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## MAKING ROOM FOR FORMATIVE ASSESSMENT PROCESSES: A MULTIPLE CASE STUDY

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MAKING ROOM FOR FORMATIVE ASSESSMENT PROCESSES:  
A MULTIPLE CASE STUDY

By

Robert E. McEntarffer

A DISSERTATION

Presented to the Faculty of  
The Graduate College at the University of Nebraska  
In Partial Fulfillment of Requirements  
For the Degree of Doctor of Philosophy

Major: Educational Studies

Under the Supervision of Professor Margaret Macintyre Latta

Lincoln, Nebraska

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# MAKING ROOM FOR FORMATIVE ASSESSMENT PROCESSES:

## A MULTIPLE CASE STUDY

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This qualitative instrumental multiple case study (Stake, 2005) explored how teachers made room for formative assessment processes in their classrooms, and how thinking about assessment changed during those formative assessment experiences. Data were gathered from six teachers over three months and included teacher interviews, student interviews, participant-observation notes, videos of classroom experiences, and classroom artifacts. These data were analyzed using a category construction method (Merriam, 2009) that involved open coding, axial coding, and finally a cross-case analysis that grouped axial codes according to themes relating to the two research questions. Four case studies describe the process of co-created work with teachers and descriptions of axial codes that emerged during this work. The cross-case analysis revealed two major themes that influenced and reflected how teachers made room for formative assessment processes (trust/community and freedom/enthusiasm) and three major themes that describe how assessment thinking changed during the work (defining 'successful' learning, grouping students, and mindset). These themes suggest that both teacher "assessment

scripts” (Ayala, 2008) and trust and autonomy aspects of the classroom community influence teachers’ abilities to make room for formative assessment processes. Conclusions from this study imply that discussions about formative assessment processes need to honor and attend to issues of teacher autonomy and beliefs about learning. Discussions about formative assessments processes necessarily involve foundational issues about teaching and learning. This study indicates a reciprocal relationship between the formative assessment process and these foundational issues: as teachers made room for formative assessment processes, their thinking about teaching and learning changed, and these changes in assessment scripts created more room for formative assessment processes in their classrooms.



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## **Chapter 1**

### **Introduction**

In 1998, Paul Black and Dylan Wiliam published the first comprehensive meta-analysis regarding the impact of formative assessment strategies. They sought out any study that examined the impact of formative assessment on student achievement. They defined formative assessment as occurring when assessment data are “actually used to adapt the teaching to meet student needs.” (Black & Wiliam, 1998, pg. 140) After examining 681 publications related to formative assessment, they concluded that formative assessment practices have the potential to dramatically impact student learning, especially for “at risk” students, and that “these effect sizes are larger than most of those found for educational interventions.” (pg. 141). This original meta-analysis has been cited over 2,129 times (data from Google Scholar <http://scholar.google.com/>) and has been used in hundreds of popular press education articles and staff development workshops. The appeal seemed obvious: the focus of formative assessment is empowering students and teachers to use assessment data. This was one issue on which the testing researchers and the instructional researchers could agree. It seemed as if a powerful new tool for teachers had been “discovered”, and formative assessment was poised to revolutionize classroom practice.

But, 12 years later, many teachers I talk to in my role as an assessment specialist are underwhelmed by the revolution. In my district, some teachers

became very excited about formative assessment and how to use it with students, but many other teachers participate in formative assessment discussions without finding connections between formative assessment and the cultures of their classrooms. The talk about formative assessment doesn't connect with what these teachers know and practice about teaching and learning. Many teachers talk about a pervasive and overwhelming emphasis on assessment and measurement, and discussions about formative assessment are influenced by the "baggage" associated with the term assessment. Many teachers don't see connections between assessment and the goals of their teaching, and they don't see why or how to make room for formative assessment in their classrooms.

### **Statement of the Problem**

Ayala (2008) described in detail efforts to help classroom teachers integrate formative assessments into their daily work and thinking. Ayala's research group had limited success in their effort, and concluded that the classroom teachers they worked with thought about assessment in exclusively summative (evaluative) ways, instead of considering how assessment data might be used during the learning process by teachers and students. Ayala labeled this perception a "summative assessment script" (pg. 331). Cognitive psychologists use the term "social scripts" to describe our mental expectations for social situations: what we expect will happen and how others will react (Myers, 2010). Other authors (D'Andrade and Strauss, 1992) use the term scheme in the

context of cultural influences. These authors point out that the cultures we belong to influence our expectations about the nature and process of learning. This “summative assessment script” consists of teachers’ thoughts and expectations about assessment. Ayala (2008) described how this cognitive script influenced teachers to think almost exclusively about assessment data in terms of grades and evaluation instead of formative uses, such as descriptive feedback.

Summative and formative assessment scripts as described by Ayala (2008) are not mutually exclusive: while using assessment data to influence the learning process, a formative process, teachers and students might think in evaluative ways (e.g. examining how effective one method of subtracting integers is in order to plan an alternate method). Teachers who are using assessment data to evaluate and summarize student achievement, a summative process, may also suggest ways student might improve their achievement next time (e.g. suggestions on a report card about behavior changes). Ayala (2008) found that the dominant summative assessment script influences teachers to think first about how to use assessment data to summarize or conclude about student achievement instead of to this first of the potential utility of assessment data during the learning process.

The pervasiveness of the summative assessment script is not surprising. Teachers have to consider summative uses of assessment data dozens of times a day. In my district, teachers are encouraged to continually update their gradebooks. Parents have 24 hour access to student grades online, and most of the assessment conversations between administrators and teachers occur in the

context of overall course grades. Teacher preparation programs may also help foster summative assessment scripts through inattention to assessment literacy. Assessment training is not emphasized in many teacher and administrator preparation programs (Shepard, 2000; Stiggins, 2002), and when assessment is discussed in teacher training classes, summative assessment scripts dominate the conversation. Shepard (1991) found that most psychometricians subscribe to a strictly behaviorist, sender-receiver model of learning that is contradicted by current cognitive psychology research about the nature of learning.

I encounter these prevalent “summative assessment scripts” in my work with teachers: discussions about assessment are conducted within the overarching context of grades, gradebooks, points, and averages. The initial challenge of any formative assessment discussion is usually to try to widen the conversation and “re-frame” assessment as a conversation about all the ways teachers try to get information about student thinking while learning is occurring, rather than to primarily discuss measurement tools used to evaluate and summarize student learning after it is completed. Even after this attempt at “re-framing”, the dominant summative assessment scripts influence the conversation. Teachers are often focused on how much formative assessments could or should be “worth” in grade calculations instead of focusing on the value of the assessment information for informing teacher and student thinking.

This narrow sense of the “worth” of student work as defined by grades may originate in an assumed, sender-receiver theory of learning. Biesta (2007) described this pervasive theory of learning in terms of discrete causes and



effects: “a causal model of professional action. It is based on the idea that professionals do something – they administer a treatment, they intervene in a particular situation – in order to bring about certain effects” (p. 7). Under this causal model, an exclusively summative assessment script is assumed. If the correct “input” is assumed to cause a pre-determined learning “output”, the role of assessment is clear: evaluate the amount of learning that occurred so that inputs can be changed if necessary. The input-output assumption pervades the thinking of powerful educational policy makers: When asked to define good teaching, Michelle Rhee, one-time chancellor of the Washington D.C. school system, said “A highly skilled teacher should never have more than five instances of ‘inappropriate or off-task behavior’ by students within a half-hour of class time . . . no more than three minutes of teaching time should be lost to poor organization or planning.” (Turque, 2009, p. 1). The deterministic assumption that learning is a product of specified teacher behavior leads inevitably to a summative assessment script. In a sender-receiver classroom, the logical use of assessment data is to evaluate the outputs, rather than attending to the process of learning itself, how learning might be experienced differently by different learners, and consider how assessment data might be involved while learning is forming.

But this sender-receiver theory of learning ignores the reality of actual, human students and teachers. Dewey (1934, 1938, 1957) emphasizes that we are teaching human beings. When we deal with humans something happens in the gap between input and output. This gap is where meaning is integrated in an

interaction between learner, teacher, and meaning. Biesta (2004) talked about this gap specifically and defined education as “located not in the activities of the teacher, nor in the activities of the learner, but in the interaction between the two” (p. 12-13). This gap metaphor focuses attention on where learning actually takes place, in contrast to exclusive focus in the sender-receiver model on teacher activities or student actions. Long before Biesta, Dewey (1934) conceived of the gap as part of the process of an “educative experience”, and wrote about the “long period of gestation” during an experience. Dewey wrote extensively about what happens in the gap, describing and summarizing the “transformation of energy into thoughtful action, through assimilation of meanings from the background of past experiences” (Dewey, 1934, p. 60). Biesta’s and Dewey’s conceptualization of the gap opens up the “black box” implied by the input/output model of learning. The black box is the place between the “inputs and outputs” described in the sender-receiver model. Student reflection, background, motivations, intentions, and self-efficacy reside in this space, this black box. In the sender-receiver model, students receive the inputs and produce the outputs, but no attention is paid to what happens within this black box, within the learner. Biesta and Dewey open up the box instead of turning away from it, describing how the learning is a relational, interactive process, rather than the simple transmission and reception of information.

So we are left with a problem: Black and Wiliam’s meta-analysis indicates that using assessment data in a formative way is a powerful tool teachers can use to help students learn and increase motivation, especially students who have

low self-efficacy in a course (Stiggins, 2007). Biesta (2007) and Dewey (1934) describe how essential the reflection and other relational, integrative processes that take place between input and output are to learning. The formative uses of assessment studied by Black and Wiliam are aimed directly at exactly these kinds of reflections: formative uses of assessment data involve students and teachers reflecting about thinking. But many teachers and administrators almost exclusively think about summative uses of assessment data, and these summative assessment scripts tend to elbow out other more formative uses of assessment data.

### **Purpose of the Study**

Since summative uses of assessment data are so prevalent, it may be useful to examine multiple cases of formative classroom assessment practice in detail. Teachers and administrators read and share research extolling the benefits of formative assessment, but fleshed-out examples could help show how data can be realistically used formatively in classrooms in the context of dominant summative assessment scripts. The purpose of this study is to examine the implementation of formative assessment processes in classrooms. Specifically, the data gathered are used to examine how teachers “make room” for formative uses of assessment data and how the assessment scripts of students and teachers in the classroom are influenced.

## **Chapter 2**

### **Literature Review**

In order to further discuss how and why teachers might make room for the formative assessment process, it may be useful to place the formative assessment process within the context of overall theories of learning. In this chapter I will use the metaphor of learning as an ongoing conversation that will be useful in future discussions about the role of assessment in learning, then discuss the construct of formative assessment within this view of learning, and finally review a specific example of the formative assessment process, ending with a description of a pilot study that involved this formative assessment process example.

#### **The Relational Nature of Learning/Knowing/Understanding**

Conversation is a process of coming to an understanding. Thus it belongs to every true conversation that each person opens himself to the other, truly accepts his point of view as valid and transposes himself into the other to such an extent that he understands not the particular individual but what he [sic] says. (Gadamer, 2000, pg. 385).

Dewey addresses part of this process of “coming to an understanding” described by Gadamer through the concept of “habits”. According to Dewey, one of the key results of learning is the development of “habits”, which “channel” our sensations, emotional experiences, and “natural impulses” (1922, pg. 258). What Dewey calls knowledge originates from the interactions of these habits and our impulses, rather than originating directly from sensations (1922, pg. 189).

Listening to “facts” in a lecture (sensations) does not inevitably produce learning. These sensations are part of the learning process Dewey described: We use these sensations along with our impulses and current cognitive habits to understand experiences (and develop new habits that enable us to productively think about future experiences). Growth in learning and knowledge occurs when habits develop from “routine, unintelligent habit” to “intelligent habit or art” (1922, pg. 77). These intelligent habits are “intellectually efficient” (1922, pg. 172) in the sense that they are automatic and organize the chaos of sensation in useful ways (1922, pg. 177). The sensations we experience during a classroom lecture can come at us as mere noise, but if we have intellectually efficient habits we may automatically start to interpret these noisy sensations in useful ways that help us discern meaning, and possibly refine our habits further.

Habits are not discrete, depersonalized input/output factual algorithms, but depend on impulses that are “projective, urgent” (1922, pg. 186) and “feelings as well as reason” (1922, pg. 76). These habits, impulses, and feelings interact in the process of forming conclusions about experiences allowing us to “fasten upon and single out . . . features of one experience which are logically best” (1910, pg. 113). For Dewey, habits are the core of the learning experience, so much so that schools should be “institutions of embodied habits” (1922, pg. 108).

The process of habit development is an integral part of “educative experiences” involving the “transformation of energy into thoughtful action, through assimilation of meanings from the background of past experiences” (1934, p. 60). Dewey describes reflective thinking as essential to growth, in which

“present facts suggest other facts (or truths) in such a way as to induce belief in the latter upon the ground or warrant of the former” (1910, pg. 8). This process of learning, knowing, understanding, and habit development occurs when we enter into relation with perceived meanings, through interactions with others and our past experiences. This view of learning/knowing/understanding as relational is echoed by Sidorkin (2002), who discussed the centrality of relating in the learning process, and Stengel (2004) who defined knowing as “response-able” relation; knowledge enables learners to be more able to respond in future experiences (p. 139). The habits developed during learning experiences equip us for future educative encounters.

This process of learning and knowing, the process of learning through relation, can be thought of as a conversation. Gadamer (2000) describes conversations in telling detail, including the vital element of “control” or power within the conversation. Gadamer reminds us that power is neither seized nor shared. Power or control in the conversation emerges from the shared relationship with the subject matter: “To conduct a conversation means to allow oneself to be conducted by the subject matter to which the partners in the dialogue are oriented” (pg. 367). This emergent element of control is one of the elements of what Gadamer calls a true conversation: “. . . the more genuine a conversation is, the less its conduct lies within the will of either partner. Thus, a genuine conversation is never the one that we wanted to conduct” (pg. 383). The mutual interactions within the conversation itself establish the arc of the dialogue and lead to the learning that emerges: “The partners conversing are far less the

leaders of it than the led. No one knows in advance what will ‘come out’ of a conversation” (pg. 383). Gadamer proposes that one of the important ways learning occurs is through these genuine conversations. Meaning may emerge during a true conversation because of a mutual willingness to be “led” by the arc of the conversation. Students and teachers converse about subject matter in order to help each other discover and discern meaning from ideas: both the ideas they shared and the ideas that emerge during the conversational interactions. Instead of always trying to “lead” students toward a certain understanding, as teachers we should be prepared to focus on being a conversational partner engaged with the subject matter, letting the “control” over the conversation come from this mutual engagement. Gadamer directly refuted the idea that conversational partners should actively seek to control or direct the course of a conversation. Passivity, rather than activity, may be a sign of conversational engagement, because “the ability to act theoretically is defined by the fact that in attending to something one is able to forget one’s own purposes” (pg. 124). Engagement in theoretical discussion requires this loss of self-consciousness of our own purposes, which leads Gadamer to conclude that “true participation [is] not something active, but something passive . . . namely being totally involved in and carried away by what one sees.” (pg. 124-125).

Dewey (1938) outlined a similar role for control and power during educative experiences, pointing out that “factors of control that are inherent in the experience” (pg. 8) encourage more educative motivations than external controls. In classroom conversations, the question is not “Who is directing the

conversation – teachers or students?” For Dewey and Gadamer, control emerges from a shared conversation oriented toward and within the context of subject matter. The interactive discussion about the subject matter inherent in relational conversations encourage reflection and change more effectively than either “teacher-led” or “student-led”, externally controlled conversations. This aspect of emergent-control of true conversations should inform how teachers think about their classroom conversations. Conversation and relationship are not mere “teaching techniques” used to engage students and bring them to specific understandings. Orally quizzing students about factual recall may not be an effective way to inspire true conversations. A true conversation is not a trick used to check whether someone was listening or to convince them to agree with you. A true conversation, an educative conversation, involves honest engagement with conversational partners about the subject matter and a willingness to let the shared perspectives and interpretations about the subject matter lead everyone to uncover meaning. These conversations, these social relationships, are at the heart of knowing/learning/understanding. These conversations, these relationships, involve personality, emotion, negotiation, and reflexive thought, and understanding and learning emerges through these social interactions.

Many of our experiences as teachers convince us of this conversational, relational nature of knowing. Learning experiences in our classes don’t often come directly from the “technologies” of our classroom. I never heard a student gasp after reading a copy of one of the black-line masters of worksheets that came with my textbook, or smile in delight at a slide from the supplemental



materials. Meaning emerges during honest encounters: encounters during conversations when we touched on a topic that invited partners into the learning experience. These moments happened when students encountered topics that connected to their lives, or connected elements of their own lives in new ways. These new connections help students form thinking habits that equip students to relate with further new experiences in useful ways. The “technologies” and “teaching tricks” we use to save time, to “cover” content in efficient ways, are useful for reasons other than inspiring students to make meaning. We discover from our first moments in classrooms that learning often emerges out of relating. We might run from that realization at times when the pressure to cover content or seize control of our class overwhelms us, but we acknowledge the centrality of relationships in our classrooms when we search students’ eyes for a connection, and when we wave our arms and raise our voices in attempts to catch students’ attention and draw them in.

Learning often occurs through social interactions, through conversations. Learners engage in conversations with teachers, with each other, and with texts. Educative conversations impact the ways we relate to each other and interpret our own experiences. These interpretations result from our use of intellectual habits, these intellectually efficient patterns of thinking we develop through learning interactions, and our habits may in turn modified by the meanings created. These new learnings and habits impact our next encounters and conversations. Many learning conversations in classrooms involve (or could, or should) involve assessment. The assessment processes we include or fail to

address in our classrooms impact the relational nature of learning. This study focuses on formative assessment processes within classrooms and the implications of these processes within the context of the relational nature of learning.

### **The Construct of Formative Assessment**

Formative assessment is defined by the purpose and use of assessment data. Assessment data is used formatively when it is used during the learning process to help inform teacher and/or student decisions about teaching or learning. Formative uses of assessment data focus on providing and using feedback, while summative uses of assessment data focus on evaluation and grading. Popham (2008) summarizes the definition crafted by the Chief State School Officers (CCSSO): “Formative Assessment is a planned process in which teachers or students use assessment-based evidence to adjust what they’re currently doing” (p. 6). Teachers and/or students using data from assessments to change the process of learning when needed are acts of formative assessment (e.g., a teacher might use feedback from an assessment as a suggestion to continue a conversation in a different direction, a student might use feedback from an assessment as a suggestion to reflect further about a specific issue or debate). Stiggins and Chappuis (2006) describe the distinction between formative and summative assessments by dividing uses of assessment data into two categories: assessment FOR learning, and assessment OF learning (pg. 11). They describe teachers using assessment data as feedback for students as

assessment FOR learning, rather than assessment OF learning, using data to evaluate the quality of learning at the end. Assessment for learning impacts learning as it is happening, and they caution against repeated and frequent summative uses of assessment data, such as grades, which “sum up” learning and may end conversations. Assessment for learning, formative assessment, implies a continuing conversation: assessment only becomes formative when it is used by teachers/and or students to reflect on the learning process. Assessment of learning, summative assessment, implies an “ending” to the learning process: assessment becomes summative when student learning is summarized, most often in the form of an overall grade.

This current dialog about the relationship between formative and summative assessment is mirrored and informed by Dewey’s (1910) warning against over-emphasizing assessment in teaching: “It is fatal to be forever digging up either experiences or plants to see how they are getting along” (pg. 208). Dewey (1922) also anticipated the limitations of excessive summative assessment, that focusing on evaluation and grading can create an atmosphere of “training rather than education” based on “premature mechanization” of classroom interactions (pg. 96). Instead, Dewey recommended what would now be described as formative assessment: “What we need is something which will enable us to interpret, to appraise, the elements of power and weakness, in the light of some larger growth-process in which they have their place” (1910, pg. 9). Dewey identified as vital the teacher’s “skill in diagnosing the state of his [sic]

pupils and in supplying the conditions that will arouse serviceable mental responses” (pg. 201).

This emphasis on the use of data as the defining characteristic of formative assessment may be one of the obstacles during formative assessment discussions: to someone operating with a summative assessment script, the only associations with the term “assessment” relate to summative uses of data. Simply sharing the definition and supporting research behind formative assessment may not help teachers think/talk about formative assessment in useful ways. An example of formative assessment that teachers see as realistic and useful may help broaden assessment conversations. Perhaps one specific example of formative assessment could “push back” against the summative assessment script to make room for other ideas about how assessment data can be used in formative ways.

**Single Diagnostic Items.** Ciafalo and Wylie (2006) describe a formative assessment technique called “Single Diagnostic Items” that may be a useful example to use during formative assessment discussions. Single Diagnostic Items are designed to focus on one important concept and “diagnose” student misconceptions about that concept. Ciafalo and Wylie define these items as “single, multiple choice questions connected to a specific content standard or objective. They have one or more answer choices that are incorrect but related to common student misconceptions regarding that standard or objective” d(pg. 4). These items are designed so that each incorrect response indicates a specific

misconception about the concept, so that student responses identify specific misconceptions. Ciafalo and Wylie provide the following example of a simple Single Diagnostic Item (pg. 4):

“Question: Write two thousand sixty-seven as a number

A. 267

B. 2067

C. 200067

D. 2000607”

A student’s response to this item provides information about whether or not she or he understands how to answer problems like these. If the student answers incorrectly, the incorrect response provides information about what misconception the student might be using, and this information can be used by the teacher or student to quickly correct the misconception. A student who answers “C” tries to solve the problem by first writing the entire number 2000, then adding the second number, 67. Similarly, a student who answers “D” also tries to first write the entire number 2000, then writes the entire number 60 and then adds the last number, 7. A student who answers “A” doesn’t understand how to use zeroes as placeholders.

The explanation above describes how Single Diagnostic Items can help diagnose student misconceptions. These items are designed to be given to an entire class of students at once (via overhead/LCD projector, white board, etc.) Students all respond simultaneously by holding up a card indicating their answers, using a “clicker” response system, or responding in some other way.

These responses provide immediate data about understandings and misconceptions. The technique becomes formative when teachers or students use the data during the learning process. Ciafalo and Wylie (2006) briefly discuss how a teacher might use these data as a baseline at the beginning of a lesson to determine what to focus on during instruction, or to check on student understanding at the mid point of a lesson to determine what to re-emphasize. Other formative uses of the data are also possible: teachers might use the data to sort students into discussion groups, each group tasked with analyzing their responses and re-thinking the solutions. These meta-cognitive reflections could help students correct their own misconceptions as well as deepen their understanding of why the correct answer is “right.” Students can also use these data in formative ways: Teachers could provide a “key” for students that explains which misconception corresponds with each incorrect answer. Students could then self-assess their own understanding and/or misconception and reflect on what further practice they need in order to better learn the concept. This self-assessment and reflection could help prepare students to be more independent in their learning in the future and communicates the message that assessment data can be used by students, rather than exclusively by teachers (and exclusively for grading purposes!)

This emphasis on formative uses of data from the diagnostic items allows the traditional form and guidelines for multiple choice items to be “loosened in several interesting ways.” (Ciafalo and Wylie, 2006, pg. 5). This “loosening” exemplifies an opening up of the dominant summative assessment script for

multiple choice items. Traditional rules for multiple choice items include ensuring that the stem asks a single discrete question, the answer choices are parallel in structure and similar in length, and that there is one and only one correct answer (Thorndike & Hagen, 1977). However, these guidelines assume a summative context for data use. Since data from multiple choice items are typically used summatively to evaluate and grade students teachers need to ensure that there are multiple items assessing the same body of knowledge and that these multiple items can be read fairly quickly. Since multiple items have to be used in order to obtain an accurate “average score”, the items have to be relatively short and quickly readable. Each item must have only one correct answer since the items will need to be scored and the data used in overall averages. It is difficult to design traditional, summative multiple choice items for nuanced or very complex concepts because of the limitation that the “right” answer must be summarized by only one of the choices.

But when the context is changed from summative to formative uses of data, the context changes. Since the data will be used by teachers and students to inform changes in the learning process rather than evaluate and summarize learning through a grade, some of the traditional rules for writing the items no longer apply. Consider the item below:

Which of the following is an animal?

- A. Cow
- B. Tree
- C. Human

- D. Shark
- E. Mushroom
- F. Worm
- G. Snail
- H. Bacterium” (William, 2006)

This item violates several traditional item multiple choice item writing “rules.” Eight possible answers would normally be considered far too many, since students would be required to retain the stem of the question while reading through the long list of answers. Also, there are several possible correct answers to this item. In fact, the correct answers outnumber the incorrect, and at least one answer (bacterium) may even require discussion or clarification before it is determined to be correct or incorrect. These limitations would complicate the use of data from this item as part of a summative process.

These “violations” limit the ability of the item to be used in a summative way, but enhance its ability to generate useful formative assessment data. Consider the information a teacher could glean from this item: If a student chooses “A. Cow” as the only correct answer, what can we diagnose about that student’s thinking about the category of “animal?” The student’s mental concept of animal may only include mammals and exclude humans from the category. Each option, correct and incorrect, can reveal important details about the ways in which students are thinking about this important categorization. Teachers could use this item and student responses to start discussions between students with different conceptions about what is included in the category of “animal.” Students



who include different answers in the animal category might be able to lead each other toward greater inclusiveness, gradually moving toward a mutual, technically correct understanding. The aspects of the item that limit its summative utility enhance its effectiveness to provide formative feedback about student thinking.

### **Single Diagnostic Item Pilot Study**

In order to better understand and discuss the single diagnostic item formative assessment technique, I will describe an example of how it was applied in a classroom. Educational psychology is littered with intriguing ideas that, according to perceptions of teachers, never quite work in actual classrooms (Rust, 2009). As enamored as I was with the idea of single diagnostic items after reading about them, I was also determined to try them in an actual classroom. I asked an instructor of an introductory psychology class at a local small liberal arts college for permission to work with one of her classes. After obtaining permission from the college's IRB, I spoke with the instructor about what key concept might be useful to design an item around. We eventually choose the topic of "working memory." The text for the course did not cover this topic thoroughly and the instructor had not yet discussed this topic with the class.

After introducing myself and explaining the goals of the research project with the class, I asked them to fill out a form designed to gather information about their current conceptions of working memory (see Appendix A). Then I asked the class to participate in a working memory demonstration: They closed their eyes and mentally counted the number of windows in their house. After they finished

this task, I asked them to close their eyes again and asked them to “count the number of words in the sentence I just said.” After they finished this task, I asked them to raise their hands if they had to use their fingers to count when I asked them about the number of windows in their house (none of the students raised their hands). Then I asked how many used their fingers to count the number of words in the sentence (almost all the students raised their hands). Then I projected a formative diagnostic item on the screen:

Why do most people have to use their fingers when they count the words in the sentence, but they don't when they count the windows?

A) Windows are visual, and visual things are easy to process.

B) Most people are visual learners.

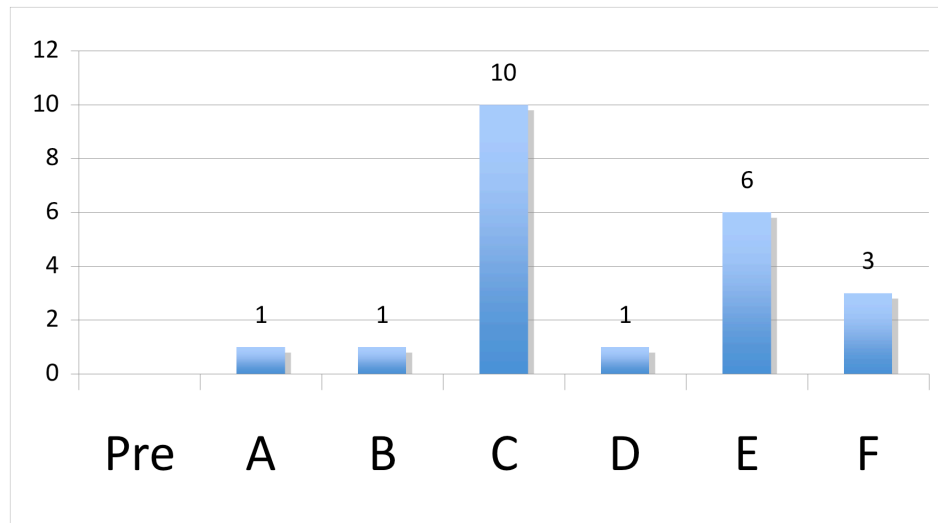
C) The windows are in long term memory, but the words are in short term memory.

D) Familiarity - I'm more familiar with my windows than I am the words in that sentence, so that task is harder.

E) I can picture the windows but I can't picture the words, and that has something to do with it.

F) Working memory must process words and pictures differently.

Students then indicated their response to this item (using their cell phones and the website Poll Everywhere: <http://www.polleverywhere.com/>). We briefly discussed the diversity of their responses:

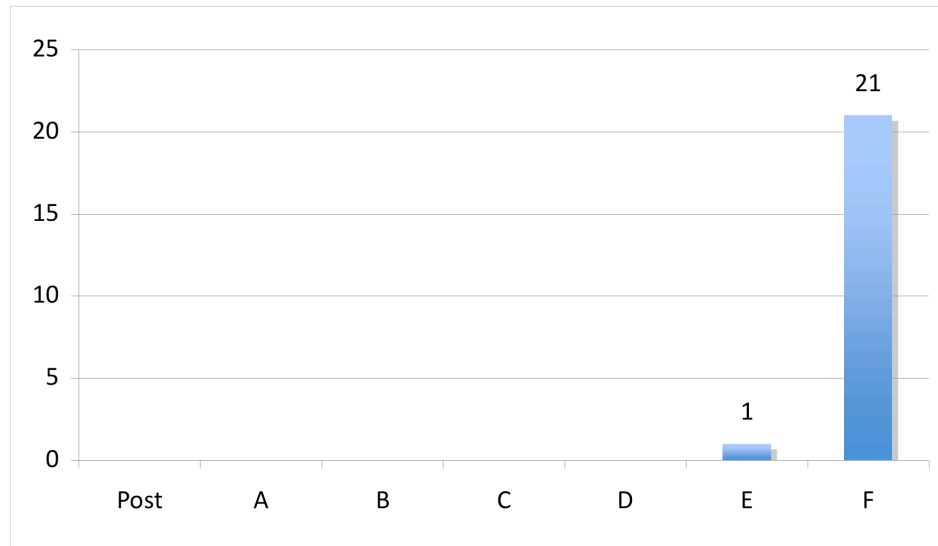


Students pointed out that at least one student in the class chose each of the possible responses. We discussed the frequency of the different responses : most students chose answer C (“The windows are in long term memory, but the words are in short term memory”) or answer E (“I can picture the windows but I can't picture the words, and that has something to do with it”). We briefly discussed this diversity of responses and concluded that the data indicate that the class doesn't yet have a common explanation for why the word counting task required almost everyone to count on their fingers and the windows counting task did not.

Then I explained the origin of the task they were asked to do: Baddeley (1974) used this and several similar tasks to demonstrate that working memory (then called short-term memory) was not the simple, temporary storage it was previously conceived to be. This kind of memory task demonstrates that not all information is treated equally in working memory. Baddeley established that working memory is actually an active system that deals with different kinds of information in different ways. To complete the “counting the windows” task, first

working memory has to categorize the incoming information and figure out what needs to be done with it. Baddeley calls this aspect of working memory the “central executive.” The central executive determines that the windows need to be pictured and then counted. Baddeley calls the aspect of working memory that handles images (e.g. picturing the windows) the “visuo-spatial sketchpad” and the aspect that handles words and numbers the “phonological loop.” In the counting windows task, the central executive can “tell” the visuo-spatial sketchpad to “look” at the windows and the phonological loop to count them. But when faced with the “count the number of words in the sentence I just said” task, the central executive encounters a problem. The phonological loop has to repeat the words in the sentence, but the visuo-spatial sketchpad can’t count, so most people have to use their fingers to complete the task.

After explaining Baddeley’s research and terminology to the class, I asked students to again complete their answer to the writing prompt “In a few sentences, please briefly describe working memory (aka short term memory).” Then I asked them to again use their cell phones to vote on the correct answer to the diagnostic item:

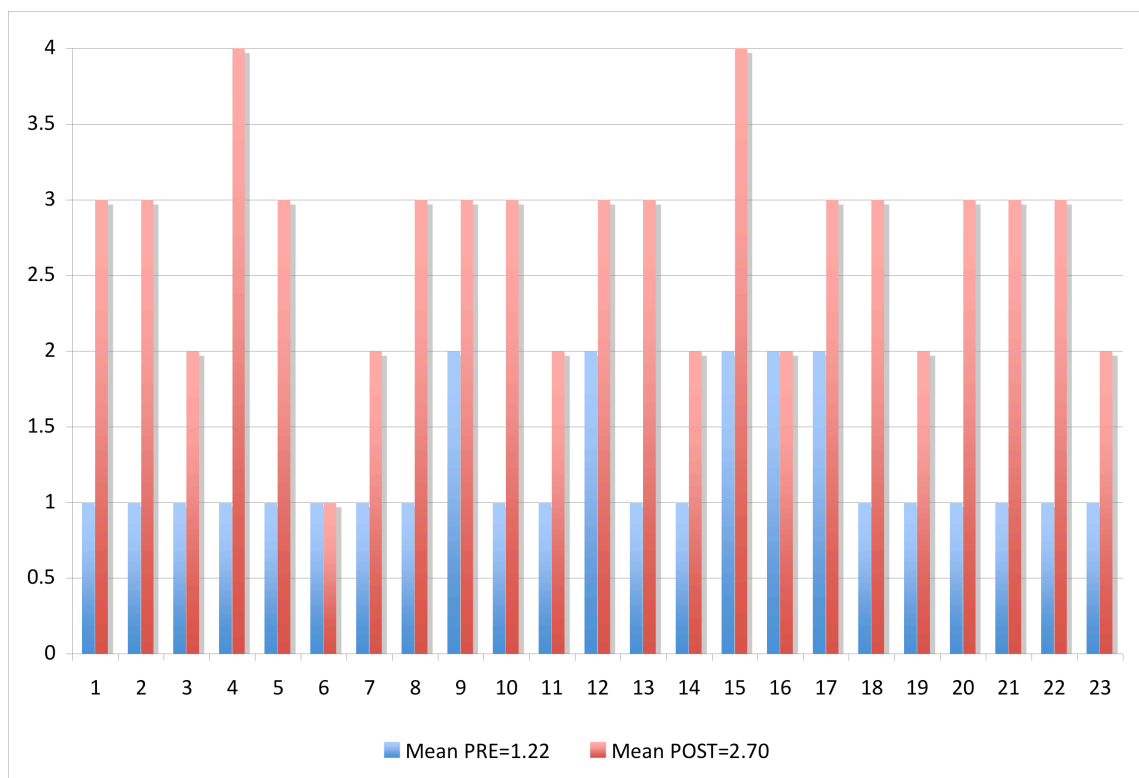


The class discussed these data and agreed that the memory demonstration and explanation changed their conceptions and knowledge of the nature of working memory. Almost everyone in the class agreed in the end that answer F “working memory must process words and pictures differently” was the most correct answer. We discussed the two previous most common answers (C and E) and the class was able to describe in what ways those responses were correct and incorrect. I re-explained a bit about the purpose of this study with the class, answered the few questions they asked, and the class period came to an end.

Later I analyzed the students’ written responses to look for other evidence of changes in understanding of the working memory concept. I created a short rubric to use to score students’ pre and post writing responses:

1	2	3	4
Response <b>does not refer or attempt to define</b> any component of working memory: Central Executive, Phonological Loop, Visuo-spatial sketchpad	Response <b>refers to/attempts to describe ONE OR TWO</b> of the three components of working memory: Central Executive, Phonological Loop, Visuo-spatial sketchpad	Response <b>refers to/attempts to describe ALL</b> three components of working memory: Central Executive, Phonological Loop, Visuo-spatial sketchpad	Response <b>lists and correctly describes</b> all three components of working memory: Central Executive, Phonological Loop, Visuo-spatial sketchpad

Each student response was scored by me and a colleague who did not know which responses were “pre” and which were “post.” These scoring data also indicate changes in the understanding of the working memory concept:



All the samples of student writing showed progress according to the rubric except for the responses of participant #6. The writing data support the data from the formative diagnostic item and the conclusion that the memory demonstration and explanation helped students in this class better understand the concept of working memory.

This small pilot study provides evidence that hints at the potential effectiveness of formative diagnostic items in providing data that teachers and students can use for formative purposes. But do teachers have “room” to use the items and the data formatively in their classrooms? An examination of the classroom contexts of several teachers might help answer this question about the roles formative diagnostic items might play in classrooms, how teachers make room for both the items and, more importantly, formative uses of assessment data from the items.

The purpose of this study is to examine how teachers “make room” for formative uses of assessment data and document associated changes in assessment scripts. During the pilot study, the formative diagnostic item about working memory used in the introductory psychology class worked effectively to establish that student understandings about the nature of working memory changed as a result of the demonstration and explanation. These same data could have been used for several other formative purposes: I could have regrouped students into discussion groups based on their responses and asked groups to process the rationale behind their answers. Heterogeneous discussion groups might be useful, each student discussing their different answer with the

goal of the group moving toward a consensus conclusion. I could have used the two most common answers and used classroom demonstrations that focused on those misconceptions directly. All these possible formative uses of the assessment data share a common characteristic: data from this one item are used to focus specifically on student misunderstandings about this important concept. This focus on the misconceptions these students demonstrate address student thinking actively and directly. The assessment data could inform instructional choices by the teacher and metacognition by the students.

Data from the diagnostic item in this pilot study could conceivably have also been used in a summative way. Student responses could be scored and assigned points for relative “correctness.” This kind of data use best fits the summative assessment scripts of teachers and students, but the summative use of data in many ways precludes and prevents the important formative uses. Ciafolo and Wylie (2006) point out that the reliability and validity issues differ sharply between formative and summative data uses: “reliability becomes less of an issue because of the nature of the usage of the item. The teacher is not using the item to develop a score or grade from students’ responses but rather to gain clearer insight into their thinking.” The validity of a formative diagnostic item depends on how useful the data are for students and teachers as they about conceptions/misconceptions and acting on this feedback.



## **Chapter 3**

### **Research Methods**

The single diagnostic item pilot study described in Chapter 2: Literature Review emphasized for me that the most important question teachers need to ask about classroom assessment is: how will the data be used? Teachers and students most commonly operate under a summative assessment script (Ayala, 2008). It is often assumed that assessment data will be used to evaluate and grade student learning. When conversations about assessment begin with phrases like “How many points is it worth?” or “Will this be on the test?” there isn’t much room for formative assessment data use or thinking. The ubiquitous context of grades and other summative processes overshadows other possible uses of assessment data. My overarching goal in this study was to work with teachers to “make room” for formative processes in conversations about assessment and their classroom assessment experiences. The discussions inherent in this process of making room for formative assessment and the immediate, formative uses of these data may help encourage formative assessment thinking in the context of dominant summative assessment scripts.

### **Methodology**

This goal can be usefully explored through an multiple case study design (Stake, 2005). The three aspects of this methodology align well with this research: First, case studies can be useful ways to explore decision making in

context. Second, instrumental case studies can help provide insight into a specific issue and can lead toward generalization. Finally, multiple case studies enable an analysis across several contexts allowing for triangulation.

The purpose of this study was to examine how teachers make room for formative assessment process in their classrooms and document how the process of working on formative assessment practices changes summative assessment scripts. Yin (2003) describes the overall goal of case study research as the detailed description of a set of decisions made within specific contexts, with attention paid to why decisions were made, how they were implemented, and with what results. This intention matches the goals of the proposed study well: The study explored how teachers made decisions about assessment data use, how they implemented these formative data uses, and with what results.

Stake (2005) differentiates between intrinsic and instrumental case studies. Intrinsic case studies are used when researchers are most interested in a better understanding of a particular case or set of cases. Stake contrasts intrinsic case studies with instrumental case studies, which examine cases “to provide insight into an issue ... The case facilitates our understanding of something else” (pg. 445). This study seeks to explore how teachers make room for and implement formative uses of assessment data. The focus of the study is on this issue of formative assessment processes rather than primarily on the cases themselves, and is in this sense instrumental rather than intrinsic.

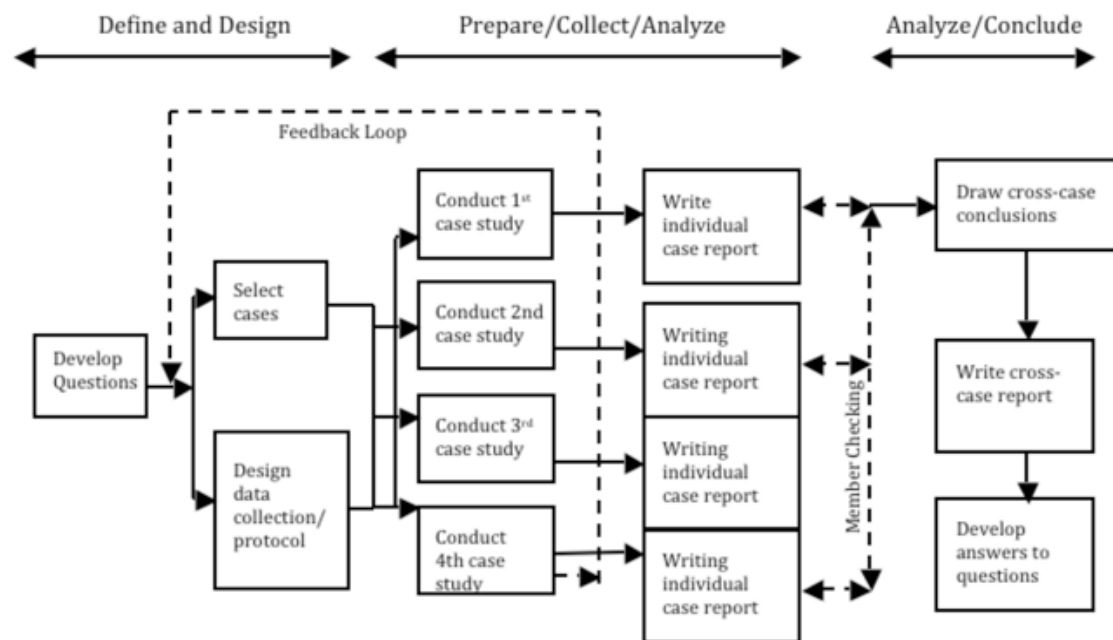
Finally, this study will use multiple cases rather than a single case. Stake (2005) advises that multiple cases be used when “it is believed that

understanding them will lead to better understanding, and perhaps better theorizing, about a still larger collection of cases” (pg. 446). The focus of this study was to gain insight into how teachers might be able to make room for formative uses of assessment data, and therefore an examination of multiple cases could lead to greater understanding of how this process might work across different classrooms. Yin (2003) extends this argument through “replication logic” (pg. 47). In the past, some researchers treated multiple case studies in the context of “sampling,” that is, multiple cases were seen in a similar way as multiple respondents to a survey. Yin argues that a better analogy is “to consider multiple cases as one would consider multiple experiments – that is, to follow a ‘replication’ logic” (pg. 47). Yin isn’t claiming that replication serves the identical purpose in a multiple case study as it does in traditional a quantitative, experimental methodology. Rather, this “replication logic” is a better rationale for the use of multiple cases because of the researcher’s intention behind the choice to use more than one case. Researchers choose multiple case study designs over single case study designs in order to check tentative conclusions based on each case, in a similar way that other researchers replicate studies in order to check conclusions drawn from initial studies. This study used multiple cases for a similar reason: the ways in which each teacher made room for formative assessment data were examined in order to better understand decisions other teachers might make in other contexts about how to use assessment data in formative ways.

## Research design

Refer to figure 1 below for a visual representation of the research design.

Figure 1: Research design



Adapted from Yin, Robert (2003) *Case Study Research: Design and Methods* Sage: Thousand Oaks, CA pg. 50

The design begins with the research questions for the study:

1. How do teachers make room for formative assessment processes in their classrooms?
2. How do the assessment scripts of students and teachers change as they make room for formative assessment?

Then cases were selected (see sections below for descriptions of each step in the research design) and data collection procedures initiated. Data was collected in each case study, and initial data analysis informed revisions in the data

collection process (this iterative process is represented by the dashed “feedback loop” in figure 1). Individual case reports were written, then used to develop a cross case analysis (chapter 8). This cross-case analysis was be used to explore and reflect on the research questions.

### **Case selection**

This study began with volunteer teachers purposefully chosen based three criteria: willingness of building principals to invite teachers in their building to participate in the project, willingness to allow me access to their classroom, and diverse content areas/school settings. This diversity of experiences served to help ensure that participating teachers represent “a purposive sample, building in variety and acknowledging opportunities for intensive study” (Stake, 2005).

After receiving Institutional Review Board approval for the project, I received permission from the school district to contact all building principals to explain the research and request access to teachers. Seven building principals responded to this initial request: one high school, two middle school, and four elementary principals. Each of these principals suggested names of teachers they felt I should contact about possible participation. I contacted the eight teachers suggested by principals and six teachers responded: two middle school and 4 elementary school teachers. The six teachers chosen for the study offered the opportunity to work in a diverse set of classrooms, serving students from different demographic groups across several academic subjects: four of the teachers taught at buildings serving mostly students who participated in the

free/reduced lunch program, two of the teachers primarily worked with students who participated in special education services, one teacher self-identified as primarily a math teacher, one teacher identified as primarily a writing teacher, and two teachers worked mostly with students who were identified as English language learners. The six teachers worked with students ranging from pre-school age through sixth grade. I met with these six teachers over four months during the second semester of the 2011-2012 school year. Toward the end of the data collection process (see next section), two of the teachers decided that the completing parent consent/permission forms would not be possible in their classroom contexts. These forms were required in order to be able to collect observation data with students, so I did not collect or use data from those classrooms in this study. Case studies for the other four teachers are included in this dissertation.

### **Data collection**

Data was collected from teacher participants using interviews, direct observation notes, physical artifacts, and participant-observation notes. The participant-observation process is especially well-suited to this project: Yin (2003) describes the role of the participant-observer as participating in “a variety of roles within the case study situation and may actually participate in the events being studied” (pg. 94). During this process of working with teachers to discover how to make “room” for formative assessment processes, I was able to participate in the decision making process with suggestions and feedback. This process involved

collaboration and discussion before, during, and after the feedback experiences we planned for their students. I sent participant-observation notes to teachers after classroom observations and we discussed these notes during interviews, using them to plan and make changes to the feedback experiences.

Part of each of the early conversations with these teachers involved an explanation and example of a single diagnostic item. I believed that this concrete example of a formative assessment technique might help start our discussions about how to make room for the formative assessment process and that teachers could use a single diagnostic item as a first formative assessment technique and then move on to other formative processes. I quickly discovered during the early interviews with each teacher that my presumption about using single diagnostic items in each classroom was unrealistic and not necessary. As I talked with each teacher about the formative assessment process, the teachers quickly moved towards developing their own unique applications of the formative assessment process for their unique classrooms. My original idea of using single diagnostic items as a “common” method to start our conversations did not develop as I anticipated. I thought teachers might need a concrete example of the formative assessment process. Instead, the teachers involved in this study enthusiastically embraced the idea of formative assessment processes and moved past the need for concrete examples, developing their own original, effective applications of the idea.

## **Data Analysis**

The interviews, direct and participant observation notes, and physical artifacts were gathered and stored electronically for analysis. Data were stored in the form of audio and text files. Merriam (2009) summarizes the overall purpose of qualitative analysis in a case study as a process of organizing the qualitative data to make the case ready to use: "Information is edited, redundancies are sorted out, parts are fit together, and the case record is organized for ready access" (pg. 203).

In this qualitative project, this analysis process involved what Merriam (2009) calls "category construction" (pg. 178). First, I read through all the data for each case, then reviewed the data again and developed "open codes" (short phrases marking initial thoughts about concepts or categories of meaning). I grouped these open codes into categories that were meaningful within the context of each case. Merriam (2009) refers to this process as axial or analytical coding (pg. 180). During this process, I grouped codes based on interpretation and reflections about intent and meaning of the participants. I chose these overall (axial) codes based on three criteria: relevance for the research questions (does the code help address the focus of the study?), exhaustiveness (the codes should represent the entire data set), and conceptual congruency (codes at the same "level" should represent similar levels of abstraction) (Merriam, 2009, pgs. 185-186). The open and axial codes for each case were developed independently and were unique to each case. Codes did not cross or carry over to different cases. Each case was analyzed independently, and I waited to begin the cross case analysis only after all the cases were analyzed and written.



### **Individual case reports**

The codes described above were used to start the process of developing case reports. Yin (2003) describes the process of analyzing a set of coded qualitative data for the purpose of developing case reports, and suggests that the case reports should “rely on theoretical propositions” in order to transform coded data into a case report. (pg. 130). The theoretical proposition (which in this study is examination of how teachers make room for formative classroom assessment processes) was used to organize codes and data into a coherent report about individual cases. Yin suggests that the following criteria be used during this analytic step (pgs. 160-162):

- Attend to all the evidence: The analysis must include all the available evidence, including an indication that all relevant evidence was sought for a specific case.
- Address rival interpretations: In developing the case report, acknowledge and discuss other possible interpretations while arriving at the interpretation used in the final case report.
- Focus on the most significant aspect of the case: Use a central focus, issue, or theme when analyzing the data for the case report.
- Use prior knowledge: Identify and use your “lens” as a researcher, and explain how your position and knowledge influences your case report.

These case reports were based on a triangulation process across the multiple sources of data within each case. Looking across many different data sources is a strength and requirement of the case study method (Yin, 2003). In this study, examining teacher discussions about formative uses of assessment data (interviews, participant-observation notes) and teacher-student conversations (direct observations) and written communications between teachers and students (physical artifacts) provides the opportunity to develop rich descriptions of how teachers make room for formative assessment and how assessment scripts change during the process. These conclusions were shared with teacher participants in a “member checking” process (Merriam, 2009): teacher participants reviewed and suggested revisions for the individual case reports (see Appendix A – Member Checking, Teacher Feedback on Case Reports). Three of the teachers sent written feedback and changes were made in the case reports based on their suggestions.

### **Cross case analysis**

The cross case analysis focused on the “big picture” emerging from the individual cases regarding decisions about formative assessment use and assessment script change. Stake (2005) recommends that multiple case study designs be used in order to “investigate a phenomenon, population, or general condition” (pg. 445). In this study the phenomena focused on in the cross case report was: how teachers “made room” for the formative assessment process, and how assessment scripts of students and teacher changed. This cross case

analysis aligns with Yin's (2003) advice to consider multiple cases within a "replication" context: each of the cases served to "test" conclusions about the research questions, building to a more complete and rich description of how teachers make decisions about how to make room for formative assessment processes and how assessment scripts change as these decisions are made and implemented.

## **Chapter 4**

### **Case 1: Sofia**

Sofia (all teacher and student names used are pseudonyms) is an experienced sixth grade middle school reading/math/social studies teacher who is teaching her final year before retiring (after 35 years teaching middle school). Sofia's classroom radiates organization and focus: The large calendar covering one entire wall that lists the goals for each day of this month. The carts holding class sets of textbooks, neatly lined up and facing out for student use. The practical (but not new looking) stool at the front of the classroom where she usually sits behind a (also not new) music stand with her notes for the day. Paper dodecahedron student-made sculptures hang from the marker trays on both white boards in the front and back of the room. Opposite her stool and music stand is a small table with a document camera and LCD projector aimed at the front screen. Sofia is also focused-looking: thin and energetic, always moving around her classroom toward the next goal or plan. When we meet for our interviews, I invariably walk in on Sofia fixing something in her classroom, cleaning, or otherwise getting ready for another task with students.

Sofia was the first teacher I met with about participating in this study, and the last. She was the first to volunteer for the project, and I got to meet with her at the end of the year after the last day of school (her last day in the building before she officially retired). I worked with Sofia extensively during our semester together (see Appendix B - Summary of Data Collection by Case): Seven hour-

long interviews, four classroom observations, and four student interviews. Sofia was interested and engaged from the beginning of our work together. Our conversations weren't about "convincing" each other of the value of feedback. Rather, we talked about the "how-to" of the process (possibly jumping to some "solutions" before we were ready to). Her class moves quickly from topic to topic, and our work together was similar: We moved quickly into plans for implementing feedback use in her classroom, and after that plan was done we moved on to our next best idea. Three main issues emerged from our work together: Did the feedback "work?" What "big ideas" we were after? What was the role and nature of trust between teachers and students (and students and students) in the feedback use process? In this chapter, I will briefly describe the process of the work Sofia and I did together, then discuss how these three main issues developed during the course of that work, and then reflect on these themes in the context of relational learning.

### **The Process**

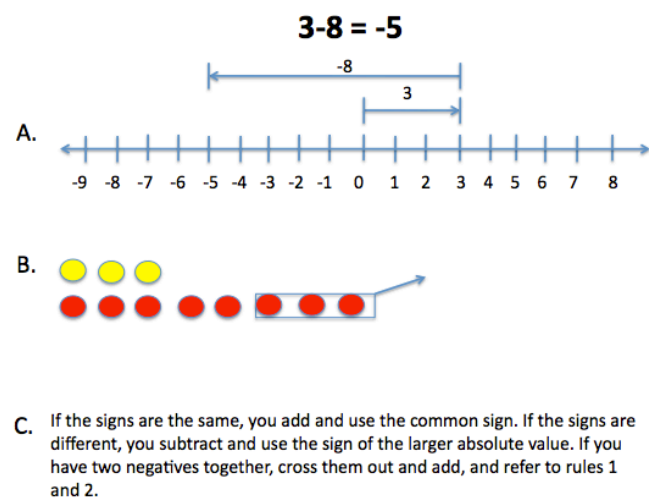
When I described the Single Diagnostic Item (SDI) technique to Sofia, she was immediately interested in the possibilities. We moved quickly into planning a class observation during which we would use an SDI to get feedback about student thinking. Sofia knew that her students would soon be tackling subtracting integers and her classes struggled with this process in the past, so we decided to try to develop and use a subtraction of integers SDI. Sofia began with the three methods the student textbook suggests for solving these kinds of problems:

using a number line, using positive (red) and negative (yellow) plastic “counters”, and using the “rules”:

1. If the signs are the same, you add and use the common sign.
2. If the signs are different, you subtract and use the sign of the larger absolute value
3. If you have two negatives together, cross them out and add, and refer to rules 1 and 2

Sofia and I thought that we could use an SDI to help students discover which of these methods helped students find the correct answer on different kinds of integer subtraction problems. We thought that if students self-identified as “belonging” to one of these three groups, it might help increase their self-confidence and ability to solve integer subtraction problems. I developed three items like the item below (Figure 1) to help students identify which problem solving method worked best for them.

*Figure 1. Subtracting Integers SDI*



Students held up cards with “A” “B” or “C” on them to identify which of the three options they felt worked best when solving the problem. Sofia and I regrouped the students based on this feedback and asked two more, similar subtracting integer problems and students shared whether or not they used the same option or a different one. Only a few students “regrouped” themselves on these subsequent problems.

Sofia later asked the class to solve a set of integer subtraction problems and to show how they reasoned toward their answers. When we looked at the results we noticed that students generally did not use the options they identified with earlier. Most students used the “rules,” and different groups of students tended to make similar mistakes. We changed our plan at this point and developed specific feedback for each kind of mistake groups of students were making (see Appendix C - Specific Integer Subtraction Feedback). After dividing the students into groups based on the kinds of mistakes they made, we asked them to read the specific feedback designed for their group. Then we asked the students to complete a few integer subtraction problems, and then explain how they used the feedback while solving the problems.

When Sofia and I discussed these feedback attempts, she decided that they were beneficial overall. Sofia listened in on some of the group discussion about the feedback, and she heard several encouraging examples of students using the feedback in their conversations. After looking at the sample problems students solved at the end of the activity, Sofia identified four students who still seemed to be struggling with the concept of subtracting integers. She

recommended that I talk with these students individually to try to figure out what kind of feedback might be most useful for them. I met with each student for 20-30 minutes, asking them about their understanding of the concept, showing them the sample items they completed, providing some specific feedback, and then asking them to talk through their reasoning while they solved an integer subtraction problem.

Toward the end of the semester, Sofia and I decided to try to use SDIs to gather information about how students were thinking about a different mathematical process. She was concerned about how students were thinking about concepts of proportion. Students would soon be asked to convert between percentages, fractions, and decimals, and Sofia was interested in how they thought about these different representations of proportion. We designed a series of SDIs about these different representations and asked students to answer them (first individually, then discussing their answers with a group and revising their reasoning and answers – see Appendix D Proportion Single Diagnostic Items). Students wrote about why they changed their answers to the items and briefly discussed some examples of why they “changed their mind” in class. Sofia and I reviewed the students’ writing, and talked with her class the next day about the general trends we uncovered .

Our process ended with a final interview. I repeated the questions I asked Sofia during our first interview, and she expanded on her initial answers. Then we talked about how our thinking changed during our work together. I shared some of the themes that I thought were emerging from our interviews and Sofia



helped me develop those ideas. After writing that section of the dissertation, I shared it with Sofia and she provided some feedback (see Appendix A: Member Checking, Teacher Feedback on Case Reports). Sofia provided general feedback about the benefits she perceived from our work together, but did not suggest specific revisions to this case summary.

### **Did the feedback “work?”**

This question about the impact of the feedback and feedback use was ever-present during each of my conversations with students and Sofia. Sofia was focused on the impact of our feedback work on student learning, as measured by the sample problems she provided (and later summative tests). This focus on tangible results is foreshadowed in our first discussion together. During that first interview, Sofia described her multiple methods of providing feedback to students: commenting directly on student papers, providing oral feedback, student nonverbal responses in class (e.g. thumbs up, thumbs down), and student marks (e.g. percentage correct on homework assignments). Sofia used each of these methods to help students move closer to the goal of understanding. Sofia is driven to help students succeed and success is defined as students moving toward a well-defined learning goal. This results-focused philosophy set the tone for our feedback work: at each step we evaluated the “success” of our attempt to provide use-able feedback and immediately moved on to the next possible “solution.”

One manifestation of our results-oriented focus occurred when we examined the results of the first integer subtraction SDI. Our goal was to use these SDIs to help students self-identify into groups based on which of the three methods were more comfortable for them. After that classroom observation, we noticed that a few students switched groups from one method to another. For example, some students started in the number line group for the first SDI, but then moved to the rule group for the second and third. We interpreted this movement as students finding a group that better matched their preferred method of solving these kinds of problems, and that the overall migration toward the rule group indicated that students needed to learn this method for solving the problems because it seemed to be most applicable to most integer subtraction problems. Our results-orientation may have caused us to not consider other possible interpretations of this first SDI activity. We didn't ask students to explain their thinking as they used the method they began with, or why they moved. We assumed that all three methods were equal in "value," that it didn't matter which method students used as long as they got to the goal (answering the item correctly). It is possible that each method could be a valuable window into student thinking. What would it mean if a student could follow the "rule" method, but did not understand how to use the number line? The counter method seemed to confuse most students (and at first it confused Sofia and I). Does that confusion indicate a lack of value for the method, or does it uncover an important gap in conceptual understanding? Summarizing this point: in order to "get" integer subtraction, do students need to only be able to solve a problem, so

should they be able to look at the problem through the cognitive lenses of the three different methods? Is the right answer or the thinking toward the right answer more important?

This overall theme of whether or not feedback “works” also surfaced during interviews with Sofia’s students. During the three interviews, each student mentioned learning “tricks” that eventually helped them complete the items correctly. Because of their struggle in Sofia’s class, these students received extra math help in a separate setting (a resource room). The students mentioned learning in these from the resource teachers how to “box” the numbers, which involves drawing an actual box around the number, looking at the positive or negative sign, and using that to determine whether or not to add or subtract the numbers from each other. Each student reported that this technique helped them get to the right answer, but they talked about the technique differently. One of the students (Jane) talked about the technique as a step-by-step “recipe:” “Box the numbers, then change all the subtraction signs to positive signs and add them.” This technique helped Jane write down a correct answer, but her responses to other integer subtraction items indicated that she didn’t understand why the technique worked. Another student (Greg) talked about this technique conceptually: “Box the numbers... you have to subtract them because the signs are different.” Greg understood the utility behind boxing the numbers in order to look at the positive and negative signs, and his reasoning on the other sample integer subtraction items showed similar reflection. After interviewing the students, I heard from two other middle school math teachers about an “easy

method” for teaching the concept: The “Stay, Flip, Flop” method. Students are told to “stay” the first number (don’t change it), then “flip” the subtraction symbol to addition, then “flop” the sign of the second integer. This technique always produces correct answers. When I shared this trick with Sofia, we were impressed with the ingenuity, but we wondered about the relationship between “knowing” that trick and understanding how to subtract integers? If a student uses this trick to write down a correct answer, should we conclude that teaching this technique “worked,” or do we need to know more about student thinking? This discussion motivated us to use formative assessment processes later to explore student thinking, rather than focusing on their ability to solve problems correctly.

Our emphasis on student use of feedback highlights an important aspect about how we might answer the central question “Did the feedback work?” If the only criteria for “working” is students answering more items correctly on a quiz, then providing students with specific feedback may be much less efficient than focusing on tricks that will help students get to the right answer. But if the goal is to help students understand the processes conceptually, feedback about their thinking may be essential. After we worked with integer subtraction, Sofia suggested we use SDIs to investigate student thinking about proportion. She knew students would soon be required to convert between fractions, percentages, and decimals on the state-wide math test, and she wanted to learn how her students thought about these different representations of proportion. We developed a series of SDIs and reflection questions about proportion (see

Appendix D Proportion Single Diagnostic Items) and included both pictorial and numerical representations of proportion. We asked the students to answer each item, discuss their answers with their group, then revise their answers if the discussion led their thinking toward different answers. Students wrote about their thinking if they changed their answers, and these reflections sometimes revealed details about what Sofia started calling students' "math thinking." One student answered the first proportion item (a pictorial representation of 25% using shaded boxes) incorrectly, explaining her thinking by saying "The number of boxes were the same in the choices I made... the ones shaded were the same number." After discussing the item with her group, she revised her answer (correctly) and explained: "I didn't think to reduce and now I see that they all have  $\frac{1}{4}$  in common. The group discussion made a lot of sense." Another student also answered incorrectly at first, saying "I am looking at the pictures and some of them look similar." After discussing with his group, he changed his answers, explaining "I figured out you have to simplify all of them."

These detailed reflections based on feedback from peers were not the typical responses in class, however. Many students changed their answers on the first proportion item, but most did not explain their thinking nearly as completely. Most students reported that they changed "because my group talked about it," or "I feel strongly about my answers" and other responses that didn't reveal their thinking about the math processes. Some students also reported that they tired of the process of answering items, discussing them with their group, and writing about their thinking.

Sofia and I looked at the student responses to the proportion items, and she decided she wanted to discuss the process with the class, so the next day when I came back to observe, Sofia talked with her class about the importance of “math thinking.” She began the discussion by talking about their homework, a process all her students are very familiar with. She chose a few students to explain their answers to selected homework problems, and then to talk through how they solved the problems. As one student was explaining his answer, Greg (one of the students I interviewed earlier in the semester) spontaneously said “ooh! I know what I did wrong!” and was very excited to explain his new thinking. Sofia used this discussion as a way to talk about the proportion SDIs we spent time on the day before. We talked with the class about each item, emphasizing how many students changed their answers after the group discussion and why. A few students expressed revelations during this discussion. We heard: “Oh! You just have to simplify D!” and “Just because three people in your group have one answer and you are the only one with the other answer, you may be right.” One student concluded: “What happens lots of times is we eyeball the problem instead of taking the time to really think about each answer.” Sofia closed the discussion by emphasizing the need for math thinking: “Sometimes if you just learn the rules, you really don’t understand the basic concept. Sometimes we go clear back to a model - we should understand on a basic level what the concept is, and then go on to do the math.”

I wonder now about our focus on the question “did the feedback work.” This question was the focus of most of the work Sofia and I did, but our thinking

about what success meant evolved during our semester together. The early focus on the direct outcome of the feedback (solving more items correctly on a quiz, etc.) evolved into an emphasis on reflection and process. At the end of my experience in her classroom, I got to hear Sofia talk passionately with her students about the importance of “math thinking.” Her class talked about the difficulties they experienced when trying to write about their thinking while puzzling through math challenges, and why it might be important to practice this kind of reflection instead of just spend their time solving problems. At the end of our semester together, we answered the question “Did the feedback work?” question very differently than we did at the beginning. We moved beyond the idea that feedback “works” if students get more items correct on a quiz. We came to see the value of the feedback beyond its instrumental, means-to-an-end, value. Student use of feedback became more valuable beyond a “cause-effect” orientation. Sofia became interested in how students thought about solving math problems rather than just getting to the punchline and solving them. Attempts to help students use feedback helped us see the goal as reflection rather than conclusion.

### **The Big Ideas**

One of the premises of the SDI process is to start with the “big ideas” in a unit of instruction. In their original article about SDIs, Cifolo and Wylie (2006) suggest that teachers work together to define crucial understandings or skills students need to progress toward a defined learning goal or academic standard.

Other authors (Popham, 2008) describe this process as a learning progression or a learning trajectory. This model of learning assumes that teachers can use their experience to describe discrete steps student work through as they progress toward a learning goal. The role of an SDI in this model is to diagnose student misunderstandings at crucial steps in the learning progression, and teachers and students can use this diagnosis to change student misconceptions.

Sofia and I started from this orientation: Sofia was interested in working with me because she was interested in SDIs and encouraging students to use feedback about their conceptions and misconceptions about mathematical processes. During our initial integer subtraction work, we looked to the textbook to try to understand the different ways students solved integer subtraction problems and we wrote SDIs to diagnose which of these methods students were most comfortable using. Our experience with student use of this feedback complicates the learning progression model implied in the textbook. Students followed the directions and grouped themselves according to one of the three integer subtraction methods. But as we talked with students in these groups and looked at their later math work, the lines between the three methods blurred. Some students who reported being most comfortable with the number line method used it only to confirm the thinking they accomplished using the “rule” method. Other students struggled to use the method they reported preferring (usually the “counter” method). When students tried to use the “diagnostic” feedback provided by the early integer subtraction SDIs, what we discovered together was that the boundaries we predicted between ways of thinking about



subtracting integers interfered with the overall big idea of how positive and negative integers relate to one another and the subtraction process. My interviews with students support this conclusion. None of the three students talked about choosing a “method” when they dive into an integer subtraction problem. As they described how they thought through each problem, I heard them dealing with the problem conceptually, figuring out what they needed to do. Each student thought through the problems differently: Emily dove right into the subtraction process (“You take away 3 from 8 and you get 5”), while Greg first addressed the signs of the numbers (“3 is positive and -8 is negative”). The third student, Nadia, jumped to the end of the problem and reasoned her way back through the process (“I think the answer is 5. 3 subtract 8 would be 5”). Each student brings their own individualized progression to the learning situation, and the three methods Sofia and I chose to offer to the students in some ways supposed that they were all starting from “step 1” of a learning progression. Our experiences suggest that feedback that doesn’t become enmeshed with the reasoning students are already bringing to bear on a problem is feedback that will be difficult or impossible for students to use.

Another aspect of the learning progression model entered our discussion as we continued to work with the students over time: the “stickiness” or permanence of the assumed learning progression. Sofia became concerned with whether or not students were truly understanding the processes and whether they could repeat what they supposedly learned if asked later or in a different ways. The required learning goals (as expressed through district Math

Standards) are ambitious and comprehensive, requiring that teachers and students move from topic to topic at a fast clip. Sofia felt anxious that students were acquiring some skills only temporarily: “I thought, oh my golly, if this ever comes around again it will be a disaster.” Were the assumed learning progressions helping students acquire lasting skills? This thought returned at the end of our experience as we asked students to write about their “math thinking” regarding different expressions of proportion. Some students were frustrated by the request to write about their reflections. They wondered why finding the right answer wasn’t enough, why they “couldn’t just do them in our head.” Sofia’s emphasis on student thinking may have been an effort to help students express their lasting understandings rather than only their current ability to find the right answers.

A separate, outside pressure in Sofia’s classroom significantly influenced how the “big ideas” were chosen and communicated. Sofia’s students were required to take the statewide math achievement test, and the inevitability of this test influenced how big ideas about math skills discussed and thought about. Often the goals or purpose of learning the math skills were defined by this end assessment. As students talked about “math thinking” after their experiences with the proportion SDI items, students talked about individual proportion items they remembered from the state math test. Sofia agreed that this was an emphasis on the assessment: “We think on the NeSA math test that there are model problems - sometimes that’s harder than just doing the math.” This conversation immediately followed an involved discussion about the importance of being able

to think about the math processes, for students to be able to express why they are solving the problem in a specific way. The importance of this reflective math thinking is reduced to just a few items on the statewide test. Other assessments influenced the conversation as well. When answering questions about why the subtracting integer skill is important, students and Sofia often referred to testing outcomes. An important reason to learn how to subtract integers was because there would be integer subtraction problems on the unit test, or to “stay out of functional math” (a separate class for students who need extra math help). As I observed Sofia’s class, I saw and heard moments of revelation from students. There was excitement and eagerness when they discovered a new way to think about math. These expressions came spontaneously, not in response to a request for feedback. We heard “Oh! You just have to simplify!” and “There’s a decimal and we didn’t check that one!” These moments of insight contrast with the test-centric message of “you need to know how to do it because it will be on the test.”

## **Trust**

During our first interview, Sofia discussed the need for trust in the context of students using feedback. She described her efforts early in the year to emphasize trust, specifically to convince students that feedback is useful. Sofia said most students enter her classroom with the preconception that feedback is necessarily negative because it indicates you aren’t skilled. She believed that the ways her students have been graded contributed to this attitude: “Historically, the

grade is at the top. It takes convincing. Students who struggle the most need the most convincing about using feedback.” Sofia talked about actively working to create an atmosphere in her classroom in which feedback wasn’t seen as negative. I wasn’t able to observe these efforts (my work with Sofia started second semester), but I saw the results of her efforts.

My most uncomfortable moments during observations in Sofia’s classroom involved a lack of student anonymity. The first time I observed Sofia’s classroom, individual students were solving math problems publicly (writing on their own papers which were projected on the screen at the front of the room). The students were all focused and very quiet, watching the work progress on the screen. Students interrupted the work when they saw a mistake, letting the student doing the work know if a step was skipped or done incorrectly. As soon as a mistake was made, Sofia called on another student to step up and finish the work the previous student started. During discussions about homework problems, Sofia asked students to raise their hands if they got some of the items wrong (and the students did!). I cringed whenever students were interrupted or personally identified as making a mistake, but this seemed to be a norm in Sofia’s classroom, and something she made “OK” through her work early in the year. My experience as a teacher and my comfort level with students publicly acknowledging mistakes caused me to cringe, but Sofia’s students didn’t seem to share my discomfort. I didn’t observe any instances of student reluctance to speak in class or offer their ideas. In fact, most students seemed eager to offer their answers, and I didn’t sense resentment or disappointment when their

answers were deemed wrong. While I can't know that this is true of every student, my observations indicate that the trust Sofia established with her students helped them receive feedback without becoming discouraged.

Greg, one of the students I later interviewed, exemplified this level of trust during our integer subtraction lesson. After students used the feedback we gave them in their groups, they went back to their normal seating arrangement to work on a page of practice problems Sofia gave them. Most students finished the problems fairly quickly, but Greg was still working after the other students finished. Sofia noticed and told Greg to keep working while the rest of the class moved on to a different discussion. I noticed this and cringed, wondering if Greg felt singled out and if he would be discouraged. I started to write him a personal note after class to let him know that I admired his determination, but I stopped because the class was moving on to a different topic, and I didn't want to interrupt. I commented on this episode to Greg during our later interview, and he clearly remembered that moment, but not with the apprehension I felt at the time. He said that he was really struggling with subtracting integers at first, but after that episode he went to an "extra math class" (the functional math class) and he understands it much better now. During the interview Greg explained his reasoning in detail as we worked through the integer subtraction items, and he now seemed comfortable with the concept.

The experience of another student in the class raises a separate trust issue. Sofia and I talked about the struggles of one student, Sabirah, early during our interviews. It was obvious that Sabirah struggled to understand integer

subtraction, and Sofia shared some of her experiences with me: She said that Sabirah has “other challenges” and was concerned that “she would never get it.” When we placed students in groups based on common mistakes they made while solving integer subtraction problems, Sabirah was placed in several different groups, meaning that her errors were erratic and multiple. Sofia shared that she and the other sixth grade teachers stopped placing Sabirah in the supplemental “functional math” class because it didn’t seem to help. Sabirah’s basic number sense was very different from other students’: Sofia asked her individually “Would you rather I gave you \$10 or \$4?” and Sabirah replied “\$4.” I wonder now about the sense of trust Sabirah experienced in Sofia’s classroom. I observed Sabirah consistently trying during class. She didn’t seem reluctant or discouraged. I wonder what kind of feedback we should have provided to Sabirah. She wasn’t able to use the feedback provided for her in useful ways: after trying to use the feedback, she was still unable to think through the integer subtraction problems. She needed feedback about other, earlier mathematics processes, but nothing Sofia or the resource teachers tried worked. Did Sabirah trust that we were giving her the feedback she needed? Should she have trusted us?

Toward the end of our work together, Sofia said that one of the changes she observed in her class as a result of our feedback work related to trust. Sofia felt that more students reached what she called the “it’s OK if I don’t understand” stage. She felt that our feedback processes sent the message that they can learn these math procedures if they try, and if they use feedback provided. She

thought for some students that the emphasis changed from “being good or bad at it” toward more confidence that they can learn. She said one of her students told her “I can be in control of this – I’m just hung up on one little part.” Even when our feedback wasn’t as useable by the students (such as the feedback about which subtraction integer method they preferred), some students heard and used the “meta-message” that Sofia wanted to give them feedback, not a just an evaluative summary judgment about their ability.

### **Thinking about Feedback Use with Sofia**

My semester with Sofia was busy, exciting, worrying, and inspiring. Each of our meetings was focused on what we wanted to try next, and Sofia never seemed to tire or become discouraged. I often left the class observations a bit worried about whether or not we’d accomplished what we set out to do, but the next time we met Sofia would share the progress she saw students making. All our conversations revolved around students, usually specific students, and how we could do better. Our conversations about the issues of “did it work”, the “big ideas,” and trust cause me to reflect on issues about the nature of learning and how these issues might relate to and inform some of the topics Sofia and I discussed.

By the end of the semester, Sofia had redefined what she meant by success in the classroom. Early in the semester the question of “Did it work?” was defined by the number of items students could answer correctly. At the end of the semester, the question was defined by something very different: what

Sofia called “math thinking.” Sofia talked passionately with students about the importance of being able to express their thinking about math processes. This orientation is very different from the more direct, dichotomic thinking at the beginning of the semester about getting math problems right or wrong. The evolution in perspective reflects an increased attention on process, on the thinking and reflection students go through while solving math problems. The nature of the teaching task moves away from a focus on sorting students into groups based on current ability (which we focused on in our first SDI attempt, which sorted students into groups based on which method they preferred to use on the integer subtraction problems). It moves toward a focus on how students think about the problems, how they use what they know to understand what is being asked and how to reach an answer they understand (which was the focus of the later proportion reflection questions). This shift in thinking mirrors a move from what Biesta (2007) calls a “sender-receiver” theory of learning, in which teachers send information to students, who receive and use the information. It is a deficit model: students are missing something, either skills or information, and when they receive it, they have “learned.”

Our attempts to help students use and think about feedback led us away from this model, toward a model closer to what Dewey (1934) described as an “educative experience.” To Dewey, learning involves a “constant reorganizing or reconstruction of experience” (1934, pg. 76). Learning to subtract integers is not merely a process of hearing a teacher describe a trick and then repeating the trick successfully. Understanding how to subtract integers involves bringing what



you already know toward the problem, using that knowledge during a reflective “long period of gestation” (1934, pg. 60), and assimilating a new understanding based on this experience. Sofia’s emphasis at the end of our experience was on students’ abilities to describe their new understanding. As we asked students to use feedback, we discovered together that students were seldom asked to express their “math thinking,” their newly revised reflections about processes based on learning experiences. Most of Sofia’s students didn’t feel skilled at expressing these understandings: some resisted, asking why they couldn’t just solve the problems instead of writing about how they thought about them. But that was no longer the entire goal. Merely solving repeated problems correctly no longer defined success for Sofia. In a classroom focused on students being able to use feedback, understanding necessarily involves attention to the process, and reflection about feedback and revised thinking when needed. By the end of our work, we answered the question “Did it work?” very differently.

This change in the scope and nature of the goal also caused us to reflect on our predictions about how students went through these processes. Our SDI efforts during the semester reveal that we started with definite preconceptions about the “learning progressions” involved: the steps students “needed” to go through in order to learn each math process. Our first foray into feedback demonstrates our presumptions: using the textbook, we developed an SDI to sort students into their preferred method of solving integer subtraction problems. We didn’t examine them at the time, but this choice is based on several assumptions: that we knew the three methods students should use, that these methods are

distinct and separate, that students could and should use primarily one method, and that if students knew which method they preferred, they would be able to employ it on any example of integer subtraction. Even though we were working together on a formative assessment project, our assumptions may have grown out of what Ayala (2008) calls the “summative assessment script.” Summative assessment scripts, a cognitive framing of assessment as right/wrong evaluation data, may have influenced how we planned these initial SDI learning experiences. As we started planning how to teach students to subtract integers, our persistent summative assessment scripts led us toward a rote, de-individualized, de-contextualized step by step method of getting from the beginning (not knowing how to solve the problems) to the end (solving problems correctly). The message to students from these integer subtraction SDIs was: there are three ways to solve these problems, you should fit into one of the three “camps,” and you should stay there, using that method primarily to solve the problem.

The big idea we discovered together later in the semester attends to the productive learning space Biesta (2004) described as “the gap” (pg. 12). This shared space created between teacher and learner during a learning experience is where meaning making occurs. The textbook we relied on when developing the integer subtraction SDIs assumed that the process for learning integer subtraction, the process in this “gap,” consisted of the three possible methods. This assumed “learning progression” for integer subtraction led us to the process we chose. As we discussed that SDI experience, we noted that students who had

placed themselves in each method “group” were using the methods in unanticipated ways. Students used one method to find an answer, then relied on a different method to explain or confirm their answers. Some students used the methods in unanticipated, helpful, and even spontaneous ways: some students in the “counter” group developed their own methods of using the red and yellow chips to tackle integer subtraction problems. Our assumptions about the methods, the learning progression, for integer subtraction led us to use the SDI technique to provide feedback that students used in unanticipated ways. In describing her own case study work with a teacher, Macintyre Latta (2001) says: “This advance thinking appears to engage her in finding resources, materials, and background information that will support many possibilities and be a springboard to unanticipated ones. In this way, students and teachers do not know exactly what learning outcomes may arise” (pg. 23-24). The spontaneous uses students developed for the integer subtraction methods demonstrate the reflection processes taking place in Biesta’s “gap.” Later in the semester, Sofia and I didn’t assume the “big idea” learning progressions. Instead we listened to students (through their writing and in discussion) and developed feedback based on their thinking. Learning to attend to student processes during learning experiences helped Sofia and I provide feedback that was more attuned and attentive to student thinking processes.

Finally, our experiences confirmed and deepened our convictions that trust is a crucial variable as students learn to use feedback. During our first conversation, Sofia emphasized the importance of trust in her classroom: “This

year has been an easy one for that. This class has some academic challenges, but they are willing to be open to each other, and this openness compliments their academics.” Sofia used feedback at the beginning of the year to reinforce a sense of trust in her classroom. She got students accustomed to receiving feedback on their work and encourages them to talk about their mistakes. By the time I met the class, they were comfortable talking through their thinking in front of the whole class, even when they received feedback about mistakes.

My comfort level didn’t match theirs at that time. In my observation notes, I documented my discomfort and “cringing” when students were publically corrected and when students were identified as making mistakes by name. Why did I cringe? Was my emotional reaction influenced by the summative assessment script? My experiences as a student and a teacher have not led me yet to the level of trust that I saw in Sofia’s classroom. In my experiences, mistakes were something to be experienced in private, between the teacher or student and myself, because the goal of feedback was to determine whether something was right or wrong, not to uncover something meaningful about a thinking process. When I was teaching, I made sure to keep student mistakes as private as possible. Mistakes weren’t made visible, and they certainly weren’t honored as useful windows into thinking processes. Sofia worked with her class to make sure her students trusted that these public “mistakes” were valued as ways to grow academically. Students didn’t cringe as I did because they trusted that Sofia and the other students would use what they said in formative rather than summative ways. The mistakes were listened to and used to help further

thinking rather than evaluate the worth of the learner. Later in the semester, Sofia reported that this trust related to feedback use developed further. She reported that her students seemed more open to using feedback, and she attributed this change to our work together.

Noddings (2007) described this change process during a discussion of what she calls “confirmation.” She defines confirmation as “an act of affirming and encouraging the best in others” (pg. 229). Confirmation is one of the components to caring student-teacher relationships, and I observed it in Sofia’s classroom. Sofia’s early efforts at providing students feedback were efforts to affirm their efforts and encouraging potentially productive change. She wanted students to see (and feel) that making mistakes, visibly, was a way to receive affirming and helpful feedback, rather than a punitive event. Trust in her classroom is an important precondition for confirmation, as Noddings says: “Trust is required for the carer to be credible and also to sustain the search for an acceptable motive” (pg. 229-230). Some of Sofia’s students learned gradually over the year that she was a credible carer in their classroom. She responded to their work with care, offering feedback that affirmed their work and offered a way forward, rather than simply judged their current understanding. As Sofia and I became more open about the goals of learning math and how students progressed toward understanding, our feedback became more useable. These students learned they could not only trust Sofia to provide useful feedback. They could trust their own thinking, their own use and reflection about the feedback they received.

## **Chapter 5**

### **Case 2: Lily**

Lily doesn't teach in an actual school building. Her elementary school is being remodeled, so the staff and students spent the year in a temporary location. It is a large space in a strip mall. The flag flies out front and welcoming signs greet visitors at the door, who enter through a narrow hallway facing the parking lot. This hallway leads to a large open area that does double duty as a cafeteria and physical education space. Lily's classroom is at the end of a long hallway made up of temporary walls that do not reach the tall, open, ceiling filled with heating and air conditioning ducts. Student work seems to spill out from each classroom: student drawings and writing are posted by each classroom door creating a collage of words and pictures on the bare drywall. The atmosphere is lively and noisy, the sound from each classroom going up and over all the temporary walls.

Lily teaches in a preschool program at this elementary school. This program is designed for students participating in the English language learner program and other students who may need a "running start" at kindergarten. During our time together, her class of 18 students included only three students for whom English was the most commonly used language in their homes. A large poster outside her classroom door displayed pictures of each student, along with one of their current creations. I watched these artifacts of her students' work change during our semester together. Early in the semester, line drawings were

displayed by each student's name and smiling picture. Then cut out shapes began to appear, followed by hand written attempts at their own names. Lily made sure to display examples of her work, such as a drawing of a tree, proudly next to her name and smiling picture. I noticed that Lily's picture and work appeared alphabetically in the midst of her students' work, rather than at the top, bottom, or "set apart" in any way.

Lily's desk sat outside her classroom. She shared a space with another teacher, and their workspace was always packed to the top with papers, plastic bins of art supplies, and desks with tiny spaces reserved for their white laptop computers. Our interviews were usually scheduled at the end of her day, and when I arrived she and the other teacher in this shared space were usually simultaneously writing documentation about events of the day, calling parents, arranging supplies, and checking email. They were invariably tired, slumped down in their chairs, but smiling and talkative. Lily was always dressed for active work: Hair pulled back with comfortable shorts and a shirt. She often wore her "utility" belt around her waist: a nail apron from a hardware store repurposed to hold art supplies, stickers, and the small laminated signs Lily used to communicate with some of the students as they learned more English.

Lily's classroom reminded me immediately of an art classroom. Low tables were arranged near the door, surrounded with enough small chairs for all the students. Opposite the door was an open space with a soft rug. This area was defined by a white board on one wall and two walls of windows on the other two sides. Students spent most of their time on this rug, working with each other or

(usually at the beginning of an activity) talking as a group with Lily. On the day of our first interview, Lily showed me around her classroom and then we went to the library to talk because it was the only reliably quiet area in this temporary school.

Two main issues emerged from my work with Lily: the influence of her perceptions of freedom/autonomy in her classroom, and the culture of community she strived to establish and maintain. In this chapter, I will describe the process of our work together, then discuss how these two main issues developed during our work. I will end the chapter by discussing these main issues in the context of formative assessment processes and changes to our summative assessment scripts.

### **The Process**

During our first interview, Lily said “My job is all feedback...Feedback IS the classroom.” Lily said she was dedicated to making her classroom a place where students provide feedback to each other, and this dedication deepened during our semester together. Lily said that, as teachers, we are “always in the students’ space”, by which she meant that students are constant, careful observers. Teacher behaviors and comments are always either intentional or unintentional feedback, which is why Lily believes “You have to be a total professional in those rooms.” Lily demonstrated her dedication to her conceptualization of professionalism through her work with her 18 preschool students.



At first, our conversations about feedback in her classroom focused on specific parts of the student day. Lily believes that students interact most often during their time outside and specific parts of the day set aside for their own work. Feedback is “infused throughout the day,” but there are specific small group work times in which students may receive the most feedback. We talked about opportunities to work together on how to encourage students to use feedback. Lily was about to start a series of activities related to physical movement, and she wanted help thinking through how to incorporate feedback into those lessons. We decided to help students use feedback from peers while they learn to strike a moving ball with a racquet.

Our discussion about this process involved “learning progressions.” Lily wondered if physical education teachers might know specific steps involved in this striking skill that would help our planning. Later, I spoke with an expert in physical education instruction and gathered some research specific to the striking skill. Lily and I looked through these materials and noted that they indicated an early important step: being able to move the hand to maintain balance in a still object. After talking and thinking about the learning progression for the striking skill, Lily decided her students would start by learning an early step in the learning progression: balancing a balloon on their hand. We wanted to set up a context in which students would provide feedback for each other about how to improve this skill. Together we agreed on three pieces of feedback we thought might be useful for students to provide for each other: “eyes on the balloon,” “flat hand,” and “still body.” Lily often uses laminated signs for her students (such as

“share” or “listen”) since many are still learning English (these signs are an important tool in her “utility belt,” and are attached to a one of the retractable key rings she wears for quick access). She decided to model the feedback process and then help students provide and use feedback. She modeled the process for her students, asking a volunteer student to give her feedback as she tried to balance her balloon. When the student held up one of the three laminated signs as Lily balanced the balloon, Lily asked all the other students to read the sign out loud, then Lily modified her behavior according to the advice on the sign. After this modeling, the students each received miniature, “kid sized” laminated signs with the three messages, and they worked on balloon balancing in small groups. This was a lively and undeniably cute lesson, and I observed students in each group using feedback from peers as they practiced. One or two students in each group had the opportunity to try to balance the balloon, and in each case they used the feedback from their peers (delivered via the laminated signs) to change their balancing efforts.

After this experience, Lily and I talked about the impact of the student use of feedback. She liked the reactions she saw in the groups as the volunteer students from each group used feedback from peers. We wondered together whether students could provide and use feedback related to a more open-ended task. Could students generate their own feedback for each other rather than just using the prepared signs as they did during the balloon-balancing activity? Lily decided to incorporate student use of feedback during a common activity in her class: figure drawing. Lily made “feedback buddy” necklaces: pictures of each

student hung on yarn, and each student received one of the necklaces for their assigned buddy. Feedback buddies sat by each other as they drew, and Lily encouraged them to give each other feedback about their drawings. This was a challenge for many of the groups: I observed several buddy pairs sitting silently until prompted by Lily with specific instructions about what to comment on about their buddy's drawing. Lily and I talked about what we heard and saw as students tried (or were reluctant to) give feedback to each other, and we concluded that students might have felt uncomfortable commenting on the drawings of other students since they'd never been asked to do that before.

Toward the end of our work together, Lily and I decided to go one step further: Could we observe spontaneous examples of students providing and using feedback that other students could use without teacher direction, reminders, or "hints?" Lily videotaped groups of her students doing another common activity in her classroom: putting together jigsaw puzzles. We decided that we would both independently watch these videos and write notes about examples of feedback we observed, then compare notes. During our note comparison discussion, we identified many examples of verbal and non-verbal feedback, and multiple contexts in which students used feedback from others. This analysis and discussion occurred close to the end of the academic year, and Lily and I met one final time to talk about our semester together. I asked again the questions from our first interview, and Lily and I discussed her initial answers in the context of our work together. Lily talked about some discoveries and revelations coming from our work. I shared some of the themes I thought were

developing as I read and listened to our interviews, and Lily helped me develop those ideas.

### **Freedom and Autonomy**

One of the themes that emerged during our work was the relationship between feedback, student feedback use, and Lily's sense of freedom and autonomy in her classroom. I arrived early for one of our interviews and met Lily as she brought her students in from outside. There is a small greenspace outside Lily's temporary school, and her class uses it for recess as often as they can. During our interview, Lily talked about this "outside time" and said it is her favorite time of the day: "The kids are so much more free." I asked her to explain, and she talked about the non-scheduled, non-planned student interactions she observes outside. Students crouching down to watch ants crawl into the manicured lawn, and students who don't speak up much in the classroom run from group to group, talking away. Lily values the spontaneous feedback students get from each other outside. She mentions in three interviews a specific hallmark of feedback she wants to eventually see from her students: If a classmate falls down or gets a scrape or needs help for some other reason, she wants to see other students helping them up and comforting them. Lily describes the importance of this goal: "Kids have moms. They need teachers." Lily doesn't want to be the sole or principle source of comfort and help in her classroom. She wants to encourage feedback in her classroom not primarily for the purpose of comfort, or self-esteem. The goal is for students to develop into citizens of their

classroom and school, citizens who offer feedback and help to others when needed.

Lily's goal is for students to become more autonomous learners, able to provide useable feedback for themselves and others, and during our discussions Lily realizes that this autonomy includes (and may depend on) students' ability to give and use feedback. This goal doesn't appear on her official district curriculum guides or standards/objectives documents for this preschool program. Lily talks about the discontinuity between the official goals described in those documents and the goals she discovered through her work with students. Her focus on student autonomy "is not what my bosses ask me to focus on. Not what my families are asking me to focus on." She suspects her practices differ from some other preschool teachers in that she focuses on goals, like autonomy, that may seem less concrete to teachers and parents. Her goals are more open-ended, more focused on student thinking, and she gathers information with her students in a different way: "Presenting open ended tasks for students is hard... I don't have a single worksheet ... we're not supposed to have any worksheets in preschool but people do it all the time." These goals developed as she worked with her students. Lily's students also progress toward the more concrete goals expected by administrators and parents (mostly language goals focused on speaking), and she designs activities that allow students to demonstrate this kind of progress, but she is more interested in helping students develop a sense of themselves as autonomous, capable learners.

Our exploration of the relationship between autonomy and feedback started with our first co-created activity. During the balloon-balancing activity, Lily wanted to see if students could provide effective, immediate feedback for each other about a physical task. One of the unexpected outcomes of this activity was the intense focus by some students on the process of giving feedback. Not all students in the small group were equally engaged, but several students became very interested very quickly in providing feedback for their balloon holding peer. Lily told me later that typically when teaching this kind of physical skill she would “do visual feedback about a physical task - usually just modeling and talking.” This was the students’ first experience giving this kind of focused feedback about a physical task. Lily reported: “the idea of the kids giving the feedback is huge.” Students were not just following directions, they were looking at a multistep physical task and choosing on their own what kind of feedback their peer needed next, then watching to see how their peer used the feedback. Lily saw this as an important step toward her goal of student autonomy.

Lily decided she wanted to try using feedback to expand student autonomy in a different way in our next task together. As Lily and I watched the videotape of the balloon holding lesson together, she commented on students who were immediately able to offer feedback to peers and other students who needed more practice at the skill. She was pleased with what she saw and talked about how this idea of students giving each other feedback, and she wondered how students would react if they didn’t have the laminated signs. Could students

choose the feedback they offer their peers instead of having that feedback predetermined?

We discussed the relationship between choice and later autonomy in life: “Preschool is kind of like college: you should be able to learn what you love and follow it.” Lily was interested in her students being autonomous in their choices about what to learn and create as well as offering feedback about peers’ work and choices. We decided to try the drawing activity, in which students choose a “feedback buddy” and draw their best representation of their buddy on cardboard “gingerbread” figures. Feedback buddies sat by each other and were encouraged to comment on their buddy’s drawing as it was being created. Lily modeled this activity for them and then the groups were off and running. During this activity, I again observed some students offering feedback immediately while others hung back. Most students were able to offer complimentary feedback about their buddy’s drawing, but Lily’s prompting was often needed for the feedback to progress beyond compliments. Without the support of the very specific, predetermined feedback (the laminated cards), many students didn’t know what to say to each other about the drawings. The video of this activity documents multiple examples of students eagerly working on their own drawings, sharing their work eagerly with their buddies, and mutual grins and smiles, but not the back-and-forth feedback process that exemplifies autonomous use of feedback.

Lily wondered if some of the limitations we saw in the drawing activity might be due to language barriers. Many of her students were still learning English, and she felt it was possible that they might be able to offer and use

nonverbal feedback. She suggested another common classroom activity as a context to examine non-verbal feedback use: Jigsaw puzzles. Lily videotaped her students working on jigsaw puzzles, and I watched the videos and wrote notes on my observations. Then we met to compare observations. In the videos, we both saw multiple examples of students getting excited about their group's progress on the puzzles, and we heard multiple examples of students using feedback to compliment classmates: "You got it!" "I'm helping him!" "Oh look, it fits!" Less common were comments meant to help classmates figure out their puzzle, or suggestions for changing the group process in order to succeed. Some students identified mistakes ("That doesn't fit"), and some commented on progress made ("We need one more"), but students did not give each other specific feedback on the process of putting the puzzle together, or "hints" about possible locations for pieces or problem solving strategies that could make the group more successful. Lily said she did not observe a connection between lack of feedback and English skills, but age was a major factor: "The younger kids couldn't handle someone else being with them, giving feedback." Lily observed that the older students in the class tried to communicate more often about the puzzles. This desire to communicate manifested itself in the video: several older students clearly tried to help their groups, and lead (or tried to lead) other students toward solutions. They pointed to puzzle pieces, directing other students in the group to try them to see if they fit. They exhibited enthusiasm and confidence, letting the group know that they were doing well or were "getting close." Lily noted that some students in each of the puzzle groups used feedback



to peers, patience, and confidence to try to help the group progress. Some of the same students who did not provide much feedback to their buddy during the figure drawing activity actively were able to provide useable feedback to the puzzle-making group. There may be crucial differences between these tasks and experiences that influence students' abilities (and willingness) to offer and use feedback. The puzzle making activity is familiar to the students and has a clearly defined goal, but few prescriptions about paths toward the goal. Students expected to collaborate in a group to complete the puzzle, and a few of the students spontaneously used feedback to others in order to work toward the goal. The goal in the drawing activity was clear, but the necessity of collaboration was not as inherent. Students worked happily at their own drawings but feedback didn't feel as vital or necessary. Student autonomy as expressed through providing and using feedback is influenced by the nature and expectations of the task.

## **Community**

A second, related theme emerged from our work together. Lily's emphasis on establishing a sense of community in her classroom impacted the feedback activities, and the student behaviors Lily observed during those activities influenced Lily's thinking about her classroom community. Lily spoke in an early interview about the value of community in her classroom. Community building is another example of a classroom goal that may be undervalued by her colleagues: "It takes a while to build at the beginning. Hard to get adults to see

that.” Lily spends this time building the community because she sees it as a necessary context for other goals in her classroom, including feedback. Many of the goals in her pre-school classroom involve social behaviors and she wants students to provide feedback about the social behaviors because “Kids listen to kids better.” Feedback about these social behaviors that impact the classroom community was a common practice in her class, but the idea of students providing feedback about “academic” work was novel: “I use kids to talk to kids all the time about behavior, but not academic work.”

One aspect of community that is especially important in Lily’s classroom is culture. Lily’s students come from all over the world (a dozen countries and 7 languages are represented among her students). Lily knows that culture influences many aspects of her class, including feedback: “Some cultures are more used to giving feedback and we say ‘no talking’ – some kids from some cultures are more prone to give feedback.” She also experiences gender differences in feedback use: “Girls are supposed to be ‘nice’, and giving feedback can be hard.” Lily is an enthusiastic supporter of a professional development effort in her district called “cultural proficiency”: a book and discussion series designed to help adults become more aware of their own and others’ cultures. Lily says: “Cultural proficiency – that will change teachers through reflection about ourselves and our lives. I was forced to do this as a person when I started teaching this class.” Lily’s experience with cultural influences in her classroom helped her become more aware of her cultural experiences and cognitions, and she sees this as a necessary process for all teachers.

Why is culture important in the context of student feedback use?

According to Lily, students are excellent observers and form immediate and definite conclusions about the value of feedback they receive, and feedback may be deemed “inauthentic” because it does not attend to intrapersonal factors, such as culture and relationship. “Kids see relationships better than we do” according to Lily. She points out multiple examples of student interactions in the jigsaw puzzle videos, interactions in which culture and relationships influence students’ willingness to offer or use feedback. Cultural rules and roles developed and influenced the jigsaw puzzle activity. During a discussion of one group’s process, Lily observed “They are all captains!” All the students in this small group were trying to lead. A few students started the task in this group. They made sure the picture on the box of the finished puzzle was always visible to the group and offered multiple suggestions about what to do next. After some time, two students from elsewhere in the classroom left their groups and gravitated toward the “all captain” group and adopted their enthusiasm and group tactics. This growing group was the most vocal and the most enthused about the task. Lily commented on the social skills and confidence exhibited in this group. Feedback influenced and was influenced by student cultures, and students spontaneously used feedback to change or maintain cultures as they worked towards their goals.

**Thinking about Feedback Use with Lily**

The story of my work with Lily during our semester together is a story about growing realizations. Realizations about the ubiquity and centrality of feedback in her classroom, and realizations that what we at first considered to be different aspects of learning are actually intertwined themes in the song of her classroom. Our conversations dove deeper into smaller details regarding how students use feedback in her classroom, but our reflections zoom out to these realizations about how the process of students' use of feedback underlies learning experiences.

During our first interview, Lily said "My job is all feedback." From the beginning of our work together, Lily recognized the ubiquity of feedback in her role as teacher. She was already very aware of her role as a feedback provider: she described providing feedback to "get them to the next level", to "take notes about student behaviors" and use that information to "repeat what students are doing, to say out loud what she is doing as a teacher. Modeling: This is what students need." By the end of our semester together, Lily's thinking about feedback changed focus in an important way. During the first interview, Lily said her job is all feedback (emphasizing her role as feedback provider). During our last interview, Lily said "Now I know kids are using feedback all the time" (emphasizing the student role in feedback use). She discussed feedback as the core of skills she hears other teachers describe as vital: supposed "21<sup>st</sup> century skills" like collaboration, problem-solving, and critical thinking. This change of focus from teacher role to student role is evidenced by the evolution of our work together, moving from very direct, predetermined feedback during the balloon-

holding activity to the transparent, open ended jigsaw puzzle observations.

Student use of feedback became something some students were in control of and did as part of the learning experience, rather than something the teachers planned and executed.

Lily's evolution in thinking is an important aspect of the difference between what Ayala (2008) described as the summative assessment script. This script emphasizes the power of the role of the teacher in the assessment process: teacher as commenter and evaluator. In the context of the summative assessment script, the teacher's role is to carefully plan the gathering of data and use those data to evaluate and summarize progress, rather than use feedback as part of the learning process itself. This is an input-output model, envisioning learning as a product to be created via a planned process. Lily was already moving toward a formative assessment script at the beginning of the semester, as evidenced by her attention to feedback in her class. But Lily's evolution in thinking represents a previously unattended aspect of the difference between formative and summative assessment scripts: the student, rather than the teacher, is at the center of the feedback process. The student is recast as the protagonist in the story of learning. Biesta (2007) discusses a similar recasting in his argument against the medical model of learning: "Being a student is not an illness, just as teaching is not a cure – the most important argument against the idea that education is a causal process lies in the fact that education is not a process of physical interaction but a process of symbolically mediated interaction. If teaching is to have any effect on learning, it is because of the fact

that students interpret and try to make sense of what they are being taught” (pg. 8). Biesta goes on to discuss the role of student use of feedback in the mediated interaction of learning: “We should not think of these interventions as causes but as opportunities for students to respond and, through their response, to learn something from them” (pg. 9). Student response, students thinking about and using feedback, is central to learning, and an exclusive focus on teacher planning and administration of feedback misses this importance focus. This realization matches Lily’s evolution in thinking over our semester together.

Lily was already aware that her classroom goals and her sense of mission as a teacher included affective and cultural elements not shared by her colleagues. Her reluctance to send worksheets home with students and to emphasize autonomy and interrelationships indicate her dedication to creating a classroom based on personal, relational learning. During our work together, we both became more aware of the importance of physicality in her classroom, and how physicality offered a glimpse into the inner lives of her students. This realization began as we watched videos of our co-created lessons. Lily often commented on how students positioned themselves relative to their peers, and how their movements indicated engagement or attempts to engage. We noted how Lily attended to the physical arrangement of her classroom and lessons in order to model and encourage her students to physically encounter each other and tasks. Students were physically brought into and out of learning experiences: During the balloon-balancing activity, she brought a student in front of the class who were all sitting cross legged on the floor. She and the volunteer student

stood face to face, giving each other feedback using the laminated signs Lily created. After this modeling, Lily gathered the students in groups and made sure they stood in circles, proximate to each other, turning their bodies toward the students in the center who were engaged in the balancing task. The feedback students offered each other was focused on physical movement: students giving each other information about the stillness of their hand, the focus of their eyes. Later, during the jigsaw puzzle task, Lily and I noted how students arranged themselves and how these movements implied both their problem solving strategies and their affective involvement with the task and with each other. One large group committed to their shared task by all arranging themselves around the puzzle, even taking turns with different parts of the puzzle without prompting by an adult. Lily described this group as “all captains,” focused on their task but working together. This group decided, without verbalizing it, to place the cover of the jigsaw puzzle in the center so that all group members could see it. One student with very limited English skills demonstrated through his feedback to others (pointing, encouragement through pats on the back, and enthusiasm) that he had several insights about puzzle pieces and the group flowed around him as he moved into different parts of the puzzle. The videos show feedback provided and used by students not predicted by Lily and I during our planning. The physicality of the student work evidences students offering and using feedback via their body postures and movements.

O’Loughlin (1995) encourages us to attend to just this kind of physicality in learning experiences. She says “education must involve a recognition of the

inherent order of human locatedness.” (pg. 5). Too often learning experiences are viewed through an exclusive cognitive lens, instead of a more inclusive view of the physicality of the encounter, and all the interactions inherent in that physicality. Lily’s students explored the physical tasks through verbal interactions and feedback, but also, importantly, through their physical interactions and arrangements. “Education needs to be seen as education in environmental encounter,” O’Loughlin (1995) advises, “That world is to be explored experientially” (pg. 5). The learning experiences Lily crafted for her students would have been significantly altered had she not attended to, and noticed, the feedback students received without any words being spoken at all. In this way, Lily was rebelling against a narrow focus she felt from some teacher colleagues. She knew that some teachers and parents expected her to focus on sets of discrete skills, such as letter recognition and rhyming. It was her choice to include physical tasks as goals in her class, and she was aware that attending to these physical tasks pushed the boundaries of acceptable learning experiences with the other adults. She made this choice for multiple reasons, including a recognition that “open ended tasks can be hard for teachers ... but tasks can have many outcomes.”

Lily’s openmindedness about including physical tasks as goals in her class aligns with Dewey’s (1934) recognition that “the actual world, that in which we live, is a combination of movement and culmination, of breaks and reunions, the experience of a living creature is capable of esthetic quality” (pg. 17). Learning experiences should not be narrowed to specific channels, limited to cognitive or



affective or kinesthetic. They can be a combination of the interaction between the so-called mental and physical. Dewey (1934) proposed an origin for the tendency to limit our focus on the mental rather than the physical in learning experiences: “Oppositions of mind and body, soul and matter, spirit and flesh all have their origin, fundamentally, in fear of what life may bring forth” (pg. 22). Lily risked stepping outside the generally accepted practice of her colleagues through her choice to emphasize the physical in her classroom, and our video observations reveal the inherent physical feedback and use of feedback her students demonstrated during the experiences Lily crafted. The central vision for student autonomy, the “wish” for students that Lily expressed several times during our interviews contains an inherent physical element: Lily wants to see students who risk their physical selves while encountering the world (running outside), and when they experience injury, she wants students to assist each other with physical comfort rather than relying on an adult. This lovely vision of kindness expressed through autonomy is inherently physical, and the videos of student work exemplify the necessity of attending to the physical when reflecting about feedback and the student use of feedback.

## **Chapter 6**

### **Case 3: Alice and Ruby**

Alice and Ruby's students love writing. They talk about (and demonstrate) this accomplishment with pride, because not everyone expects their students to love writing. Alice and Ruby teach second and third grade English Language Learner (ELL) students before they "graduate" out of the ELL to join other students in non-ELL classrooms. They are justifiably proud of the atmosphere of celebration they create in their classroom, and our work together focused on how to help students give and use feedback about their writing.

Alice volunteered to work with me on this dissertation project, but during our second meeting she asked Ruby to join us in our discussions. Alice and Ruby teach in the same classroom. Alice is the team leader for early ELL instruction and Ruby is the classroom teacher, but their students do not differentiate between these job titles. To their students, they are two teachers in the same classroom. Ruby started meeting with us after the second or third time Alice asked her a question about our plans during our interviews. Ruby agreed that it would be easier to all work together, and shortly after that became as involved in the project as any of the teachers who originally signed the consent form. Alice and Ruby teach at a medium sized elementary school with one of the highest rates of participation in the free/reduced lunch program in the city. When I walked into the building for the first time, I noticed differences between the posters by the front door at this building versus other elementary buildings I visit.

In other elementary schools in other parts of the city, the posters usually reference parent meetings or groups like the Girl Scouts or sports opportunities. The posters at Alice and Ruby's school referenced parent meetings with free day care and food for the whole family, and advertisements for homes for sale in the neighborhood. The building is historic and the architecture is impressive: original woodwork on an impressive stairway greets visitors, and original, operating glass transom windows top every door in the building. My immediate impression was that this older building was a busy, lively, well cared for place.

Stairs near the main office lead to Alice and Ruby's classroom. Everything in their classroom is "kid sized": during our interviews we sat at Alice's work table, which is low enough to fit her blue molded plastic child height chairs. A metal bookshelf immediately inside the classroom door holds popsicle sticks at student eye level. Student names are written on the sticks, and as they enter the classroom students put their stick in one of three jars: "I'm feeling great!" "I'm doing OK" or "I'm a little sad." Posters line the walls, most in teacher handwriting, all hung as close to the floor as possible. The center of the room is devoted to an open space. The rug on the floor is large enough for all the students to occupy, and at the front of the open space is another small chair for Alice or Ruby to use as the talk to the whole class. These discussions always involve the large chart paper on the easel next to the small chair. Alice or Ruby will write in impeccable handwriting during the class discussions, documenting ideas and suggestions made by students. During each interview I saw different notes from different discussions displayed on the easel at the front of the group rug.

Alice and Ruby talked about their passion for helping students develop their writing early during our process and our work together focused on this goal. Alice and Ruby wanted to help students develop the skills addressed by the school district developed rubrics, but their interest extended beyond those well-defined goals. They are justifiably proud that their students want to write. Their students will often choose writing during “free choice” times in the classroom, when students can choose any activity they want to work on. They see pride in their students’ eyes when they talk about their writing, and they worry whether this intrinsic motivation will survive past their ELL experiences. Alice and Ruby and I worked to help students talk with each other about their own writing, and to help them listen and use the feedback from their readers.

Two main issues emerged from my work with Alice and Ruby: the reciprocal relationship between their students’ enthusiasm for writing and feedback, and how the formula for judging writing provided by the rubric influenced feedback experiences. In this chapter, I will describe the process of our work together, then discuss examples of these two issues. At the end the chapter I discuss implications of these themes in the context of overall educational goals.

### **The Process**

My first two interviews were with Alice, who originally volunteered to participate in this research. These interviews took place in the school psychologist’s office, along with another volunteer teacher (this second teacher

and I met many times, but she concluded later in the semester that it might be disruptive to her students and students' parents to go through the informed consent process, so I am not including details or summaries of my conversations with this second teacher in this dissertation). After meeting as a group in this office for the first two interviews, Alice and I met together in her classroom. During this third interview, Alice asked her co-teacher, Ruby, to join our discussion. I talked with Ruby about the research and showed her the informed consent form, which she signed and returned. Ruby joined us for all our subsequent interviews.

The dominant topic during our early interviews was student writing rubrics. Alice and Ruby used the writing rubrics provided by the district. They said their students frequently need help understanding the rubrics, so they re-wrote them using language students would understand. They said they wanted to help students see their progress, and imagined a "race track" with "markers along the way" that would help students see their progress. This idea of public displays of progress changed into more personal "markers of progress," as we discussed the potential power of students using a revised rubric to describe their own writing. Alice and Ruby thought it might help if students first examined some "fake paragraphs" we wrote together and used a rubric to provide feedback on these models: "Let's look at kid work and generate some wrong and right paragraphs and have the students look at them and figure out which ones meet a rubric and why." We wrote these paragraphs (see Appendix E – Paragraphs with Mistakes). We discussed how to use these paragraphs and rubrics (see Appendix F –

Student Research Writing Report Rubric) and we scheduled a time for me to come observe the class using this process.

At the beginning of this lesson Ruby sat with the students on the rug and reviewed a paragraph they read the day before. Ruby asked the students to identify what is missing in the paragraph and decide on the “score” the paragraph should get according to the rubric. Most students participated enthusiastically. A few students who sat toward the edge farthest away from the circle were not engaged, and Alice spoke with these students quietly while Ruby talked with the rest of the class. Ruby walked them through a sample paragraph about badgers written by a student volunteer. After specific sentences, Ruby asked, “What did that sentence sound like to you?” Ruby asked the class if the sentence was a topic or supporting sentence and whether it was “dynamic.” Most of the class seemed eager to help in this process, and they offered multiple suggestions about how to make a topic sentence about badgers more exciting: “Badgers live all over the world,” “Badgers are not afraid of nothing.” Ruby encouraged the group to think and talk about what makes sentences more exciting. Ruby and Alice then organized the class into groups and asked each group to look at the three sample paragraphs and offer revision suggestions based on the rubric (see Appendix E – Paragraphs with Mistakes). In the groups I met with and observed, students first focused on “scoring” the sample paragraphs, figuring out which column of the rubric the paragraph best fit. The criteria they used in this decision were the number of supporting sentences (the rubric directs that each paragraph should have at least three supporting sentences) and that the topic sentence

should be “dynamic.” The group I sat with decided that the original topic sentence (“Baboons are interesting looking apes”) was not dynamic enough. Someone in the group proposed the sentence “Some baboons can be crazy” which elicited giggles from the rest of the group. Ruby gathered all the groups back together to discuss their decisions about each paragraph and wrote all the revision suggestions on chart paper.

Then Ruby assigned a partner for each student, and partners read their writing to each other. Each pair had a set of sticky notes, and they were asked to write comments for their partner based on the rubric (focusing on topic sentences, supporting sentences, and making their topic sentences more dynamic). I got to listen to a few groups, and much of the discussion focused on making topic sentences more dynamic and what score their partner’s paragraph might receive. The students I listened to seemed to understand the criteria from the rubric well and they wanted to follow the “rules” of the rubric strictly and get the score “right.”

After this observation, Alice, Ruby, and I met to look at the students’ writing, what feedback they provided on the sticky notes, and how students used the feedback to revise their work. Ruby and Alice saw progress based on this work: “Students were able to spot the problems in their papers and make revisions.” Our conversation moved towards using the same process of peer feedback for a slightly different purpose. Based on past writing samples, they noticed that many students struggle with structuring their writing, creating a “beginning, middle, and end” to their stories: “They get stuck in ‘and then’ mode,

including too many details and not focusing on the important parts.” They decided to design a graphic organizer for students to complete with space for students to fill in their “lead” (beginning), important details, and “satisfying ending.”

I observed Alice and Ruby implementing this idea. Alice led the students through a group process on the rug, showing and talking with them about how she would fill in the graphic organizer for her story. Then she told the story using the graphic organizer. She asked the class for feedback. Several students focused on mechanics in the writing (mostly word choice), and Alice redirected their attention to the details she included in the story. Together they filled a piece of chart paper with suggestions about new or changed details to include in the story. Alice and Ruby then organized the students into groups to work through this process on their own writing. I moved from group to group to listen as they told their stories from their graphic organizer and got feedback from other students about what the most exciting parts of the story were. Group members were mostly successful at telling authors what they wanted to hear more about, and authors used feedback from group members to revise their graphic organizers before writing their draft of the story.

During our final interview, Alice, Ruby, and I discussed the different examples of feedback they tried with students and which kinds seemed most useful for their writers. Alice and Ruby felt that most students became independent quickly during the process of providing and using feedback, and this surprised them. In previous years, they tried to teach many of these steps in the



writing process primarily through modeling, and they were more satisfied with this more participatory process. They wondered about the future of their young writers. Would their enthusiasm continue after they left the atmosphere of this ELL classroom? They were excited about sharing the successes they saw in their classroom with other teachers (Alice and Ruby later agreed to present their feedback techniques to 30 other staff members at the school). They hoped some of these techniques would spread beyond the walls of their classroom.

### **Enthusiasm**

The first theme that emerged from my experiences in this classroom related to the evident student enthusiasm for writing. Alice and Ruby mentioned several times how surprised and grateful they were that most of their students loved writing: “They don’t want to leave. They’d stay here all day and write, I think... it feels great that students WANT to write!” This desire to write extends into a willingness to use feedback about writing: “They are OK with the risk factor, they feel safe in here and are comfortable with feedback.” Alice and Ruby work to establish “really good relationships from the beginning,” and they see student ability to think about and use feedback as an essential goal for writing instruction: “One of the goals for them is that they will become self-reflective ... [the] release of responsibility is very beneficial, and [they] will definitely use something like this for any kind of writing.” Because of the atmosphere of trust in the classroom and the emphasis on using feedback, they “saw kids be more independent almost immediately.”

I observed this enthusiasm for the writing process during my observations. Whenever Alice and Ruby told the students that it was their time to write, most students headed straight for their tables, grabbed their binders with half-finished stories, and got right down to the work of writing. Some students spontaneously integrated ideas about word choice and audience into their thinking. Ruby told me a story about one student who noticed the word “burrow” in another student’s essay. The class was getting ready to read their stories to second grade partners, and this student was worried that their second grade partners may not know the word burrow, so one young man suggested that each student create a glossary along with their writing for their second grade audience. Ruby and Alice were thrilled when they heard examples like this of spontaneous writing awareness, such as when students in one group spotted similes in each other’s work. Students’ conversations in their small groups often indicated interest and engagement with each others’ writing. I participated in a conversation with a group of boys who were responding to a student’s report about baboons. They were working on the “lead,” the first sentence in the report, trying to make it more dynamic. The boys joked (and giggled) about changing the first sentence “Maybe we say ‘Some baboons can be crazy’.” Another group described the purpose of their feedback as “work on a part that is bothering Rose [a group member].” The writer just finished reading a part of her story that was “very important to her” and her group members were offering feedback. The group offered the author several rewording suggestions that the author understood, but didn’t accept yet. Eventually the group and the author negotiated a specific writing change that was

different than the original and the suggestions. This co-editing occurred without teacher intervention. This group's enthusiastic participation and multiple revision suggestions indicated to me that they lost track of the explicit instructions and the boundaries of the original task, eventually losing their awareness that they were in a "class" doing a "feedback activity." They were writers talking to each other about writing.

Ruby and Alice suspected that their students' growing familiarity with English impacted this ability to become immersed in writing and feedback. Their students' identity and self-concept as students includes the "English Language Learner" label (ELL): "all know they are learning English." This label, at least in this classroom, is not discouraging. Their students are aware that part of the goal of the classroom is to "move through" the defined ELL levels, but this awareness is not usually discouraging or stigmatizing. Alice talked about an incident that made their students more aware of their ELL label: "The only time they saw this was when they pulled in general education kids. Those kids were aware they were coming to ELL and it was 'dumbed down.'" Usually in Ruby and Alice's classroom, students' identity as English Language Learners is a source of group belongingness, but when other "general education" students visited their classroom, the ELL students became more aware of their "status." Observing this incident and others like it cause Alice and Ruby concern about what will happen to "their" kids in the future. They have "high hopes, but also realism ... The General Education writing curriculum moves really quickly, bouncing from genre to genre, not a lot of time to linger ... hope that it won't change their passion for

writing.” In this classroom, student attitudes about writing seemed positively connected with their identity as English language learners, and this connection influenced student attitudes and willingness to write and use feedback about writing.

Toward the end of our semester together, Ruby and Alice reflected on their attempts to encourage students to use feedback. In previous years, they said that would provide feedback to students in individual conversations and they would help students revise their own work using this teacher feedback. They felt their attempts to help students offer each other feedback and use peer feedback helped both student writing and students’ affect about writing: “Comparing it with other teaching methods, we were getting to the point where some of them could do it independently.” I noticed during our last few interviews how independent Alice and Ruby became compared to the beginning of the semester. In our early interviews, I asked many questions and was very involved in planning student feedback experiences. Toward the end, I mostly sat silent during our planning sessions, taking notes and offering to help when needed. Ruby and Alice took the idea of students using feedback and ran with it, planning experiences for students independent of our research project together. Later in the semester I received an email from them inviting me to observe a writing experience they planned, in which their third grade class was visiting their second grade class to offer and use feedback on their writing. This was an invitation to come observe, “if I had the time,” and it was clearly planned independent of any obligations they felt toward our research project. The students’ enthusiasm for writing extended

into an enthusiasm from Alice and Ruby to offer more opportunities for students to use feedback.

## **Formula**

The second theme that emerged from the open coding process in Alice and Ruby's case is the idea of a formula for quality writing. The decisions about writing experiences and feedback made by Alice and Ruby and I were always influenced by messages from outside their classroom. In their planning and thinking, Alice and Ruby often referred to writing curriculum and rubrics developed by others within the district. They perceived that use of these materials was encouraged (and imposed) by other teachers/administrators in their building and administrators at the district office. When we started planning our first attempt at student use of feedback, we started by looking at the district research writing rubric (see Appendix F – Student Research Writing Report Rubric). This rubric defines the criteria used to determine whether or not student writing is proficient or not, on a scale of 1 to 4. The rubric addresses four qualities of student research report writing: Defining the task, seeking information, recording information, and “written product” (organization and writing mechanics). The rubric describes a context for student writing, and establishes boundaries and landmarks for “proficient” writing. It was assumed that any research writing experiences we provided for students would work within this context. Alice described the purpose of the rubric as a “Formula for writing. It describes the purposes of each paragraph.” As we began planning our first classroom writing

feedback experience, Alice referred to this rubric and immediately circled two difficult criteria her students struggled with in the past: “paragraphs have 2 or 3 supporting sentences” and “each paragraph begins with a topic sentence.” This led to our plan for our first co-created writing experience: we developed “right” and “wrong” paragraphs according to these rubric guidelines and asked students to provide feedback to “fix” the “wrong” paragraphs. Students also viewed the rubric as authoritative about their own writing, and looked to the rubric for “answers.” When providing feedback about others’ writing, they refer to language from the rubric: “This sentence needs ‘wow words’... maybe ‘Bald eagles are so beautiful I wish I could see one in real life.’”

As our work progressed, Alice and Ruby spoke more often about what they perceived as restrictions imposed by the writing rubric. Some of the requirements on the rubric felt like they conflicted with what Alice and Ruby knew as teachers about student writing. For example, the rubric requirements for an “exceeds district standards” paragraph include a dynamic topic sentence and four supporting sentences. Alice and Ruby talked about the artificiality of these requirements. Should every topic sentence really be “dynamic?” Are four supporting sentences really required for every paragraph? If published writing followed these rules, wouldn’t it feel formulaic, or even irritating? They considered looking at the nonfiction writing students read in their anthologies to see if they followed these rules, and wondered about teaching students this formula if it didn’t match the models of writing they read.

Another outside influence on student writing and writing instruction is the statewide writing test (the NeSA Writing exam). All students are required to take the statewide writing exam in grades 4, 8, and 11. Alice and Ruby's students did not have to take the exam during our time together, but the inevitability of this test was felt in their classroom, and it shaped some of the decisions Alice and Ruby made about writing experiences. The genre of writing required on the NeSA writing exam is a personal narrative, so most student writing experiences in their classroom focus on this kind of writing. The district writing rubric we used in planning the experiences is based on and targeted toward the eventual NeSA writing exam. Sometimes this test is used as an explicit target or goal, such as when Alice said "Good job third graders, we are passing the NeSA" after several of her students enthusiastically offered feedback about a sample piece of writing. The statewide exam also influenced Alice and Ruby and their students to offer feedback in a very specific way: through a numerical "score." The statewide exam is scored on a 1 through 4 scale, and usually writing feedback in the classroom used involved this scale. When looking at a sample paragraph, students said "we scored it a 2 because it has different sentences that don't belong here." Students were asked to "decide on a topic sentence to move [a sample paragraph] to a 4." Students scored each other's writing and student conversations about these scores focused on strictly follow the scoring rules. At one point a group I worked with asked Alice for help and together they all decided that a paragraph "can't be a 3 without a topic sentence." Many students spent much of their time in their feedback groups talking about the rules of rubric

scoring and it was important to them to agree on a score and to get it “right.”

Ruby pointed out during one of our discussions that “these kids are asked to score and rate things a lot, like video game and Netflix ratings,” so this process of scoring is familiar to them. Writing feedback in Alice and Ruby’s classroom was often expressed using this rating language from rubrics. The fact of the exam, the rubric, and numerical labels from the rubric shaped the kinds of feedback offered about student writing. I wondered what other kinds of feedback Alice and Ruby and the students might have offered to each other if the statewide writing exam wasn’t so present in their thinking.

At our last interview, Alice wondered “how rubrics influence the teaching of writing, and how much does the rubric help or hurt. Are they writing for someone else or themselves?” This vital question about audience captures a tension in their writing classroom. The students’ enthusiasm for writing and talking about writing is potentially in tension with the writing formula created by the ever-present context of rubrics and the NeSA writing exam. In our conversations, Alice and Ruby were obviously emotionally committed to helping students write, and they valued student enthusiasm and attitude about writing. But everyone (teachers and students) felt an obligation to work within the boundaries set by the NeSA-inspired rubric. We all began to wonder what kinds of writing feedback students might offer and use outside these boundaries. This felt tension between enthusiasm and formula was still present at the end of our semester. Alice and Ruby resolved this tension at the end of the semester as they talked about their hopes for their students who were moving on to a “general education” (non-ELL)



classroom. Alice and Ruby shared with me that it is common practice for fourth grade students to write “pocket stories” in preparation for the NeSA writing test. Pocket stories are short, generic personal narratives students are trained to write in preparation for the exam. Pocket stories are general enough that they might apply to any writing prompt, enabling students to just repeat a personal narrative they’ve practiced many times before on the exam rather than actually write in response to the writing prompt. This practice disturbs Alice and Ruby and they were excited about sharing our feedback work with fourth and fifth grade teachers in an attempt to offer an alternative to this pocket story practice. Alice said they have a “hidden agenda: Don’t force the general education kids to write pocket stories.” In the end, Alice and Ruby revealed their commitment to “real” writing over the formula, to authentic enthusiasm for written expression rather than the imposed demands of the rubric.

### **Thinking about Feedback Use with Alice and Ruby**

The tension between enthusiasm and the writing formula Alice and Ruby perceived is not unique to their experiences or their classroom. Dewey (1922) emphasized the essential role of passion in learning: “The conclusion is not that the emotional, passionate phase of action can be or should be eliminated in behalf of a bloodless reason. More ‘passions’, not fewer, is the answer” (pg. 136). The spark of interest, the enthusiasm of the ELL students in their classroom was often the first topic Alice and Ruby mentioned to me as we started planning feedback experiences. They recognized the essential role of

passion and enthusiasm in the writing process. Eisner (2005) describes this tension by contrasting two visions of education. The Formalist vision assumes that teaching and learning involve “rule guided activities” as inputs and predetermined ends as outputs. The contrasting view is the Romantic vision: the view that teaching and learning involve surprise and discovery, and assumes that the ends are not only not predetermined, but a variety of ends is desirable. Eisner uses these two visions to describe the utility of both enthusiasm and formula: “Clearly there have to be tasks and procedures in which utter uniformity is exactly what one wants, spelling, for example. But when that model of correctness so permeates the curriculum, it communicates a tacit lesson that for every question there is a correct answer and for every problem there is a correct solution” (pg. 4). Alice and Ruby looked to the writing rubric as a model of correctness for student writing, and as students used feedback that followed the rubric, they began to question whether or not the “answers” it was providing were too limiting. Eisner (2005) describes an alternative: “One wants to encourage children to explore, to judge, to hold opinions that are individual ... This practice could be accused of a rampant form of subjectivism, but I would argue that there needs to be room for subjectivism in our schools.” Toward the end of our experiences with feedback and student writing, Alice and Ruby were craving more room for their students to use their subjective judgment about writing. Perhaps there should be room in the formula described in the writing rubric for students to be able to think and talk about other possibilities for their writing. Perhaps there

should have been room made for them to give each other feedback about whether or not this particular topic sentence in this piece of writing needed to be dynamic, or mundane, or different in some other way, or how many supporting sentences a specific paragraph really needed. Maybe the formula needed to give a little in the face of enthusiasm and the context of real students writing about their lives.

Alice and Ruby recognized early in our work together that their students' enthusiasm about writing was important, and this recognition led to questions about the writing rubric. Latta, Buck, and Beckenhauer (2007) described a similar reflective process in their formative assessment work with science teachers. They documented a movement from the view that assessment marks an ending to a learning experience, the belief that "assessment products can thwart process and undermine the work of learning as a movement of thought." Their conversations and observations in science classrooms led to an opening up of possibilities for assessment in classrooms, noting that "formative assessments can reveal the ensuing dynamic inherent to the creation of meaning." (pg. 17). My conversations with Alice and Ruby followed a similar path. The process of encouraging students and teachers to use assessment data within the context of learning, instead of using it solely to evaluate learning after it occurs, can encourage reflection about the ongoing learning and might push back against formulaic notions of learning. Biesta (2010) discusses two different kinds of questions about educational practices, and these different kinds of questions relate to the

tension Alice and Ruby experienced between enthusiasm and formula. Normative questions, according to Biesta, inquire about what is “good” education, what interactions lead to educative learning experiences. Normative questions can be overshadowed by “technical and managerial questions about the efficiency and effectiveness of the process, not what these processes are supposed to be for” (pg. 2). Assessment can contribute to the displacement of normative questions, through the tendency to “measure what we can easily measure and thus end up valuing what we can easily measure.” (pg. 13). Alice and Ruby eventually questioned what Biesta would call the “normative validity” of the writing rubric on this basis. The clarity of some of the requirements in the rubric, such as the requirement for three supporting sentences in each paragraph, may contribute to the technical validity of the rubric, but Alice and Ruby were concerned that it undermined normative validity. Listening to students provide writing feedback led Alice and Ruby to wonder if the straightforward writing requirements described in the rubric should be modified to make room for students to provide different kinds of feedback, such as feedback about the important normative questions Biesta describes.

Barone (1993) describes how assessment, in his view, contributes to “rigid, traditional organizational structure of the American public school.” In his view, the ways assessment data are commonly used feed the formula model of learning, and data “serve to gauge the effectiveness of the workers/teachers in molding the raw materials/students into products that

match the prototype.” My experiences with Alice and Ruby provide a counter-narrative to the claim that assessment inevitably leads to factory models of education and learning. Assessment, specifically students participating in a formative assessment process by providing and using feedback, led to reflection about writing and learning in Alice and Ruby’s classroom. Alice and Ruby ended the semester with enthusiasm to describe their experiences to other teachers in the building, and to try to persuade other teachers to avoid practices like “pocket stories.” Pocket stories might increase scores on the statewide writing test, but Alice and Ruby knew that this was a mean and small goal compared to the larger possibilities for assessment and feedback in their classrooms.

## Chapter 7

### Case 4: Susie

Susie taught fifth grade at a large elementary school located in a historic neighborhood. This school is located in one of the more wealthy areas of town and the free/reduced lunch rate is less than a quarter of the rate at Alice and Ruby's school. The semester we spent together was the end of her first year of teaching (she student taught at an elementary school across town with a much higher poverty rate). Susie is a young teacher who fostered and maintained very positive relationships with her students. Her youth may have contributed to her ability to form strong relationships with the young people in her class. She shared many cultural references and interests with her class. When she learned that most students in her class loved *The Hunger Games* series of books, she started using references from those books across disciplines in her class to capture students' attention. Susie's class responded to her energy and passion to connect. I suspect that to her students Susie may have looked like their version of a modern young professional, from her tattoos to her very fashionable and hip shoes.

This liveliness was manifested in her large, busy classroom. Susie's classroom was lined with student created tri-fold posters proudly celebrating their favorite books. Several bookshelves occupied one corner of the classroom opposite tables arranged in circles for group work in another corner. Susie's desk sat at the back of the classroom. The piles of papers on Susie's desk indicated to

me that she spent significant time looking at student work, but I never saw Susie behind her desk during class. When students were in the room, Susie was either perched on a stool at the front of the class, or consulting with students working in groups. No one would accuse Susie's classroom of being "neat as a pin." She admitted that her classroom got "destroyed" daily as students worked, and engaging with students was prioritized over organization of materials.

All of my conversations with Susie were intense. Her desire to know and discover how to best reach her students permeated every discussion. Susie was interested in everything we talked about, even when our conversations moved from assessment and feedback to cognitive psychology, motivation theory, or sociology. I was shocked when I realized that teaching wasn't Susie's only job during the school year: she was still teaching yoga part time, and regularly traveling to a nearby city for yoga training and workshops. Susie was also passionate about experiencing other cultures. A few days before I met her for our first conversation, she had just found out that the Peace Corps accepted her application and she would be spending the next 25 months in Africa. As I write this chapter, Susie is in Kenya working with a group of young people who hope to teach English in Kenya and the surrounding region.

Three overall issues emerged from my work with Susie: how making room for formative assessment processes impacted and was impacted by the ways she grouped students, how student thinking about whether practice would impact their ability (mindset) influenced formative assessment practices, and the influence of careful listening on Susie's assessment script. In this chapter, I will

describe the process of our work together, then discuss examples of these three issues. At the end the chapter I discuss implications of these issues in the context of the changes Susie and observed in her classroom and our thinking.

### **The Process**

During our first interview, Susie spoke about her homework practices and how she provides feedback for her students. On most homework assignments, Susie circled incorrect items and encouraged students to correct their mistakes and turn the assignments in again through her written comments. She reviewed the topic again in class if most students in class seemed to be confused by some of the homework items. She used homework as a way to gauge whether or not she should re-teach a topic and students were expected to keep trying on their homework assignments and “show me it’s fixed.” She thought it was important not to assign final grades to student work until they had several opportunities to practice and show their best work. Susie spent much of her outside of school time commenting on student work, using sticky notes, graphic organizers, and colored pens to “make it special.” She experimented with grouping students based on current level of ability, and found that this didn’t seem effective for math instruction but was expected for her reading instruction (the other fifth grade teachers in her building grouped students based on ability, so she continued this practice in her classroom). To her, teaching reading seemed “more complex” and less predictable than math instruction: “In math, kids are so much better at following routines, they know the expectations.”



During this discussion of the complexities of teaching reading, we talked about the different kinds of skills she taught during reading instruction. Susie identified summarizing as a key skill she focused quite a bit of instructional time on and she was interested in thinking about how feedback might help students summarize text passages. Her students struggled in different ways when they tried to summarize: some “can make a list... but can’t pick out the important details” and others “can pick out details but can’t put them together into a summary.” At the time, Susie was giving students feedback about the completeness of their summaries and helping students fill out story maps (fill in the blank worksheets that document the sequence of a piece of writing). As we talked about these different kinds of difficulties, Susie started wondering about the reading groups she made. She was concerned about the students becoming discouraged by placement in “lower level” reading groups, and she wasn’t certain of the benefits of the groups. She decided to regroup the students based on their summarizing skills, and then use those groups to identify useful practice tasks. This led to a discussion about how to encourage students to identify and reflect about their attempts to summarize and we decided on a student reflection activity.

The reflection activity we designed together used the metaphor of “superpowers” and “kryptonite.” Susie talked with her class about summarizing and the summarizing techniques she taught them so far. She discussed the importance of summarizing for communicating an understanding of a text, and then asked them about their confidence in using the skill (by holding their thumbs

up, sideways, or down). Several students expressed doubt about their summarizing abilities, and Susie told them this matched her perception of their work so far. She said she noticed that all of them “have strengths in summarizing – superpowers! And we all have some weaknesses – kryptonite.” After explaining “kryptonite” to some of the less superman-savvy students, she led the class in a discussion about what they think are their summarizing superpowers. Students were very engaged in this discussion and almost every student raised her or his hand to contribute an idea. The list Susie made on the board quickly outgrew the available space. As they described their superpowers, students spontaneously chimed in that they were “good” or weren’t “good” at the skill Susie was listing. Susie then changed the focus of the discussion toward the summarizing strategies she had used with the class so far. She asked the students which strategies were more and less effective for them, and the discussion became even more animated. Almost all the students seemed excited to tell Susie about techniques they felt “worked” or didn’t: “I like the rubric thing because then I know what to put,” “I don’t like doing the bullets because I don’t get why we choose bullets for some details and not others.” Susie brought the discussion to a close by concluding that everyone in the class has a different experience with summarizing, and many students nodded or said they agreed. Susie reminded them that they all have superpowers and kryptonite, and promised to help them use this realization soon.

When we debriefed later, Susie said she was surprised by the students’ passion during the discussion and their strong feelings about the summarizing

strategies. She reported that several students were more involved in this discussion than previous discussions in class. She tried to capture some of the complex and productive discussion by writing on chart paper in front of the class as they contributed ideas (see Appendix G – Summarizing Discussion Poster).

She said this discussion was the first time she had invited students to comment on the teaching strategies they were using in class. She loved their passionate contributions and was excited to use their feedback. Susie and I looked at some examples of students' attempts at summaries of a nonfiction passage, and we divided them into five groups based on their superpowers and kryptonite: a strong summary but low supporting detail group, a strong detail but less effective overall summary group, a group who expressed that graphic organizers didn't help, a group who wanted to use graphic organizers more, and a group who thought they struggled more with nonfiction text than fiction.

We discussed different ways these groups might be able to use their superpower and work through their difficulties with their kryptonite. We decided to customize a summarizing task for each group. Each group was presented with a summarizing task that focused on and honored feedback from that group: students who wanted to use graphic organizers more extensively were asked to design their own graphic organizers to use when summarizing. Students who struggled to identify details were asked to work backwards from their summary and write key questions they should answer about the text to support their summary. Students worked on these customized tasks in their groups as Susie moved from group to group, checking in on their progress. After this work Susie

asked the class to talk about what they accomplished in their groups, and several students commented on how much they “liked” their task. One girl asked if she could take the graphic organizer her group made home and continue working on it. Another student noticed that some of the questions another group asked about their article matched the sections of the graphic organizer he made. During this discussion, I noticed that small group of students were very dedicated to contributing to the discussion. They raised their hands at the beginning of the discussion and kept them raised, waiting patiently, for several minutes until it was their turn to speak. We asked the students to reflect on this process in writing, and later when we read these reflections together, she noticed that the students summaries were stronger and more clear than they were before in general. Some students didn’t think the process was useful (“I didn’t learn anything”) but Susie saw progress in these students’ summaries as well. Overall, Susie thought this reflection and discussion process uncovered the diversity in student skills and thinking about this single summarizing skill, and she noticed that the groups that developed during this process were very different from the reading ability groups she established at the beginning of the year.

After this summarizing work, Susie said that she would like to explore helping students use feedback to help their vocabulary achievement. In the fifth grade, students work on learning the meaning of a long list of vocabulary words, and they are expected by the team of fifth grade teachers at the school to know the entire list by the end of the year. At the end of a vocabulary quiz, Susie asked her class to again reflect on what vocabulary “studying techniques” were most

effective for them. She noticed that students weren't able to talk in detail about how they learned vocabulary. Students wrote in general terms about improving by "studying more," but none of the students talked about any specific techniques they might use. She asked the class about this later, and some students said that by studying harder, they meant using flash cards, "studying every day" or "studying during free time." Together we developed a single diagnostic item designed to help students think about different vocabulary studying techniques (see Appendix H – How to Study Vocabulary Item). Susie asked students to commit to one of the answers to this item and write about why they chose this response. Then we discussed as a class the rationale behind each answer, and why some of the techniques may be more effective than others given what we discussed about research relevant to how we learn and remember information. Then students re-committed to an answer after the discussion, and wrote about why they changed their original answer or why they didn't. At the end, students were asked to design a vocabulary studying plan and choose a way they could measure their own progress. Some students reported a deeper understanding of effective studying techniques after this discussion: "I knew about making your own sentences, but I didn't know you could connect it with vocab." Other students used perceived difficulty as a way to choose a studying method: "I chose all of them except A, because they all seem very easy." On their way to recess, Susie reminded the students to keep their studying plans, and promised she would follow up with them about how well their plans worked. I asked Susie if I could interview three of her students before our final interview, and she helped me find

time and space during the students' schedules to complete the interviews. During these interviews, I asked the students about what kinds of feedback they received on their work, how they used this feedback, and how feedback relates to their learning. These students' comments supported our conclusion that students didn't think about studying in elaborate or detailed ways, reporting plans that emphasized repetition, or simply talked about studying "more."

During our final interview, Susie shared that only a few students returned these studying plans (even though she rewarded them with candy for showing them to her). Very few students write anything about how they would know if their plans were effective. However, their vocabulary test results were much improved as a class, and Susie thought their reflection did impact their studying and vocabulary mastery. Susie shared that our work together inspired her to ask her students more directly and more often about her teaching and the impact of learning experiences in the classroom: "I'm more direct about asking for their feedback about my teaching." She pointed out that talking with students about using feedback is "one of the most important parts of teaching" but "it's given the least thought to. Everything that's going on is about summative assessment, getting them ready for the NeSA tests. They don't see NeSA scores, no feedback from it ... I don't have time to go over stuff with them like I'd like to. Not sure what the solution is."

## **Groups**

One of the first objects I noticed in Susie's classroom was the chart paper

listing groups and student names (see Appendix I – Reading Groups). I asked Susie about it, and she told me that these are the reading groups she established at the beginning of the year based on assessment data about whether students were at, above, or below the expected reading ability for fifth grade. Susie let the students name their group: the “Toucans” group had assessment scores that placed them “on” grade level for reading, the “Pawners” group was below grade level, “Nachos and Cheese” were above grade level, and the “Study Buddies” were on grade level but read a little more slowly. Susie expressed mixed feelings about these groups during our first interview. Reading groups were an expectation by teachers at her grade level, and she could see some potential advantages: she felt she “might be able to go farther with the on level kids all grouped together.” But she was unsure if the groups were really “distinct”, if the students in the groups were truly similar in reading ability. She did not use these kinds of homogeneous reading groups during her student teaching experience, and she was conflicted about the purpose of the groups. She thought perhaps the intention was “to see modeling,” so that students of similar reading ability would be able to model reading performances at levels similar to their own. She perceived some overall “tracking” in fifth grade and spoke with her principal about it. During this conversation, her principal confirmed that the fifth grade students were not randomly assigned to teachers, and that student reading level was considered when the decision was made about how to assign students to teachers. Based on conversations with other fifth grade teachers, Susie suspected that most of the students who were perceived to be struggling with

reading skills were assigned to her class.

Susie's students responded in different ways to their membership in these reading groups. When I asked whether students were aware why there were assigned to each group, Susie said "some do ask about ability and which group they are in." She suspects the students do know about the reading levels of their groups, and when she has changed students from one group to another, she's noticed that "when they move up, some feel like it is a promotion... Another boy moved up, and he proudly talked to his mom about it." One student was obviously aware, and disturbed by the group she was assigned to: "One girl tried to white her name out during recess." Susie talked with her and resolved the situation by talking with the student and her parents about what the group membership indicated, but the image of the girl trying to remove herself from that reading group stuck with Susie and was one of the critical events that caused to her reflect critically about the wisdom of assigning students to reading groups.

The feedback activities we created together disrupted the "set" reading groups Susie was using. After both activities, Susie said that the groups students ended up getting sorted into were very different from the established reading groups. When Susie talked with the class about working with these "mixed up" groups, students were able to verbalize what parts of the work seemed productive and non-productive to them. One of the groups talked about not understanding why they were grouped together and what they were supposed to accomplish, but students from the other groups were able to talk about specific tasks they accomplished during their work time. Susie still felt that it would have



been better if she had time to “talk with each of you and your group about your process” but she was satisfied with the work atmosphere these new work groups provided. In a later discussion, Susie connected this discussion with her hesitations about the “set” reading groups. She noted again that she did not use this homogeneous grouping technique in her math instruction. She and other teachers were trying “mixed ability grouping” in math and they were now considering it for reading instruction.

### **Mindset**

Susie decided towards the beginning of our work together that she wanted to focus on how students use feedback about their writing. Susie’s experiences with teaching writing sometimes left her frustrated or worried. In her experience, students came into her fifth grade classroom with their minds already made up about what “kind” of writer they were. She heard students say “I’m average or below average” when they described their writing. This low self-efficacy about writing manifested itself in specific behaviors: when Susie asked students to work on their writing, many students didn’t take their work home, or didn’t turn it in. Susie said she’s “not sure what it is. Frustration? Maybe they feel there isn’t a point in trying? ... They don’t try. They’ve accepted their fate.”

We talked about connections between these experiences and Dweck’s (2006) “mindset” theory. We talked briefly about Dweck’s research, and the implications of “fixed mindsets” (student beliefs that their abilities in an academic are fixed and unchangeable) and “growth mindsets” (student beliefs that their

abilities can change if they practice). Susie immediately connected Dweck's work with the attitudes she saw in many of her students about their writing. We spoke about what it might mean to have a "fixed" mindset about writing. Susie said that she saw this belief in "mostly boys." She noticed that she had to call on them personally and make several attempts to "pull it out of them" before they would share their writing. "They don't seek help," she said, and with these students she knows that she has to check in often in order to get any sense about their writing. Susie wondered if the tracking she noticed in her school was in connected with these fixed mindsets. Over the year she thought she'd seen indications that some of the students whose parents were from lower socio-economic situations were concentrated in her class. She wondered about connections between economic class and fixed/growth mindsets. She spoke in detail about one young man in her class who she felt definitely had a fixed mindset about writing: "Milo – he's always looking to escape the situation. When I ask him to take a second look, he can do it if he slows down and tries again. It's like he doesn't care."

Susie saw related tendencies in the group feedback work we asked students to do. She noticed that groups often focused on finding the "right" detail to include for support, and that they were concerned about not including the "wrong detail."

Susie thought this tendency to view learning and writing as a dichotomic right/wrong manifested itself when we asked students to think about how to study their vocabulary words. Students wrote about studying harder, studying more, or just "doing better." Susie said some of her students view "learning as magic. Learning will somehow happen if I study harder." This conversation led us to

wonder together what a “growth mindset” would look like in her students. Susie asked: “What is growth? How do I move them? What is the role of feedback?” Susie was determined to identify and try to change her students’ attitudes about writing, and we worked together to determine the role of conversations about writing, the role of feedback, in this effort.

## **Listening**

Listening to students, and creating a context that encouraged students to listen to each other, developed into a major strategy Susie used during our time together to help students reflect about their writing. Early in our conversations, Susie did not connect feedback on student work with listening. Feedback for her mostly meant corrective evaluation: students received written feedback about whether or not their homework was correct or incorrect, and if their overall grade was below a certain mark, they were encouraged to correct their mistakes. On writing assignments, Susie showed the class how she evaluated their writing with the writing rubric and clarify with them individually what they should do to improve. Her attitude about feedback at this point was marked by hope: she hoped that her feedback was helpful. She worked hard to provide extensive feedback on everything students turned in, and she strove to make her feedback clear, and she hoped (dearly hoped) that it would help them learn.

Susie said she felt that a culture of trust was an important precondition to students using feedback, and she felt “like I’ve created a safe community.” When students violated this classroom trust, Susie addressed it immediately. A few

weeks before we started working together, Susie started noticing a large number of broken pencils on her floor at the end of the day. This persisted for a few days, with more and more pencils being broken by someone during class. Susie and her students “talked about it at a class meeting, and we decided not to provide pencils for the rest of the quarter.” This violation of trust was treated seriously by their classroom community, and they discussed it together and came to a resolution.

This previous example of resolution through group discussion and listening foreshadowed some of the feedback work later in the semester. As a part of the group summarizing activity, Susie decided to ask the class to share their perceptions of some of the summarizing techniques they used earlier in the semester. Susie later described this discussion as a revelation: the majority of her students were excited and motivated to talk about their personal impressions about the effectiveness of what they worked on in class. Susie was surprised by the diversity of these perceptions. A few students thought the graphic organizers they used were very effective and they wanted to explore designing their own graphic organizers, but many other students said they didn’t feel graphic organizers were helpful for them at all. Susie said “This whole process has been very useful to me... hearing what their process is is valuable, good to know what’s working and what isn’t, good to know the huge diversity.” We both became concerned during the discussion that some students may have been confusing “liking” a learning experience with what they considered “easy” or “hard” learning experiences. Some students’ comments seemed to indicate that

they valued the ease of the activity over the learning value, because they emphasized the time the activities would take or how fun they might be. We wondered about students' ability to judge how valuable some learning experiences were.

But despite this concern, Susie thought the discussion was illuminating, and it impacted her future plans for working with her class. In the past, her discussions with her class were "more closed. This was the first time I got feedback on class activities" and she was surprised by students' interest and passion to share. Even as she was trying to wrap up the discussion, students' hands were still enthusiastically up in the air, waiting for their turn to talk about their perspective on their learning. Susie said the discussion helped her realize that "summarizing is a big skill and it's hard to know what to include and what we shouldn't – it's individualized." The diversity of student responses during the discussion uncovered the revelation that each student's learning experience was different, and the students' passion about discussing their perspectives on the learning experiences emphasized to Susie the need for more of these reflective discussions.

### **Thinking about Feedback Use with Susie**

A key moment in our work together occurred when I watched Susie ask her students specifically, for the first time, to evaluate the effectiveness of some of the ways she had been trying to help them practice their summarizing skills. Susie asked her class a very open and direct question: "Have the ways we've

been practicing summarizing helped you?” Her students’ hands immediately shot up on the air. Susie had to try to keep careful track of which students wanted to contribute to the discussion because there were so many opinions and ideas flying around the room. Many students waited quite a while to say their piece, and Susie’s chart paper filled with ideas very quickly. As her students talked, I saw Susie’s face register surprise, concern, frustration, and realization. This experience of hearing students reflect on their own learning was new in her classroom. The discussion was confusing at times: some students directly contradicted what other students said about what was and wasn’t effective. The discussion was messy: students didn’t follow through on one topic before starting another, and Susie had to work hard to organize their thoughts on her chart paper. The discussion was passionate: students obviously wanted to talk about their learning and they wanted Susie to know what they thought.

This conversation between Susie and her class about their perceptions of teaching and learning was revelatory. The process of this conversation mirrors what Gadamer (2000) discussed as the vital connections between conversation and learning. The inherent back and forthness of a genuine conversation requires a sharing of power and a willingness to be open to different outcomes: “The partners conversing are far less the leaders of it than the led. No one knows in advance what will ‘come out’ of a conversation.” (pg. 383). Susie was initially surprised at her students’ willingness to dive into the conversation, but once she recognized their zeal, she made the decision to let the conversation be open to all kinds of comments from students, to let them direct the conversation to areas

other than those defined by the original discussion question, and devote the rest of her class time to the discussion. She was a partner with the students in the conversation rather than trying to lead it toward a predetermined end. This sharing of power is a hallmark of what Gadamer calls a true conversation: “. . . the more genuine a conversation is, the less its conduct lies within the will of either partner. Thus, a genuine conversation is never the one that we wanted to conduct” (pg. 383). Susie was genuinely involved in the conversation through her participation and through her willingness to actively listen and go where the conversation took them: “true participation [is] not something active, but something passive . . . namely being totally involved in and carried away by what one sees.” (pg. 124-125). Susie’s chart paper filled with a messy, complicated visual depiction of her questions for the class, student responses, and Susie’s resulting probing questions about what her students said. This discussion mirrored the feedback process Susie and I were trying to invite students into: receiving feedback and then using that feedback in a subsequent response.

In a later interview Susie said that this revelatory discussion helped her realize the power of asking students for their feedback. This conversation was more “open” than she’d ever tried before. She described her previous attempts to help students use feedback as one sided: she provided the feedback and tried to help students use it, but there were few opportunities for students to give her feedback and see how she might model feedback use. This conversation with her students vividly demonstrated another dimension of the power of feedback and feedback use for Susie: the role of feedback in a genuine conversation, and

how feedback use contributes to the shared emergence of meaning through interaction.

This genuine conversation set the stage for further realizations about the power of feedback, for Susie and me and her students. Our work moved from this conversation about summarization to vocabulary learning. Susie's students were expected to understand and be able to use a large list of vocabulary words by the end of the year, according to the curriculum pacing guide used by fifth grade teachers in her building. For most of the year, Susie was encouraging students to study the vocabulary words and recommending extra practice for students who didn't perform well on vocabulary quizzes. Parents were encouraged during parent teacher conferences and other conversations to help their daughters and sons practice at home. Susie and I decided to ask students to describe what they meant by "studying" their vocabulary words. As we looked at the responses, we realized that students were thinking about learning vocabulary and studying in a very general way. When asked about how they studied their vocabulary words, most of the students didn't provide much detail. They either left that question blank or provided simple, non-descriptive answers, such as "study at home." A few students described learning in terms of time and effort, but few other details: "I came in and talked to her [Susie] about vocab, she said I should study more, and that worked!" Students talked about memorizing the words, looking at them over and over, and studying "harder" or "longer" in order to learn. Some students talked about choosing a studying method because it "seemed easy." The learning model these students described was a simplistic



one: learning occurred through a process called “studying” that students did not or were not able to define or describe, and “studying more” (longer or with more effort) would somehow result in more or better learning. No differentiation was made between different kinds of studying, and no description was provided about how their thinking related to their studying or their learning.

This limitation concerned Susie, because she wanted her students to be able to think about their learning in more sophisticated ways so that they could use feedback reflectively during learning experiences. She tried to model different kinds of learning for them in class, using pop culture references to retain their interest and help them connect with the material, and trying a variety of teaching methods in order to connect with all her students. But based on student responses, she didn’t think her students were able to use these learning models from class in their own “self-teaching” as they studied at home. She wasn’t sure students were connecting learning models from class about relational learning, relating learning to their lives and being reflective about feedback, to their own thinking and studying. We started talking about the cognitive psychology work of Dweck (2006) and Susie thought her descriptions of fixed mindset fit many of the comments she heard from her students. Many of her students didn’t seem convinced that their effort and practice actually helped them learn. When I asked her what kinds of behaviors she sees in her students indicate a fixed mindset, she referred to students who resisted her attempts at helping them revise their writing: “they don’t try, they’ve accepted their fate. [They] don’t take stuff home, don’t turn it in. Not sure what it is. Frustration? Maybe they feel there isn’t a point

in trying?" She noted that some students stop trying and "don't seek help." When she noticed this, she "feels like she has to call on them and pull it out of them." She used the example of one young man in her class who is "always looking to escape the situation. When I ask him to take a second look, he can do it if he slows down and tries again. It's like he doesn't care."

Susie's interest in Dweck's (2006) mindset theory heightened as our semester together sped toward its end. I asked her to let me interview three of her students about our feedback experiences, and during one of the interviews, a student spoke about feedback Susie provided and how it helped her writing: "At the beginning of the year I wasn't good with essays, [but] now she showed me all these leads, ways to tell the reader what perspective to use." This student thought about her writing differently based on Susie's feedback, and her use of this feedback helped her change her attitude about writing. During the interview the student talked about how using feedback helped her become a better writer. She developed a growth mindset about her writing: she knew through her experiences that if she used Susie's feedback, she felt her "got better", not just to Susie but in the student's judgment as well. When I asked this student what advice she would give to other teachers about feedback she also chose to talk about the context of writing: "Relate the feedback to real life. If you're doing an essay, relate it to real life ... tell them, show them, explain why. That will help because if you're just reading it, you'll forget it, but if you tell them along the way, show them, make sure they understand it, then they are more likely to use that knowledge."

This student was able to talk using specific examples about the relationship between using feedback and improving, but more importantly she felt and believed that feedback use led to powerful learning experiences for her. She was convinced that her efforts, her use of feedback, helped her learn and grow. Susie and I became convinced through our work together that listening to each student as an individual, rather than thinking of students in their tracked achievement groups, was essential to understanding them as learners. This listening helped us understand the diversity of attitudes toward and beliefs about learning, and was the beginning of a powerful discussion about how to help students think more critically about their learning experiences. Susie wanted her students to learn and understand, and to be able to think and communicate about these learning experiences. She was convinced from the beginning of the project that feedback could help them. But the ways we thought about this goal changed as we worked together. By the end of our semester, we were more interested in listening to how students talked about their learning, and we were excited about helping them think more deeply about what they meant by “studying harder” or “doing better.”

## **Chapter 8**

### **Cross Case Analysis**

The purpose of this cross case analysis is to look across the four case studies for themes and ideas that may provide answers to the two research questions:

1. How do teachers make room for the formative assessment process?
2. How do the assessment scripts of students and teachers change?

In each case described in the previous chapters, I explored how teachers made room for the formative assessment process and how our thinking about assessment changed during the co-created work. In this cross case analysis, I will explore how shared themes from the four cases relate to each research question, and how these themes may fit together to provide possible answers to the research questions. This goal follows Yin's (2003) advice regarding cross case analysis: to "test" ideas and themes from each case by considering all the cases, and in this way to build a more complete and rich description of the answers to the research questions exemplified in the four case studies. In each of the sections below, I identify themes that crossed all four cases and explore how the themes emerged evolved in the classrooms. These themes are organized according to the two research questions, and I propose answers to the research questions based on how the themes manifested and developed during the classroom work.

### **Research Question 1: How do teachers make room for the formative assessment process?**

The teachers who volunteered to participate in this study entered the experience open and willing to explore how to use formative assessment processes. In each case, our conversations quickly built on this initial openness toward co-created formative assessment experiences. Across the cases, the teachers talked about two aspects of their classroom culture that influenced how they made room for the formative assessment process: trust/community, and freedom/enthusiasm.

**Trust/Community.** Teachers emphasized the relationship between the formative assessment process and a felt sense of trust/community in their classes. Teachers said the context of trust they worked hard to establish and maintain with students enabled them to make room for formative assessment processes. These five teachers made room for the formative assessment process in their classrooms first by recognizing, discussing, creating the preconditions of trust/community in the classroom, making room for students and teachers to use feedback in educative ways.

Sofia talked about this classroom culture of trust during our first interview. She noticed years ago that most of her students came to class with evaluative assessment experiences, rather than experiences that led them to view assessment as feedback. She deliberately planned lessons and assessment opportunities early in the term to provide experiences for students that challenged this perception of assessment. Since students came to her class

preoccupied with grades, she deemphasized grades at the beginning of the semester and made room for students to work with feedback from her (mostly on homework assignments) and didn't include grades. Sofia helped her students become comfortable with making their learning process "public." By the time I began working with her, the students in her class seemed comfortable working through math problems on the board in front of everyone else, and mistakes were treated as opportunities to learn rather than moments of embarrassment. Sofia's goal was to help students see the utility of feedback, and to view feedback as useful instead of criticism.

Lily spoke about establishing a similar classroom culture as an effort to build "community." Lily's students brought diverse cultural experiences to her classroom and Lily recognized the necessity of honoring these cultural experiences while establishing a "classroom culture." Lily noted (and we found evidence for) the influence of culture as students used feedback: some students viewed feedback as inauthentic or not useable because the feedback didn't attend to their culture and relationships with other students. Lily used music, repeated classroom "ceremonies," and careful relationship building to develop a shared sense of community within her classroom, while recognizing and honoring the other cultures her students also belonged to. She publicly noted examples of feedback use by students, and was able to find different kinds of examples of students using feedback. Some students used their words to show how they used feedback, while other students used feedback non-verbally through

behavior, and these diverse uses were honored equally in Lily's classroom community.

The sense of trust/community in Alice and Ruby's and Susie's classrooms emerged during our discussions of how they and their students defined their classroom community. In Alice and Ruby's classroom, all the students identified themselves as English Language Learners, and this common identity united their class. Alice and Ruby honored this shared identity by being transparent about students' progress, and all the students knew they were "in it together." During my time in their classroom, I didn't observe students being impatient with each other based on their language skills, or bragging about language accomplishments, or teasing classmates about language struggles. They knew they were in this class because of their shared goal to learn English, and this shared goal helped define their classroom culture and increase students' sense of community.

In contrast, the sense of trust and community in Susie's class was less transparent at the beginning of our time together. Susie recognized the importance of trust and community in her classroom, but talked about elements of her classroom that challenged her trust with students and their trust for each other. During my interviews with students, they discussed how their personal interactions with Susie created a sense of connection and trust. Each of the students trusted Susie to make personal, unique connections with them and mentioned examples of Susie relating class work to their personal lives and interests. But the students did not talk about a shared classroom community, and

during our time together, Susie had to address actions by anonymous students that undermined the sense of trust in her classroom (e.g. students intentionally breaking pencils). Susie was concerned about how her assigned reading groups based on ability (as measured by the reading assessments teachers were expected to use) undermined her classroom community. The groups created a hierarchy, and corresponding stigma, in her class. One of our first conversations involved her discomfort with the groups and we thought about how to use formative assessment processes to disrupt what she saw as an unhealthy focus on what “level” group each student should be assigned to. This process led to students’ providing feedback to Susie about her teaching, and Susie cited this open discussion as the beginning of different sense of community in her classroom.

Like this dissertation, Roth (2005) used a multiple case study to explore the complexities of several classrooms. Roth focused on the context of trust in the school she investigated, and her findings provide another lens through which to look at how trust relates to this research question about making room for the formative assessment process. Roth identified four elements of classrooms that encourage a context of trust: teachers’ connectedness, teachers’ genuine interest, teacher-student collaborative inquiry, and environment of safety (pg. 30-34). My experiences support Roth’s conclusions, and the addition of the formative assessment process context may extend Roth’s thinking by exploring why assessment is an integral part of the relationship between the elements and classroom trust.



Roth finds multiple examples of the relationship between teacher connectedness and trust, and Lily's sense of mission with her students exemplifies this idea of connectedness. Lily's passion for her community of students was evident and constant during our time together. Culture was an integral part of this classroom community, and Lily and her class developed shared ceremonies and norms to both honor their diverse cultures and build a shared culture than connected them all. During our work, Lily realized the central nature of assessment and feedback in their classroom culture, and eventually recognized the role the formative assessment process played in connecting her with her students and her students with each other.

Susie's students recognized her surprise and interest during their discussions about the effectiveness of her teaching techniques. Susie's discomfort about the established reading groups and her willingness and enthusiasm to listen to her students demonstrated genuine interest. As Susie made more room for the formative assessment process in her classroom, she was able to hear more feedback from students, and her willingness to use the feedback showed her genuine interest to her students.

Roth might view Sofia's realization about the importance of math thinking as an example of teacher-student collaborative inquiry. The inquiry process Sofia and I designed depended on students' willingness and abilities to write about their ways of thinking about mathematical processes. The students' struggle with this process and the later discussion about the importance of math thinking was a collaborative process between Sofia and her students. This process was a

genuine inquiry: neither Sofia nor her students realized before they began the process that math thinking would emerge as a new, deeper goal for their math work.

All of the teachers in this project recognized the need for an environment of safety as a precondition for the formative assessment process. This felt sense of safety was most obvious in Ruby and Alice's classroom. An identity as an English language learner student could easily undermine a student's sense of safety and competency, but in Alice and Lily's classroom this identity was instead a force for group belongingness and safety. I observed these students enthusiastically offering and using feedback about writing, and this formative assessment process strengthened the environment of safety felt by these young writers.

**Freedom/Enthusiasm.** Teachers felt the context of trust/community set the stage for formative assessment processes, but the passion, the driving force for feedback use in these classrooms came from a sense of freedom and enthusiasm. Roth (2005) discussed the relationship between the previous theme, trust, and this theme of freedom/enthusiasm: "An environment in which trustworthy relationships can thrive requires that students be free to make choices that reflect their interests, to disagree with teachers' perspectives, and to take risks with ideas that are new and not fully formed" (pg. 34). I observed different manifestations of freedom and enthusiasm in each of the classrooms. The atmospheres of trust the teachers fostered enabled them to both inspire a

sense of freedom and enthusiasm and to make room for the formative assessment process.

This driving force of freedom and enthusiasm was most immediately obvious in Alice and Ruby's classroom. Alice and Ruby were proud of and excited about their students' attitude toward writing. They mentioned their students' love of writing several times during our conversations. They recognized the power and precious nature of this desire to write: our co-created plans built on this passion, and Alice and Ruby's "hidden agenda" was to share our work with the other teachers in their building in order to try to help preserve students' excitement about writing. Alice and Ruby felt that their students' ability to give and use feedback depended on this enthusiasm. In the groups of students I observed, I saw several examples of students' passion to communicate their stories to others. This passion helped motivate them to carefully consider the feedback from their group members. The students in their role as author wanted to make their stories "better," which to them meant make the stories more interesting and more clear. This desire to revise their stories was connected to their intrinsic interest in writing. The audience for their stories wasn't clearly defined, nor was there a defined "goal" or product for their stories. They weren't writing the stories in order for them to be published, or even necessarily shared with their families. But it was important to them to make their stories "better," and this enthusiasm drove their desire to use feedback and to provide useable feedback to other authors.

The relationship between this enthusiasm and teachers' perceived autonomy became more clear in Lily's classroom. Lily often spoke of the advantages of her position as a pre-school teacher in terms of what she was allowed to do: she didn't perceive that administrators or district personnel were "watching" her or even knew what she was doing, so she felt free to experiment in her classes and follow her own judgment and research as she planned experiences in her classroom. As we talked about feedback, Lily became excited to see how her students could use feedback from peers, and she immediately began thinking about how to implement peer feedback in her classroom. Her first thought wasn't how she could fit a formative assessment process into a scripted schedule, or what required standards or objectives she would have to hasten through in order to make time for peer feedback. Lily had the autonomy to immediately integrate ideas into her classroom, and this autonomy gave her room to explore ideas more completely. The arc of Lily's thinking about formative assessment processes followed a different path than the other teachers: she was immediately interested in how her students might use feedback, and these implementations progressed to an ultimate realization that feedback was "everything" in her classroom. By the end of our discussions, Lily saw feedback as integrated into all the experiences she shared with her students. The autonomy and freedom Lily felt helped support this rapid progression of thinking and ultimate realization.

Sofia and Susie's senses of freedom and autonomy in their classrooms contrast with what Lily and Alice and Ruby experienced. Sofia was very

conscious of the recommended pacing for her sixth grade students, and we had to schedule our work carefully in order to catch opportunities for feedback use. At the beginning of the semester we looked ahead in the pacing guide and chose subtracting integers because Sofia felt that this was a difficult concept for students, but also because these lessons occurred far enough in the future that we would have time to plan feedback experiences and develop materials. The time pressures in Sofia's class were different than Lily and Alice and Ruby's classroom. Sofia knew she was responsible for addressing certain topics on certain days and maintaining a predetermined pace. Her students knew they were responsible for settling into the lesson, doing their work, and moving on to the next topic quickly. As we made room for the formative assessment process, we were both conscious of how it would fit into this pace, and some of our discussions involved how student use of feedback might speed up or slow down the pace.

As a first year teacher, Susie was very conscious of the expectations of other teachers in her building and she used feedback and cues from them about how to, and whether to, linger on some topics. Susie often seemed caught between teaching impulses: she wanted to spend her time engaging with students, and she saw our feedback work as a powerful way to engage. She was fascinated when students gave her feedback on her teaching techniques. She devoted considerable time to this discussion and carefully attended to all students who wanted to contribute. At the same time, Susie was very aware of the decisions of other teachers in her building and grade about how to organize

class time. She maintained the “ability level” reading groups, even though she was conflicted about them. She met regularly with the other teachers at her grade level and she knew she was expected to maintain a similar pace with the other classrooms. She often expressed the perception that parents of her students had similar expectations, and that her classroom decisions and experiences were closely watched by others. During our interview time, she and I were deeply involved in discussions about students’ senses of self-efficacy, our perceptions of their understanding and engagement, and how individual students responded to questions about how they learn best. But Susie was also under pressure to make sure her classroom was similar in many ways (in ways that others deemed important) to the other teachers’ classrooms. Susie’s sense of freedom and autonomy influenced how she was able to make room for formative assessment processes. Our interviews are filled with examples of where she wanted to go with the ideas and what she wanted to do, but the experiences we had time and space to complete were limited by the boundaries imposed by her teaching context.

### **Research Question 2: How do the assessment scripts of students and teachers change?**

Ayala (2008) described the tendency to think about assessment exclusively in terms of evaluation as a “summative assessment script,” (pg. 331) referring to a cognitive script that defines our expectations about what will happen and predictions about how others will react. During our work together,

the teachers and I uncovered subtleties about our own summative assessment scripts, and these scripts changed as a result of our work. In addition, our feedback work with students exemplified non-summative uses assessments, and these examples influenced students' expectations of assessment. The feedback use experiences in these teachers' classrooms highlighted alternatives to the dominant summative assessment script and revealed aspects of the script that the teachers and I weren't aware of. During our semester together, our summative assessment scripts changed regarding how learning should be defined and measured and how we think about grouping students.

**Defining “successful” learning.** One of Sofia's first questions after we tried out the feedback experience we designed was: “Did the feedback work?” In order to answer that question, she and I looked at the sample subtracting integer problems we asked students to complete. We counted the number of problems students found the predetermined right answers for, and used an increase in the right number of answers to conclude that our feedback was “working.” The irony of our thought process didn't occur to us until much later in the semester.

Our first feedback experiences involved asking students to solve integer subtraction problems. We looked at their responses and wrote feedback tailored to their answers. We asked the students to use this feedback as they worked in groups (organized by the kind of feedback we provided) on another set of integer subtraction problems, and later Sofia gave all the students a short quiz involving integer subtraction problems. When we checked the number of right answers on the quiz, we were unwittingly supporting the idea that the only or primary goal of

assessment feedback is to evaluate students. Our internal summative assessment scripts were manifesting themselves. Sofia and I were both passionate about the formative assessment process and committed to using it in her classroom, but when we asked “did the feedback work,” our first impulse was to use the assessment data to evaluate students. Other options didn’t occur to us at the time: we could have looked at the processes students used on the quiz to gain insight into how the students were thinking about the problems. We could have looked at the students’ answers within the context of the feedback we provided for them earlier in order to answer a different (and potentially more important) aspect of the question “did the feedback work?” We jumped from the detailed, granular, diverse idea of students using feedback, a process, to a singular measure that defined success exclusively by an outcome. Our thinking at the time about how success might be defined didn’t include the idea that students might change their thinking processes in different ways. We didn’t recognize how we’d limited our thinking until later in the semester when we asked students to write and talk about their thinking as they solved proportion tasks. After talking with students, and reading their responses after a group discussion, Sofia realized that these students who she’d been working with for almost an entire year struggled to talk or write about what she called their “math thinking.” Many of the students couldn’t describe how they reasoned their way through math problems in words. In retrospect, Sofia realized this shouldn’t be a surprise: students were rarely asked to talk or write about their reasoning in math classes. They were just supposed to solve the problems. In order to use the



feedback we provided, students needed to be able to consider how they addressed a problem, understand our feedback, and then integrate the feedback into their processes. Sofia and I wondered: if students struggled to verbalize their math thinking, could they use feedback about math thinking? Toward the end of our time together, our discussions about “did the feedback work?” changed significantly. The criteria for “success” changed from solving problems correctly on a quiz to students each being able to describe how they worked through math problems. Our feedback work and discussions highlighted our internal summative assessment script and caused us to reconsider.

Similar changes in the summative assessment scripts in Alice and Ruby’s classroom occurred as the limitations of the writing rubric became more clear. As soon as we decided to focus on writing, Alice and Ruby familiarized me with the research report writing rubric used by all elementary teachers (see Appendix F – Student Research Report Writing Rubric). The rubric defines what a proficient research report looks like by describing necessary elements for paragraphs. Proficient paragraphs start with a topic sentence and include two or three sentences that relate to and support claims made in the topic sentence. Alice and Ruby used this rubric before and found it helpful when talking with young writers about their work. But as we worked with students during the feedback experiences, we began to notice what we saw as limitations of the rubric: we wondered why a proficient paragraph needs two or three supporting sentences? And why adding more sentences necessarily “improved” a paragraph from non proficient (one sentence) to proficient (two or three sentences) to exemplary

(more than three sentences)? We encouraged students to revise their topic sentences until they were “dynamic,” mostly through including emotion-laden, dramatic, or vivid words. Students responded to this feedback well, helping each other think of these “wow words,” but after the experience we wondered about the artificiality of these requirements. Their students were so excited to work on their writing, and the students complied with feedback about the criteria from the writing rubric, but we wondered what kinds of feedback they might offer each other if the rubric wasn’t so present in the process. The emphasis on the writing rubric is a reflection of a dominant summative assessment script. The rubric is designed to enable consistent and clear evaluation of student writing. Counting the number of supporting sentences is a straightforward way to categorize a paragraph. But what if the process started with the idea of individualized feedback instead of ease of evaluation? What kinds of feedback could students have offered to each other if their writing didn’t have to be placed in rubric categories for the purposes of evaluation? Alice and Ruby valued students’ excitement about writing and about their stories, and our feedback experiences caused us to think critically about the influence of the writing rubric. We concluded that the rubric originated out of a summative assessment script, and this conclusion led us to wonder what opportunities were missed because of the context of summative assessment processes.

The summative assessment script context was not as dominant in Lily’s and Susie’s classroom. Lily’s context was very different than the other teachers: her goals for her pre-school students involved process rather than pre-defined

products. Lily saw her teaching mission as helping her students experience learning in engaging contexts, and to work with each other to solve problems. From the beginning of our time together, she talked about goals related to “character” and social interaction rather than the goals defined by rubrics (as in Alice and Ruby’s class) or percent correct on exams (as in Sofia’s class). Lily’s students did create products, and these products were proudly displayed and celebrated. Each time I came to Lily’s classroom I saw each student’s latest creation (a picture, a written word, or some other creative product) displayed in the hallway by their name and photo. But the learning goals in Lily’s classroom were not to make these products “better” as judged by outside criteria. Lily was able to talk with parents about how their daughter’s or son’s skills were improving, but she placed an equal emphasis on their love of learning and their skills at working with others. Lily talked several times about a “vision” that represented a specific process goal in her classroom: if a student fell on the playground, other students would come to her or his aid instead of an adult. This social goal and others like it drove Lily’s passion for teaching and influenced what learning experiences she developed for students. The social and process oriented goals in Lily’s classroom influenced our summative and formative assessment scripts as we talked and planned and worked with students. The major change in our thinking had to do with scale or scope, rather than with a change in outcome or issues of measurement/evaluation. Lily realized over our semester together that feedback and student use of feedback wasn’t a part of what she did. It wasn’t an element of her classroom as she first described it in

our early interviews. Toward the end of our experience she described assessment and feedback as “everything” in her classroom. Assessment was less of a separate event in the classroom and more of an integrated, ongoing conversation. Lily’s script changed based on the realization that assessment and feedback were a part of every learning experience in her classroom.

Like Lily, at the beginning of our semester together, Susie saw assessment in summative terms, as a culminating, separate event occurring after learning. Assessment meant summing up, measuring learning that has already occurred. During our early interviews, Susie discussed her homework checking policies and her hopes that feedback might help students perform better on tests and “move up” in reading levels. But Susie was also troubled by the evaluation system imposed on her class. She was very aware of what other teachers were doing and it was important to her to collaborate with her colleagues, but she wasn’t satisfied with simply teaching and assessing the expected lessons in the expected way. Susie wondered how effective some of the established teaching strategies were, and this questioning led to a change in the dominant summative assessment script. During our co-created work with students on summarizing, Susie decided to ask the entire class about the effectiveness of the summarization techniques Susie already shared. This discussion was a revelation for Susie: her students were passionate about contributing to the conversation, and Susie realized she’d never asked students this question before. As more students raised their hands even higher for a chance to contribute to this discussion, Susie became more interested in hearing their

perspectives. When we talked about the discussion later, we both realized this was an assessment event, but of a very different kind. Susie was gathering information from students for the purpose of critically examining learning experiences, not for the purpose of evaluating their skills. Susie immediately saw the need to use what students said to create different kinds of learning experiences, leading to the individualized feedback and activities we developed for different groups. Susie realized she'd never asked students for this kind of feedback before, and she vowed to ask more often. Susie's summative assessment script changed and opened to the idea that students can provide valuable, useable feedback about instruction and learning experiences. Assessment was not limited to measuring learning after it occurs. It can be a reflective part of the learning process, offering students opportunities to share their perspectives on the value of learning experiences.

Biesta (2010) addresses the complexity and importance of defining "successful" learning by distinguishing between the technical and normative validity of assessments. Educators often discuss the technical validity of assessment, whether or not an assessment is reliable, whether items are written well, or whether scores or other marks from an assessment communicate effectively. Biesta points out that normative validity questions about assessments are, perhaps, more important than technical questions and are less often discussed. Normative validity questions ask how we are defining successful learning in a classroom, and "whether we are indeed measuring what we value, or whether we are just measuring what we can easily measure, and thus end up

valuing what we can measure.” (pg. 13). As I worked with each of the teachers, our summative assessment scripts changed as the ways we defined “success” changed. These changes reflect thinking about normative validity questions in these classrooms. As we thought about and experienced how students used feedback, we uncovered important normative questions about the learning goals of the experiences. Sofia’s emphasis on math thinking at the end of the semester represents a change in her answer to normative questions about the purpose of math instruction. Alice and Ruby’s critique of the writing rubric impacts their thinking about the normative question of the purpose of writing instruction. Lily started the semester with passionate answers to normative questions about goals in her class, and our experiences with student feedback led to her eventual view of the formative assessment process as an overarching structure for all educative encounters in her classroom. The feedback provided by Susie’s students raised challenging normative questions about how individualized reading skills can be and her teaching practice moved from single goals to a diversity of outcomes.

In each classroom, our co-created work with students about the use of feedback led to discussions about how we defined “success” of our efforts. These normative questions about measuring success led to increasingly sophisticated definitions of learning goals for students. These new understandings of the goals in each classroom gradually included an increasing emphasis on student reflection and process, formative assessment processes, and changes in our summative assessment scripts.

**Grouping Students.** The practice of grouping students was present in all of the teachers' classrooms in different manifestations, and the ways this practice changed over the semester influenced, and was influenced by, our changing assessment scripts. The criteria used to group students and the intention or purpose of these groups reveal a movement in thinking about the possibilities of feedback and assessment.

During my first conversation with Susie I asked about the chart paper on the wall listing reading groups by student name (see Appendix I – Student Reading Groups). Susie helped me understand the common practice in her building: within each class, students were placed in at, above, or below grade level reading groups based on reading diagnostic information. The purpose of this grouping practice is to allow teachers to better target reading material appropriate for student reading abilities and to individualize reading practice assignments. During our conversation Susie wondered about the benefits and dangers of these reading groups. The practice was firmly established in her school and not using it would have been a radical departure, but she was concerned with how the students perceived their membership in these groups. She observed and heard students talking about which group they were in and how they perceived the hierarchy of which group were better and worse readers. A few students even talked with her individually about whether or not their reading achievement would allow them to change groups, which they perceived as moving “up.” She saw one student trying to erase her name from one group

and add it to another. These observations and our conversations led us to our first plan involving student use of feedback. Susie wanted to use feedback to disrupt these groups, so we involved students in a discussion about their “superpowers” (strengths) and “kryptonite” (weaknesses) with a specific reading skill and regrouped the students based on these self-identifications. Then students participated in other activities based on their superpower and kryptonite, using feedback from Susie and the other students, and reflected on this practice. Part of this reflection involved an open-ended discussion with students about what kinds of practice and support are effective, and Susie reported that the discussion influenced her thinking about the groups. Previously, students were grouped based on a summative, evaluative use of assessment data, and the students had no voice in the process. The evaluation and grouping was private: students weren’t supposed to know why they were placed in each group, and any discussion of their placement had to take place behind the scenes. This practice precluded student involvement and reflection about what the reading assessment data might mean about them as readers or how they might use the feedback. Susie’s thinking about these groups changed as her assessment script changed: Students were regrouped based on their own reflection about their learning, and students were invited into the process of discussing what the assessment feedback might mean. The groups were fluid and students were able to talk about the effectiveness of this practice. Rather than precluding student involvement, the new groups depended on student reflection. Basing the groups on student self-reflection and use of feedback (formative assessment processes)



deconstructed the earlier grouping paradigm, which was evaluative, summative, and very private. Susie's grouping practices reveal a movement from a summative assessment script to a formative assessment script.

Sofia emphasized group membership from the beginning of the semester in her class, but in a different way than Susie did. Sofia wanted her students to think about their achievement and accomplishments as a group rather than emphasize individual achievement. She emphasized that the class was a group, and they succeeded and failed together. Sofia felt this team emphasis helped students view their efforts and achievements (and mistakes) differently: one of her goals was to help students become comfortable making and correcting mistakes when working with other students. I observed this practice as I started working with her at the beginning of second semester: When I observed her classroom, I saw several examples of Sofia or other students publically pointing out a mistake in student work, and although it made me cringe, students didn't seem to be concerned or embarrassed by these public mistakes. Sofia emphasized group-belongingness with all students in her class and this helped students use feedback without embarrassment or stigma.

In addition to this public sense of her class as one united group, Sofia talked about different groups of students she perceived in her class. Sofia shared her private opinions about how she mentally grouped students according to their math abilities, and her concerns about some students' potential to grasp some of the more difficult concepts. This more summative, evaluative assessment script led her to prioritize efforts with the different groups of students based on how

much help they needed and her perspective on how much feedback might help different groups of students. As we talked about these behind-the-scenes groups, we decided to use a formative assessment process to uncover what cognitive techniques students might be using when solving math problems (specifically, integer subtraction problems). We shared three different ways to conceptualize subtracting integers and asked students to self-identify which method they used most often or most effectively. These new groups received feedback based on their method and we asked them to practice their preferred techniques with integer subtraction items. As Sofia and I met with each group, we noticed unexpected diversity: students wanted to move between the groups, changing their minds frequently about which method to use. Students used different methods for different purposes, using one method to find an initial solution to the problem and a different method to check their solution. Sofia and I concluded that these groups may not have been helpful for most students, and we decided to ask students to write about their problem solving methods in order to better provide feedback students could use. This request to write about their “math thinking” was revealing: many students struggled, and resisted the request to write about how they thought their way through the proportion problems we offered. We designed a series of four practice items, asking students to write about their math thinking on each problem. The responses to the first attempt were the most extensive and revealing. Most students were able (and willing) to write about their process. But each subsequent request elicited fewer and less detailed responses. This trend may have been due to fatigue, but after

discussing it with students Sofia concluded that students were unfamiliar with the process of describing their math thinking, and this lack of familiarity led to frustration with the repeated requests. Some of the students who she had previously privately grouped as most capable expressed the most frustration. Some students asked why they had to describe their thinking and were frustrated by their lack of ability to do so. This realization changed our conversations about groups in her class, and mirrored a change in our assessment scripts. Previously, students were grouped in our minds based on evaluative, summative data about their math abilities. We looked at their performance on quizzes and concluded about their abilities. But changing the task from item completion to writing about their thinking upended this process. Suddenly the goal was different, and the previous private achievement groups were disrupted. Sofia noted some students who she may have not privately put in a high achieving group before were much more able and willing to describe their thinking. Our semester together ended with a discussion between Sofia and her class about the importance of being able to talk about math thinking and why just solving multiple problems correctly isn't the goal of the class. The previous groups were disrupted by a change in emphasis from summative evaluation data, item completion, to a process of math thinking and using feedback, a formative process.

Alice and Ruby's students came to their classroom already strongly identified with a group: English Language Learner (ELL) students. Alice and Ruby's identities as teachers were strongly connected to ELL instruction, and this

group identification was ever-present in their classroom. I didn't observe students seemed stigmatized by this ELL label or overly concerned with moving "up" or "out" of the program. I didn't experience or observe subgroups based on ELL level within the classroom. When I worked with students in small groups, students seemed to move easily between working with different partners. The emphasis in the small groups was to accomplish the task of listening to partners' stories and offer suggestions. However, the criteria used for these suggestions was based on a different aspect of grouping: the research writing rubric (see Appendix F – Student Research Report Writing Rubric). This rubric includes four levels of achievement for each of the addressed writing criteria, and these four levels quickly became shorthand for a different kind of grouping. Students talked about paragraphs being "level 3" or "level 2" paragraphs and offered suggestions to each other about how to change their writing to move it into a higher level group. Alice and Ruby and I discussed how students were offering and using feedback with each other in their groups, and we saw many examples of students using feedback from peers effectively. But as we talked about the nature of the changes, we wondered about the impact of the groups established by the writing rubric. Moving to a higher achievement level on the rubric necessitates specific and concrete changes in student writing, and sometimes these changes seemed superficial and unjustified. We wondered if simply adding an additional supporting detail to a paragraph was necessarily a valuable revision suggestion for many of the students, and we were concerned that this process was communicating a superficial vision of what it means to write to students. The

writing rubric was designed to neatly separate student writing into different groups based on achievement level: an evaluative, summative process. Alice and Ruby's students became skilled at offering and using feedback based on the achievement groups established by the rubric, but our formative assessment feedback scripts caused us to think critically about whether these achievement groups established by the rubric led to effective feedback, and what kinds of feedback students might offer each other in the absence of the rubric's summative influence.

Lily and I rarely talked about groups in her classroom. I started learning names of her students very early in the semester because she referred to individual students often during interviews, and I studied each face in the pictures posted outside her classroom. The idea of grouping students by achievement didn't occur often as we talked, but as we analyzed videos of her students interacting, the influence of groups emerged in an unexpected way. As we watched the videos of students solving jigsaw puzzles, we noticed students separating themselves into different groups, and moving from group to group. As we watched this movement more closely and talked about it, we realized that students were moving themselves from group to group based on learning interactions with classmates. Lily spotted behaviors she labeled "leadership" by students, and these behaviors were associated with movement between groups. During this very open ended activity, students were working on jigsaw puzzles they chose with a group of students. These groups were initially organized by Lily, but students were free to move from group to group. We noticed some

students working with classmates to accomplish the task, and this leadership influenced group membership and movement. One student made sure that the jigsaw box lid was placed in the center of the group and helped group members find spots to sit in that would help them work on specific parts of the puzzle. This group stayed intact, and few if any students moved in and out of it. A different group formed around the puzzle, but students frequently moved in and out of the group. Few of these students were interacting with each other. An individual student or pair of students worked on an isolated part of the puzzle, but little to no communication occurred between students. We saw several examples of students providing feedback (nonverbal and verbal) to each other about progress on the puzzles in each group, and this spontaneous student feedback, and how the feedback was received and used, influenced group formation and stability.

Lucas (1999) carefully documented what he called an “unremarked revolution” in American education, which involved the dismantling of overt systems of assigning students to educational tracks by perceived ability level. After documenting this process and its impact, Lucas concludes that “students now encounter a more hidden in-school stratification system. The implications of that system for students are profound.” (pg. 131). Students were grouped in each of the four classrooms I encountered, sometimes publically and sometimes privately. Changes in the summative assessment scripts of the classrooms involved changes in these overt and covert grouping schemes for students. Lily wasn’t aware of any overt or covert groups for her students, but our observations of student feedback use led us to notice groups organized by the problem solving

and feedback process. Alice and Ruby's students identified their entire class as a group of English language learners, but the feedback they used based on the writing rubric led us all to question the power of the writing achievement level groups even as students enthusiastically used the levels to revise their writing. Susie started our conversations with apprehension about the reading achievement groups publically displayed in her classroom, and our feedback work led us to activities that undermined those established groups and instead resulted in groups based on the students' personal reflections about their own learning. Sofia helped her students develop a class identity as a team working toward a shared goal, but privately she thought about students in different ability groups. Our work led to summative assessment script changes regarding the goals of math instruction, which undermined her previous conceptions about these ability level groups.

**Mindset.** Another aspect of the changes in our summative assessment script in this study involves Dweck's (2006) mindset theory. Teachers discussed student attitudes about learning in ways that align with Dweck's description of "fixed mindsets" (the belief that ability in a specific area or skill is fixed and unchangeable) and "growth mindsets" (the belief that abilities can change based on effort and practice). Susie talked about mindset theory most directly as she described students who viewed their writing ability as fixed and unchangeable. She observed that these students didn't seek help or seem to value practice opportunities and even looked for ways to escape receiving or using feedback. Sofia did not talk about mindset theory explicitly but described similar behaviors

in her class. When some of Sofia's students resisted talking about how they solved math problems, they may have been expressing a fixed mindset attitude, not seeing the value of reflecting on their own practices or modifying their thinking based on feedback. Alice and Ruby and Lily's observations about their younger students exemplify growth mindset attitudes. Alice and Ruby recognized the value of what they called "enthusiasm" about writing from their students. This recognition, which is an acknowledgement of the role of effort and practice, reflects a growth mindset: the belief that writing ability will change based on effort and practice. Lily also did not use mindset theory language in our discussions, but many of her behaviors and communications in her classroom are based on a belief in the value of practice. She carefully observed individual student behaviors and tried to provide exactly the right practice opportunities at exactly the right times. She believed, and emphasized with students, that each student was following their own learning path and that effort and practice were absolutely necessary to their learning.

As teachers made room for formative assessment processes, summative assessment script beliefs about whether abilities were fixed or changeable evolved. The emphasis on reflection about feedback is inherent in both the mindset and formative assessment processes constructs. Stiggins (2007) recognized this focus long before the current terminology of formative assessment were in common use. Stiggins talked about students who were convinced they were on "losing streaks" (pg. 22) in the same way Dweck (2006) talked about students with fixed mindsets. The "losing streak" students Stiggins



described were convinced that their efforts would not change any learning outcomes, and proposed that formative assessment processes were vital to changing this mindset. Early in our interviews, Sofia described a student who did not “get” basic math concepts and wondered if feedback was even useful for her process. Later in our semester as she made more room for formative assessment processes, Sofia talked about this student differently, attending to her ability to talk about her “math thinking” rather than an exclusive summative focus on the numbers of problems she did correctly.

Mindset theory and formative assessment share an emphasis on the value feedback use, and beliefs about the value of feedback influence both summative assessment scripts and the success of formative assessment processes. Data gathered by Ruiz-Primo (2010) and colleagues indicate that formative assessment processes may influence student motivation based on teacher assessment scripts: student scores on a motivation questionnaire varied widely between teacher and student groups in their study, leading these researchers to conclude that the ways teachers thought about and used formative assessment practices in their classrooms influenced student motivation more than the simple inclusion of “more” formative assessment. These researchers may have uncovered prevailing summative assessment scripts in teachers who were asked to implement formative assessment without discussions about the underlying philosophy and intent of the formative assessment process. What these researchers call a lack of “fidelity of implementation of the intervention” (pg. 152), Dewey (1938) might have called a failure to attend to the importance of the

participation of the learner: “There is I think no point in the philosophy of progressive education which is sounder than its emphasis upon the importance of the participation of the learner in the formation of the purposes which direct his [sic] activities in the learning process” (pg. 67). Teachers who aren’t asked to participate in discussions about the learning process involved in formative assessment are in the same position as students who are tasked to complete assignments but not asked to reflect on their learning. The changing summative assessment scripts the teachers and I experienced involved Dewey’s emphasis on the participation of the learner and attention to purpose. Mindset theory advises teachers and students to attend to the value of practice in our changing thinking and abilities, and this same attention to process and practice is inherent in teachers’ changing thinking about formative assessment processes. Barone (1983) called for this kind of evolution in summative assessment script thinking: “We need to devise and welcome new evaluation approaches that can reveal the qualities within educational experiences and the teaching process – approaches to augment the quantitative strategies and instruments that prevail” (pg. 26). Like Barone, the teachers in this study emphasized the role of reflection and feedback within the learning process as they made more room for formative assessment processes. This emphasis on the value of practice and feedback mirrors mindset theory and represents an important change in summative assessment scripts.

## **Chapter 9**

### **Conclusions**

In my school district, meta-analysis data (Marzano, 2003; Hattie, 2009) are often used to make conclusions about “what works” in schools. These meta-analyses offer lists of teaching strategies along with effect size statistics predicting how much student achievement will increase if the recommended strategies are used. Many teachers are now asked to share with administrators and other teachers which teaching strategies they plan on using and to provide research support for these choices. Our district’s school improvement office publishes lists of “universally approved teaching strategies” based on these meta-analyses. One message teachers might take from this emphasis on “what works” is: here are lists of strategies you can choose from, you should determine which strategies will work for you based on research done by someone else, and if you choose from these lists, you can be confident that your teaching will “work”.

My experiences with teachers during this dissertation leads me to a different conclusion. Formative assessment teaching strategies are included on these lists of recommended teaching strategies, and meta-analyses conclude that formative assessment increase student achievement (Marzano, 2003; Hattie, 2009; Black and Wiliam, 1998). But what happens when a teacher chooses to use formative assessment based on these lists? Can teachers find room for formative assessment within their other obligations and concerns? Is announcing “what works” and encouraging teachers to use formative assessment effective?

Biesta (2007) cautions against this process: “To suggest that research about ‘what works’ can replace normative professional judgment is not only to make an unwarranted leap from ‘is’ to ‘ought’; it is also to deny educational practitioners the right not to act according to evidence about ‘what works’ if they judge that such a line of action would be educationally undesirable” (pg. 11). No matter how attractive, exciting, or well researched a teaching strategy is, teacher reflection should be at the center of the decision about whether or how to use that strategy.

When teachers are not in the center of these decisions, assessment decisions can restrict possibilities in classrooms rather than expand them. Au (2007) documented how decisions about high-stakes assessments led to a narrowing of the curriculum taught in the schools he examined and influenced teachers to focus on test preparation rather than other goals. These kinds of top-down assessment decisions may be influenced by dominant summative assessment scripts in schools. Stralberg (2006) described the evaluative (and mostly negative) metaphors teachers and students use to describe assessment, and most testing specialists describe learning using behavioral, causal models rather than relational or constructivist conceptualizations (Shepard, 1991; Shepard, 2000). Assessment can be a valuable part of relational ways of learning and knowing, but it requires thinking beyond this summative assessment script. Delandshire (2002) proposes that “Since learning is a ‘kind of doing,’” our assessments can take this “dynamic nature into account” (pg. 1479). Formative assessment processes can help teachers and students make the dynamic nature

of learning visible in classrooms, and teachers and students use feedback as part of the learning process, rather than using assessment data to sum up learning after it is “over.” Reflective participation by teachers and students is a precondition for this kind of change in the dominant summative assessment script. It is not something that can be effectively decreed by a remote decision maker. Making decisions about assessment for teachers and students rather than with them reduces the space available for reflection and using feedback rather than expanding it.

I was nearly guilty of an example of this restriction in space available for reflection as I planned my dissertation. My original plan involved working with each teacher on a single diagnostic item as a way to introduce the formative assessment process. This plan presumed that the teachers I would work with needed an introduction to formative assessment processes, and that I could and should predict and control what this introduction should be. My intentions were good, and the single diagnostic item technique was and is an intriguing idea. But I discovered very quickly after talking with these teachers that my presumption about single diagnostic items as the way we should all start making room for formative assessment processes was naïve and potentially disruptive. We talked about single diagnostic items in the early interviews, but the unique context, experiences, and reflections in each case took each conversation in different directions. We didn’t need to all start in the same place or use the same idea. We needed to listen carefully, reflect, respond to each other, and try out ideas.

Listening is central to the formative assessment process, and in each of the four cases, careful listening guided our processes toward individualized, contextual formative assessment experiences rather than imposed, top-down strategies. Haroutunian-Gordon (2010) warns against “recommending ‘greater effort’ for students who, historically, have had no choice but to listen and who today are asked to listen to curricular materials which are of questionable educational value (while also being denied a chance to talk or listen among themselves)” (pg. 2740). This warning is applicable both within the classrooms in this study as well as in my conversations with teachers: as teachers made room for formative assessment processes, they created opportunities for students to use their voices in reflections about their learning and empower them to use feedback rather than passively accept evaluative assessment data. The warning also applies to conversations between the teachers and myself as researcher. Asking teachers to use formative assessment (or single diagnostic items) only because it is a well-researched strategy can be similarly silencing. Making room for formative assessment processes necessarily involves careful listening rather than provocative or compelling “sales pitches,” just as the formative assessment processes themselves involve empowering students to listen and use feedback rather than accept it and move on. Through listening the teachers and I were able to gain insight into their classrooms, their goals, and their wisdom about how feedback already fit into their classrooms. Together we were able to generate ideas about ways in which students using feedback might continue to work toward goals already established, and valued in their classrooms.

In each case, what teachers said they valued was attending to the learning process, rather than an exclusive focus on product. As teachers made room for formative assessment processes, their thinking about assessment and feedback focused on student thinking, student insight into learning, and/or the central nature of feedback in the learning process. These formative assessment experiences led to more discussions about summative assessment scripts, which focus on outcomes rather than the reflexive process of learning. During my first conversations with Sofia, Alice and Ruby, and Susie, we discussed the “ends” of learning: how formative assessment might help students achieve specific goals in writing or math. But the formative assessment experiences we designed together led us to focus more on the “means” of the learning experiences: the reflections and thinking involved in the learning, and in using feedback during formative assessment experiences. We began to recognize the limitations of what Hansen (2001) called “outcome-based views” (pg. 5). This perspective “focuses so heavily on results or ends that that the means of their realization are treated in an instrumental manner” (pg. 5). Focusing just on student achievement rather than attending to student thinking as well is treating students instrumentally, as a means to an end, rather than recognizing the value of the thinking involved in the learning process. Similarly, focusing on the “end” of increasing formative assessment can treat teachers instrumentally unless the vital “means” of reflection are honored and made central to the process. Dewey (1922) argued that achieving ends related to learning depends on attention to means: “To reach an end we must take our mind off from it and attend to the act which is next to be

performed” (pg. 34). A focus on the means, the learning processes involved, may be more likely to impact lasting thinking patterns: “Until one takes intermediate acts seriously enough to treat them as ends, one wastes one’s time in any effort at change of habits” (pg. 35). Greene (1995) applies this same attention to the means of thinking to assessing learning: “Only when teachers can engage with learners as distinctive, questioning persons – persons in the process of defining themselves – can teachers develop what are called ‘authentic assessment’ measures” (pg. 13). The processes of making room for formative assessment and the process of changing summative assessment scripts are both means and ends.

Two of the researchers who began the “formative revolution” (Black & Wiliam, 1998) also explored the complexities of formative assessment as means and ends when they worked with teachers to implement formative assessment processes in classrooms. Their experiences mirror some of the process and findings of this dissertation, and a brief discussion of their study may provide an opportunity to reinforce some of the conclusions of my research. A team of researchers led by Black (2003) worked with 24 secondary school teachers with the goal of encouraging the implementation of a list of formative assessment practices in their classrooms. Initially, the research team worked on establishing a context of trust with the teachers: “The plan was to work in a genuinely collaborative way with a small group of teachers ... supporting them as well as we could, but avoiding the trap of dispensing ‘tips for teachers.’ At first, it appeared that the teachers did not believe this.” (pg. 21). This context of trust



and community between the research team and teachers led to unanticipated changes in the methodology. The research team originally required teacher participants to “steer clear of summative assessment as they developed their formative work.” (pg. 53). The teacher participants let the research team know how unrealistic this expectation was and that formative assessment had to be integrated into the overall summative assessment expectations in their classrooms. The research team changed their original list of recommended formative assessment practices to include formative uses of summative tests (pg. 53). In the discussion of their findings, the research team emphasized the unexpected complexities involved in integrating formative assessment into existing classroom systems with established expectations about summative assessment and communicating achievement to parents and others. The summative assessment scripts already in place influenced these teachers’ and researchers’ abilities to implement formative assessment processes. The research team that originally set out to implement a defined set of formative strategies with a small group of teachers changed their process to include co-creation of strategies and reflection about how to modify strategies for each context. The researchers’ final, poetic summary emphasizes the individualized, reciprocal nature of this kind of work: “To fall in love with ideas is but a start on the long hard road of commitment to the relationship, one in which the numerous and intimate details have to be worked out both at a personal and at an institutional level.” (pg. 123).

I encounter this long, hard road of commitment during my work as an assessment specialist in my school district. I am often invited to work with groups of teachers on projects involving formative assessment processes. As a district office administrator, the context of this work is usually a large group meeting, and my expected role is to present information about formative assessment. During these meetings, the expected process is that an individual addresses the large group of teachers from the front of the room, usually using a slide presentation to transmit information about research findings and “expert opinion” on a topic. The district administrator is expected to make the presentation as clear and entertaining as she or he can, then leaves as the building administrators and teachers take over the work involved in translating the transmitted information into action with students, or to move on and not use the transmitted information. My work with teachers during this dissertation convinces me that this easy and expected process is inadequate. In my role as an assessment specialist, I should attend to the inherently contextual and reciprocal nature of the formative assessment process. The teachers I worked with in this study made room for the formative assessment process through our continuing discussions, not because I arrived in their classroom to transmit information about formative assessment. Just hearing about formative assessment would not have been enough for them to make room for it in their classrooms, even if I brought well-designed slides or a clever and witty presentation. Making room for formative assessment requires conversation, reflection, and authentic engagement within the context of teachers’ classrooms

and goals. My role as an assessment specialist requires me to acknowledge and honor this realization by challenging the expected model of how a district administrator works with teachers.

I may be able challenge this expected model in a productive way by using findings from this study to address the dominant summative assessment script for teacher professional development. The professional development workshops teachers attend often resemble my near-mistake in this dissertation: they begin with assumptions about what experiences or examples teachers need rather than creating the context for a more open conversation. Two of my experiences leading professional development experiences exemplify this contrast: A few years ago, a colleague and I were asked to talk to teachers at each of the middle schools about a revised report card. We dutifully developed a set of explanatory slides about the advantages of the new report card, and we made appointments at each middle school. We presented our slides to all the teachers in the school, usually in the cafeteria or auditorium. After our presentation, we answered a few questions, usually from teachers who were upset enough about the change to speak up, even when asking questions inevitably meant that the meeting would last longer. Then we left that building and went on to the next, with no plan or prospect of continuing the conversation. A more recent professional development experience contrasts with these report card presentations. A few colleagues and I asked middle school teachers to become involved in an “action research team” with the goal of discussing how teachers use homework. We met with a group of volunteer teachers at two buildings and started a discussion focused on

identifying what each teacher wanted to investigate about homework in their classroom. We shared references and literature that we felt might be useful, and each teacher developed a plan they wanted to try in their classrooms. Each discussion built on teachers' ideas and experiences, and the job of the group was to offer ideas and feedback about each teacher's project. On the surface, these two teacher education experiences are similar: they both involved grading practices of middle school teachers. They shared similar goals involving formative and summative assessment practices and how these practices are put into practice through grading practices. But the processes of these two teacher education experiences contrast sharply. Each of these four cases presented in this dissertation implies that teacher education necessarily involves reflection by teachers and attention to teacher reflection in the process. Lecturing an entire staff about how to implement a new report card may successfully transmit factual information about a policy change, but it is not likely to increase teacher capacity to use grading practices to promote learning. It does not attend to what these teachers are currently thinking about their grading practices or their goals for grading. Our action research team discussions were more effective because they attended to the major implication about teacher education from this dissertation: making room for formative assessment requires reflection about assessment script, and changes in assessment scripts affect how teachers make room for formative assessment.

I began this dissertation by describing a dissonance I experience as an assessment specialist and district administrator: the dissonance between the

message from educational researchers that formative assessment “works,” and what I hear from teachers about the obstacles they experience as they think about and work with formative assessment processes. The teachers I talked with in this study were interested in making room for formative assessment in their classrooms. As we worked together, we discovered that making room for formative assessment requires reflection and discussion about issues of trust, autonomy, student self-efficacy, as well as philosophical issues about the nature of teaching and learning. These discussions involved, and changed, expectations about purposes and practices involving assessment. I believe Barone (1983) hinted at these interconnections between assessment and assessment scripts when he called for “new evaluation approaches that can reveal the qualities within educational experiences and the teaching process” (pg. 26). As teachers made room for formative assessment, qualities about the learning process were made visible during our discussions. Our discussions focused on how to gain insight into student thinking about mathematical processes, how students’ experiences of trust and community impacted their ability to use feedback while learning, and how preconceptions about the outcomes of learning affect how feedback is given, received, and used. The teachers talked about needing room, both in terms of time to reflect and freedom to experiment, in order to puzzle through how to help students use feedback in formative processes. Kemmis and Smith (2008) recognized the need to provide teachers with the “professional autonomy and responsibility to act in the interest of their students” in order to create “conditions for people to live educationally, not by applying rules, but by

being ‘philosophical’ about what they are doing.” In our experiences together, being philosophical about making room for formative assessment processes required that teachers had the autonomy to attend to the specific contexts of their classrooms, rather than implement a predetermined, decontextualized idea of formative assessment processes. It would have been easy for teachers to “apply the rules” and simply add an example of a formative assessment from their curriculum materials or other outside source. This addition could have been justified with the rationale that formative assessment “works” according to research. This process could have attended to the technical validity of the formative assessment processes: the assessments might have included well-written items or tasks along with detailed scoring guides and extensive feedback for students. But this decontextualized process would likely miss what the teachers in this study uncovered: making room for formative assessment processes in real classrooms meant attending to issues not commonly addressed, like trust, freedom, conceptions of learning, and beliefs about how assessment data could be used with instead of strictly about students and learning experiences. Making room for formative assessment processes pulled on multiple connected threads in these classrooms, and these interconnections drove the conversation to deeper normative validity issues of assessment.

Teachers need room to reflect, discuss, and uncover the opportunities for feedback and feedback use within learning experiences, and this processing room impacts thinking about learning and assessment, which may lead to more room be made for feedback uses in learning experiences. Making room for

formative assessment processes impacts assessment scripts, which impact formative assessment processes. Based on my experiences through these four cases, I conclude that teacher judgment and reflection are central to any successful integration of teaching strategies, such as the formative assessment process. This conclusion is based on findings from the two research questions: teachers make room for formative assessment processes through reflections about the assessment scripts in action in their classrooms. This process is reciprocal: reflecting about assessment scripts enables teachers to find room for formative assessment processes, and making room for formative assessment processes provides experiences and evidence that help teachers further reflect on their assessment scripts. Our conversations led us towards viewing assessment as an integral part of the reflective and relational nature of learning and understanding. Figuring out how teachers and students could use feedback in ways that promoted reflection during educative experiences required examination of and changes in our assessment scripts. Making room for formative assessment processes became an important way we could all talk about the heart of the matter: thinking together with students about the understandings we were developing, and acting upon our thinking to continue our learning conversations.

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## Appendix A – Member Checking, Teacher Feedback on Case Reports

### Sofia

“Rob, I finally opened the paper using an iPad. Wow! You have made me sound really smart. I enjoyed reading your work. When do you have everything wrapped up so I can call you Dr. McEntarffer? ...Rob really helped me focus on how I can learn about students and their needs through the assessment process. I have always been a big believer in descriptive feedback, but I'm not sure I ever did a good job of utilizing assessment to the extent that learning was retained by the students because they had a better understanding of the material. Students liked having Rob come to our classroom because he is a fun person to have in the classroom; but, more importantly, I think they felt he could help us get to the root of our misunderstandings in math that were barriers to success.”

### Ruby

“ I finally got a chance to sit down and read your paper. First, I have say thank you for capturing our love of teaching in your words. I got tears in my eyes while reading and I appreciate the care you took to convey the importance of what we do with students. As for the details and chronological order, I think you covered everything in correct order. I did notice a couple of little details you might want to fix: the rubric we use is based on the district rubric but was altered to be in kid friendly language. You may have written this and I missed it. Also, the younger kids who came in to work with 3rd grade were 2nd graders not 1st graders. Other than those things, I think your facts are correct. On another note: Dawn and I are co teaching writing this year with 4th grade gen Ed teachers so we get to observe our ELL kids in the gen ed environment. I am so proud of how confident they are in front of the whole group and they take pride in sharing their knowledge about writing and the writing process. Their love of writing is still there....so far. They are having a little trouble with the "bouncing around" of the curriculum but I try to reassure them that the traits of quality writing are in them as students and not to be stressed about daily activities that they may view as disconnected from good writing. They are so aware of when to ask for help and "knowing what they don't know". That will help them so much to be successful in gen Ed. Thank you for giving me the opportunity to become more reflective about my teaching. I wish you the best of luck in your studies and don't hesitate to stop in at Clinton and say hello!

### Lily

“Omg - i love it! You captured our classroom perfectly! Thank you so much for your insight - you're gonna make me miss teaching. I love my new job, but am exhausted. We have been all over the state doing beginning of the year workshops. Cant wait to focus I'll be working with [name of school deleted] school - so maybe I'll see you sometime again! I do miss the work we did - it was so intentional. Thank you and good luck! ...I'm proud of your work!”

### Appendix B - Summary of Data Collection by Case

Teacher	Classroom context	Interviews	Audio files	Classroom observations	Artifacts	Ideas for the case report:
A.H.	Special Education teacher, grades 3-5, Clinton Elementary	9	7	2 (no video)	One main idea item created (not used yet), reading passage samples, email exchanges	<ul style="list-style-type: none"> <li>early discussions (and sharing articles, etc) about motivation</li> <li>in depth discussions about the influence of NeSA on learning goals and assessment</li> <li>discussions about reading comprehension/main idea</li> <li>discussions, really took off when we started talking about her writing club.</li> <li>Passion about writing, feedback for authors</li> <li>Writing club and classroom observations</li> <li>Nothing "tried out" in her classroom.</li> </ul>
Sofia	6th grade teacher, School Middle School	7 (4 with students)	7 - B.T. 2 - students	4 (3 videos, 1 incomplete)	Subtracting integers items, proportion items, content from textbook, student response sheets for each observation	<ul style="list-style-type: none"> <li>conversations about the role of trust, comfort with being "wrong", being open about needing help, and classroom atmosphere in feedback use</li> <li>specific discussions about hopes for students using feedback, "highlights" in class when it happens</li> <li>Extensive conversations and "trying out" of SDIs and other feedback use in classroom (context=math).</li> <li>limitations of SDIs, and student abilities to self identify?</li> <li>Most contact with students in this context (interviews)</li> <li>Use to items as diagnostic of student thinking</li> <li>Feedback individualized for students (did it</li> </ul>



						work?) <ul style="list-style-type: none"> <li>This case is my "deepest dive" into a classroom.</li> </ul>
B.C.	Special Education teacher, grade 6-8 School Middle school	5	4	0	(none)	<ul style="list-style-type: none"> <li>Great conversations every single time</li> <li>Discussions about how his students use constant feedback from him.</li> <li>Feedback in the context of "social skills" development</li> <li>Worked on plans for student involved rubric</li> <li>A new baby in his family disrupted our plans to implement with his students.</li> </ul>

Teacher	Classroom context	Interviews	Audio files	Classroom observations	Artifacts	Ideas for the case report:
D.L.	ELL grade 2&3 teacher, Clinton Elementary	8	7	3 (3 videos)	Samples of student writing, feedback from peers, revisions to student writing	<ul style="list-style-type: none"> <li>emphasis on partnership (welcome to the project Hillary!)</li> <li>Context=writing right away (passion for writing in this class!)</li> <li>discussions about kinds of feedback beginning writers might be able to USE and give each other (sample paragraphs, feedback sheets)</li> <li>in class observations - successes! limitations?</li> <li>rubric discussions: NeSA pressures competing with other models of writing (e.g. "dynamic" topic sentences?)</li> <li>redundancy of Rob (into the 2nd observations)</li> <li>hopes for these kids as they go forward?</li> </ul>
K.R.	ELL preschool teacher, McPhee Elementary	7	6	3 (3 videos)	(none)	<ul style="list-style-type: none"> <li>In depth discussions of the constant role of feedback in her classroom <ul style="list-style-type: none"> <li>feedback and relationship to student independence/"character"</li> <li>started with "does it happen and how",</li> </ul> </li> </ul>

						<p>progressed through different ways students DO use feedback, eventual realization: "this is happening all the time and it may be the basis of everything!</p> <ul style="list-style-type: none"> <li>◦ he complexities of feedback with young language learners.</li> <li>◦ Innovative feedback techniques (signs!)</li> <li>◦ insights from video analysis: leadership, modeling, sharing</li> <li>◦ community in classroom</li> <li>◦ expectation = we take care of each other in here</li> </ul>
M.W	5 <sup>th</sup> grade teacher, Sheridan Elementary	9	7 – M.W. 3 - students	3 (3 videos)	<p>Student feedback list about what "helps" them learn, student writing to identify "superpowers and kryptonite, student reflections about how to study vocabulary</p>	<ul style="list-style-type: none"> <li>• Discussions about "tracking" - different reading groups</li> <li>• Emphasis on feedback from students about writing instruction techniques.</li> <li>• Very open to using feedback from students.</li> <li>• Metaphor used for students: Superhero powers and Kryptonite in their writing.</li> <li>• Tension between "what's fun/easy" and "what helps me."</li> <li>• Students implementing "studying plans" for vocabulary.</li> <li>• Megan is ?ing many practices at her school. SES issues, meritocracy issues?</li> <li>• Feels supported by her principal. Enthusiastic, not much experience to draw on.</li> </ul>

## Appendix C – Specific Integer Subtraction Feedback

*[student names included here]*

Hi group! We looked at how you were answering the subtracting integers problems, and we noticed that when you get an answer wrong, sometimes you **added the two integers and missed the "signs"** (negative and positive).

### ***Here's what we'd like you to do:***

Step 1) Please read through the feedback below. When everyone in your group is done, please take turns explaining the feedback to each other. Please make sure EVERYONE in your group understands the feedback, and write in the space below what your group thinks is the MOST IMPORTANT piece of advice:

---



---



---

Step 2) Practice on the sample items. Make sure you use what you learned from the feedback!

Step 3) Be ready to answer questions about how you used the feedback on the sample items!

### ***Here's the advice about the different "types" of subtracting integers problems:***

Type 1: Subtracting a negative integer from a positive one:

$$3 - (-8) = 11$$

Notice that you are subtracting a negative. For problems like this, remember that the two negatives "cancel" each other out, and you can add the two integers to get the right answer. (Remember: the final answer is POSITIVE because the two negatives cancelled each other out!)

Type 2: Subtracting a positive integer from a negative one:

$$(-3) - 8 = -11$$

Notice that you are subtracting from a negative. For problems like this, remember that you can add the two integers and use the common sign (Remember: the final answer is NEGATIVE because it's the common sign)

Type 3: Subtracting a negative integer from a negative one:

$$(-3) - (-8) = 5$$

Notice that you are subtracting a negative. For problems like this, remember that the two negatives "cancel" each other out, so you can subtract and use the sign of the integer with the larger absolute value (Remember: the final answer is POSITIVE because the two negatives in front of the 8 cancelled each other out).

*[student names included here]*

Hi group! We looked at how you were answering the subtracting integers problems, and we noticed that when you get an answer wrong, sometimes you **subtracted the integers and missed the "signs"** (negative and positive).

***Here's what we'd like you to do:***

Step 1) Please read through the feedback below. When everyone in your group is done, please take turns explaining the feedback to each other. Please make sure EVERYONE in your group understands the feedback, and write in the space below what your group thinks is the MOST IMPORTANT piece of advice:

---



---



---

Step 2) Practice on the sample items. Make sure you use what you learned from the feedback!

Step 3) Be ready to answer questions about how you used the feedback on the sample items!

***Here's the advice about the different "types" of subtracting integers problems:***

Type 1: Subtracting a negative integer from a positive one:

$$3 - (-8) = 11$$

Notice that you are subtracting a negative. For problems like this, remember that the two negatives "cancel" each other out, and you can add the two integers to get the right answer. (Remember: the final answer is POSITIVE because the two negatives cancelled each other out!)

Type 2: Subtracting a positive integer from a negative one:

$$(-3) - 8 = -11$$

Notice that you are subtracting from a negative. For problems like this, remember that you can add the two integers and use the common sign (Remember: the

final answer is NEGATIVE because it's the common sign)

Type 3: Subtracting a negative integer from a negative one:

$$(-3) - (-8) = 5$$

Notice that you are subtracting a negative. For problems like this, remember that the two negatives "cancel" each other out, so you can subtract and use the sign of the integer with the larger absolute value (Remember: the final answer is POSITIVE because the two negatives in front of the 8 cancelled each other out).

*[student names included here]*

*[student names included here]*

Hi group! We looked at how you were answering the subtracting integers problems, and overall it looks like you are understanding how to subtract integers well! We noticed a few examples of some of you following the rules correctly but getting the wrong answer because of **a mistake in arithmetic**.

***Here's what we'd like you to do:***

Step 1) Please read through the feedback below. When everyone in your group is done, please take turns explaining the feedback to each other. Please make sure EVERYONE in your group understands the feedback, and write in the space below what your group thinks is the MOST IMPORTANT piece of advice:

---



---



---

Step 2) Practice on the sample items. Make sure you use what you learned from the feedback!

Step 3) Be ready to answer questions about how you used the feedback on the sample items!

***Here's the advice:***

It might help if you completed a few practice problems and spent some time checking your arithmetic. You can choose a way to check that works best for you: Doing the problem again to see if you get the same answer, using a number line, etc.



**The answer(s) I'm committing to right now (please circle)**

A

B

C

D

**I committed to those answer(s) because:**

**After talking to my group, I'm thinking the right answers are:**

A

B

C

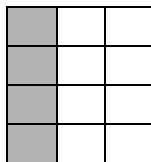
D

**I changed my thinking about the right answers because:**

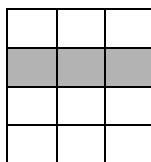
*Day 1, Item 2*

Name: \_\_\_\_\_

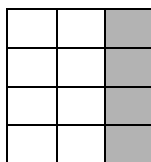
**Which of the following proportions are EQUAL to the proportion below?**



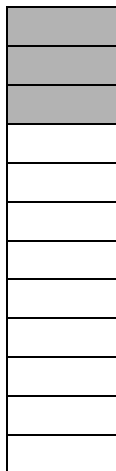
**A.**



### B.



**C.**





**D.**


**The answer(s) I'm committing to right now (please circle)****A****B****C****D****E****F****I committed to those answer(s) because:****After talking to my group, I'm thinking the right answers are:****A****B****C****D****E****F**

**I changed my thinking about the right answers because:**

*Day 1, Item 3*

Name: \_\_\_\_\_

**Which of the following proportions are EQUAL to the proportion below?**

**33%**

A.  $\frac{1}{3}$

B. .33

C.  $\frac{33}{100}$

D.  $\frac{3}{9}$

**The answer(s) I'm committing to right now (please circle)**

A

B

C

D

**I committed to those answer(s) because:**

**After talking to my group, I'm thinking the right answers are:**

A

B

C

D

**I changed my thinking about the right answers because:**

## Appendix E – Paragraphs with Mistakes

- no topic sentence:

*Cheetahs live in Africa. Some cheetahs live in Asia. A few cheetahs live in zoos.*

- sentences don't support topic sentence:

*Polar bears are beautiful mammals. These bears live on the arctic coast. Global warming is melting the ice and shrinking it. It is harder to hunt for the polar bears.*

- topic sentence with supporting sentences:

*Baboons are interesting looking apes. They all have brown hair. Some have pink faces. These animals have long tails.*

## Appendix F– Student Research Report Writing Rubric

Research Report Writing Rubric for Grade 3				
	3	2	1	
<b>Defines Task</b>	<ul style="list-style-type: none"> <li>independently chooses topic</li> <li>independently narrows topic</li> <li>independently identifies more than 3 questions related to topic</li> <li>independently selects and reads anchor book at independent reading level</li> </ul>	<ul style="list-style-type: none"> <li>chooses topic with little teacher support</li> <li>narrows topic with little teacher support</li> <li>identifies 3 questions related to topic with little teacher support</li> <li>selects and reads anchor book at independent reading level with little support</li> </ul>	<ul style="list-style-type: none"> <li>chooses topic with much teacher support</li> <li>narrows topic with much teacher support</li> <li>identifies 3 questions related to topic with much teacher support</li> <li>selects and reads anchor book at independent reading level with much support</li> </ul>	<ul style="list-style-type: none"> <li>topic selected by teacher</li> <li>does not narrow topic</li> <li>teacher selects questions</li> <li>teacher selects anchor book or student does not read anchor book</li> </ul>
<b>Seeks Information</b>	<ul style="list-style-type: none"> <li>independently finds 3 sources (i.e. print and/or online)</li> <li>independently determines importance of information to answer questions</li> </ul>	<ul style="list-style-type: none"> <li>independently finds 2 sources (i.e. print and/or online)</li> <li>determines importance of information to answer questions with little support</li> </ul>	<ul style="list-style-type: none"> <li>independently finds 1 source (i.e. print and/or online)</li> <li>determines importance of information to answer questions with much support</li> </ul>	<ul style="list-style-type: none"> <li>teacher finds information for student to read</li> <li>unable to determine importance of information</li> </ul>
<b>Reads &amp; Records Information</b>	<ul style="list-style-type: none"> <li>independently records many supporting details</li> <li>independently and accurately records notes on graphic organizer</li> <li>independently changes notes into complete sentences</li> </ul>	<ul style="list-style-type: none"> <li>records many supporting details; little teacher support</li> <li>records notes on graphic organizer with little teacher support</li> <li>changes notes into complete sentences with little support</li> </ul>	<ul style="list-style-type: none"> <li>records few supporting details</li> <li>records notes on graphic organizer with much teacher support</li> <li>changes notes into complete sentences with much support</li> </ul>	<ul style="list-style-type: none"> <li>does not record supporting details</li> <li>only records notes on graphic organizer with teacher support</li> <li>does not change notes into complete sentences</li> </ul>
<b>Written Product</b>	<ul style="list-style-type: none"> <li>lead grabs readers attention</li> <li>thesis statement flows naturally in introduction</li> <li>each paragraph includes a dynamic topic sentence</li> <li>paragraphs have more than 3 supporting sentences</li> <li>satisfying ending; lets reader know report is finishing</li> <li>report is interesting from beginning to end</li> <li>correct punctuation and spelling throughout report</li> </ul>	<ul style="list-style-type: none"> <li>includes a basic lead</li> <li>includes thesis statement</li> <li>each paragraph includes a topic sentence</li> <li>paragraphs have 2 or 3 supporting sentences</li> <li>ending lets reader know report is finishing</li> <li>most of report is interesting</li> <li>punctuation and spelling are correct throughout most of report</li> </ul>	<ul style="list-style-type: none"> <li>weak lead</li> <li>thesis statement written with much teacher support</li> <li>some paragraphs include a topic sentence</li> <li>paragraphs have 1 supporting sentence</li> <li>ending leaves reader wondering</li> <li>interest is lost early in story</li> <li>many punctuation and spelling errors, but meaning is not lost</li> </ul>	<ul style="list-style-type: none"> <li>lead is missing</li> <li>thesis statement missing</li> <li>topic sentences are missing or confusing</li> <li>sentences are weak or unrelated</li> <li>ending is missing</li> <li>report is uninteresting</li> <li>punctuation and spelling errors confuse the reader</li> </ul>

When the term "support" is used, it refers to support outside the mini-lesson.

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## Appendix G – Summarizing Discussion Poster

**Summarizing:**

**Superhero powers (What we're good at)**

- longer/shorter pieces of text
- Summarizing familiar texts
- Summarizing lit/personal Read books (entertaining)
- Picking out details
- Picking out main events of a story
- Easier to summarize when you're writing your opinion

Mix up parts of non-fiction text when no background knowledge  
 Confusion on how to piece together info. that you've read  
 Too many characters/big plot

**Kryptonite (What is hard or "What" we need to work on)**

- Putting details/main ideas together
- Summarizing new/unfamiliar texts
  - unsure what important info is or where to find it
- Summarize non-fiction
- When need re-read/unsure of what you've read
- Putting details together to write summary
- Difficult when there are lots of dates/facts (picking out what's important)

• Picking out good details  
 • over-whelmed

**Appendix H – How to Study Vocabulary Item**

Name: \_\_\_\_\_

**What is the best way to learn the definitions of vocabulary words?**

- A. Writing the definition of the word 50 times
- B. Using my vocabulary quizzes to figure out which words I need to study the most
- C. Reading a page from the dictionary every day when I wake up
- D. Making up my own sentences using words I need to study
- E. Figuring out how the words I need to study are connected to words I already know
- F. Using other words in the sentence to figure out what a vocabulary word probably means
- G. Drawing a picture to help me visualize the meaning of the word
- H. Repeating the definitions out loud of the words I need to learn

**I think this is the best way to study vocabulary right now (please circle one or more ways that you feel help students do well on vocabulary tests)****A   B   C   D   E   F   G   H****I think these are the best answer(s) because:**

**After our class discussion, I'm thinking the right answers are:**

**A B C D E F G H**

**Did my thinking change after meeting with my group? If so, why did it change?**

**Here's the studying plan I developed after talking with my group:**

**Why did I choose this plan? Why do I think it will work?**



**How will I know if my plan worked?**

**Please use this page to track of any way you used your plan to study (for example, writing sentences using the vocabulary words you missed or drawing pictures to help me remember definitions):**

**Appendix I – Student Reading Groups**

Reading Groups:		
<b>Partners</b>	Totally Blue Toucans	
Milo	Jonas	Abby
Blake	Matthew	Noah
Brittany	Adison	Madison
	Jessie	
<b>Study Buddies</b>	Nachos & Cheese	
Taylor	Tillie	
Payton	Will	
Carley	Daniel	
Jackson	Nick	
Luke	Tenna	