this study was to understand individual experience, not generalize. Therefore, the themes of meaning presented are pictures of adaptive expertise; they are not forwarded as generalized findings, but rather intersections of experience that may suggest ideas for future action (Clandinin and Connelly, 2000). Resonance between the expert teachers' experiences and the scholarship on expertise emerged in the analysis of this study. Moreover, the findings seem to contribute to extensions in the story of teaching expertise via implications for how the dominant themes in expertise literature connect to one another in practice and point to the need for a framework like adaptive expertise to explain how expert instruction occurs. The findings also offer implications for ways to extend the adaptive expertise framework in future research through articulations of how the operations of adaptive expertise occur in actual practice. What follows is a discussion of the findings in relation to the narrative themes, reviewed literature, and the conceptual framework; specific attention is given to how the current study suggests extensions in understanding expert teacher practice.

Research Question #1

> How do secondary English language arts teachers who have been identified as experts describe and explain their reasoning and reasoning processes behind decisions within instruction?

The current study's findings extend understanding about adaptive expertise by indicating possible ways the themes in literature might relate to one another in practice and set the stage for justifying the need for the framework of adaptive expertise to explain expert teacher practice. Key themes from the teacher narratives related to this extension of understanding are the presence of efficiency within adaptive reasoning and the use of student response as a catalyst for instructional decisions to support lifelong learning. Each teacher described her instructional actions as being initiated in a routine, efficient way—based on prior experience—but continued through adaptive thinking as a means for assessing the appropriateness of an efficient response. Further, they each explain how their students' responses were the indicators for how and when they acted on adaptive thinking to support learning within and beyond their classrooms.

Theme 1: Efficiency within adaptive reasoning. The expert teachers in this study each explained a process for enacting efficiency in their practice that involved adaptiveness. Adele used the term "routinely adaptive" to characterize this stance in her instruction. She described entering instructional experiences with assumptions based on prior experience; however, she continued to detail how such assumptions were held loosely in the instructional event to allow for adaptations based on students' needs. Bethany also shared explanations that echoed Adele's efficient, "routinely adaptive" approach where she employed past experience in planning for instruction but looked for student response to inform subsequent teaching choices. The teachers' explanations of this "routinely adaptive" approach resonate with scholarly themes regarding how

experts use efficiency—specifically routine application—through a reflective stance. This reflective stance can begin to explain the adaptive actions expressed by the teachers in this work. The stories from this study extend understanding regarding the quality of adaptive behavior in expert, reflective action. Teachers' explanations suggest that the embedded nature of efficiency is accomplished within adaptive practice via simplification—a quality not expressed in previous work.

Participating teachers' stories depicted simplification as a choice exercised through reflection for the purpose of students' developing conceptual understanding of the content. Adele exhibited this process when describing her use of an outline handout for thesis statement creation. While students worked, Adele circulated to assess understanding. For some, she withheld her feedback until they reached a certain point in the assignment with the rationale that the students would be better positioned to absorb her counsel after they attempted the steps of the work independently. By simplifying the students' focus through the use of the handout and reinforcing the simplified steps through withholding her feedback for a time, Adele believed students would reach a greater understanding of the underlying purpose of writing thesis statements that would serve them in her classroom and beyond. Bethany expressed this process in her explanations of the tone in poetry lessons. As students worked in pairs to practice reciting self-selected poems with different tone styles, Bethany made specific adaptations for students through simplification. For one student who was uncomfortable with trying new tone expressions, Bethany narrowed the tone list (provided on a handout) to three possible styles that would fit the student's poem. By shortening the options and telling the student that the few styles would work with the poem, the student was better positions to experience success in the assignment. Success in each teacher's example lessons was expressed as students accomplishing

learning experiences that give them independent practice relevant to real world purposes. For Adele, the thesis statement lessons were to teach students the process of organizing thoughts in writing to support clarity of communication and opinion. For Bethany, the tone lessons were to lead students to confidence in verbal expression and understanding appropriateness of tone in verbal expression. Efficiency with adaptive reasoning characterized the teachers' descriptions of how they set out to and adjusted during the pursuit of these instructional goals. Lessons were approached through the efficiency of experience and instruction was purposefully simplified through adaptations to support learning goals within and beyond the classroom.

Theme 2: Student response as catalyst for instructional decisions. The previous discussion theme of "efficiency within adaptive reasoning" subsumed the literary theme of "reflective adaptation within routine application" and extended understanding to include the feature of simplification. Simplification was a means through which the expert teachers enacted routine application throughout the examined lessons. Situated between these simplifications is the space of assessing student responses to determine the simplifications to be pursued. Figures 4.7 and 4.8 depict how the reflective quality within pattern recognition (another literary theme) can begin explaining this adaptive space. Patterns that the teachers' noticed centered on student learning needs, which were perpetually reassessed during instruction to determine if adaptations in teaching were necessary. Similar to the first theme of this discussion, the second theme "student response as a catalyst for instructional decisions" is a theme that subsumes the literary theme "reflective adaptation within pattern recognition" and extends understanding by way of suggesting a connection between routine application and pattern recognition that is facilitated by adaptive simplification. The expert teachers described examples of applying routines, noticing patterns in students' responses, and deciding whether adapting the routine would best support the

students' toward reaching the learning objective. Simplification of the task characterized a majority of adaptations the teachers made in response to the assessment of student response. Adele exhibited this process in her description of managing instruction for a student who had been absent. Adele explained her rationale for giving a previously absent student only one section of the assignment for the day. She reasoned that a smaller quantity of work for the present day would set the student up to complete the outstanding work and reach understanding of the conceptual idea of the lesson—rather than force him to make up all the elements of the missed work in a shorter time frame. Adele managed this process amidst leading non-absent students toward the current day's learning objective. This expert teacher applied routines and assessed their appropriateness through noticing patterns that developed in the needs of different students. The non-absent students displayed patterns different from the absent student and each required different responses. Simplifying the response for the absent student seemed to give Adele time to focus on non-absent students while giving the absent student a more appropriate, adapted learning goal that better suited his learning location in the unit after being absent. The previous example from Bethany's classroom also exhibits this process. Adaptive, simplifications characterized her instructional response to the students struggling with the tone activity. The simplification of narrowing students' focus to fewer choices of tone styles to practice with their poems came after Bethany noticed patterns in the students' actions when working on the assignment. Bethany's explanation of this process characterized how the literary theme of "reflective adaptation within pattern recognition" is affirmed in the practice of this expert teacher; moreover, the theme is extended through explication of how pattern recognition served to facilitate a specific kind of adaptive response in the participating teachers' instruction: simplification.

Theme 3: Learning within and beyond the classroom. In each examination of instruction, the expert teachers continually explained an individual commitment to instruction that had relevance within and beyond their classrooms. Each teacher mentioned connections from their classrooms to college and workplace readiness. This focus tempered their selection of routines and how they adaptively responded to pattern recognition. What is noteworthy in their explanations is how such focus was carried out. To perpetually maintain instructional relevance, the expert teachers explained nimble shifts in the presentation and assessment of instruction that was facilitated by their deep conceptual knowledge of their content and audience. Knowledge of this kind builds the foundation for the second tier of examination of this study, for the exercise of adaptive expertise is built on this kind of conceptual knowledge.

Research Question #2

> To what extents do expert secondary English language arts teachers' descriptions and explanations of their reasoning and reasoning processes behind decisions within instruction align with the conceptual framework of adaptive expertise?

Adaptive expertise for this study was characterized as the balance of efficiency and adaptability in practice (Schwartz et al., 2005). Additionally, adaptive expertise was described as distinct from routine expertise by way of conceptual knowledge of a domain. Adaptive experts are able to perform expert operations and articulate why a particular practice works because they have conceptual knowledge of the domain. Routine experts are able to perform expert operations but only when the conditions remain constant. Since they do not have conceptual knowledge of the domain—knowledge regarding why an operation works—routine experts cannot perform expertly outside of controlled, consistent circumstances (Hatano & Inagaki, 1986). Descriptions and explanations offered in this study affirm the participating teachers' adaptive expertise

through their articulations of why they made instructional decisions. The teachers rarely advanced in a classroom moment without a conscious rationale for why the subsequent action was most appropriate. The reviewed literature characterized this conscious rationale as dynamic understanding. Such rationale informs the quality of balance in the adaptive expertise framework. Stories from this study serve to advance the literary theme and the conceptual framework by specifying ways two expert teachers enacted this balance in the practice of adaptive expertise. Specifics regarding how adaptive expertise occur in practice is a feature that has been missing from research regarding adaptive expertise in teaching. The participating teachers' enacted the balance of adaptive expertise through confidence with their classroom content, justification for simplifications of instruction, and understanding of students' affective needs.

Theme 1: Balance via content confidence. To physically achieve balance, one is continually shifting one's weight through nuanced shifts in muscle use. To instructionally achieve balance, the expert teachers of this study continually reflected on the effectiveness of their instruction for their particular groups of students. Content confidence served as one of the instructional muscles they each used to achieve this balance. Adele expressed this confidence when describing her plans to create an original rubric for the thesis statement lessons that was apart from the prescribed curriculum. In her explanation of this decision, she did not express doubt about how to teach thesis statements to her students; she expressed a struggle with the confusing nature of the curriculum that motivated her to make adaptations to the materials. Adele expressed the balance of adaptive expertise through her confidence in adapting the prescribed materials to fit the needs of her current students. Her confidence regarding the content and instruction of thesis statements enabled her to select which elements of the curriculum would

support her current students (efficiency) and make adjustments to the aspects that might be ineffective (adaptability). Bethany exhibited this same content confidence in her adjustments to the poetry presentations lesson in her class. When the class period was interrupted by a fire drill, Bethany was able to make adjustments to the remaining minutes in order to reach the lesson goal: having students practice recitation of their poems in front of the class to grow more comfortable and prepared to speak formally. In debriefing the lesson, Bethany's descriptions of her decisions showed a rationale rooted in instructional purpose rather than just time management. Through her confidence in the purpose of addressing the poetry content in her class, she was able to quickly adapt how the class was ordered to preserve instructional integrity even amidst interruptions. It is important to note that the content confidence described here is not simply the domain knowledge frequently addressed in expertise literature. Content confidence within the adaptive expertise of these teachers specifically includes a conceptual understanding of content that facilitates use across different scenarios. Previous conceptions of domain knowledge align with the descriptions of routine expertise. The teachers' stories in this study serve to illustrate how conceptual understanding can be enacted across diverse situations thus supporting the description of conceptual understanding in the framework of adaptive expertise.

Theme 2: Balance through simplification via justification. Simplification describes another instructional muscle the teachers in this study used to achieve the balance of adaptive expertise. As previously noted, reflection on routine application and pattern recognition in the teachers' lessons frequently resulted in adaptive, simplifications to the lessons. In each description of simplification, the teachers explained detailed rationale for why the simplification was the best choice to support the learning goals and students' needs. By simplifying the lesson step through adaptations the teacher was able to preserve instructional time and devote it to

bringing students to conceptual understanding. When discussing cultural connections between the poem *Invictus* and the recent passing of Nelson Mandela, Bethany chose to simplify the student-generated discussion to one aspect of the content connection given available class time and purpose of the discussion. Through this approach she balanced efficient management of class time with adaptations of class discussion to support cultural connections to and interpretation of the poem. Adele demonstrated this same balance when modeling identification of a thesis statement in an example text. Rather than have students identify the thesis, Adele chose to directly identify the thesis of an example text. Her rationale was based on the confusing nature of the text and how direct identification would help students reach understanding of the conceptual meaning of thesis statements sooner rather than waste mental energy on the potential confusing nature of the example in the prescribed text. For each teacher, simplification served to facilitate the balance of efficiency and adaptability through bringing focus to the most important features of a concept in order to support conceptual understanding of the learning objective.

Theme 3: Balance through affective understanding. Understanding of students' affective needs served as another instructional muscle the participating teachers used to achieve the balance of adaptive expertise in the examined lessons. For them, knowing students affective needs was another dimension of classroom content that they pursued understanding. Such knowledge helped them make decisions between efficient and adaptive instructional moves. For example, Adele described her consideration of students' affective needs when giving feedback about writing. She was intentional to give encouragement rather than just criticism. While it may seem efficient to point out deficiencies in writing to reach the appearance of correctness in writing, Adele was focused on the importance of each student's feelings about the quality of his/her writing and how it contributed to the quality of their final products. Bethany also attended

to the affective needs of students in the balance of adaptive expertise. She described observations of one student during the tone activity where she could tell the student was withdrawing from participation because she was unsure of the assignment. Bethany adapted the explanation and approach of the activity for this student to help draw her to participation in a way that was more comfortable while still preserving the instructional objective. Bethany shortened the list of tone styles to only include those that could easily relate to the student's poem. This move capitalized on Bethany's efficiency of experience and adaptiveness through understanding students' affective needs.

Summary of Discussion of Research Questions

Adaptive expertise is more than adjustment in practice or the application of a routine; it is the balance of both through a dynamic understanding of the reason why an approach works and the nature of the content it addresses (Hatano & Inagaki, 1986; Schwartz et al., 2005). Schwartz et al. further that, "A major theoretical challenge is to understand how efficiency and adaptability can coexist most effectively" (p. 30). It is believed that this study responded to this challenge by offering explanations of how efficiency and adaptability coexist in expert practice. This study drew from previous presentations of adaptive expertise, synthesized their contributions, and advanced the descriptions of how adaptive expertise is accomplished in expert practice.

Prior to this study, adaptive expertise was understood as a conceptual explanation for masterful practice. Research on the topic had confirmed the extent to which efficiency and adaptability were operations within such practice, as well as generalized descriptions of what constituted efficient and adaptive actions. The current study offered individual experiences that supported past literary and research themes and extended understanding regarding adaptive

expertise in practice. Figure 5.1 illustrates the existing definition of adaptive expertise in literature with themes from the participating teachers' stories. Schwartz et al. (2005) explained the operations of adaptive expertise along the optimal adaptability corridor (See Figure 2.1). This construct was utilized by Crawford (2007) to display findings that confirmed the adaptive expertise of her participants. If the calculation of coded, participant statements fell within the optimal adaptability corridor, teacher participants were believed to exhibit a balance of efficiency and adaptability thus constituting adaptive expertise. However, the illustration stopped short of explaining how the teachers accomplished adaptive expertise specifically. Figure 5.1 displays the findings from this study that extend the knowledge from past research. It includes specific operations of the expert teachers in their actual classrooms and how each action is positioned in the exercise of adaptive expertise. The embedded adaptiveness that teachers in this study explained aligns with the manner in which expert teachers in past research describe their processes and applications of pattern recognition: patterns are noticed but questioned for verification of instructional effectiveness. The placement of pattern recognition in the figure illustrates advancement in understanding adaptive expertise. More than just describing a dimension of masterful instruction as adaptability or pattern recognition, Figure 5.1 depicts how this study shows pattern recognition as a particular kind of adaptability occurring at a particular moment within efficient practices that together contribute to adaptive expertise. Additionally, this study contributes specificity regarding what kinds of efficient decisions expert teachers exercise around adaptiveness. Figure 5.1 articulates the dimension of efficiency as routine application, which aligns with reviewed literature, and further explains the type of routines the teachers typically exercised. Finally, the teachers' commentaries in this study confirmed the presence of dynamic understanding as the foundation for executing the balance of efficiency and

adaptiveness in adaptive expertise; moreover, findings revealed distinct themes in what constituted this dynamic understanding for the participating teachers: content confidence, rationalized simplification, and affective understanding.

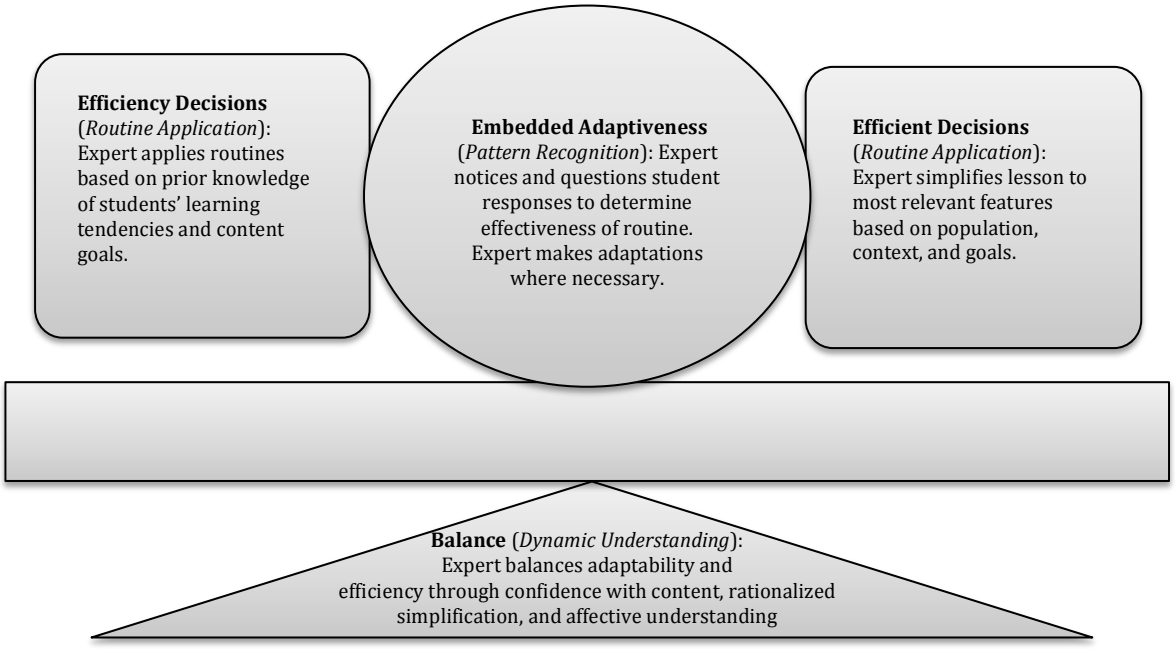

Figure 5.1. Illustrations of how findings contribute to advancements in understanding adaptive expertise

The aim of this study was to describe how adaptive expertise explains the actions of participating expert teachers, although more insight emerged in the journey. The teachers' commentaries served to offer greater specificity about how the operations of adaptive expertise are carried out. It is believed that the interpretations of the data make a case for the alignment between adaptive expertise and expert teaching and lay a foundation for future research to confirm this connection.

My Placement in the Research

My journey to this study was through my experiences as an artist who found herself in the creative space of the classroom where the processes of art making continued to come alive. As a new teacher, I used these processes as a method of survival because they were familiar; however, as I continued teaching, I purposefully selected these artistic approaches because they seemed to align with best practice. In art making, one's creation is never apart from the participation of the audience. In teaching, one's instruction is never apart from the involvement of the students. This alignment of process is hinged on the balance between creating and responding: the signature of adaptive expertise.

As the teachers in this study shared their stories, I found resonance with my experiences as a teacher. I shared my attempts to make my influence explicit, and my choice of study design was selected to use such resonance as a point of strength. I began by describing my rationale for selecting secondary English language arts teachers based on my experience in the same role. As data collection and analysis progressed, I shared my reflective thoughts and how they specifically related to interpreting the teacher stories, as illustrated in the attached appendices (See Appendices D-I.). The stories shared here are a synthesis of the teachers' journeys and mine, for my questioning and analysis could not be completely separated from my own experiences as an educator who believes in the applicability of the concept of adaptive expertise to teaching practice. In addition to supporting research and literature, I leaned on my experience to formulate probing questions and reflective analysis of the teachers' commentaries. I liken my process with managing this influence as analogous to the balance that has been the ongoing theme of this study. I was careful to not step out too far into interpretation based on my experiences without assessing my interpretation against research and literature. I was also

mindful to attend to the teachers' experiences that were unlike my own; therefore, I sought to remain balanced in the creative-tension space of interpretivism that embraces the atypical to further understanding.

Balance is the signature of adaptive expertise and of artistry. Physically, achieving balance as a dancer is an ongoing execution of nuanced shifts in muscle tension to maintain the appearance of weightless suspension in interpretations of a ballet's theme. Dramatically, balance is the perpetual listening to one's environment to ensure the scripted response is authentic to the live moment. Instructionally, balance is the continual engagement with students in the interpretation of classroom content through students' academic and affective needs. I believe that I maintained this signature stance through the process of this narrative research.

Significance of Study

Adaptive expertise distinguishes teaching expertise as having a particular quality apart from traditional ways of describing masterful practice. Such a distinction is necessary considering the fluid dynamics in which teaching takes place. Previous descriptions of expertise blend well with professional domains that are practiced in continual certainty: where the environments are predictable and routine. However, teaching occurs at the intersection of many dynamics and requires expertise that can respond to the many dimensions. This study is important to the field of education because it points to teaching expertise as having an adaptive dimension in practice that responds to such dimensions. Findings from this work begin to fill in a gap in existing research by responding to the call for explaining how the balance of adaptability and efficiency of adaptive expertise is achieved.

Balance equals routinely adaptive. Routinely adaptive was a label Adele used to characterize the way efficient decisions were embedded within her adaptive actions. Bethany's commentary also resonated with this description. The quality of this term holds significance for the field of teaching because it sheds light on how the operations of efficiency and adaptability are related within the practice of adaptive expertise for these expert teachers. Previous research suggested that the balance of efficiency and adaptability in adaptive expertise was a toggling back and forth between the cognitive activities; however, the experts in this work describe the relationship between the two decision processes as being woven together. It could be suggested that efficiency and adaptability serve one another in the practice of these experts and could not be explained as wholly effective as singular actions. Descriptions of this relationship offer starting points for future research examining this connection. If confirmed, the understanding of this connection could inform the way practicing teachers plan for and carry out instruction and the way student teachers are trained to interpret the events of the classroom.

Balance equals instructional rationale. Instructional rationale characterizes a through-line in the teachers' stories from this study. In analysis of the teachers' reasoning and the alignment of their practice to adaptive expertise, articulations of purposes for instructional choices were clear. Their expert practice could not be described through mere execution of the lesson plan; teaching took on turns and twists that they described through deep understanding of the curricular content, learning context, and the student population. For them, expert practice—the balance of efficiency and adaptability—could not be characterized without the element of instructional rationale. This understanding also holds significance for future work regarding the adaptive expertise of expert teachers. Research could focus on whether these themes in instructional rationale ring true for a greater population of expert teachers. Such findings could

inform the content focus of instructional planning and reflection for practicing teachers and the curricular content for student teachers learning how to ground their instructional choices.

Implications

The present study was small in scope and focused on information gathering; it was not intended for generalization of the storied findings. In each presentation of the results, care was taken to express outcomes as particular to the two participating teachers and not characteristic of a population wider that this study. For example, findings are characterized as "inferred:" based on the resonance of the individual accounts in this study, inferences were suggested regarding what might be seen in the collection for more teachers' storied accounts of expert practice. Additionally, the resonance between the two expert teachers' experiences hints at worthwhile next steps in the pursuit of understanding adaptive expertise and its relationship to expert teaching. Next, implications for next steps are discussed in relation to practice and research. Table 5.1 organizes the narrative themes from this study in relation to inferred findings and future implications.

Implications for Secondary Classrooms

Professional conversation and development. The narrative themes of this study imply consideration for professional conversation and development of secondary educators. Table 5.1 describes how such themes inform suggestions for secondary practice. Perhaps the themes of this work could make their way into the department meetings and peer conversations of educators to further elaborate the relevance of the findings of this study in relation to actual classroom practice. Conceptual purposes for instruction and their connection to simplification techniques

could become a regular conversation at the beginning of instruction. Specifically, expert experienced teachers could share seasoned wisdom with new teachers regarding instructional purpose and simplification strategies that support conceptual understanding. Teachers could also use this topic as a touch point amidst an instructional unit as an effort in collective reflection. Similarly, teachers could discuss past patterns of students' responses within instruction prior to the start of an instructional unit and reassess noticed patterns mid-unit to evaluate the appropriateness of instructional adaptations. Similarly, time in such conversations could be given to describing and developing the most important aspects of the content and how to communicate it to students while attending to their affective needs.

Peer connections. An additional hope is that the stories from this study will affirm expert teachers in environments where their expertise may be overlooked through prescribed, inflexible environments. The work of Hatano & Inagaki (1986) and Berliner (2001) point to restrictive measures as counterproductive to the learning outcomes necessary for success in today's world; such measures could be likened to the scripted nature both teachers referenced as part of their teaching experiences. Interestingly, both teachers in this study commented how they persevered in best practice in the midst of such restrictions; therefore, this study offers insight through the teachers' accounts of the ways they enacted adaptive expertise within a restrictive environment. Further, given Adele's comments on the importance of peer connections in practice, perhaps these stories can serve as a peer connection for other expert teachers needing to feel affirmed in their practice.

Professional assessment. Perhaps these stories can also be used to encourage the re-evaluation of current methods of professional assessment. If adaptive expertise is seen as the defining framework for teacher practice, these illustrations could be used in devising a manner of

assessment that helps interpret the flexible actions of a teacher more specifically. As each teacher commented regarding the environments where standardized testing reigned, administrative evaluation of instruction was exercised with little interest in understanding the rationale for a teacher's decisions, and professional guidance was provided in formulaic, rigid ways. For Adele this left feelings of fear and doubt that took energy away from other aspects of her practice. For Bethany, as long as students were performing on the state tests, she was free to operate as she pleased. In each example, although Bethany's implies more autonomy, there was little concern for the support and development of professional practice. One wonders if the absence of administrative feedback beyond the curiosity of students' test scores is due to uncertainty in how to provide specific feedback regarding expert practice. Using an adaptive expertise framework with findings similar to this study, perhaps administrators would feel more equipped to interpret the nuanced, ever-changing moves that comprise expert teaching in a manner that supports the flexible needs of the profession.

Implications for Teacher Education

Darling-Hammond and Bransford (2005) forward adaptive expertise as the standard for teaching practice today given the fluid dynamics of our world. The illustrations of expert practice shared through this study may support the development of adaptive expertise in future teachers. The stories build on previous research offering more specific operational terms for how such instruction occurs. As student teachers begin to practice instructional techniques, they can examine such expert stories, combined with the operational descriptions, to help make sense of the many dynamics of the classroom. More than the general descriptions offered in previous adaptive expertise research, the findings from this study can help point emerging teachers to specific steps in practice that lead to expert instruction through examples with specific content

and specific profiles of students. Bereiter and Scardamalia posit that the manner in which expertise is manifest suggests a manner in which it was developed (2005); therefore, if the development of teaching expertise can begin in the study of adaptive expertise, there may be greater potential for adaptive expertise to be developed.

Implications for Future Research

Research on the relationship between simplification and adaptive instruction. Given the situated role of simplification in the adaptive practice of the teachers in this study, future research could examine a greater number of expert teachers' descriptions of their simplifications within practice and explore the relationship between this feature and adaptive instruction. Such understanding would be timely in teaching climates such as Adele is experiencing where simplification seems to be a go-to strategy for curriculum implementation; albeit, the simplification quality she asked to enact did not seem to be grounded in the follow-through of a deep conceptual rationale. It would be interesting to learn how expert teachers in her similar context describe simplification choices within instruction. Such understanding could support the exercise of adaptive instruction within such restrictive environments.

Research on the nature of content confidence in adaptive expertise. Teacher confidence regarding their classroom content was a distinct feature of this study. Future research could elaborate on this aspect of practice by examining a greater number of expert teachers explanations of what constitutes their content knowledge and how they described its connection to their instructional rationale. Research could also explore how each teacher describes acquiring and maintaining such content knowledge. Understanding of this kind could clarify how instruction takes place through the blend of content knowledge and rationale.

Table 5.1 Themes and Implications of Findings

Narrative Themes from this Study	Inferred Findings from this Study ***Bold Italics:*** Discussion theme that applies	Implications for Practice	Implications for Future Research
The expert teachers selected and adapted routines during teaching through simplification based on the purpose of learning within and beyond the classroom.	Simplification of instruction facilitates the blend of efficiency and adaptiveness within adaptive expertise to support students' conceptual understanding of content. ***RQ 1 -Theme 1: Efficiency within adaptive reasoning*** ***RQ1 -Theme 3: Learning within and beyond the classroom.***	Make identifying the conceptual purposes of instruction a standard for professional conversation and development along with practicing in development and application of simplification techniques that support such purposes.	Examine a greater number of expert teachers' use of simplification in relation to instructional adaptations and instructional goals.
The expert teachers noticed patterns in students' responses to instruction and used them to create simplified, adaptations to content.	Simplification is enacted through pattern recognition within students' responses. ***RQ 1 -Theme 2: Student response as a catalyst for instructional decisions.*** ***RQ2 – Theme 1: Balance via content confidence.*** ***RQ2-Theme 3: Balance through affective understanding.***	Make noticing patterns part of professional conversation and development, as well as identifying rationale for simplified responses to such patterns.	
The expert teachers balanced efficient and adaptive actions through confidence with classroom content.	Content confidence in adaptive expertise includes a conceptual understanding that is applicable across diverse situations. ***RQ2-Theme 1: Balance via content confidence.***	Make developing of content confidence (focusing on conceptual understanding) a regular part of professional development.	Collect and examine a greater number of expert teachers' explanations of what comprises their content knowledge, how they acquired and maintain confidence, and how it relates to descriptions of instructional rationale.
The expert teachers balanced efficient and adaptive actions through adaptive simplifications of instruction based on a conceptual rationale.	Adaptive, simplifications of instruction serve to support conceptual learning objectives. ***RQ1 - Theme 3: Learning within and beyond the classroom.*** ***RQ2 – Theme 2: Balance through simplification via justification***	Make identifying the conceptual purposes of instruction a standard for professional conversation and development along with practicing in development and application of simplification techniques that support such purposes.	
The expert teachers balanced efficient and adaptive actions through understanding students' affective needs during class time.	Students affective needs serve as domain knowledge to consider in the exercise of adaptive expertise. ***RQ 1 -Theme 2: Student response as a catalyst for instructional decisions.*** ***RQ2 – Theme 3: Balance through affective understanding.***	Make understanding techniques for understanding students' affective needs a regular part of professional conversation and development.	Examine a greater number of expert teachers' explanations of their treatment of affective needs of students within instruction.

Research on the role of affective understanding in adaptive expertise. A powerful point of this work was the importance the expert teachers placed on affective understanding of students. Future research could explore a greater number of expert teachers descriptions of the role students' affective needs play in their instructional approaches. Knowledge of this kind could help pinpoint more nuanced strategies for adaptive instruction that attend to the needs of individual students.

Other research implications. An additional hope stemming from this study is that future research will continue in the line of Hatano's preference in study: examination of an authentic situation (Inagaki & Miyake, 2007). Focusing data collection on the content of teachers' actual classrooms was the heartbeat of answering the research questions for this inquiry to advance understanding of adaptive expertise. Wineburg and Crawford's work laid a solid foundation for generalized operations within the construct, but more attention should now shift to build on the findings from studies like the present that took the previous work to authentic learning experiences with teachers and their students. Such intent will help bring about findings that make the relevance and application of adaptive expertise more tangible for the advancement of teaching practice. As expressed all throughout this report, such advancement is imperative for the development of teaching practice that continually supports current learning needs.

Lingering Questions

Although this study offered much understanding, it also provoked more questions regarding expert teaching.

- How long does it take a teacher to accumulate the experience that comprises the efficient operations within adaptive expertise specifically?

- What role does understanding the affective elements of the classroom play in the exercise of adaptive expertise?
- How much does one's environment impact one's willingness and ability to enact adaptive expertise?
- How do current methods of teacher evaluation foster adaptive expertise?
- How are the definitions of adaptability and efficiency different and similar across expert teachers' experiences?

Conclusion

The guiding questions for this study dealt with eliciting expert teachers' descriptions and explanations of practice and determining how such articulations aligned with the conceptual framework of adaptive expertise. This pursuit was informed by a literature review, which revealed an adaptive quality that was distinct in the practice of expert teachers. Adaptive expertise was forwarded as the conceptual synthesis of this trend in the reviewed literature. Previous research with the construct was explored to reveal that this study's findings confirmed the presence of adaptive expertise in the teaching of the participating experts, but "how" this type of practice is achieved was still a lingering question. The study plan included justification for a narrative design to explore this end, which focused on understanding individual teachers' explanations of how they achieved this kind of practice. With many layers of data collection and analysis facilitated through the Critical Decision Method, teachers' stories were gathered to shed light on this lingering question. It was believed that these efforts would advance adaptive expertise one step further in having utility in serving the development of future and practicing teachers. What emerged from the narratives were affirmations of the trends in literature and

extensions of the findings in research. Teachers' stories confirmed the theme of reflective adaptation in expert teaching practice and offered illustrations of how adaptive expertise occurred in live instruction. The illustrations centered on how efficient operations possessed an embedded adaptive nature that was facilitated through dynamic understanding relative to students' learning needs.

This study story began with Jim Burke's thought, "What moves me most about teaching is the extent to which it is, in the end, a creative act" (2008). His words were purposefully poised at the start of this narrative; for this inquiry was built on the belief that teaching is, as art, a continually generative activity. Teaching is not a static procedure that is routinely enacted in a consistent context. Both teaching and artistry are enacted to create content for the nuanced needs of the audiences each serves. This perpetual motion is achieved through a balanced position poised between preparation and performance: the teacher and artist navigating careful predictions and live responses to craft content that realizes its aim. The result is artful action that leaves an audience feeling that the creation was unique to each of their needs.

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APPENDICES

Appendix A: Teacher Participant Informed Consent

Study ID:Ame1_Pro00013247 Date Approved: 12/30/1899 Expiration Date: 10/23/2014

Informed Consent to Participate in Research
Information to Consider Before Taking Part in this Research Study

IRB Study # ____13247 **_____**

You are being asked to take part in a research study. Research studies include only people who choose to take part. This document is called an informed consent form. Please read this information carefully and take your time making your decision. Ask the researcher or study staff to discuss this consent form with you, please ask him/her to explain any words or information you do not clearly understand.

We are asking you to take part in a research study called:
Balanced Artistry: Describing and Explaining Expert Teacher Practice as Adaptive Expertise

The person who is in charge of this research study is Nina Graham. This person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge. Dr. Jane Applegate and Dr. Diane Yendol-Hoppey are guiding Nina in this research, and they serve in this capacity as Co-investigators.

The research will be conducted at the schools where participants are employed.

Purpose of the study

The purpose of this study is to:

- *The purpose of the present study is to understand how adaptive expertise describes expert teacher practice. You are being asked to participate in this study because of your expert teaching status as indicated through your years of teaching experience (7 or more), the achievement of the National Board Certification for teaching in English Language Arts and/or your achievement of advanced training in educational theory and practice. Previous research has shown National Board Certified Teachers with the above kind of certification to exhibit expertise as defined by an exhaustive review of research and scholarship related to expertise and teaching (Bond et al., 2000). Research has also revealed expert thinking in teachers with advanced training in educational theory and practice combined with their years of experience (Crawford, 2007; Crawford et al., 2005).*
- Nina Graham, the Principal Investigator for this study, is a doctoral candidate in the Ph.D. program for Curriculum and Instruction at the University of South Florida. Her specialization within the program is English Education. As a doctoral candidate, Nina will be conducting this study as the research for her dissertation.

Study Procedures

If you take part in this study, you will be asked to:

- Complete a questionnaire regarding how you think about decisions within instruction.
    - The questionnaire includes a scale from 7(strongly agree) to 0 (strongly disagree). Although there are pre-written prompts on the questionnaire, you will be allowed to annotate any prompt if you feel your written commentary would help explain the extent to which your thinking aligns with the prompts.
    - *You may also choose to share your responses verbally with the P.I. during an initial interview meeting, rather than record written responses. The conversation would be recorded to document your responses.*
- Participate in the video-taping of three class sessions of your instruction.
    - Three-class sessions of one of your classes (e.g. 2nd period English II) will be video-taped for this study.
- Respond to questions within a semi-structured interview.
    - *The initial questions in each interview will be used to code decision points within the video of instruction using a coding software program called TeachScape. The P.I. will take care of entering the codes from your verbal responses.*
    - Each interview is also designed to elicit more detail regarding the labels you assigned to class moments in each video that inform your reasoning and reasoning processes behind decisions within instruction.
    - The approximate time needed for each interview is one and one-half hours.
- Review results of the study.
    - You will be given the opportunity to review the narrative syntheses of data related to your instruction. This step is to ensure that the results align with your interpretation of instructional decisions.

Data Collection Duration

- *Data collection will be conducted over approximately three to six weeks and follow the approximate schedule below:*
    - *Week one: pre-screening questionnaire and video taping session one (one class period)*
    - *Week two: coding and semi-structured interview regarding video session one*
    - *Week two or three: video taping session two*
    - *Week three or four: coding and semi-structured interviews regarding video session two*
    - *Week three or four: video taping session three*
    - *Week four or five: coding and semi-structure interview for session 3 regarding video session three*
- Teacher review of narrative syntheses will occur approximately three to six months after the completion of data collection.
- Video-taping and interviews will be scheduled to occur at your school.

Video and Audio Recording Confidentiality

- After a class is video taped, the video will be uploaded into a teacher's personal account within Teachscape. This account is password protected. Those with access to content within the participants' accounts will be: the participant, the P.I., the Head of School at the P.I.'s school, and the Instructional Support Specialist at the P.I.'s school; however, the Head of School and the Instructional Support Specialist have agreed not to access the material related to research participants. Since the Teachscape software license is with the P.I.'s

school, the Head of School and Instructional Support Specialist have administrative access to the Teachscape content related to teacher accounts; however, as previously noted, they agree not to access any information related to the research participants.

- Each semi-structured interview will be transcribed using a service called CastingWords. Below is CastingWords' statement regarding confidentiality.
    - "…we are not able to guarantee confidentiality at this time. Work is posted on a website and while we take every precaution to keep your transcript secure, we cannot guarantee anything. We use a large pool of vetted contractors to do the work, and they understand that the work is confidential, and that they will never work for us again if they release it. Additionally, due to our workflow most workers see just small sections of the transcript, making tracking and penalties easy to enforce" (n.d.).
- All data will be kept in a locked filing cabinet and password protected devices of the PI. Audio recordings will be stored on the password protected computers of the P.I. The data will be retained for a minimum of five years after the final report has been submitted to the USF IRB. After a minimum of five years, paper records will be destroyed by using a paper shredder, and video and audio files will be completely deleted from any digital recorders and computers.

Total Number of Participants

Three individuals will take part in this study. The three participants may or may not be employed at the same site/school.

Alternatives

You do not have to participate in this research study.

Benefits

A potential benefit for teacher-participants may be the contribution to advancing understanding regarding teacher expertise. An additional benefit may be learning processes for examining one's practice that affirm and further develop one's expertise.

Risks or Discomfort

This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. Given the minimal risk of participation in this study, there are no other safety precautions in place beyond those that would be in place during any regular class session ("every day" type safety precautions).

Compensation

You will receive no payment or other compensation for taking part in this study.

Cost

There will be no additional costs to you as a result of being in this study.

Privacy and Confidentiality

Your study records will be kept private and confidential. Certain people may need to see your study records. By law, anyone who looks at your records must keep them completely confidential. The only people who will be allowed to see these records are:

- The research team, including the Principal Investigator and Co-investigators.
- Certain government and university people who need to know more about the study. For example, individuals who provide oversight on this study may need to look at your records. This is done to make sure that we are doing the study in the right way. They also need to make sure that we are protecting your rights and your safety.
- Any agency of the federal, state, or local government that regulates this research.
- The Department of Health and Human Services
- The USF Institutional Review Board (IRB) and its related staff who have oversight responsibilities for this study, staff in the USF Office of Research and Innovation, USF Division of Research Integrity and Compliance, and other USF offices who oversee this research.

Steps to Protect Privacy during the Study

- All data will be kept in a locked filing cabinet and password protected devices of the PI. When data is uploaded to Teachscape, teacher pseudonyms will be used for Teachscape account identification. Additionally, final reports of data analysis will include pseudonyms for participants and any reference participants make to students. Further, final reports will not include details that would enable a reader to distinguish the employment locations of participants.
- Prior to agreeing to participate, potential participants will be made aware of the scope of confidentiality offered by the transcription service being used for this study, Casting Words, and of Teachscape. The confidentiality statement of Casting Words is listed below, as well as an excerpt from the Teachscape privacy policy that describes protection of personal information. Should a teacher wish to see the entire Teachscape privacy statement, a copy will be provided for him/her.
    - Casting Words
        - "…we are not able to guarantee confidentiality at this time. Work is posted on a website and while we take every precaution to keep your transcript secure, we cannot guarantee anything. We use a large pool of vetted contractors to do the work, and they understand that the work is confidential, and that they will never work for us again if they release it. Additionally, due to our workflow most workers see just small sections of the transcript, making tracking and penalties easy to enforce" (n.d.).
    - Teachscape
        - "As a general matter, most of the information that we gather about you will be used for our internal purposes only. At times we may share information regarding your use of our Site with your master licensee (e.g., your educational institute or school district) or the group through which you were provided access to our Site. Some of the research and analysis we perform will be shared with potential clients,

educational institutions and systems, service providers and government agencies; however, we will not identify you personally to any outside party with regard to any such information (2013)."

(The only member of the educational institution that holds the Teachscape license who will have access to teacher-participant accounts will be the Principal Investigator, Nina Graham.)

- "Though we make every effort to preserve your privacy, at times we may be required by law or legal process to disclose your personal information. We may also disclose information about you if we believe, in good faith, that disclosure is necessary for the protection of Teachscape or its rights, or the public (2013)."

- Prior to audio recordings of semi-structured interviews, teachers will be asked to refer to students by first name only--should they need to use a student name in an explanation. At the start of each audio recording of an interview, the participating teacher will be identified by a pseudonym.

We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people identify you. Also, will not include your students' names. We will not publish anything that would let people identify your students.

Voluntary Participation / Withdrawal

You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study.

You can get the answers to your questions, concerns, or complaints

If you have questions about your rights as a participant in this study, general questions, or have complaints, concerns or issues you want to discuss with someone outside the research, call the USF IRB at (813) 974-5638 or the Pinellas County School Board, Department of Research and Accountability at (727) 588-6253.

If you experience an unanticipated problem related to the research call Nina Graham (Principal Investigator) at (727)460-4438.

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Consent to Take Part in this Research Study

It is up to you to decide whether you want to take part in this study. If you want to take part, please sign the form, if the following statements are true.

I freely give my consent to take part in this study. I understand that by signing this form I am agreeing to take part in research. I have received a copy of this form to take with me.

_____ _____
Signature of Person Taking Part in Study Date

_____
Printed Name of Person Taking Part in Study

Statement of Person Obtaining Informed Consent

I have carefully explained to the person taking part in the study what he or she can expect from their participation. I hereby certify that when this person signs this form, to the best of my knowledge, he/she understands:

- What the study is about;
- What procedures will be used;
- What the potential benefits might be; and
- What the known risks might be.

I can confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in the appropriate language. Additionally, this subject reads well enough to understand this document or, if not, this person is able to hear and understand when the form is read to him or her. This subject does not have a medical/psychological problem that would compromise comprehension and therefore makes it hard to understand what is being explained and can, therefore, give legally effective informed consent. This subject is not under any type of anesthesia or analgesic that may cloud their judgment or make it hard to understand what is being explained and, therefore, can be considered competent to give informed consent.

_____ _____
Signature of Person Obtaining Informed Consent Date

_____
Printed Name of Person Obtaining Informed Consent

Appendix B: Parental Permission Form

Study ID:Ame1_Pro00013247 Date Approved: 12/30/1899 Expiration Date: 10/23/2014

Parental Permission to Participate in Social & Behavioral Research

Information for parents to consider before allowing your child to take part in this research study.

IRB Study # _____13247 _____

The following information is being presented to help you and your child decide whether or not your child wishes to be a part of a research study. Please read this information carefully. If you have any questions or if you do not understand the information, we encourage you to ask the research.

We are asking you to allow your child to be video taped for a research study involving his/her classroom teacher called:

Balanced Artistry: Describing and Explaining Expert Teacher Practice as Adaptive Expertise

The person who is in charge of this research study is Nina Graham. This person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge. Dr. Jane Applegate and Dr. Diane Yendol-Hoppey are guiding Nina in this research, and they serve in this capacity as Co-investigators.

The research will be conducted at your child's school.

Why is this research being done?

The purpose of this study is to find out how the concept of adaptive expertise explains expert teaching. Adaptive expertise describes how an expert changes responses to make sure they are a right fit for the situation. The study will be conducted through video taping three classroom lessons and having your child's teacher explain his/her instruction while reviewing the video.

Why is your child being asked to take part?

We are asking your child to take part in this research study because he/she is in a class with a teacher who has achieved expert status via his/her attainment of a National Board Certification for teaching in English Language Arts and/or advanced training in educational theory and practice, as well as teaching experience of 7 years or more. We want to find out more about how such a teacher explains his/her instruction and how such explanations align with the concept of adaptive expertise.

Although your child's teacher will be the main participant in this study, we are seeking your permission for your child because your child will be in the video tapes of classroom instruction.

Should your child take part in this study?

This informed consent form tells you about this research study. You can decide if you want your child to take part in it. This form explains:

- Why this study is being done.
- What will happen during this study and what your child will need to do.
- Whether there is any chance your child might experience potential benefits from being in the study.
- The risks of having problems because your child is in this study.

Before you decide:

- Read this form.
- Have a friend or family member read it.
- Talk about this study with the person in charge of the study or the person explaining the study. You can have someone with you when you talk about the study.
- Talk it over with someone you trust.
- Find out what the study is about.
- You may have questions this form does not answer. You do not have to guess at things you don't understand. If you have questions, ask the person in charge of the study or study staff as you go along. Ask them to explain things in a way you can understand.
- Take your time to think about it.

The decision to provide permission to allow your child to participate in the research study is up to you. If you choose to let your child be in the study, then you should sign this form. If you do not want your child to take part in this study, you should not sign the form.

What will happen during this study?

Your child will be asked to spend about three days in this study. The study will last approximately six weeks, but the extent of your child's involvement will be over the course of approximately three separate days where classroom lessons are video taped. These class lessons will not be any different from the normal, daily classroom procedures and will require no extra preparation or involvement by your child beyond how he/she normally participates in class.

The process of the study includes video taping classroom lessons of expert teachers. Your child's teacher will review the videotape of each classroom lesson and comment about his/her decisions within instruction. The Principal Investigator will interview the teacher to learn more details about the teacher's decisions.

A study visit for your child will consist of one classroom lesson. These visits will last as long as a normal class period. Your child will be involved in three study visits.

At each visit, your child will be asked:

- To participate in the lesson in the manner that he/she normally would if the study were not being conducted.
- After a class is video taped, the video will be uploaded into the teacher's personal account within the TeachScape software program. The P.I. will use this program to make notes about the lesson. This account is password protected. Those with access to content within the teacher's account will be: the

teacher, the Principal Investigator (P.I.), the Head of School at the P.I.'s school, and the Instructional Support Specialist at the P.I.'s school; however, the Head of School and the Instructional Support Specialist have agreed not to access the material related to this research. Since the TeachScape software license is with the P.I.'s school, the Head of School and Instructional Support Specialist have administrative access to the TeachScape content related to teacher accounts; however, as previously noted, they agree not to access any information related to this research.

- All data will be kept in a locked filing cabinet and password protected devices of the PI. The data will be retained for a minimum of five years after the final report has been submitted to the USF IRB. After a minimum of five years, paper records will be destroyed by using a paper shredder, and video and files will be completely deleted from any digital recorders and computers.

How many other people will take part?

About three teachers will take part in this study, and the research will take place at the schools where each teacher is employed. One of these locations is where your child attends school. The number of students involved in this study will depend on the number of students in the classes of each teacher.

What other choices do you have if you decide not to let your child to take part?

If you decide not to let your child take part in this study, that is okay.

Instead of being in this research study your child can choose not to participate. In such a case, your child will still be able to participate in the video taped lessons, but the camera will be situated to avoid capturing your child on video; however, you child's voice may still be audible on the video.

Will your child be compensated for taking part in this study?

You will receive no payment or other compensation for taking part in this study.

What will it cost you to let your child take part in this study?

It will not cost you anything to let your child take part in the study.

What are the potential benefits to your child if you let him / her take part in this study?

We do not know if your child will gain any benefits by taking part in this study. It is believed that your child's involvement in the video taped classes will contribute to understanding teacher expertise.

What are the risks if your child takes part in this study?

This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. Given the minimal risk of involvement in this study, there are no other safety precautions in place beyond those that would be in place during any regular class session ("every day" type safety precautions).

Privacy and Confidentiality

We will keep your child's study records private and confidential. Certain people may need to see your child's study records. By law, anyone who looks at your child's records must keep them completely confidential. The only people who will be allowed to see these records are:

- The research team, including the Principal Investigator and Co-investigators.
- Certain government and university people who need to know more about the study. For example, individuals who provide oversight on this study may need to look at your records. This is done to make sure that we are doing the study in the right way. They also need to make sure that we are protecting your rights and your safety.
- The Department of Health and Human Services
- Any agency of the federal, state, or local government that regulates this research.
- The USF Institutional Review Board (IRB) and its related staff who have oversight responsibilities for this study, staff in the USF Office of Research and Innovation, USF Division of Research Integrity and Compliance, and other USF offices who oversee this research.

We may publish what we learn from this study. If we do, we will not include your child's name. We will not publish anything that would let people know who your child is.

What happens if you decide not to let your child take part in this study?

You should only let your child take part in this study if both of you want to. You and your child should not feel that there is any pressure to take part in the study to please the study investigator or the research staff.

If you decide not to let your child take part:

- Your child will not be in trouble or lose any rights he/she would normally have.
- You child will still get the same services he/she would normally have.

You can decide after signing this informed consent form that you no longer want your child to take part in this study. We will keep you informed of any new developments which might affect your willingness to allow your child to continue to participate in the study. However, you can decide you want your child to stop taking part in the study for any reason at any time. If you decide you want your child to stop taking part in the study, tell the study staff as soon as you can.

Even if you want your child to stay in the study, there may be reasons we will need to withdraw him/her from the study. Your child may be taken out of this study if we find out it is not safe for your child to stay in the study or if your child is not coming for the study visits when scheduled. We will let you know the reason for withdrawing your child's participation in this study.

You can get the answers to your questions, concerns, or complaints.

If you have any questions, concerns or complaints about this study, call Nina Graham at 727-460-4438.

If you have questions about your child's rights, general questions, complaints, or issues as a person taking part in this study, call the USF IRB at (813) 974-5638 or the Pinellas County School Board, Department of Research and Accountability at (727) 588-6253.

Consent for My Child to Participate in this Research Study

It is up to you to decide whether you want your child to take part in this study. If you want your child to take part, please read the statements below and sign the form if the statements are true.

I freely give my consent to let my child take part in this study as described above. I understand that by signing this form I am agreeing to let my child take part in research. I have received a copy of this

form to take with me.

_____ _____
Signature of Parent of Child Taking Part in Study Date

_____
Printed Name of Parent of Child Taking Part in Study

The signature of only one parent was obtained because:
☐ The other parent is not reasonably available. Explain:_____
☐ The other parent is unknown.
☐ The other parent is legally incompetent.
☐ The parent who signed has sole legal responsibility for the care and custody of the child.

Statement of Person Obtaining Informed Consent

I have carefully explained to the parent of the child taking part in the study what he or she can expect from their child's participation. I hereby certify that when this person signs this form, to the best of my knowledge, he/ she understands:

- What the study is about;
- What procedures will be used;
- What the potential benefits might be; and
- What the known risks might be.

I can confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in the appropriate language. Additionally, this subject reads well enough to understand this document or, if not, this person is able to hear and understand when the form is read to him or her. The parent signing this form does not have a medical/psychological problem that would compromise comprehension and therefore makes it hard to understand what is being explained and can, therefore, give legally effective informed consent. The parent signing this form is not under any type of anesthesia or analgesic that may cloud their judgment or make it hard to understand what is being explained and, therefore, can be considered competent to give permission to allow their child to participate in this research study.

_____ _____
Signature of Person Obtaining Informed Consent Date

_____
Printed Name of Person Obtaining Informed Consent

Appendix C: Student Assent

USF
UNIVERSITY OF
SOUTH FLORIDA

Assent to Participate in Research
Information for Persons under the Age of 18 Who Are Being Asked To Take Part in Research

IRB Study # _____13247**_____**

Title of study: Balanced Artistry: Describing and Explaining Expert Teacher Practice as Adaptive Expertise

Why am I being asked to take part in this research?
You are being asked to take part in a research study about expert teaching because you have an expert teacher. If you take part in this study, you will be one of about 20 students at your school participating.

Who is doing this study?
The person in charge of this study is Mrs. Nina Graham. Dr. Jane Applegate and Dr. Diane Yendol-Hoppey are guiding her in this research.

What is the purpose of this study?
By doing this study, we hope to learn how expert teachers think about their teaching.

Where is the study going to take place and how long will it last?
The study will be take place at your school and one or two other schools. You will be asked to participate in 3 visits which will take about 3 class periods. The total amount of time you will be asked to volunteer for this study is 3 class periods over the next 3 to 6 weeks.

What will you be asked to do?
- You won't have to do anything but participate, as normal, in your class.
- Mrs. Graham will be video taping the class.
- Your teacher and Mrs. Graham will review the video as your teacher explains how she taught the lesson.

Is there benefit to me for participating?
You will be helping contribute to understanding what expert teachers do, so that other teachers can become experts.

What other choices do I have if I do not participate?
You have the alternative to choose not to participate in this research study.

Do I have to take part in this study?
If you do not want to take part in the study, that is your decision. You should take part in this study because you want to volunteer.

Will I receive any compensation for taking part in this study?
You will not receive any compensation for taking part in this study.

Who will see the information about me?
Your information will be added to the information from other people taking part in the study so no one will know who you are.

Can I change my mind and quit?
If you decide to take part in the study you still have the right to change your mind later. No one will think badly of you if you decide to stop participating.

What if I have questions?
You can ask questions about this study at any time. You can talk with your parents, guardian or other adults about this study. You can talk with the person who is asking you to volunteer. If you think of other questions later, you can ask them.

Assent to Participate

I understand what the person conducting this study is asking me to do. I have thought about this and agree to take part in this study.

_____ _____
PRINT YOUR NAME Date

_____
SIGN YOUR NAME

_____ _____
LEAVE BLANK
Name of person providing information (assent) to subject Date

Appendix D: Adele Interview 1 Data Analysis Notes

Table D1. Adele Interview 1 Coding and Memos

Time in Lesson	Quote from Transcript Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	Alignment with Orientation as described in Literature	Teacher Identified Decision Type	Reflective Memos Regarding Evidence of Balance
1:12	A lot of my procedures are geared around attendance and getting kids settled. The do now was...not that it wasn't important but it was a predictor. It was a before reading. ***But I felt that for today, because a lot of my class*** *wasn't there* and I wanted to get through as much of the lesson as possible so I went and we did lose a little bit of time at the beginning. ***That's why I did that*** (p. 8).	Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007) ***Adaptive: Slow to draw conclusions, building material of situation from evidence (Crawford et al., 2005)***	Adaptive	The teacher is understanding of the importance of a procedure in this situation but evaluates the necessity of what it is designed to accomplish given the number of students missing and the lost class time. Meaning, to her, will not be sacrificed, it seems, by changing the "do now" procedure. She specifically uses the terminology "why" she did something which is also indicative of her understanding of the meaning of the procedure and the intent of the lesson at a conceptual level.
4:03	I wouldn't say I'm adjusting just for this class. *I'm adjusting based on what I've learned.* It's the way I would do it for all of my classes, advanced or not. It's just, unfortunately, ***I don't know until I teach it. It's just a result of my teaching throughout the day.*** I'm not really saying, "Oh, you guys are higher," or, "You guys are lower." ***I'm just making those adaptations as good teaching style*** (p.10).	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005) ***Adaptive: Adaptive: Slow to draw conclusions, building material of situation from evidence (Crawford et al., 2005)***	Routine	The teacher is balancing her prior knowledge of student ability with the lesson content for the day—always open to adjust for student needs. This adjustment, and the acknowledge of adapting as good teaching style, seems to evidence a confidence in her understanding of the conceptual meaning of the lesson and her personal goals for the instruction.

Table D1. (Continued)

Time in Lesson	Quote from Transcript Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	Alignment with Orientation as described in Literature	Teacher Identified Decision Type	Reflective Memos Regarding Evidence of Balance
4:03 (Continued.)	I knew it wasn't going the way...I knew initially the way I started it was not going to be the way I ended it. ***I didn't know how I was going to change it*** (p.11)	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Routine (Continued)	(Continued – previous memo applies)
		Adaptive*: *Slow to draw conclusions, building material of situation from evidence (Crawford et al., 2005).		
	That's where sometimes with periods, especially because this is new, I have a little bit of panic initially and I have to just put that aside because I know that I'll figure it out (p.11).	***Adaptive: Stick with confusion to let interpretation emerge (Wineburg, 1998)***		
8:26	Then the other thing, I was supposed to just model, which I did for this paragraph but you'll see as I go on ***I continue modeling the whole way. I'm not quite sure how much I should have modeled on this or if I should have let them do it more. Now I do think I should have kept modeling because I don't think they would have really gotten it, because it took me a while to come up and people still could have said, "Oh, I don't think that was the main idea of that"*** (p.13).	***Adaptive: Metacognitive or self-regulative statements about the participant's own knowledge state or understanding with respect to understanding what students know and don't know. Example: "Okay, I have some idea about what students know"; "As I look at this, I am a little confused about student thinking." (Crawford, 2007)*** ***Adaptive*: *Slow to draw conclusions, building material of situation from evidence (Crawford et al., 2005).***	Adaptive	This is technically simplification of the problem space but not without the intent to uphold the value/meaning of the assignment; This further supports my inclination that there needs to be delineation between efficiency orientation and efficient decisions. I think efficiency decisions can be part of adaptive orientation—adaptive expertise.

Table D1. (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in Literature**	**Teacher Identified Decision Type**	**Reflective Memos Regarding Evidence of Balance**
8:26 (Continued)	I was thinking of all that and I did want to show them...Have them circle "love" because they might not have picked up that exact sentence but at least they got that topic of love that everybody should have got (p.13). They could have seen it the way I did it, but if they were having a hard time grasping that they could have at least had something to grasp like, "OK, that one word. I get that." That was my thought process (p.13).	Efficiency: Simplification of the task or problem space (Crawford, 2005)	Adaptive (Continued)	(Continued – previous memo applies)
8:26 (Continued)	But I thought that it was not all that challenging ***in terms of analyzing it for theme but to pick out an actual thesis statement that had to be proven, I thought that was challenging. I still wasn't sure...Did I pick out the best one?*** P.14	***Adaptive: Explicit statements about not knowing novel content (Crawford et al., 2005)*** ***Adaptive: Tentativeness, posing questions to self (Crawford et al. , 2005)***	Adaptive (Continued)	(Continued – previous memo applies)
8:26 (Continued)	But I felt that what I did show was the thing that helped me and I tried to get back at them is, "What is the point the author's trying to make about that topic?" I told them that's how I was able to come up with it (p.14)	Efficiency: Simplification of the task or problem space (Crawford, 2007)	Adaptive (Continued)	(Continued – previous memo applies)

Table D1. (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in Literature**	**Teacher Identified Decision Type**	**Reflective Memos Regarding Evidence of Balance**
8:26 (Continued)	Honestly, as a writer, this exercise is supposed to help them with their writing, ***and as a writer it's just so different than the way we're analyzing this.*** As a reader I would analyze this so differently, ***and as a writer, I don't know if this is how I would look at it. It's hard when you're a writer to break it down*** but I think when you're writing it it's just a different thing and I don't think it's always so cut and dried (p.14).	***Adaptive: Explicit statements about not knowing novel content (Crawford, et al. 2005)*** ***Adaptive: Tentativeness, posing questions to self (Crawford et al., 2005)***	Adaptive (Continued)	(Continued – previous memo applies)
8:26 (Continued)	I wanted to give them some help but really, it's just trying to show them that whatever it is you make your topic and your position you have to be able to support it. That was the main thing (p.14).	Efficiency: Simplification of the task or problem space (Crawford, 2007)	Adaptive (Continued)	(Continued – previous memo applies)
8:26 (Continued)	I felt this was more appropriate for that so I felt that I was trying to stretch to really make it fit what we were trying to do. That's ***why*** I think I modeled it the most because I knew ***if I had a hard time, my colleague had a hard time being able to line it up, then they were going to have a hard time*** (p.14).	***Adaptive: Draw conclusions based on examination of artifacts (Crawford, 2007)***	Adaptive (Continued)	(Continued – previous memo applies)
17:32	That's contrary to the way you teach main idea because main idea you say, "Look at the first sentences, last sentence, this and that" (p.17).	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005).	Adaptive	Here again, the teacher is simplifying the task but not without a foundational understanding of "why." I think you can see how she is wrestling with the inadequacies of the curriculum and trying to salvage some sense of "sense" for the students of the lesson.

Table D1. (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in Literature**	**Teacher Identified Decision Type**	**Reflective Memos Regarding Evidence of Balance**
17:32 (Continued)	Again, that was going through my mind, was trying to ***differentiate thesis statement versus main idea,*** and again, saying to myself, "OK, in this particular text, she had a lot of sentences that could have been topic sentences even." (p.17).	***Adaptive: Disequilibrium that signals that certain processes or ways of thinking (e.g. previously learned routines) are not quite working properly.(Schwartz et al. 2005).***	Adaptive (Continued)	(Continued – previous memo applies)
17:32 (Continued)	She did restate her thesis throughout, so that is another ***reason why*** I think I kept modeling it instead of having them look for it (p.17).	***Adaptive: Examination of artifacts (Crawford, 2007)***	Adaptive (Continued)	(Continued – previous memo applies)
17:32 (Continued)	"Oh yeah, I've got to remember the way I was going to do the rubric about what it was like before and what it was like after." I think this is going to help them…Picking that thesis statement in that first sentence I think will help them with their writing (p.17).	Efficiency: Intention to find out something for the purpose of planning a lesson for the remaining days before the final test, or completing the task (Crawford, 2007)	Adaptive (Continued)	(Continued – previous memo applies)
17:32 (Continued)	Even though somebody could have picked a different one and said, "Oh, this is a better one," ***it's just the structure and the way this is written is that she does repeat her topic and her thesis throughout,*** so that made it, I thought, difficult to pick it out (p.17).	Adaptive: Examination of artifacts (Crawford, 2007)	Adaptive (Continued)	(Continued – previous memo applies)
17:32 (Continued)	Yes. I thought that might be more helpful for them and just easier than sitting there and hemming and hawing over it. It really doesn't matter. The other ones in there are very similar.	Efficiency: Simplification of the task or problem space (Crawford, 2007)	Adaptive (Continued)	(Continued – previous memo applies)

Table D1. (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in Literature**	**Teacher Identified Decision Type**	**Reflective Memos Regarding Evidence of Balance**
17:32 (Continued)	(Continued from previous quote)…For them, learning how to do it, giving them that structure, showing them that structure, I thought would be most helpful (p.17).	(Continued from previous quote)…Efficiency: Simplification of the task or problem space (Crawford, 2007)	Adaptive (Continued)	(Continued – previous memo applies)
17:32 (Continued)	That was adaptive too, I guess. I wouldn't say that was a routine, because this is a very much adaptive, and I guess routine in the sense that I've...working in this year, ***I know that these lessons are not the most supportive of the writing, so I'm trying to figure out a way to actually make them work (***p.17-18).	***Adaptive: Draw conclusions based on examination of artifacts (Crawford, 2007)***	Routine	(Continued – previous memo applies)
17:32 (Continued)	I was trying to figure out a way to see if I can really focus in my head about, "OK, they have to tie this into what they're going to have to do." (p.18).	Efficiency: Intention to find out something for the purpose of planning a lesson for the remaining days before the final test, or completing the task (Crawford, 2007).	Adaptive	(Continued – previous memo applies)
19:09	In this part, I wish that I had my little rubric idea, because of the impact. Because when I want them to do in their last paragraph is to write the impact on their life today. ***I don't even know if that's part of the embedded assessment, but I felt like that would be a good way to conclude this embedded assessment*** (p.18)	***Adaptive: New ideas may simply emerge from interactions with tools and people without a prior sense that something was wrong or needed to be fixed" (p.32) (Schwartz et al., 2005)***	Adaptive	She mentions different techniques as "helping" the students. This is often mentioned in explaining a rationale for why she has simplified a particular task. So there again, the simplification has a deeper meaning that just getting something done efficiently—it will help the students.

Table D1. (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in Literature**	**Teacher Identified Decision Type**	**Reflective Memos Regarding Evidence of Balance**
19:09 (Continued)	I'm thinking that with them learning this time, <u>being a little more directive is going to help</u> (p.19).	<u>Efficiency: Simplification of the task or problem space (Crawford, 2007)</u>	Adaptive (Continued)	(Continued – previous memo)…My understanding of how she defines help is based on her continual mentioning of preparing students to …
19:09 (Continued)	***I consider everything, almost everything formative, honestly.*** I guess, it's supposed to [be] summative in the sense that, "OK. We've worked up to this and you've learned all this activity 1.14 showed you how to do this…Activity 1.16 showed you how to do this and prepared you to do this, so now you're going to show us all that you've learned in this one embedded assessment." That's the way it's supposed to work. ***I don't think it's that. I don't think it winds up that well. The thematic aspect of change and all that comes through,*** …(p.19).	**Adaptive: Examination of artifacts (Crawford, 2007)** **Adaptive: Build understanding of situation through data (Crawford et al., 2005)**	Adaptive (Continued)	(Continued – previous memo)… have independence as learners and how that would set them up for success beyond her classroom.
19:09 (Continued)	I realized I hadn't written...Gone back to this outline that I was using an example. I was thinking, ***"Do I want to just have them find it or do I want to write this out?"*** (p.20).	***Adaptive: Asking questions (Wineburg, 1998)***	Adaptive (Continued)	(Continued – previous memo applies)
19:09 (Continued)	I decided that I would, at the last minute, I'm like, <u>"I am going to write it out. I think I can do it pretty quickly,</u> and I wanted to emphasize the proof of the details." (p.20).	<u>Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007)</u>	Adaptive (Continued)	Continued – previous memo applies)

Table D1. (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in Literature**	**Teacher Identified Decision Type**	**Reflective Memos Regarding Evidence of Balance**
19:09 (Continued)	***…this idea that each one of these, each period, were different*** (p.20).	***Adaptive :Build understanding of situation through data (Crawford et al., 2005)*** ***Adaptive: Test hypotheses and judgments against new data (Crawford et al. 2005).***	Adaptive (Continued)	Continued – previous memo applies)
20:37	Yeah, first I said, "Do you need me?" and then I just made the decision, "Yeah, I'm going to do it anyway." I sometimes will do that. I'll ask them and then just not even wait for their response, and realize, "Oh yeah, I need to do this." It's almost like I'm thinking out loud more than asking the kids that (p.21).	Efficient: Retain hypotheses based on prior knowledge (Crawford, 2007)	Adaptive	To build off of her last decision point, this may be a step of simplifying the task but simplification in the scope of what will truly help the students achieve the curriculum goal and her personal goal for them of learning independence.
23:29	That was as I was trying to think of how to explain that. ***I'm not sure I did it perfectly…I didn't know if I was confusing them by saying that,*** but at the same time they had to know, "You're not going to underline every single thing." (p.21)	***Adaptive: Metacognitive or self-regulative statements about the participant's own knowledge state or understanding with respect to understanding what students know and don't know. Example: "Okay, I have some idea about what students know"; "As I look at this, I am a little confused about student thinking." (Crawford, 2007)*** ***Adaptive: Asking questions (Wineburg (1998)*** ***Adaptive: Tentativeness, posing questions to self (Crawford et al., 2005)*** Efficiency: Simplification of the task or problem space (Crawford, 2007)	"Routinely adaptive" (p.23)	The teacher mentioned being "routinely adaptive" a few times. This may highlight her sense of "balance" in instruction as well. In this decision point the teach retains a sense of metacognition while being certain of particular instructional steps the students need.

Table D1. (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in Literature**	**Teacher Identified Decision Type**	**Reflective Memos Regarding Evidence of Balance**
23:58	This is routine. Constantly reviewing the directions, checking in with certain kids. I don't think I can do that enough. Also, trying to look up and see who's paying attention, who isn't….(p.23)	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005) Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Routine	Such procedures build the foundation for meaningful instruction. She looks for cues in the students that they are ready to receive meaningful instruction.
29:55	It's a challenge to pick the amount of time they need…Is five minutes too much? It's never going to be enough for some kids and for others they will be done in two minutes and be done well. I just have to see how they're doing and if they're all sitting there I'm like, "OK, we don't need the rest of the time." That's pretty routine for me. I do that on a regular basis. I tend now to give them less time because they don't really need as much time as I think (p.25-26).	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford, 2005)	Routine	Again, such procedures make way to meaningful instruction to take hold.
32:27	With this? Oh, I want that to be a routine, where I'm always thinking about that, but, of course, ***I have to adapt to each student, and I'm always very reflective with that part because it's always, A, did I give them the right feedback…and, B, did I give it to them in the way that...***You don't want to be never telling the kids...always good job on every little thing…On the other side of it, they are sharing. You want it to be a teachable moment but you want the kids to come away liking it and feeling like they're learning and that they're not being...I don't know, what's the word? Just picked apart. ***I am asking myself that every time*** (p.27).	***Adaptive: Asking questions (Wineburg 1998)*** ***Adaptive: Tentativeness, posing questions to self (Crawford et al., 2005)***	Adaptive	The teacher has procedures for giving feedback but expresses a rationale for her approach which highlights her understanding of the "meaning and nature" of feedback in the context of her classroom (Hatano & Inagaki, 1986, p. 263).

Table D1. (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in Literature**	**Teacher Identified Decision Type**	**Reflective Memos Regarding Evidence of Balance**
35:27	That thought process. That would be, I think, adaptive because that's not a routine in terms of that particular issue with them repeating. ***I've had that issue before but I've never thought of it in that way before.*** I guess that would be adaptive (p. 28).	***Adaptive: Build understanding of situation through data (Crawford et al., 2005)***	Adaptive	The teacher mentions frequently that it is a routine for her to be adaptive. Within this routine adaptation she is commenting on procedures to establish structure in her instruction, but she also talked about how she adapts for individual student needs.
38:09	When I wrapped it up, too, ***I'm just trying to tie in why the homework's important and I'm trying***, when I think of homework, to make sure it relates more to the text (p.29).	***Efficiency: Simplification of the task or problem space (Crawford, 2005)***	"It's like routine but it's more adaptive " (p.29).	This is another example of the teacher's simplification of an aspect of the lesson, but this is where I see the simplification as rooted in "meaning and nature" of the activity and it's purpose in the curriculum and in the teacher's personal goals for the students – learning independence.
	…it's more adaptive because we have less and less time. I only give them homework once a week because they won't do more than once a week. I'm trying to use every second of time that I can as efficiently as I can. (p.29).	Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007) Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Adaptive	Although the teacher labels this adaptive, the adaptations she seems to be choosing or describing here are built on her experience.

Appendix E: Adele Interview 2 Data Analysis Notes

Table E1. Adele Interview 2 Coding and Memos

Time in Lesson	Quote from Transcript Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	Alignment with Orientation as described in literature.	Teacher Identified Decision Type	Reflective Memos regarding Evidence of Balance
3:08	… I take a different kid every day. They review the agenda. It's two things that let them know what we're going to be doing for the day. It also gives me time to do administrative tasks (p.4).	Efficiency: Simplification of the task or problem space (Crawford, 2007)	Routine	I find this use of efficiency another example of the expert teacher using procedures to set up the preparedness of students to receive meaningful instruction. The teacher understands the "meaning and nature" of the procedure as well as the content.
12:59	It's becoming more routine, especially with this assignment, since I've had some difficulty with it this week. That's why I explained to them a little more of my thinking, and tried to remind them that this is going to be what we're working on today, and that was our goal and focus (p.7).	Efficiency: Simplification of the task or problem space (Crawford, 2007)	Routine	I'm wondering if the original tone of this code in Crawford's work was one of sacrificing meaning for simplicity. I don't find that to be the trend in the tone of this teacher's use of simplicity. She uses simplicity for the advancement of the learning goals.
	…They weren't doing it or they, "I don't understand." They still didn't have the topic***, or when I went and looked at it, it was not cohesive.*** It really wasn't (p.8).	***Adaptive: Build understanding of situation through data (Crawford et al., 2005)***	Teacher did not specify	This reminds me of when this teacher describes an action as "routinely adaptive." She has a routine of preparing to adapt instruction.
	I knew when they went to write it wasn't going to be on topic (p.8).	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)		
	I think, really, this was my only way, at this point, because I had gone too far into it. Even though in my head I was like, "Oh, next time I should try this, next time." I didn't have a next time. I only had today (p.8).	Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007)		This is where the teacher seems to be feeling the pressure of the curriculum. In terms of understanding the value of the assignment, her overall tone is one of having a grasp on when pushing through because of time will not be a large detriment to the students overall.

Table E1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher Identified Decision Type**	**Reflective Memos regarding Evidence of Balance**
18:18	***…I hadn't done that all day, and that probably would have been a great way to start the whole week was to have them really to focus on...***Like I was saying, I really needed them to focus on how to write a thesis and the whole point of the change, and how it changed them, because that's where they were having a hard time (p.10).	***Adaptive: Slow to draw conclusions, building material of situation from evidence (Crawford et al., 2005)***	Adaptive	The teacher seems to be discovering a new procedure through her adaptive practice that she find would help her students in the future. This is where the understanding of "why" something works—the "meaning and nature" of the skill to be able to recognize when new procedures would be better in place of old procedures.
18:18 (Continued)	**…** I was still seeing a lot of blanks on that…On there papers. ***Because of that, I wanted to see if maybe that was***, and I knew that not all the kids needed that (p.10).	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005) ***Adaptive: Slow to draw conclusions, building material of situation from evidence (Crawford et al., 2005)***	Adaptive (Continued)	This just further supports my above thought of having a procedure, evaluating the current procedure in the present moment, and having conceptual understanding of the instructional purpose to be able to change the procedure.
18:18 (Continued)	***…but I wanted to see if that would clarify for some*** (p.10).	***Adaptive: Test hypotheses and judgments against new data (Crawford et al., 2005)***	Adaptive (Continued)	Her evaluation of the procedure was based on her deep understanding of the purpose of the activity.
18:18 (Continued)	The kids are just...I need to figure out a way to move them forward. I've already spent so much time, and the kids are going to lose interest in it. They're going to get frustrated with it. I felt like, "Let's figure out a way to move them forward"(p.14).	Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007)	Teacher did not specify Teacher did not specify	"Meaning" here seems to be focused on affective elements of learning. She is wanting to preserve the students motivation to learn by sensing when would lose interest or become frustrated. This would be more of the "nature" of the task.

Table E1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher Identified Decision Type**	**Reflective Memos regarding Evidence of Balance**
18:18 (Continued)	It's hard, because I think, I don't understand ***I don't know how much I don't understand is they really don't understand, or "I wasn't paying attention. I wasn't listening. I don't feel like doing it. It's hard***." (p.14).	***Adaptive: Metacognitive or self-regulative statements about the participant's own knowledge state or understanding with respect to understanding what students know and don't know. Example: "Okay, I have some idea about what students know"; "As I look at this, I am a little confused about student thinking." (Crawford, 2007)***	Teacher did not specify Teacher did not specify (Continued)	She sees the importance of figuring out the answers to such questions because that will inform her next procedural steps. The fact that she lingers in asking these questions shows how she defines the "meaning and nature" of the assignment rather than just trying to check off that she taught it.
18:18 (Continued)	Trying to put their feet to the fire by saying, "I want. This has to filled out." Not every kid got to where I wanted, but at least I feel like I see how I can use it. I consider it somewhat successful, but it was at least I feel a little better about where we're starting on Monday (p.14).	Efficiency: Intention to find out something for the purpose of planning a lesson for the remaining days before the final test, or completing the task (p. 4) (Crawford, 2007)	Teacher did not specify Teacher did not specify (Continued)	She is toggling the pressure to move forward with curriculum expectations with how she can make the lesson schedule fit what the students' need. For her "meaning" is the students learning needs. She is making the procedures of curriculum second to the students' needs. Her understanding of the meaning of the content, I'm feeling, gives her confidence to make these scheduling decisions.
23:44	You get mired down sometimes when you're reading through paragraphs. So I am only looking at your outline. I don't want to look at your writing. I'll be glad to look at your outline, but not your writing. So that way, it forces them back to this (p.16)… That's where go back to this, because then if forces them to make sure they have X number of details. It forces them to at least try and see (p.16).	Efficiency: Simplification of the task or problem space (Crawford, 2007)	Teacher did not specify Teacher did not specify	Again, simplification is not at the expense of learning goals. The teacher often explains her goal of students achieving learning independence. This direct response is pushing the students to grow beyond themselves in the task. It's not that she is unwilling to read their writing it's just that at this point in their development she is sensing that they need to be pushed to see how they can work independently.

Table E1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher Identified Decision Type**	**Reflective Memos regarding Evidence of Balance**
23:44 (Continued)	Right. Also, it would be a way for them to check and see, "Am I doing it right?" Again, my realization was I'm not using...and it's funny because I told myself before, ***"OK, I'm going to make them use this outline before they write."*** Somehow, that didn't happen. I saw why I had that thought, so the key is to remember but that's when ***I saw that it was not going, just having them start to write for this type of activity wasn't working*** (p.16).	***Adaptive: Metacognitive or self-regulative statements about the participant's own knowledge state or understanding with respect to understanding what students know and don't know. Example: "Okay, I have some idea about what students know"; "As I look at this, I am a little confused about student thinking." (Crawford, 2007).***	Teacher did not specify Teacher did not specify (Continued)	This shows the teacher's confidence again to change procedure in the midst of activity. The confidence, I feel comes from her understanding of the meaning of the activity in the bigger picture of the students learning experience.
23:44 (Continued)	I can see in a glance who is getting it and who isn't, verses trying to read their whole, whatever they wrote (p. 16).	Efficiency: Quick to draw conclusions from one aspect of the problem space (Crawford, et al., 2005)	Teacher did not specify Teacher did not specify (Continued)	She knows, procedurally, that taking time to read their whole pieces will not advance the meaning of the activity at this point.
23:44 (Continued)	I do think this is probably more advanced than what we taught in the past, which is ***probably where I'm having this struggle myself*** (p.17).	***Adaptive: Questions or statements to self about what one would like to know or find out. Example: "I wonder how pedigree is taught." (Crawford, 2007)***	Teacher did not specify Teacher did not specify (Continued)	She continually comments on her struggle with interpreting this content. She knows the conceptual meaning of this topic, but struggles to understand how this curriculum presents it procedurally. She doesn't give up in deducing a procedure for her students that will honor the objectives in the curriculum but not sacrifice the kind of instruction that will meet her students' learning needs.

Table E1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher Identified Decision Type**	**Reflective Memos regarding Evidence of Balance**
30:50	It's funny because I knew there wasn't enough time. They were totally not with me, so I finally gave up on this part and trying to squeeze in the rest…I'll have to start now on Monday. I'll go over that pretty quickly. Then, they can write … I know with the end of the period on Friday. I mean, they're just done…(p.22).	Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007) Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford, 2005)	Adaptive	This seems like another example where the teacher is aware of the affect elements of students responses and how that impacts the learning quality. Although she is procedurally moving on in one day, she is still holding herself accountable to the goal of the activity by follow-up on Monday.

Appendix F: Adele Interview 3 Data Analysis Notes

Table F1. Adele Interview 3 Coding and Memos

Time in Lesson	Quote from Transcript Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	Alignment with Orientation as described in literature.	Teacher Identified Decision Type	Reflective Memos regarding Evidence of Balance
:46	I adapted and ***realized that a lot of them weren't finished***… As the day went on, I realized I needed to make sure I knew ahead of time who was ready and who wasn't. That's why I did it that way (p.4).	***Adaptive: Build understanding of situation through data (Crawford et al., 2005)***	Adaptive	Even though the teacher had a procedural plan before the class, she still made sure to check and see if which procedure would be most appropriate.
	I had already kind of thought about it before the day began. If they weren't finished, if they had at least a couple paragraphs done, I felt that that activity would be beneficial for them to share what they've written (p.4).	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford, 2005)		
	I asked them before I even passed the papers out and tried to get them organized to proper seating (p.4).	Efficiency: Simplification of the task or problem space (Crawford, 2007)		
5:58	When I set up my room this year, on my seating charts I put my high kids more in the back unless they needed to be in the front for a reason…because of that, I don't really have to think too hard about where I move them. In a regular, everyday situation, I'm constantly, basically it's behavior and on-task where I'm moving kids. Or if they need to see the board. If I see a kid's off task, I'm like, "You're coming to the front." Sometimes it's like. "I need about 20 more front seats." (p.11).	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005) Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Teacher didn't specify	The teacher is using a seating chart procedure but building it with a rationale that considers her specific students rather than, "This is always how I do my seating charts." This again shows procedural understanding and conceptual understanding.

Table F1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher Identified Decision Type**	**Reflective Memos regarding Evidence of Balance**
12:32	…Saving the reciprocal writing. <u>The kids who are mature and were prepared and had at least enough of it done to share, it works great with. The process isn't really the issue. I don't think it's an issue of training them.</u> I think they pretty much know what they're supposed to do, it's just that some of them are not ready for this type of activity yet. Maybe if I were there standing next to them the whole time…(p.5).	<u>Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)</u>	Routine	The teacher even makes a statement about how she has evaluated the process and determined that isn't were there's a hiccup with the activity. This shows her conceptual understanding of the objective.
12:32 (Continued)	**...** you get to know the kids that are,… <u>you can predict what they're going to do</u>…It's routine in the sense that I know I have to be over there. That is part of my routine....(p. 6).	<u>Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)</u>	Routine	It seems like she is talking through how she knows that prior knowledge of her students is reliable, but how much should she rely on it.
12:32 (Continued)	…but I adapt based on...***I don't like to totally make assumptions***….(p.6).	***Adaptive: Indications of interest, curiosity. Example: "I am curious why students did not get this."(Crawford, 2007)***	Adaptive	(Continued – previous memo)… I would wonder if she wonders if she doesn't question her prior knowledge, might she miss an opportunity to help a student at the individual level.
12:32 (Continued)	Sometimes they're doing what they need. ***I can't always routinely say so-and-so***,..(p.6).	***Adaptive: Test hypotheses and judgments against new data (Crawford et al., 2005) Adaptiveness: Reserving judgment; (Wineburg, 1998) Adaptiveness: Revisiting earlier assessments (Wineburg 1998)***	Adaptive (Continued)	(Continued – previous memo)… It seems like she is explaining knowledge of value in developing and trusting prior knowledge (procedure),

Table F1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher Identified Decision Type**	**Reflective Memos regarding Evidence of Balance**
12:32 (Continued)	…but at the same time, because I have the prediction, I know exactly how they are…(p.6).	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Routine	(Continued – previous memo)… but the importance of periodically questioning prior knowledge (meaning/conceptual understanding).
12:32 (Continued)	**Interviewer**: Would you say you're testing that prediction even when you're working with a student who maybe has a pattern? **Adele**: Yes. I'm ***always trying to be aware,*** even if I'm in another part of the room, aware that that could mess up the whole structure of what's going on…(p.6).	***Adaptive: Test hypotheses and judgments against new data (Crawford et al., 2005)*** ***Adaptiveness: Revisiting earlier assessments (Wineburg, 1998)***	Adaptive	(Continued – previous memo applies)
12:32 (Continued)	There's a student here. One, two, three, four. There were four...There were a good handful of either different types of situations. Like, one needs a lot of support. Sometimes if they're behind, that's when they have issues or whatever…That's with an advanced class. ***That really shows me how much…My period before really couldn't handle it.*** There was no way. There were too many of them who weren't even close to being done. They constantly need that handholding in terms of their writing (p.6-7).	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005) **Adaptive: Build understanding of situation through data (Crawford et al., 2005)**	"Routinely adaptive"	(Continued – previous memo applies)

Table F1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher Identified Decision Type**	**Reflective Memos regarding Evidence of Balance**
12:32 (Continued)	**…**I did do it with every period, but not before I passed the papers out. With them I'm like, ***"Don't give them the paper until you know."*** It seemed so ***obvious, but at the end of the day...***That class before was the one where it really just...I wouldn't say "bombed." There were only a few groups that...I shouldn't even say that. ***It showed who was ready for it…***(p.7)	***Adaptive: Build understanding of situation through data (Crawford et al., 2005)***	"Routinely adaptive"	(Continued – previous memo applies)
27:03	That was adaptive because it was spontaneous. They both happened to be done. At first I told one girl, "Go to so and so. She's already done." The other girl was starting to read hers. ***When I saw the other one was finished, I said,*** "So and so, you go back to what you were doing. I'm going to put them back together." ***It was an opportunity that I saw*** (p.12).	***Adaptive; New ideas may simply emerge from interactions with tools and people without a prior sense that something was wrong or needed to be fixed" (p.32) (Schwartz, et al. 2005)***	Adaptive	The teacher is continually assessing student needs during the lesson to create/enact procedures that point them toward the lesson goal. She has to have a deeper understanding of the purpose of the lesson to do this well.
28:52	There's a student up there who needs so, so much support…I've worked with him one on one. ***It blows my mind how I can give them an outline and they don't even realize that they have to have four paragraphs when it says paragraph one, two, three, four. I'm like, "Is it the Roman numerals throwing you?" I don't know sometimes..***(p..7).	***Adaptive: Indications of interest, curiosity. Example: "I am curious why students did not get this." (Crawford, 2007)***	Teacher didn't specify	It seems that if the teacher can diagnose the reason why the students are struggling she can move forward. She doesn't seem to lack confidence that she will know how to address students' learning needs once she is able to discern where the breakdown in their understanding lies.

Table F1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher Identified Decision Type**	**Reflective Memos regarding Evidence of Balance**
28:52 (Continued)	This part ***might have been confusing***. It's Roman numeral two, but ***it says*** " body paragraph one." (p.8).	***Adaptive: Tentativeness, posing questions to self (Crawford, 2005)*** ***Adaptive: Examination of artifacts (Crawford, 2007).***	Teacher didn't specify (Continued)	(Continued – previous memo applies)
28:52 (Continued)	Even then, even when I'm going around to them and giving it to them, ***they're still not picking up on it*** (p.8).	***Adaptive: Build understanding of situation through data (Crawford, 2007)***	Teacher didn't specify (Continued)	(Continued – previous memo applies)
28:52 (Continued)	***I'm questioning if*** it's just an issue of an outline ***or if*** they're so used to, "Oh, wait. Now what do I do?" After every single thing, they want more (p.8).	***Adaptiveness: Tentativeness, posing questions to self (Crawford, 2005)*** ***Adaptive: Metacognitive or self-regulative statements about the participant's own knowledge state or understanding with respect to understanding what students know and don't know. Example: "Okay, I have some idea about what students know"; "As I look at this, I am a little confused about student thinking."(Crawford, 2007)***	Teacher didn't specify (Continued)	(Continued – previous memo applies)
28:52 (Continued)	It didn't surprise me. It was something that is pretty regular for him. …p.8	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005) Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Teacher didn't specify (Continued)	(Continued – previous memo applies)
28:52 (Continued)	"I can only catch you up so much." Absences are huge. When they're not here, I can't catch you up.	Efficiency: Quick to draw conclusions from one aspect of the problem space (Crawford et al., 2005)	Teacher didn't specify (Continued)	This seems to express the breakdown in the school curriculum expectations …

Table F1 (Continued)

Time in Lesson	Quote from Transcript Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	Alignment with Orientation as described in literature.	Teacher Identified Decision Type	Reflective Memos regarding Evidence of Balance
28:52 (Continued)	**…**I try to show him again and restate, "This is what you need to do here. This is what you need to do here." That was it…(p.9).	Efficiency: Simplification of the task or problem space (Crawford, 2007).	Teacher didn't specify (Continued)	(Continued – previous memo)… and the teacher instructional flexibility when a student is perpetually absent. This is a teacher knowing the boundaries. Is she able to make better choices in what to catch the student up on by just acknowledging that there's a limit to how many absences can take place before the students is beyond catching up in a normal class scenario.
28:52 (Continued)	I realize it's probably going to be something I deal with another day. Sometimes I try If it's not going right, to not worry about it until the next day. Sometimes things are clearer, and then I'm able to help more. (p.9).	Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007)	Teacher didn't specify (Continued)	(Continued – previous memo)… She shows understanding of the content meaning and the procedural logistics of catching a student up. But at the end, she is still committed to helping the student.
28:52 (Continued)	**…**Yes. With him, it's just restating. A lot of them, once you get them started, they're fine. (p.9).	Efficiency: Retain hypotheses based on prior knowledge (Crawford, et al. 2005)	Teacher didn't specify (Continued)	She knows at a foundational level that this particular student may recover the missed material.
28:52 (Continued)	What's frustrating this year -- ***maybe just*** with this particular assignment or just with their writing -- is that I feel like I have so many like him. ***What I'm trying to figure out is,*** is it my teaching, ***or is it*** the type of kid that I'm getting? ***Is the thing*** that I'm getting…what the kids are coming in with, ***or is it*** because I'm trying to teach something in a different way? ***That's where I'm at right now*** (p.9).	***Adaptive: Indications of interest, curiosity. Example: "I am curious why students did not get this." (Crawford, 2007)*** ***Adaptive: Stick with confusion long enough to let interpretation emerge (Wineburg, 1998)***	Teacher didn't specify (Continued)	The teacher takes it personally that the students are struggling. In all her questioning, she doesn't express doubt that she knows the content and can adjust to their needs. It's just the questioning of which is the right approach.

Table F1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher Identified Decision Type**	**Reflective Memos regarding Evidence of Balance**
28:52 (Continued)	If the process itself didn't go great, that's OK. I just want this assignment done. [laughs] The reciprocal writing, it's not like I hinged every hope on it. ***That's something that's a work in progress.*** It's a chance for them to share and get used to that idea. (p.9).	Efficiency: Certainty, satisficing to complete the task (Crawford, 2005) ***Adaptive: Stick with confusion long enough to let interpretation emerge (Wineburg, 1998)***	Teacher didn't specify (Continued)	The confidence the teacher has in her understanding of the weight of different aspects of the content allows her to flex through different class procedures.
28:52 (Continued)	I was hoping maybe that...My first period class, like I said, it went...***It's weird because it's a reversing of the trend*** that I've had from the beginning of the year. It went better as the day went on when I figured out what I was doing. This trend now is the reverse. I start off great and everything goes exactly the way I planned, and then it falls...not falls apart, it just doesn't shake out for the rest of the day. ***I don't know if that's because I have less absences or the higher number of test scores I have*** (p.9-10).	***Adaptive: Indications of interest, curiosity. Example: "I am curious why students did not get this." (Crawford, 2007)*** ***Adaptive: Tentativeness, posing questions to self (Crawford et al., 2005)***	Teacher didn't specify (Continued)	Even though the teacher made a pretty straightforward comment about the challenges of absences and student progress earlier, she is still questioning the impact of absences. This displays her continual evaluation of reasons "why" and wanting to know reasons "why" something is happening the way it is in the classroom.
28:52 (Continued)	I think that is routine for me, I just don't always have the opportunity to do it, especially today ***That's a situation that I can come in and I adapt as needed***. I don't always get the opportunity. ***I try and listen in on my groups…***.p.12	***Adaptive: Build understanding of situation through data (Crawford et al., 2005)*** ***Adaptive: Test hypotheses and judgments against new data (Crawford et al., 2005)***	Routinely adaptive	The teacher seems to build in procedures for having the opportunity to adapt. Perhaps this is based on her understanding that the content requires adaptation in her instruction.

Table F1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher Identified Decision Type**	**Reflective Memos regarding Evidence of Balance**
40:13	Basically, we're at the end. I'm trying to wrap them up and collect the papers of the kids who were in the groups. Once an announcement comes on, it's the end of the period, and we have bus riders who are dismissed five minutes early, so I have to pretty much quickly wrap things up. Because totally, Their attention is gone at that point.	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005) Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005) Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007)	Routine	Again the teacher is keeping the affective elements of class in mind. If she were to push through more content, perhaps the meaning would not be maintained.

Appendix G: Bethany Interview 1 Data Analysis Notes

Table G1. Bethany Interview I Coding and Memos

Time in Lesson	Quote from Transcript Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	Alignment with orientation as described in literature	Teacher identified decision type	Reflective Memos regarding Evidence of Balance
15:41	They had to actually guess correctly and ***as I was walking by I could hear him say,*** "Well, What was it? Put your name next to it." ***That's when I clarified. Did you actually guess that? … his response was, "No." I said,*** "Well then Maybe you should try another tone." (p.7)	***Adaptive: Slow to draw conclusions, building material of situation from evidence (Crawford, et al., 2005)*** ***Adaptive: Indications of interest, curiosity. Example: "I am curious why students did not get this." (Crawford, 2007)***	Adaptive	The teacher has a procedure in place that allows her to make the adaptations that are needed and "unique" to a particular student…
15:41 (Continued)	Because He's actually a very dramatic student, he just sometimes does not like to put the extra effort in at some points. (p.7)	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Adaptive (Continued)	(Continued – previous memo)… This understanding of a modification that would be unique for a student highlights her conceptual understanding of the meaning of the activity
15:41 (Continued)	…And so As soon as I saw who he was working with I knew that was what was going on (p.7)	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Adaptive (Continued)	(Continued – previous memo)… to be able to adjust the approach to accomplish the same goal with each student.
15:41 (Continued)	I knew that they would continue that track if they were to be left to their own devices (.7)	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Adaptive (Continued)	(Continued – previous memo applies)
15:41 (Continued)	I would label that probably an adaptive because that is ***unique to that particular student (p.7)***	***Adaptive: Build understanding of situation through data (Crawford et al., 2005)***	Adaptive (Continued)	(Continued – previous memo applies)

Table G1 (Continued)

Time in Lesson	Quote from Transcript Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	Alignment with orientation as described in literature	Teacher identified decision type	Reflective Memos regarding Evidence of Balance
16:20	I'm back at the other corner of the room at this point. ***I saw this young lady walking up from her desk. It was the first time she'd gotten up. We were already about seven minutes into their time slot and she had not yet really moved away from her desk*** (p.8)	***Adaptive: Build understanding of situation through data (Crawford et al., 2005)*** ***Adaptive: Slow to draw conclusions, building material of situation from evidence (Crawford et al., 2005)***	Adaptive	The teacher shows understanding of the nature of individual students, which is just as important as knowing the nature of the content one teaches. She is describing how she blends the meaning of content and student to create a procedure that will help each meet the goals of the lesson.
16:20 (Continued)	I think that would be adaptive because ***that's unique to her (p.9)***	***Adaptive: Build understanding of situation through data (Crawford et al., 2005)***	Adaptive (Continued)	(Continued – previous memo applies)
16:20 (Continued)	…***whether it was*** fatigue ***or*** just so far beyond her level that she, as far as interaction, that she just didn't want to push it. ***That was, I would think, very unique to her situation*** (p.9)	***Adaptive: Indications of interest, curiosity. Example: "I am curious why students did not get this." (Crawford, 2007)*** ***Adaptive: Build understanding of situation through data (Crawford et al., 2005)***	Adaptive (Continued)	(Continued – previous memo applies)
16:20 (Continued)	I could tell from the look on her face, she's one of my quieter students, she did not want to put herself out there (p.8).	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford, et al., 2005)	Adaptive (Continued)	(Continued – previous memo applies)
16:20 (Continued)	Her comment ***when I walked by was***, "None of these will fit. I can't do any of these." ***That's when I looked at her poem*** and I said, ***actually***, the first three lines were almost neutral lines, she could have done anything with them, ***and just kind of a reminder*** that the overall tone of her poem was on the sadder,	***Adaptive: New ideas may simply emerge from interactions with tools and people without a prior sense that something was wrong or needed to be fixed" (p.32) (Schwartz et al., 2005)***	Adaptive (Continued)	

Table G1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with orientation as described in literature**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
16:20 (Continued)	(Continued – previous quote)… darker side with that particular one that she chose…And that she had a whole section of the options for those tones that could have been anything that she could have used. It could have been done angry or it could have been done sly or a little bit more of the somber. It would have just been something that matched the way that she talks already more naturally to try to encourage her to get out of her comfort zone but to also, again, realize she does have the abilities (p.8)	(Continued) ***Adaptive: New ideas may simply emerge from interactions with tools and people without a prior sense that something was wrong or needed to be fixed" (p.32) (Schwartz et al., 2005)***	Adaptive (Continued)	(Continued – previous memo applies)
16:20 (Continued)	She's one of the quiet types who just likes to do her work. She does it early and does it perfectly and that's the way she likes to live her life. If it's not at a perfection level she doesn't like to try and push it out. Almost a fright to fail kind of issue (p.8).	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Adaptive (Continued)	(Continued – previous memo applies)
16:20 (Continued)	…I could have just walked up and said, "You can do it," and just let her go. I could have actually reprimanded her for not moving around with the rest of her classmates. Both of those, with her personality, would have shut her down and would have made her less likely to actually go out to the next person (p.9)	(Continued) Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Adaptive (Continued)	(Continued – previous memo applies)

Table G1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with orientation as described in literature**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
16:20 (Continued)	…she's not a disciplinary need. She is the type to always do what's right. I knew by guiding her in a positive direction instinctively based on her personality would be the right mode for her whereas some of the students who might be more of a disciplinary problem I can always go with them on the track of there's a consequence for your action instead of here's some options for progress forward (p.9)	(Continued) Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Adaptive (Continued)	(Continued – previous memo applies)
20:17	That particular student is a ***unique situation*** ...reluctance to continue to push for, not success, because he wants to be successful, but to try and push himself out of a comfort zone (p.10)	***Adaptive: Build understanding of situation through data (Crawford et al., 2005)*** Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Adaptive	This is a common comment from this teacher which highlights how she makes sense of the classroom—seeing students as individuals. There seems to be a degree of efficiency once the teacher gets to know the students; she seems comfortable trusting her assessment the longer she knows them. This is a trend in her interviews. However, it would have adaptive elements because she would be building that understanding anew of each student each year.

Table G1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with orientation as described in literature**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
20:17 (Continued)	When I was walking by him, ***this was probably on the second pass, the first time*** that I had addressed him, he only had I think two signatures on his form…Because it's a routine judgment, when I look at someone's paper and realize they're not doing what I've asked them to do, to address it directly….***And I'd overheard one of the other boys he was working with say*** "You talk the same every time." (p.10).	***Adaptive: Build understanding of situation through data (Crawford et al., 2005)*** Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Routine	So although the teacher is interpreting her initial impression based on previous understanding of this student's action, she is building understanding of this particular situation through current data.
20:17 (Continued)	And That's one of the things with him, he tends to live his life in a bit of a tone of sarcasm, when he's talking. ***And so I don't think he was*** thinking beyond his normal discussion, the way that he already talks. (p.10).	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005) ***Adaptive: Test hypotheses and judgments against new data (Crawford et al., 2005)***	Routine (Continued)	(Continued – previous memo applies)
20:17 (Continued)	And so with him, in a way it's routine, because I'm used to having to address certain things with him, including turning things in, putting your name on it, the normal routine items. Anyway, ***but I also was watching overall and saw*** that He wasn't doing anything (p.10).	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005) ***Adaptive: Test hypotheses and judgments against new data (Crawford et al., 2005)***	Routine	(Continued – previous memo applies)

Table G1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with orientation as described in literature**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
20:17 (Continued)	…I know there's going to be the first reprimand of "You need to get back on track." But I know that's, automatically, going to need something, that's going to refocus them from "I've done something wrong" to "I need to get back to work." Because they will dwell on "I've done something wrong" for a while, usually. And that will distract them...and knowing which student reacts best to which type, like the student who I had to redirect her by encouraging her on certain sides. She did not need for me to tell her "You use this one, and this one, and this one," on the next three rounds.	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Routine	In addition to being an extension of the previous note, this also starts to highlight the teacher's understanding of the affective element of students' learning process. There a need to understand the nature of how affective elements impact students learning. …
20:17 (Continued)	He did need that, and ***I think he genuinely needed it*** and was not trying to just rest on his laurels. Because You can tell students who just don't want to, versus those who, they may be genuinely confused. ***He probably needed a little bit more,*** "OK, here's exactly what you're trying. Your poem is a good one for this particular emotion". And to let him do that and [?] show him success. Once he did it, I gave him the thumbs-up and I moved on to the next side (p.11).	***Adaptive: Test hypotheses and judgments against new data (Crawford et al., 2005)***	Routine (Continued)	(Continued – previous memo)… This also is another example of how the teacher build understanding of each student as she meets them but them begins to develop a level of confidence to trust her interpretations of their actions based on prior knowledge. This is an element of "developing balance" perhaps. I think the teacher mentioned that this process takes about half the year for her to develop confidence.

Table G1 (Continued)

Time in Lesson	Quote from Transcript Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	Alignment with orientation as described in literature	Teacher identified decision type	Reflective Memos regarding Evidence of Balance
20:17 (Continued)	… I actually took his poem and I took his answer key and I said "Read these first three lines and use this tone." ***Because he's used that tone with me before, when we've been talking. And so I know he can do it…***(p.10)	Efficiency: Simplification of the task or problem space (Crawford 2007) ***Adaptive: New ideas may simply emerge from interactions with tools and people without a prior sense that something was wrong or needed to be fixed" (p.32) (Schwartz, et al. 2005)***	Adaptive	(Continued – previous memo applies)
24:12	I'm counting down the seconds. that for that class, it's routine. Because they tend to be a little bit rowdier in transition (p.11)	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Routine	She mentions in another comment about how she builds in these kinds of cues to ease this class through transitions. This is another example of her understanding of the nature of the students—this is a key element in conceptual understanding in teaching.
25:17	Things I know they're going to need for the next year, for success, and items like "didactic." They're going to see it on the SATs… I tend to put that one in every year. And I know that someone every class, it was without fail today, ask~~ing~~ "What does that mean?" And I go through and I explain it about the same way for every class. That class, I know most of parents, a lot of them are, they're repeating families I've had their older siblings. And so, I know how their parents interact with them, so I knew they would understand that, versus me or one of their other teachers being a lecturer (p.12)	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Routine	This seems to point to a relational component to the class, which could also speak to the affective nature of student learning.

Table G1 (Continued)

Time in Lesson	Quote from Transcript Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	Alignment with orientation as described in literature	Teacher identified decision type	Reflective Memos regarding Evidence of Balance
27:33	... I know that there'll be those who have no clue what their poem means, or read it with the entirely wrong tone (p.13)	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Routine	The teacher demonstrates her understanding of the nature of the content and the nature of her students in selecting introductory procedures that will help set them up for success in the assignment.
27:33 (Continued)	… I tried to pick poems that they know and that they will either be shocked by, with the Richard Cory, or that they will, at least, grasp the concept of, which is why I brought that one up with "the tone will change throughout the poem, from admiration to complete confusion for why someone would feel like they have everything, and then lose it…that's part of what I do with the section every single year (p.13)	(Continued) Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Routine (Continued)	
27:33 (Continued)	I think this is probably the first time that I have not gone through the actual poem with them...But I have not done that with this class yet, I don't know if I will or not, ***depends upon if they still need it after Friday or not*** (p.13-14).… this particular grade, this year tends to catch on very quickly. And so I didn't think they would need the full-out explanation, that ***It might actually confuse them more than it would help them***. A brief snippet would be enough to give them a morsel. this makes sense, so they can chew on it later, when they're reading their own poems (p.14).	***Adaptive; Test hypotheses and judgments against new data (Crawford et al., 2005)*** Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Routine (Continued)	Even though the teacher anticipates certain needs of students, she still evaluates her assumptions. She evaluates the procedure of using the example poems to help student grasp the nature of the content.

Table G1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with orientation as described in literature**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
27:33 (Continued)	… that group didn't need it, ***they were catching on very quickly*** and I just moved on past with the synopsis…by that point I would call it routine, because I've already done it and I knew that it works previously, with the other three classes (p.14-15).	***Adaptive: Build understanding of situation through data (Crawford et al., 2005)*** Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Routine	(Continued – previous memo applies)
27:33 (Continued)	But there's ***never a guarantee***…it will work in my last period, ***sometimes they do need something different***, today it happened to work (p.15)	***Adaptive: Test hypotheses and judgments against new data (Crawford et al., 2005)***	Routine (Continued)	(Continued – previous memo applies)
29:49	… Again, giving them clarification on what's expected. But the extra you have a safety net, you can try something new, and it's not going to really hurt you…it's become a routine I have to remind them that it's OK. Try it. Whenever I give them any assignment that does not have a rubric attached to it, where I just want them to experience it, just try something, they have, "is it completion, "Am I OK?" "You're fine. It's all going to be OK. Just sit back and relax and enjoy the ride in class." (p.15-16).	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Routine	Although this is a routine moment in class today, she is talking about understanding built throughout the year (indicating adaptiveness). She doesn't assume the students will be one way, which is another insight into her understanding the nature of her students. She also demonstrates and understanding on the scope of a procedure and the content in setting expectations that are not beyond where the students need to be with this particular assignment as this particular moment.

Table G1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with orientation as described in literature**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
33:20	I was assigning the two roles that we were going to use today. I'd already decided on those earlier in the day. I knew based upon who was going to be in class, who was out sick, and who was going to be able to read without being stressed. It was going to be a quick read. I knew we'd only have about 10-15 minutes at the end of the period to get it done. And so I wanted to pick some students who I knew would be able to get through it without stumbling too much, that the main ideas were still kept intact, and people who would be able to read loudly enough for everybody in the class to hear it (p.17).	Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007) Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005) Efficiency: Simplification of the task or problem space (Crawford, 2007)	Routine	The teacher's procedure is again built on understanding the nature of the students. She talks about selecting students that wouldn't be stressed at the thought of reading aloud—again speaking to the affective element of the learning activity.
33:40	This was a ***unique situation.*** I've taught this particular piece, This is my tenth year of teaching this particular piece. I know the names, ***but for some reason yesterday I had them written on the board in reverse.*** Especially with this particular group that I had this year, I knew they would, as soon as they saw the name, have a huge question of, "Why is this woman marrying a third person?" So I had to stop and make sure they knew exactly who the characters were and who was involved with whom.	***Adaptive: Disequilibrium that signals that certain processes or ways of thinking (e.g. previously learned routines) are not quite working properly. (Schwartz et al. 2005)*** Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford, 2007)	Adaptive	More than just correct her error, she is attentive the way in which she corrects her error. This again shows here understanding of the affective domain of teaching which deals with understanding the nature of ones students as well as the content.

Table G1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with orientation as described in literature**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
33:40 (Continued)	(Continued – previous quote)…Otherwise it would have created a lot of drama that did not need to happen in the classroom …***I had not made this mistake before***. ***This was a unique situation***, and most years probably would have glazed over it. This year I was very quick to catch.	(Continued – previous coding) Efficiency: Retain hypotheses based on prior knowledge(Crawford et al., 2005)	Adaptive (Continued)	(Continued – previous memo applies)
33:40 (Continued)	(Continued – previous quote)…They like to point out very loudly when they find an error. I wanted to make sure I addressed it first. "I am paying attention." When I do make an error, just like when they make an error, I will admit to it and be OK with it (p.18).		Adaptive (Continued)	
39:40	The reading and the questioning all of that is routine. They stumble when saying exact words every single year. Some years I don't even...I really impress the students. I don't even have the book in front of me anymore. I know exactly which word they're going to stumble on. I just fill it in. They stare at me. It's that routine that I know exactly what's about to happen for that. (p.18)…	Efficiency: Quick to draw conclusions from one aspect of the problem space (Crawford et al., 2005) Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Routine	The procedure is, again, seeming to pay attention to the affective element of teaching. Students have challenges reading aloud. It is an activity that could have positive and negative outcomes. This teacher is creating a safe way for students not to be embarrassed if they don't know a word. She is demonstrating a knowledge of the nature of the content to where it's not so much about them pronouncing every word right to meet the goals of the lesson.

Table G1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with orientation as described in literature**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
39:40 (Continued)	(Continued – previous quote)…Sometimes they will attempt to say it. One of the students actually did it today. They repeat it three or four times in different ways, hoping for a response. This way, if they don't feel comfortable doing it, they can just pause. That little insignificant pause is, "OK, I need someone who's obviously done this before. What's the name?" Normally, one or two times, they get it, and they move right through it smoothly. A couple of them did with "Oedipus," for example. Once they heard it two or three times, they were fine (p.19)	(Continued – previous coding)… Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Routine (Continued)	(Continued – previous memo applies)
39:40 (Continued)	But ***the wait time, for this class, I let go a little bit longer*** when I was asking about the characterization. With this class, that would have been an adaptive point. They tend to want quick responses. And they get very uncomfortable when you stare at them and make them think. ***I had to make this particular group slow down because they were giving some comments that were not...they were accurate, but they weren't the best options. And so I made them continue until they were hitting on some of the more important details*** about her personality as she was talking about her family (p.18)	***Adaptive: Stick with confusion to let interpretation emerge (Wineburg, 1998)***	Routine (Continued)	Even though the code from the research literature is talking about the teacher, and here the teacher is talking about the students lingering with confusion to let the interpretation emerge, the teacher has to be simultaneously comfortable with letting the student work through the confusion. This expressing understanding of the speed of a procedure in kind with the nature of the objective of the assignment.
39:40 (Continued)	This particular time, ***they were not hitting on a lot of the important parts coming up*** that I wanted them to so they understand what those characters are going to be like later on in the story (p.19)	***Adaptive: Build understanding of situation through data (Crawford, et al. 2005)***	Routine (Continued)	Teacher has understanding of the "meaning and nature" (Hatano & Inagaki, 1986) of the content.

Appendix H: Bethany Interview 2 Data Analysis Notes

Table H1. Bethany Interview 2 Coding and Memos

Time in Lesson	Quote from Transcript Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	Alignment with Orientation as described in literature.	Teacher identified decision type	Reflective Memos regarding Evidence of Balance
:30	… So we were behind from yesterday's class. So to start them off, Normally this class is very laid back, so I like to start off with a discussion. We had to hit the ground immediately with normal class items. That was definitely an adaptive for this class because we could have continued to let ourselves fall backwards, but I wanted to make sure to try to keep up with the other classes. (p.1)	Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007) Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Adaptive	The teacher is changing the procedure of class in a way that doesn't seem to sacrifice the content to be taught today.
4:49	This particular class, I'm allowing them to pick their own roles for this one. They did have some people who were reading yesterday who are not reading the strongest that they probably could have. And so That's part of the reason why it took us longer to get through, since they were having a harder time with the language, or just overall slower readers. So, instead of assigning it and just carrying it over which I could have done, I chose to allow them to pick new parts. Some of the students who were reading very slowly who were assigned previously sat back so that someone else who's a stronger reader could take that part.	Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford ,2007) Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Routine	Again, the teacher seems in tune with student affective needs in the learning process. She understands the nature of students in her demonstration of this subtle way to not single out weaker readers for a read aloud. She shows an understanding that "who" reads aloud at this point is not compromising the nature of the content goals for the lesson. But, rather than make a public claim as to why readers would be changes, she created a safe way for the shift in readers.

Table H1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
4:49 (Continued)	(Continued – previous quote) As a result, for the speed it would help us out a little bit. So I balanced giving them the role versus allowing them to choose their roles… It switches it up for them so they don't feel like they are required to read it every single day. And it gives the rest of the class a new way of hearing people give different emphasis on the points, different ways in which they could interpret something that's going on. It gives the students a better sense of what's going on in the book and the play. So this is really routine that every year pretty much the same thing. (p.2-3)	(Continued – previous coding) Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Routine (Continued)	(Continued – previous memo applies)
6:20	… to give them a goal for what they are about to read so that they have a targeted piece of information that's going to be continually in their head: What am I looking for that's a loophole? It does two different things for the students. It allows them to have a goal or intentional purpose for their reading so that they have something they're actively doing. But it also simply keeps them on task. They know that I am going to ask about that (p.3)	Efficiency: Simplification of the task or problem space (Crawford, 2007)	Routine (Continued)	The procedure of setting a goal for reading is way for her to manage the students grasping the meaning of the content. The teacher has to have a conceptual understanding of the content to be able to be selective in this way. She expresses confidence in her choice of how to focus the reading. This also shows her understanding of the nature of her students. At this place in their academic development, they need the scaffolding of a focus point for reading—especially with a piece like this.

Table H1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
14:58	… Letting this particular student, who does sometimes get off-track with his neighbor, continue on the "Breakfast Club" discussion, would actually have ended up having them both been distracted for the next five to ten minutes, easily. So, instead of allowing them to, "There's a movie, ya there's a movie, didn't you see...?" And then they talk about the movie, just nip it, "Yes it's a movie," and I moved on …***I didn't even know that the students knew what "The Breakfast Club" was for a movie.*** But they all know we have the academic club that we call the breakfast club (p.4)	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005) ***Adaptive: Explicit statements about not knowing novel content (Crawford et al., 2005)***	Adaptive	The teacher shows understanding of the nature of her students again by how she let them talk a little bit about the off topic, but then was strategic in how to move the conversation along. She balances the movement of class with her understanding of students and the time needed for the content objectives.
16:53	In the middle of the discussion about the offering, that I wanted them to understand why it was important that the dust was dry. One of the students connected the dots with the man being said, "Bring me the man," that it was not a man who had actually buried the body. It was actually the same one who brought up "The Breakfast Club". And normally, he would probably blurt out the entire item, which is why I told him I will come back to that. that, unfortunately, is a routine response, because the rate at which when they look at that piece again, when they see "man" brought up twice, it starts to click. So, actually, all day today I've had to squelch it so that they would not actually blurt that out before I got to that point in the next discussion issue we're going to have (p.5)	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005) Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005) Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007)	Routine	She is not shutting down the student's response creating a way to acknowledge the response and manage when it would be best addressed. Procedural and content understanding is evident.

Table H1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
20:02	In this class, actually, for the last several years now, I make them come up with the, "Why would he not assume it's just some body and that he has to be a man?" Because, again, we're harping a little bit on the role of women in this particular society, but also on the perceptions of people and why we would assume one thing for one gender versus another. And so that was something that I would consider, in the very beginning of my career, probably an adaptive. I would just tell them outright and assume they would absorb it. Now it's become routine where I want them to come up with it because it makes it personal to them. They've come up with it and they'll be more likely to remember it (p.6).	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005) ***Adaptive: Stick with confusion to let interpretation emerge (Wineburg, 1998)***	Routine	This is another place where the teacher has to be comfortable with lingering with the students confusion to help the student come to an understanding on their own. It seems that the teacher becomes more comfortable with this process as she sees it effectiveness of the years she's been teaching to where this is now a routine for her.
26:27	With this particular scene in the way that the play goes, a lot of students immediately believe that he's going to just cave. And the student up at the front, which is why he's so clear, when I said, "There's a level of control that he's going to look for." He says, "Oh, so he's going to give in." That's why I wanted to make sure they understood that hubris and pride, once again, is going to prevent that. So that's actually a routine question of, "Oh, so this is going to become happy." I have to rein that back in of, "No, it's a Greek tragedy…	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Routine	The teacher continually expresses confidence in these choices of how to routinely respond to students' questions. Even though she goes into the lesson with predictions, she is still waiting for students to pose the question before giving a routine response. In her last lesson, she even mentioned a similar process where the procedural response was adjusted because students did go where she has

Table H1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
26:27 (Continued)	(Continued – previous quote)…It's not going to end happily. You need to continue to watch for this character trait that we know exists." So, in a way, it reinforces the characterization without me having to stop and say, "Well, what are the traits that we know of Creon?" (p.7)	(Continued – previous coding) Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Routine (Continued)	(Continued – previous memo)… predicted. So she seems to hold the routine loosely to allow for adjustments. I think she also has these firm predictions to carry into the lessons for this piece because of the difficulty of the read. By giving confident routine decisions, I would think it helps students want to continue in the learning of a difficult text.
26:27 (Continued)	***…If he had a follow-up question, which I didn't think he would, but he might have,*** I would have had to probably stop and do something maybe with my markers on the board: "OK, what do we know is this? What would lead to this," and go back and forth. There is some adaptive ***in that with I don't know how confused they might be*** (7-8).	***Adaptive: Test hypotheses and judgments against new data (Crawford et al., 2005)***	Adaptive	(Continued – previous memo) … This shows an understanding of procedures that compliment the nature of such a text. She also manages how much to give whole group attention to one students' questions which again shows her understanding of the nature of the content, students, and instructional procedures.
26:27 (Continued)	But he was showing some confusion, which is about normal for in between scenes of a play (p)..8	Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005) Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005)	Routine	

Table H1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
31:34	Lately that one's adaptive because ***this is the first year that I have actually highlighted that point.*** I try and I tell the students this when they ask me if I get bored with my literature. I say, "No. ***I find something new every year***." (p.8)	***Adaptive: Shows interest, curiosity, about novel content (Crawford al. et, 2005)***	Adaptive	She is highlighting another dimension of understanding the nature of students. They want to know that the teacher enjoys the content as well. They will check out if the teacher is not excited about the content as well. I wonder if the teacher would choose to stop teaching the piece if she came to place where she wasn't making new discoveries with it each year.
35:36	Actually, too, here which I would probably consider adaptive, because the young woman who is talking...as we said earlier, I've taught this story for 10 years. This is the 10th time I've taught it as a 10th grade teacher. ***And I have never heard anyone look for the loophole for Creon before. That was just such an astonishing point.*** Later on in the class I did mention that: ***"I've never heard that before."*** In a way, ***I wanted the class to realize that, "OK, first of all, you can find something new in a piece even though you've taught it several years."*** (p.9-10).	***Adaptive: Shows interest, curiosity, about novel content (Crawford, et al. 2005)*** ***Adaptive: New ideas may simply emerge from interactions with tools and people without a prior sense that something was wrong or needed to be fixed" (p.32) (Schwartz et al., 2005)***	Adaptive	The teacher has to have a conceptual understanding of the content to know if to give attention to this unique discovery, then an understanding of how to draw attention to it. The way she chooses to draw attention to it displays her understanding of the nature of her students as well.

Table H1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
35:36 (Continued)	The other one is actually the routine discussion about stoning. They often have this concept that it's just one person standing there throwing little pint-size rocks at someone. They don't understand that it's not dodge ball with a stone. You actually have a way that you do it…So I mentioned in the next few moments...Actually, one of the students brought it up, Steven, the first martyr. Of course, that was done differently than what most people think. So I like to bring up the cultural side so they see, yes, first of all, this still goes on, and second of all, it's not what you're picturing. So this is much more dramatic than you actually are probably thinking it's going to be (p.10).	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005) Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford, 2007)	Routine	The teacher shows confidence in how much to give to this discussion and how it will contribute to the overall content goals. She also demonstrates understanding of the students in knowing how much of such a conversation is appropriate for them.

Appendix I: Bethany Interview 3 Data Analysis Notes

Table I1. Bethany Interview 3 Coding and Memos

Time in Lesson	Quote from Transcript Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	Alignment with Orientation as described in literature.	Teacher identified decision type	Reflective Memos regarding Evidence of Balance
00-3:42	Everything up to this point has been a routine. I've been standardizing it in every single class. It's [*audio unsure* - built with the feel] with the actual rubric itself, if someone's out they'll automatically know what to do with it with somebody else. The actual response that the young men needed as he was realizing. He didn't have his iPad. He could not find his printed copy. That is would be anticipated, as we're about to any type of performance. There is always going to be at least one person who is not prepared, and had a back-up plan of look at your neighbor. …It didn't need any other discussion. Then you can borrow someone else's, it's OK (p.1)	Efficiency: Simplification of the task or problem space (Crawford, 2007) Efficiency: Interpret situation in terms of prior experience, assumptions (Crawford et al., 2005)	Routine	To achieve the content goals the teacher uses procedures that reveal her understanding of the nature of her students.
12:29	This is all routine as far as any kind of classroom decision. But that's one thing, that when it's a routine, even the students have to know, "I'm not acting as an individual at this point. I'm acting for your safety and putting a line in the sand, basically, for it." (p.4)	Efficiency: Simplification of the task or problem space (Crawford, 2007)	Routine	This was regarding the fire drill procedures. This also carries demonstration of understanding the nature of this drill in this instructional process/expectations and the nature of her students. This also shows a degree of affective understanding of the students. Her tone in carrying out this procedure is showing her understanding of the nature of the drill and how to get her students to follow her lead during this time.

Table I1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
18:55	When the PA system interrupted As I'm in the middle of starting back up again and getting them calmed down, which, of course, required me to then address the student questions of, "What happens when?" ***I usually have a very open door policy with regards to the students. My response is one that echoes that,*** "This is exactly why it takes us longer. Today it did not. So we're getting better at this," and then, again, move on. Just like yesterday's issue, a previous lesson's issue, with they're about to go off track. It can even become a large discussion. Nip it and move on.(p.6).	***Adaptive: Indications of interest, curiosity. Example: "I am curious why students did not get this." (Crawford, 2007)*** Efficiency: Simplification of the task or problem space (Crawford et al., 2005) Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007)	Adaptive	
	The second one was when I just announced that we are going to move straight through the alphabet. Every other class today, I've been able to take volunteers first and then we move into the alphabet. Because we just lost almost 20 minutes of instructional time, and I knew that there were probably going to be more announcements coming, which there happened to actually be more interruptions that were about to start up. I knew I was going to need to crunch time to get all 21 students in before the bell rang to end the day. Otherwise, I'd have to hang it over till Monday, which impacts and has the domino effect when all my lessons next week when that one is out of synch (p.7).	Efficiency: Simplification of the task or problem space (Crawford et al., 2005) Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task (Crawford, 2007)	Adaptive	The teacher explains that this approach is not going to sacrifice the goal of this exercise.

Table I1 (Continued)				
Time in Lesson	**Quote from Transcript** Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	**Alignment with Orientation as described in literature.**	**Teacher identified decision type**	**Reflective Memos regarding Evidence of Balance**
25:16	It's a ***routine thing I look for…***	***Adaptive: Thorough systematic, exploration of data (Crawford, 2007)***	Routine	Even though this is a procedure, it's a routine for taking advantage of something she can't completely predict. She shows an understanding how what it takes to make good cultural tie-ins this way. With the nature of students and the nature of content, she cannot completely pre-plan the most authentic connections.
	… Anytime we have a chance for a cultural thing that's going on that's major in our world, I try to bring it up. This actually spurred a small discussion… which had it not been a shortened day, I would have actually blossomed that into a full discussion of, "Well, where do we see that?" ***Because it's actually in "Antigone" where she's standing up for herself, even though it's a fake story. Just so they could see the cultural tie-ins do still exist*** (p.9).	***Adaptive: Slow to draw conclusions, building material of situation from evidence (Crawford, 2005)*** ***Adaptive: New ideas may simply emerge from interactions with tools and people without a prior sense that something was wrong or needed to be fixed" (p.32)(Schwartz et al., 2005)*** Efficiency: Monitoring time spend on or remaining for the task, considering trade offs in time required to accomplish a sub-goal verses time available or value of the results, thinking about what remained to do to finish the task. (Crawford, 2007)	Adaptive	To be able to make these cultural tie-ins well, the teacher has to have a confidence in her conceptual understanding of the content at hand, which she demonstrated in the class. She also balanced how much time to spend on it as well.

Table I1 (Continued)

Time in Lesson	Quote from Transcript Underlined un-bold = Efficient Reasoning ***Bold italics*** = Adaptive Reasoning	Alignment with Orientation as described in literature.	Teacher identified decision type	Reflective Memos regarding Evidence of Balance
47:22	After they've all done their poems, which, of course, takes a little bit of time, I go back over, "Here's what you are expected to do for the competition in class. Here's what to expect afterwards," which that is routine for this particular year. All the classes have heard this spiel, and they'll all hear it again next week on Wednesday, because they are used to one method of doing things (p.10).	Efficiency: Simplification of the task or problem space (Crawford et al., 2005)	Routine	The teacher displays and understanding of the importance of reinforcing certain basics through procedures like this. The procedure also, again, shows her understanding of the nature of her students—knowing how they will receive the information best.
	I call that a routine. I know it's coming. I knew the questions they were going to ask: …I wanted them to make sure they understood that, but that's a routine. I know It's going to come up. Just go ahead and address it…I'm saying it ahead of time to try to minimize the, one person ask questions on this side of the room. Someone over here was zipping up a backpack missed the information; asked the same question. So by telling them first go ahead pack up. Which took about three seconds after I said that. They quieted right back down and could hear everything I was about to say (p.11)	Efficiency: Retain hypotheses based on prior knowledge (Crawford et al., 2005) Efficiency: Simplification of the task or problem space (Crawford et al., 2005)		

Appendix J: Internal Review Board Approval

UNIVERSITY OF SOUTH FLORIDA

RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-7091

October 24, 2013

Nina Graham
Secondary Education
Tampa, FL 33612

RE: **Expedited Approval for Initial Review**
IRB#: Pro00013247
Title: Balanced Artistry: Describing and Explaining Expert Teacher Practice as Adaptive Expertise

Study Approval Period: 10/23/2013 to 10/23/2014

Dear Ms. Graham:

On 10/23/2013, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents outlined below.

Approved Item(s):
Protocol Document(s):
Study Summary Ver. 1 9-20-13

Consent/Assent Document(s)*:
Parental Permission, Ver. 1, 9-20-13.pdf
Teacher Informed Consent Ve. 1 9-20-13.pdf

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s).

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

Kristen Salomon, Ph.D., Vice Chairperson
USF Institutional Review Board