Voicing Success in Mathematics Class:  
Andrea’s Story of Success

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Success in high school mathematics has become a focus of stakeholders in education. Debates on the essentiality of students enrolling in high school mathematics has lead to students not only studying mathematics in high school, but also understanding and valuing the mathematics they are studying. In teaching Consumer Mathematics (Manitoba Education, Training and Youth (METY), 2002), a course designed for students who do not intend to pursue post-secondary mathematical studies and often approach mathematics with little confidence, I had noticed that success could be fostered through relational teaching as articulated in Noddings’ (1984) understanding of teaching as caring and van Manen’s (1986) pedagogical relationship. However, what I did not fully understand were the ways in which these students came to be successful – leaving a stance where they perceived themselves as unsuccessful as they began to see themselves differently during the course. My on-going inquiry into my teaching practice provided the impetus for me to conduct an inquiry in my classroom, exploring what it meant for Consumer Mathematics students to become successful.

The inquiry was situated in a Senior 2 Consumer Mathematics class, where I endeavoured to answer the question: How does the nature of success of learners evolve in Senior 2 Consumer Mathematics? The research methodology drew on narrative inquiry (Clandinin & Connelly, 2000), where narrative texts such as the data collected is used to interpret the lived experiences of individuals while respecting the complexity of individuals and classroom interactions as being educatively valuable to understanding teaching and learning. Eleven students participated, writing interactive journals (Mason & McFeetors, 2002), constructing portfolios, and participating in three conversations (informal interviews). I used these data
pieces, along with daily field notes, to construct a narrative for each learner that highlighted successful moments I had noticed and I believed contributed to her/his theme of success. During each conversation, the learners and I were in discourse about their narratives of success as we came to understand the nature of their success.

In preparing for this inquiry, I was not certain about the types of success that the students would be experiencing or how I would come to understand their success. So, I prepared myself with six different theoretical frameworks, including the epistemological frames of Belenky, Clinchy, Goldberger, and Tarule (1986) and Baxter Magolda (1992; 2001); a psychosocial framework of Chickering and Reisser (1993); a psychological framework of Weiner (1972); Dudley-Marling and Searle’s (1995) ownership model; and a framework for resistance by Romagnano (1994). Throughout the inquiry, these models became secondary to the priority of the students’ experiences and their descriptions of their learning and success. In parallel to my lived experiences in the inquiry, this paper will begin by relating the story of one student, Andrea, in order to amplify her success. As I tell Andrea’s story of success, I will make limited use of the above frameworks because none provided a complete explanation of Andrea’s, or her classmates’, successes. The paper will conclude by offering a generalized theme of success for Andrea that was supported by theory, but informed and shaped by the experiences of Andrea and her classmates.

**Andrea’s Story of Success: Using Words to Tell**

Andrea approached the beginning of the school year with tentative steps. She was new to the city and to the school, so her interactions with students within the classroom were limited. She began the semester by leaving school partway through the first day because she felt
overwhelmed by a large student body where she knew no one. Andrea exhibited that same
demeanour in the classroom. Even when I interacted with her, she spoke so softly that I would
have to be in very close proximity to hear her. She rarely asked questions in class and did not
take part in whole-class interactions. Because Andrea was behind in her high school credits, she
had enrolled in a variety of Senior 2 and 3 courses, even though she was the same age as other
Senior 4 students. She wrote in her first journal that she took Consumer Mathematics to be
assured of a Senior 2 mathematics credit, because she believed that it was “easier than the other
math courses.” Her journal statement indicates her orientation to mathematics class, that she was
not a successful mathematics learner in school. However, her interactions with me at the
beginning of the semester also point toward her inability to say things about herself, her thinking,
her learning or her successes. Although Andrea began her journey of success saying very little,
the way in which Andrea used words in class evolved over the semester. I came to understand
that the theme of her story of success was “Using Words to Tell”. Listen carefully to the way in
which Andrea used words as I re-tell her story, in order to hear the individual steps of success
Andrea took and how they contributed to her journey of success in Consumer Mathematics.

*Asking a Teacher for Help*

At the beginning of the semester, Andrea’s predominant interaction in class was to ask
me, her teacher, questions when she did not know what to do or when she was stuck on a specific
question. Andrea would use a limited number of words to tell where she was stuck, so that I
would explain clearly and slowly how to complete a question. She used this as a strategy early
in the semester to request of me to tell her exactly what to do and then she would do it. Andrea
viewed me as an authority figure in the classroom, someone who was an authority on
mathematical knowledge as well as knowledge of her as a learner. She also believed that the knowledge she needed to have could be given to her by an authority figure. At one time, Andrea had approached a resource teacher, viewed as an authority figure as well, to explain similar triangles to her. This moment became a part of Andrea’s first narrative of success.

During the semester, I have noticed that you often ask me for help in class. Sometimes you will call me over to your table. Other times, you will walk over to me and ask a question. I thought about this as I read journal 3, the one where you describe how to go about applying for a job. You also mentioned some of your strengths and weaknesses. I was surprised to read that asking for help is something that you have a hard time doing when you’re frustrated. This made me wonder about a specific time when you asked for help. The time that sticks out in my mind is when you, Cynthia, and another student stayed after school to work on the similar triangles assignment. Do you remember? You let me know that the resource teacher had also worked with you during the day, but you were still confused.

Andrea and I talked about this moment in our first conversation. She told me more directly about the experience with the resource teacher by relating, “And finally, she told us what to do. And then, she said that what we were doing was wrong. But we were doing it the exact same way she taught us” (bold is mine). Andrea’s expectation that the teacher would listen patiently and tell her clearly how to complete the question can be seen in Andrea’s frustration with the perceived “help” she had received.

Andrea’s description of the similar triangles event demonstrates her stance toward knowledge and authority in the classroom. The manner in which she asked questions, only pointing to where she was stuck which omitted her communication of what she did understand and what she had done correctly, demonstrates her devaluation of her own words and ideas. The expectation in which she waited for a teacher to tell her the mathematical steps to complete a question shows her reliance on an authority to give her knowledge. Andrea’s limited use of words and her reliance on authority demonstrate an approach to knowing that Belenky et al. (1986) recognized as silent knowing. Silent knowers rely on authority that they perceive to be all
knowing. Their lack of confidence in their ability to know and learn is exemplified in the difficulty they experience describing themselves and engaging in self-reflection. Andrea’s initial stance in Consumer Mathematics is characterized by silent knowing and provides a backdrop for the successes that she experienced subsequently. Even though Andrea was able to solicit help from an authority figure, she did so in way in which she used words in a very limited manner, as she said nothing about herself, her thinking, her learning or her success.

**Asking Peers for Help**

As the semester progressed, rather than waiting for me to come to her or interrupting when I was assisting another student, Andrea began to ask her peers for help when necessary. When we discussed this emerging strategy in our first conversation, Andrea mentioned, “’Cause if you don’t understand a question, and they do, then, if they do, then somebody you know tells you how to do it. They explain it differently.” Andrea believed that her peers could explain, better than a teacher, how to do a question because they would use words that she understood. She found teacher’s words hard to understand, partly because “they learned it so many times, they sometimes talk like their professors would talk.” When I probed further, Andrea clarified that her peers explained the same steps to her, but just in different words. There is a shift in Andrea’s actions in class when she needed help, to ask peers because their words were more understandable than a teacher’s words, without a shift in her belief about the nature of knowledge.

Andrea’s prioritizing of asking peers for help demonstrated a shifting of her stance of authority roles in the classroom. In believing that her peers had to give her knowledge and tell her how to complete questions, Andrea still located the source of knowledge in others. Andrea
was not the only learner in the class to enact this strategy. With many requesting intensive one-on-one help, several students reported asking table partners or other peers for help in class. They appreciated the convenience and relative anonymity of the kind of help peers provided. However, asking peers for help was more than just a matter of convenience for the students, but an indication of a shift in belief about which individuals in the classroom were authorities of mathematical knowledge. It demonstrated more closely the stance of a received knower (Belenky et al., 1986), someone who still does not construct their own knowledge yet begins to use words to affect her/his identity. A received knower has emerged from a stance of silent knowing, yet still uses words in a limited way and perceives others as being authorities of the knowledge they view as valuable.

Baxter Magolda’s (1992) epistemological reflection model provides a small comparison to aid in understanding the significance of the stance shift of Andrea. In the model, Baxter Magolda explores is the role of peers. Her first stage of development called absolute knowing, which is similar to received knowing in Belenky et al.’s model (1986), describes the role of peers as explaining “what they have learned to each other” (Baxter Magolda, 1992, p. 75), or transmitting content knowledge from the course. If students, like Andrea, have an orientation of silence to knowledge and learning that precedes this model, a shift to absolute knowing where peers are expected to tell ideas to another is a shift in stance for the learners in this inquiry. The shift in stance is from obtaining the teacher’s knowledge from the teacher to obtaining the teacher’s knowledge from peers, in peers’ words. And although there was progress, Andrea and her classmates were using words in this context just to get done, just to finish specific questions or tasks. Andrea’s intentions for her words did not really include learning the mathematical ideas or skills.
Interacting with Others to Learn

As I continued to observe Andrea and talk with her in further conversations, I began to notice that asking peers for help was not the only way that she interacted with classmates. Andrea was building on that success by engaging in more complex interactions with her peers. While the previous interactions with individuals had occurred before the first conversation, I began to notice this next type of interaction between the first and second conversations. The theme of Andrea’s second narrative was the way in which she used words in the classroom. In response to the narrative, Andrea told me about her three learning partners, Whitney, Susanne, and Lindsey. Although each learning partnership had unique characteristics, there was a common element between Andrea’s interactions with Susanne and with Whitney.

When Andrea sat with Susanne, she did more than ask Susanne how to do specific questions. As she stated in the second conversation, “And Susanne, well, we’re both kind of the same, try to figure it out both … well, we had fun trying to figure out stuff for the assignments!” Because she felt they had similar ability levels, she contrasted Susanne with Whitney, who told her, and Lindsey, whom she told. There is a shift in words that Andrea used to describe her interactions with Susanne. Rather than asking questions of each other or telling each other how to do something, Andrea and Susanne were figuring out the concepts and skills that they were learning together. The mutuality indicated in this phrase demonstrates that Andrea and Susanne were working toward a common goal of learning, rather than one’s goal being to clearly explain and the other’s goal to listen carefully. Instead of a one-directional information flow with Whitney or Lindsey, Andrea and Susanne were interacting in mutuality to progress in mathematics class. Andrea was developing a sense of authority over her actions in the classroom.
When Andrea sat with Whitney, she told me that she also did more than ask Whitney questions. At first, Andrea described Whitney as someone she “could rely on … because she could understand”, relying many times on Whitney to explain. Later on in the conversation, she also talked about a different kind of interaction with Whitney when I asked her about her best table partner. She believed Whitney was the best table partner. She justified her claim by saying, “And when we were working together, she’d, we’d both work, instead of just one or the other.” Rather than focusing on the help that Whitney often provided, Andrea was beginning to see the importance of learning with her table partner. I also noticed this mutuality during class time. Instead of interacting with Whitney for the purpose of Whitney giving knowledge to Andrea, Andrea was interacting with Whitney so that together they could learn. The intentions that Andrea had for her words, to affect her learning and to affect her relationship with Whitney, was a step forward from the intention of acquiring help. There exists a new complexity in Andrea’s use of words in this example.

A shift in Andrea’s role within the peer-to-peer relationship is evident as she moved from listening to actively engaging in the classroom discourse and in her learning. Within this process, Andrea was actively involved in using words to learn with others and to learn about mathematics. A parallel can be made to current research in mathematics education (Borasi, 1992; Davis, 1986; Pugalee, 2001b; Ward, 2001). Within the constructivism view of learning, students must be active in the construction of their own knowledge and understanding. Being actively involved in their own construction leads to rich and complex learning. Learning to use words in more complex ways, similar to constructing mathematical knowledge and understanding, is a rich and complex task that requires the individual to be active throughout the process. By using words in more sophisticated ways, Andrea was beginning to say things about
herself and her learning. For her classmates as well, who demonstrated active engagement through responding to writing prompts and being in discourse about themselves in conversations, success occurred as they were actively engaged in using words to learn about themselves and to learn mathematics.

*Explaining Mathematical Concepts and Skills to the Class*

Up until now, Andrea’s interactions had been one-on-one or small group interactions for gathering knowledge or learning in mutuality. As Andrea built confidence in her context, both with individuals and with mathematics, the nature of those interactions continued to evolve. Just before our second conversation, an interaction occurred between Andrea and me, where I was helping her with a question about calculating daily vitamin intake. As we corrected the assignment later on in class, Andrea volunteered to explain the answer and concept behind the solution to the class. Andrea was becoming more active in class, willing to provide explanations to the whole class. Because this was a new way that I noticed Andrea using her words in class, I highlighted the moment as a part of her second narrative of success:

Another way I have noticed you use words is to answer questions in class. You are often willing to volunteer answers in class when we are going over an assignment. Most of the time, it happens after you and I have had an opportunity to work on some questions together. One example is looking at food labels and working with the recommended daily intake. You explained really well to the class that you would need to eat 10 servings of cereal to receive the recommended daily intake of a vitamin because there is 10% of it in one serving. Another example was the definition of perimeter, when you told the class perimeter is just the distance around. When you answered in class, I used your words to make the notes for the rest of the class. I’m wondering if these are examples, for you, of times when you had a good math idea that you thought others should hear as well. It also makes me wonder whether putting the math ideas in your own words is what makes the ideas important to share.

I would like to think more about how explaining things in your own words could help you be more successful in math class. When I think about explaining things, it means more than just telling me your thinking when you are confused and want some help. And, it means something more than resaying other people’s words. I know that
you do some good thinking in math class, Andrea, and it makes me wonder if you could use your words to tell me when you are doing some good thinking. I wonder what value there would be for you to tell me some of the good thinking you’ve been doing in your portfolios. I’m wondering if noticing and explaining good thinking will help you be more successful in math class.

Andrea took part in the classroom discourse in two different ways. First, with the daily vitamin intake question, she described to the class a solution and answer after she was sure to check with me first to confirm she was correct. She still did not view the idea as her own, but she engaged in vocalizing a mathematical idea and took ownership of giving that knowledge to her classmates. This still demonstrates a received knower’s stance (Belenky et al., 1986), yet Andrea was beginning to recognize the importance of her words and that they had value for her and for others – a stance that demonstrated movement away from silent knowing. As I helped Andrea with the assignment and then observed her explaining it to the class afterwards, I recognized growth from her previous stance of being the individual who had to be told. Now, Andrea was doing some of that same telling.

A few weeks later in class, I observed Andrea contributing a mathematical idea and skill again to the class – the definition and formula of perimeter was a second way in which Andrea was involved in class. The context of her contribution to class differed from the daily vitamin intake example because in this instance Andrea did not check with me before explaining to the class what perimeter was and how it is calculated. In our second conversation, she recalled that example as a time when she explained something in class without checking with peers or me first. She felt it was a good moment that demonstrated her success because the ideas she explained were her own and “’Cause it’s like, it really makes you feel confident. Like, other people are using how you describe stuff.”
Andrea’s use of words in the perimeter example differs in two distinct ways from the daily vitamin intake example. First, she was using her words to affect her identity as a confident mathematics learner and also to affect her classmates’ knowledge. Second, she believed that an idea was her own. Andrea’s belief that an idea was her idea demonstrates a significant shift in her use of words from our first introduction to her as a student who said very little because she believed her words and ideas held little value. Andrea’s explanation of perimeter to the class demonstrates that she was not only getting better at the same kinds of successes throughout the semester (using words), but rather she was retaining her original successes and building on more complex success (using words to communicate her ideas).

**Having a Good Idea, But Remembering It?**

Andrea had moved beyond a silent knower’s stance in learning. She had also moved beyond just telling about other’s mathematical ideas in her words. She was beginning to see ideas as her own. As the semester progressed, I continued to look for moments of success where Andrea was constructing her own ideas and saying them out loud. During a perimeter/area inquiry, Andrea and Whitney were exploring rectangles with constant areas and differing perimeters. Andrea described to me how the perimeter of a “2 by …” rectangle increased by two units every time she added a column of two blocks. It was an astute pattern-recognition moment in which Andrea was generalizing a pattern she noticed and saying the generalization to me. The mathematical success Andrea experienced in this situation was the idea that she constructed from the inquiry activity to build a more complex understanding of area and perimeter. In my field notes that evening I recorded, “What a concept! I couldn’t believe that she saw a pair of sides
basically didn’t matter. … That’s a pretty sophisticated thing to notice.” I was certainly encouraged by Andrea’s thinking.

However, she demonstrated in an extra conversation a few days later that she had no recollection of thinking the idea or saying it out loud. She finally stated, “I don’t remember thinking that” near the end of our conversation, after I guided her to see the same pattern she had recognized and communicated a few days earlier. Andrea’s success, in this example, is not contained in the event that she could not remember having a good idea. Her success is in having the good idea. Eleanor Duckworth views “the having of wonderful ideas [as] … the essence of intellectual development” (1996, p. 1). Having her own ideas was success enough to see this moment as building on to previous successes Andrea had experienced. What is also significant about this moment is that I noticed the success. I knew Andrea well enough as a student, learner, and individual, to recognize this moment of cognition as something that was significant to her lived experiences in the classroom. My noticing Andrea’s success signifies that a student’s shift in the use of words requires another to be inviting students to engage in the process and to be vigilant. These small shifts in stance would be easy to miss if the teacher did not live in pedagogic relationship with them and was not engaged in listening closely. As I lived with my students, I was continually looking for successful moments that I could celebrate with each learner.

*Valuing Her Own Words for Understanding*

In the previous section, we saw the fragility of Andrea’s use of words as it became a more complex process. However, Andrea was beginning to perceive the value of her own words.
In our second conversation, I asked her to pick out a phrase from a paragraph in her narrative that seemed significant to her success.

A: {pause} Resaying other people’s words.
J: Resaying other people’s words?
A: Yeah.
J: Okay. So what’s important about that?
A: Well, if they can describe it better. And you don’t really have the right {inaudible words} trying, what you’re trying to say. But you know the answer, but you can’t write it down in your own words. Then it’s easier to use somebody else’s because then you can look back on it. And if there’s a question on describing it, then you, later on you’ll put it in your own words, instead of using other people’s.
J: So, for right then when you’re not quite sure, you write down exactly what somebody else said.
A: No, you change it a little.
J: Oh, okay.
A: ‘Cause they can use their words, and you might not understand it. But, you can kind of change it a little so that you will understand it. [Okay.] And then, later on you’ll be able to put it all into your own words.
J: Oh, okay. And, is it important to put it all into your own words later on?
A: Yeah.
J: How come?
A: ‘Cause then you’re not relying on other people all the time.

Andrea expressed the importance she perceived of putting mathematical ideas in her own words, instead of using the words of others, in this excerpt. She believed that it was important to put mathematical ideas in her own words so that she could understand and develop an independent stance in her learning. Her words contained an intention to support her learning so that she could understand the problems she was solving in mathematics class.

Within Andrea’s story of success, this conversation is significant because Andrea was coming to value the words she said as effective in learning mathematics and in identifying herself as a successful mathematics learner. For Andrea, to explain the value in saying things in her own words for her understanding was building a success on previous successes. With her belief of the necessity of saying things in her words to understand, she was using words to do more than report to the class. Andrea now turned inward in her explanations, intending to affect
Valuing her own words for understanding demonstrated a shift away from received knowing (Belenky et al., 1986) because she was engaged in constructing her own understanding with her words instead of relying on the teacher to give her the mathematical ideas and the words. Andrea’s indication that her words were important to her understanding was an important moment for me to notice her success in our second conversation.

**Andrea Telling about a Successful Moment**

Andrea completed the semester approximately a week early. A few days before she finished the course, she and I had a moment that was a capstone for her experiences in Consumer Mathematics and a capstone for her success. Because Andrea was completing the course early, I had given her a list of textbook assignments that she needed to complete independently. She would read the examples in each lesson and then try the questions that I had suggested. One of the topics was capture-tag-recapture sampling, which is a ratio-based method used for determining the population of wildlife. Because Andrea’s last day was not definite, she happened to be in class when the rest of her classmates learned this idea and skill.

Although Andrea never had an opportunity to retrospectively tell me about this capstone moment, I recorded our interaction in my field notes. This is what I wrote:

Andrea was really happy that she had done the assignment already and knew how to do the questions. She came up to me, just before I went over the questions on the chalkboard with the class. She said (something like), “You know what I saw with these questions, Mrs. McFeetors? You just use the numbers backwards from the way the question is written. You start with the last number and you put it over the second last number and then that’s equal to the first number over what you need to find. I noticed that [pattern] while I was working on the questions.” She was really proud of herself. And, she came up to me just to tell me that. It made me think about if she was willing to look for those general ideas and come and tell me them because we have an open communication about when she is doing things really well in class. I wonder if it has to do with the writing of stories I have been doing and our conversations together. But what is significant is that she came to communicate to me something she saw. It’s also a
thoughtful piece – that she at least noticed (and was maybe thoughtful) about the structure of the questions she was doing. It is a metacognitive piece that is within the grasp of these students. Andrea did it!

There are several elements of Andrea’s use of words in this moment that point to her success in Senior 2 Consumer Mathematics. We could point to the metalearning statement that Andrea made to me when she generalized the steps for the question, noticing that the steps were the same for each of the questions she had completed. We could point to Andrea’s responsibility to complete assignments ahead of time and in a nearly self-directed manner. We could point to Andrea’s learning how to complete capture-tag-recapture questions on her own, without the support of her peers or me. Rather than placing significance in Andrea’s responsibility, metacognition or studenting, her ultimate success was located in Andrea noticing and expressing her success. Her use of words was to say when and how she had been successful, with the intention of shaping her identity and her relationship with others. It was a pinnacle moment for Andrea for learning and self-identity because of the nature of her use of words.

**Drawing Meaning from Andrea’s Story of Success**

During the semester, I noticed that the way in which Andrea used words over the semester evolved. At the beginning of the semester, she said very little and only in order to solicit help from a teacher. As the semester progressed she began to say things about mathematics and her learning as she interacted with her peers and me. She began to see the value of her own words and to construct mathematical ideas herself. Her capstone moment of success was using words to express her own idea as well as her success. The particular theme of Andrea’s success, which I came to see through her lived experiences and our conversations together, was in the way in which she used words. This theme was closely tied to Andrea’s
learning in Consumer Mathematics – and the particularized themes of each of the learners in the
inquiry differed because of their uniqueness. As data collection and interim data analysis
concluded, as an inquirer, I was left to make sense of the learners’ successes. I wanted to draw a
theme of success from all of the learners in order to come to understand the nature of their
success and how it evolved over the semester.

Andrea was not the only student that changed the way she used words over the semester;
in fact, it was a success that all the students experienced in some way. As I recognized this
commonality, I considered how the six theoretical frameworks I had prepared myself with could
inform this kind of success. I re-read portions of the frameworks and could not find a match
between the progress that previous researchers had noticed and the way in which my students
spoke in mathematics class evolved over the semester – the learners’ success seemed to augment
existing theory. The *epistemological frameworks* of Belenky, Clinchy, Goldberger, & Tarule
(1986) and Baxter Magolda (1992) provided a starting place for data interpretation, especially as
Baxter Magolda described several underlying story lines in the data she had collected from
college students. One of the underlying story lines that Baxter Magolda (1992) recognized was
the “development and emergence of voice” (p. 191). I began to consider the usefulness of this
theme to illuminate the success of Andrea and her classmates because of the similarity to the way
in which individuals use words to say things, especially about themselves. There was one
significant difference, however, between Baxter Magolda’s participants and my students –
throughout her inquiry her participants were cogently self-descriptive while it is clear that
Andrea could say very little at the beginning of the semester.

I noticed that the learners in my inquiry had come to the course with a stance of
*voicelessness* (Belenky et al., 1986) in relation to mathematics and mathematics class – they
could not say things about themselves, their studenting (the way in which they fulfilled the role of a student in relation to school as an institution), their learning, and their success. Over the semester, their successful moments occurred as they began to say things about mathematical ideas, themselves, their studenting, their learning, and their success. Through listening closely to the students, I noticed the initial utterances of internal voice that other educational researchers had not heard and reported previously. Their voice was emerging. The movement away from a stance of silence embodied the emergence of voice for each of the learners as the essence of their success in Consumer Mathematics – emergent voice, their new voice-stance, was indicative of all the learners’ success.

What I captured in the students’ moments of success was the emergence of voice, the nascent and tentative sounds of the students’ emergent voice. The evolution of Andrea’s use of words evidence three characteristics of emergent voice. These characteristics were drawn from the data, as I considered the way Andrea and her classmates used words to be successful mathematical thinkers and learners. The students came to be vocal as they used words to say things they believed were worth saying (they developed a sense of authority in speaking out). The students came to be verbal as they chose specific words to point toward the things they believed were worth saying (they authored their success and learning as they named their studenting and learning). And finally, the students came to be intentional as they used words to affect themselves and their context (they said ideas with purpose as they developed a sense of audience with themselves and others). They were in the process of becoming – forming their identity as students, learners, and human beings.
Andrea was Vocal

The first characteristic of emergent voice is that the individual is vocal. Being vocal means that the students felt that they could speak out, or say things aloud (in writing or orally), and that they did speak out. The stance of silence at the beginning of the semester was characterized by an absence of words with which the students learned. Because the absence of words was related to a stance of silence, the fact that students, like Andrea, were being vocal and saying things about mathematics, themselves, and their learning becomes a foundational element of emergent voice. For Andrea, her ability to speak out is most simply seen as she began to explain mathematical skills and concepts to the class. She vocalized a mathematical idea, with scaffolding from me, when she explained the daily vitamin intake questions. Andrea’s voice was emerging as she took ownership of giving that knowledge to her classmates. She further consolidated her ability to be vocal, speaking with an emergent voice, when she explained perimeter with no teacher scaffolding. Andrea’s independence is emerging in the perimeter example, compared to the daily vitamin intake example. Explaining mathematical ideas to the class demonstrates Andrea’s ability to be vocal, but also signifies that she was moving in a progressive manner, even within one element of emergent voice. Speaking out meant that Andrea had the confidence to explain mathematical ideas to the class.

As Andrea’s voice emerged, she began to say more things to me about the quality of her learning. For instance, when Andrea and I talked about how she had begun to ask peers for help she was evaluating an emerging effective strategy for learning. She could recognize and say that asking peers was a better strategy to support her learning than asking me. Expressing that one strategy was better than another demonstrated an increasing authoritative stance toward her learning. Belenky et al. (1986) noticed that individuals who are in the process of gaining a voice
are also beginning to see themselves as their “own authority” (p. 54), rather than relying on external authority to tell them what to believe and to give them knowledge. Andrea was becoming an *authority* on her learning as a result of her emergent voice.

Freire (2000) emphasizes the significance of being *vocal* when he states, “Human existence cannot be silent . . . human beings are not built in silence, but in word” (p. 88). To begin to emerge from silence, Andrea and her classmates needed to first say something – and the content of what they said was not as significant as the fact that these students were beginning to say things to themselves and to others. As the students began to be *vocal*, they were saying with their words that the teacher was not the sole authority on their thinking and learning. They were becoming aware of their thinking and learning, and through their use of words were developing a sense of *authority*.

*Andrea was Verbal*

Being *verbal* is the second characteristic of emergent voice. Being *verbal* means that the individual is pointing toward specific objects through the selective use of words, rather than just putting words to thoughts and saying them aloud. Freire (2000) identifies this process as *naming*, in which I observed two constitutive elements through my learners’ use of words. The first element is to identify significant objects in the individual’s world through a reflective stance. Within my classroom it meant that the students noticed their thinking and/or learning and recognized it as an important cognitive act. The second element is to give a name to the object, which is a label constructed by the individual that points to the object under consideration. Within the context of this inquiry, students were sponsored to write and talk about their thinking and learning, which required them to name their specific cognitive acts.
The two elements of *naming* are evident in Andrea’s words, although not as transparent as being vocal. Her reflective stance can be seen in our second conversation when she selected an example as a successful moment for her in Consumer Mathematics. As she identified her success by reflecting on her experiences and the narrative I authored, she used the phrase “resaying other people’s words” that I had written as a label to point toward a significant moment of her success. This example illuminates the ability of Andrea to verbalize as she named her success by using a phrase to reflect on and point toward a specific moment. Andrea’s use of the label “resaying other people’s words” further refined the meaning and use of the name (Searle, 1983) in describing her success.

By *speaking out* and being in discourse about her successes, Andrea had already begun to develop *authority* in her emergent voice. However, with the additional element of being *verbal*, Andrea became an *author* of her own success. An *authorial* stance required Andrea to identify successful moments and label them with words or phrases, like “resaying other people’s words,” that were meaning-filled for her and that she could use to interact with the world around her. In terms of mathematical cognition, Andrea engaged in an authorial act as she stated a pattern for “2 by …” rectangles in the perimeter/area inquiry. More than requesting others to tell her or simply noticing the pattern, Andrea spoke with an emergent voice as she authored the pattern-generalization to me. As her classmates also engaged in *naming* their cognition, learning, and success, they also moved beyond their stance of silence as they began to author their own success. The *authoring* was at once retrospective as they talked about what they had done well, and prospective as they were beginning to say how they were succeeding in mathematics class.
Andrea was Intentional

Intentionality is the third characteristic of emergent voice. Being intentional means that individuals say things to themselves and to others with specific purposes. These purposes place intentionality behind the things individuals say. The learners in this inquiry developed intentionality in what they said (chose what they wanted to say) and how they said their words (chose the words they wanted to say). Although some similarities to being vocal and verbal exist, learners were using their nascent abilities of speaking out and naming to say things to a specific audience with the intent of affecting the audience.

The concept of audience is central to the intentions of students because the perceived audience affects their intentions. The students sometimes said things to themselves, intending to affect their success, when they viewed self as audience. Belenky et al. (1986) observed that individuals who were gaining voice would “engage in self-expression by talking to themselves” (p. 86). Emergent voice needs to say things to self in order for the individual to internalize, author words of significance, and explore intentions imbued in statements to self and others. The students viewed others as audience when they said things to someone else, usually to me, about their thinking and learning, intending to affect the teacher-with-learner relationship. In this case, the students often believed they would help me understand them and notice their success in mathematics class. Emergent voice needs to say things to others in order to establish the individual’s authority, to make intentions explicit to others, and to make self-referential statements.

As Andrea began to speak out during the semester, her intentions became more sophisticated and she moved from others as audience to self as audience. This movement demonstrates more complexity and confidence in speaking with her emergent voice, and is in
parallel with her sense of authority over her learning. Closer to the beginning of the semester, Andrea located the authority of mathematical knowledge in me, her teacher. As the semester progressed, she began to locate authority in her peers. We observed Andrea’s shift in asking me questions to asking peers questions in order to be given mathematical knowledge. She was intentionally selecting the audience with which she believed she could learn mathematics, or be successful in mathematics class. She was using words to gather knowledge, rather than learning mathematics in meaningful ways. Andrea demonstrates progress from this stance as she began to interact with peers in order to learn and affect her relationship with her peers. Further, as she responds to questions in class and begins to explain mathematical ideas to the class, she continues to select others as audience, but now for a different intention. The intention is more complex than simply learning mathematics, but turns inward as Andrea intended to affect her identity as a confident mathematics learner.

Andrea’s movement inward with her intentions signified that her audience for using words was evolving from others as audience to self as audience. As she spoke with her emergent voice, Andrea was using words to affect herself and her understanding. In our second conversation, Andrea communicated that putting ideas in her own words was important for her to understand and learn. Andrea wanted to positively affect her understanding by putting mathematical ideas in her own words. Her intentions were directed at improving her mathematical understanding, and her emergent voice was intentional in supporting her success at mathematical learning. There is a complexity present in Andrea’s intention with words as she comes to use her emergent voice to affect herself.
**Andrea’s Voice was Nascent**

The three characteristics of emergent voice were indicators that the voice-stance of the students was evolving, from voicelessness to emergent voice. However, being *vocal*, *verbal*, and *intentional* are not necessarily small steps away from voicelessness, each requiring sophistication in their use. While the idea that learners spoke with an emergent voice was a significant success for them in mathematics class, their voices were just *emerging*. I deliberately constructed the label of *emergent* to convey that the learners did not come to a fully refined voice by the end of our semester. Instead, their emergent voice was *nascent*, in the act of coming into existence and in the process of being established. By definition, the *nascent* nature of emergent voice does not assume a robust and mature voice, but a voice that is growing at differing rates and in a variety of directions as it becomes more established. For Andrea, her emergent voice was tentative as she used words in more sophisticated ways during the semester.

Emergent voice is nascent because of its *tentative* nature. Speaking with a *tentative* nature means that emergent voice is prone to “fall backs” as voice emerges. Remember back to Andrea significant cognitive experience of expressing a pattern-generalization about “2 by …” rectangles, and then not being able to recall that moment days later. Within this mathematical success, there is a need to recognize a degree of fragility in Andrea’s ability to use words to learn in mathematics class. Andrea’s inability to remember her good idea and express the pattern she noticed highlights her struggle to believe in the value of her ideas and words. Rather than moving away from received knowing in a “forward” bearing movement (Belenky et al., 1986), it would seem that Andrea was moving toward silence again. Chickering and Reisser’s (1993) conception of vectoring aids in making sense of Andrea’s inability to remember because they noted that development, in their vectoring model, is not always linear. Rather, part of the
process of growth incorporates a movement “forward” and “backward” as a student experience success. In other words, as Andrea worked hard to add on more complex successes, she would sometimes return to a previous stance readying herself to experience more success.

In addition to Chickering and Reisser (1993), Kieren and Pirie created a model that helps explain the tentative nature of emergent voice. They believe that students need to “fold back to an inner level of activity in order to extend their current action capabilities and action spaces.” (Kieren, Pirie, & Gordon Calvert, 1999, p. 218; italics in original) So, it seemed necessary in the emergence of a new voice-stance that individuals return to a former stance as they move toward more sophisticated stances of voice. This shift back to a previous voice-stance provides an opportunity for individuals to notice that they were indeed moving forward, away from voicelessness, and that the stance shift was a positive movement for their growth as learners, students, and individuals. So, although at a cursory glance the tentative nature of emergent voice seems to denote a pause in success, it is a necessary element of emergent voice. For others who are noticing the emergence of voice, the tentative nature of emergent voice highlights that the success the students experienced was not static – rather, it was a dynamic success that captured growth as it was occurring, and that the growth itself (not the destination) was what was important in the learners’ journeys of success.

Interpreting Andrea’s Capstone Moment of Success

Andrea’s capstone moment of success, noticing and expressing her success, provides the clearest pictures of the three characteristics of emergent voice interacting as Andrea engaged in the emergence of voice. The capstone event that demonstrated Andrea’s success in Consumer Mathematics was about her emerging voice. The process, which started near the beginning of
the semester as Andrea and I established our pedagogic relationship, was continuously progressing. Andrea’s emergence of voice progressed as she continued to add small successes and small characteristics of emergent voice on top of previous successes. Her emergent voice continued to evolve with each interaction and event in the classroom, and as she refined the way in which she used words. Her authority over her own thinking and ideas is established as she vocalized to me her moment of success. She spoke out about her success. Her authorial stance is apparent as she verbalized the pattern of completing the questions. She named her cognition as she explained the steps. Her sense of audience is complex as she came to me with certain intentions in what she says to me. *She purposefully told me about her success.* By telling me about her successful moment, I believe Andrea intended to affect her learning about capture-tag-recapture sampling. As well, I believe she intended to affect her relationship with me as she initiated the discourse about success (rather than my initiation through narratives). More importantly, in this example of telling of success, Andrea was intending to affect her *identity,* identifying herself as a successful mathematics learner that could construct her own ideas and as an individual that could say significant things about herself – her success. The emergence of her voice, from voicelessness toward emergent voice is captivated in a moment Andrea and I could celebrate together.

**Andrea’s Journey as an Exemplar**

Andrea is an exemplar of the emergence of voice. An exemplar is an individual that serves as an ideal model or example for a group of individuals that all demonstrated some emergence of voice. Andrea is an exemplar because her story allows us to hear many of the small steps of the emergence of voice throughout her semester. We hear in her example the
small moments of success that demonstrated her voice was emerging from a stance of voicelessness. The emergence of voice occurred through her active involvement as I listened closely to her successes and guided her in exploring her zone of proximal development (Vygotsky, 1978). The journey was not flawless, because no journey in the gaining of voice is. Rather, the return to previous stances provided opportunities for Andrea to consolidate specific characteristics of emergent voice before building on more complex successes. Andrea is not an exemplar of the emergence of voice because she experienced the largest or smallest amount of growing and stretching during our semester. This would be quite difficult to ascertain because of the unique nature of the journey of each learner.

The unique nature of the journey of each learner is of central importance to this inquiry. It is of central important because of the particularity of the individual students who participated in the inquiry. It is of central importance because of the nature of the inquiry question and the process of inquiring into the success of learners and how that success evolves. Just as with Andrea, each learner’s story is distinct and highlights different processes of the emergence of voice, perhaps in differing orders and also in differing intensities. What Andrea’s story does exemplify, on behalf of all of her classmates, is that the emergence of voice was a tentative process and one in which I needed to listen closely to their moments of success to catch the subtle shifts in stance as they lived a process of forming their identity. Andrea also illustrates, on behalf of her classmates, the brilliance of each of the small steps the learners took as they moved away from a stance of silence and the fact that they were constantly in the process of building on more complex successes to the ones that they already had. The pleasure of watching and living with the learners as their voice emerged was particular to each of them, but significant for all of them.
References


