



**Motivation to learn: The role of the Allison Algebra Project in fostering confident and capable learners**

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### ***Introduction: Can self-efficacy be taught?***

Wendy Gallimore and Kim Rohall are teachers at Warren A. Allison Elementary School in the Twin Rivers Unified School District (TRUSD) located in the suburbs of Sacramento, California. Joanne Bookmyer is a Senior Analyst in the School of Education at the University of California, Davis. Collectively, we are part of the Allison Algebra Project (Allison AP), which began in 2009 when the district and the California Teachers Association Institute for Teaching (CTA / IFT) agreed to support a pilot project designed to test the feasibility and impact of implementing Algebra Project Pedagogy in conjunction with the district's regular math curriculum.

During the first year of the project, in addition to rolling out the Allison AP in our classrooms, we simultaneously conducted a collaborative research study. We investigated what happened when we made a concerted effort to engage parents as project partners. We ended the year convinced that if a teacher makes themselves authentically available to their students' parents, the parents will feel much more comfortable and will be much more likely to actively engage themselves with the school, the classroom, and their own child. We learned that a teacher's ability to engage parents is essential to the relationship between parents and teachers and can yield huge benefits in student learning. Our general conclusion was that the Allison AP provided a useful vehicle for developing our own skills in this area, as evidenced by the extraordinarily high levels of parent engagement in our classrooms. (Gallimore, Rohall, Zacharias, and Bookmyer, 2010). This included volunteering in the classroom, attending Family Math Nights, and advocating for the school and for their children.

The line of inquiry we chose to pursue during the second year of the pilot project (2010/11) was student engagement. We started the year by asking ourselves a number of questions including: what does it mean for a student to be engaged, what does student engagement look like in a successful elementary school classroom, and how does student engagement contribute to success in math? Most importantly, we asked ourselves what actions we were taking to create an environment in which our students were motivated to learn?

Self-efficacy is commonly defined as the belief in one's capabilities to achieve a goal or outcome. Bandura notes that a person's self-efficacy determines "how people feel, think, motivate themselves and behave" (1994). A strong sense of self-efficacy enhances accomplishment and personal well-being, while a low sense leads to low aspirations and weak commitments to goals they choose to pursue.

Our belief is that self-efficacy can and must be taught for a student to be both motivated and successful. Algebra Project, Inc. (AP Inc.) on which the Allison AP is modeled, does not refer directly to self-efficacy, however, it is implicit in the language and practices

employed by its developers and proponents. At the core of the AP Inc. model is the expectation that if given the correct context virtually all students can learn algebra. Central to this learning context are four essential components (Siva et al., 1990):

- The curriculum directly addresses the conceptual leap students must make from arithmetic to algebra;
- Ongoing teacher training, follow-up, networking and support;
- Instruction is built out of an experientially based curricular process that links familiar physical experiences to abstract mathematics; and,
- An expectation of achievement that is reinforced by students, teachers, parents, and administrators.

Our research interests this year are centered on the fourth essential component (an expectation of achievement). This study was intended: to increase our understanding of motivation to learn; to develop a tool for articulating that understanding in ways that might help inform our own instructional practices, as well as that of other teachers interested in the Allison AP model; and to begin to identify evidence that the Allison AP has been successful in setting an expectation of achievement for participating students.

The study is framed within three underlying questions:

1. What is the relationship between mathematical instruction and students' motivation to learn?
2. What are the specific tools and strategies built into the Allison AP model to support the self-efficacy of our students?
3. Is the Allison AP helping students to be self-efficacious (to believe in themselves as learners)?

Finally, before moving on to the results of our work this year we would like to mention several key changes to the Allison AP pilot design in this, its second year of implementation. These include:

- A marked decrease in the level of support provided by AP Inc. and the Southwest Network of Industrial Areas Foundation (IAF), both of which were active partners during the first year of implementation.
- The loss of one of the teachers engaged in year one of the pilot project and the subsequent reduction in the total number of participating teachers (from three to two). This teacher was reassigned from 6<sup>th</sup> grade to a different grade level and elected not to continue her engagement in the Allison AP.
- The reassignment of the participating 5<sup>th</sup> grade teacher (Gallimore) to the 6<sup>th</sup> grade, which resulted in her having the same students for a second year.
- A new group of students entering the classroom of the participating resource teacher (Rohall). The lower skill level of this group of students significantly changed classroom dynamics and the way in which these students were able to participate in the Allison AP.

## ***Context and Background***

Overview of The Algebra Project, Inc. model and methodology (extracted from Silva et. al, 1990).

Since its inception in the 1990s the Algebra Project Inc. has had three broad goals: 1) to develop mathematically literate, self-competent, and motivated middle-school learners who are able to master the college preparatory high school mathematics curriculum necessary for mathematics and science related careers or other careers where mathematics is a necessary tool; 2) to change the way mathematics teachers construct their learning environments by producing teachers who are able to facilitate a mathematics learning environment grounded in real-life experiences and to support students in the social construction of mathematics; and 3) to build a broader community of individuals including parents, community volunteers, and school administrators who understand the problem of mathematics education as a problem of mathematics literacy and who understand the question of students capability as learners as a matter of effective effort.

The Algebra Project Inc. builds on overcoming a conceptual barrier involving students' concept of number and the underlying questions available to students to process data pertaining to numbers. Essentially the successful transition to algebra, according to Moses and his colleagues, requires being able to generalize the concept of numbers (i.e., to transition from concrete thinking to abstract reasoning) and address not only the question of 'how many' but also of 'which way?' (i.e., which of the two opposite directions is involved in this context?). Key to making this happen is providing an appropriate context—one that employs cooperation and participation in group activities as well as personal responsibility for individual work. Related to this is purposefully providing students with opportunities to learn about the role of risk-taking, mutual respect for their peers, and to organize their thinking, defend their positions, explain their reasoning, and express themselves.

Moses and his adherents posit that teachers employing this method must be able to engage students in thinking mathematically and relating their real world experiences to the work of mathematics. Teachers are asked to observe and encourage patterns of behavior that promote the social construction of knowledge such as cooperativeness, willingness to share knowledge, and helping one another, as they transition students from being able to comprehend a topic (recognition) to being able to remember a topic independently (recall) to being able to use a concept, employ a technique and apply ideas learned in one context to new situations (assimilation). The Algebra Project Inc. underscores the principle that all children can learn and gives teachers strategies for putting that principle into action in the classroom.

## **The Allison Algebra Project**

Our project is a spin-off of the instructional method developed by Civil Rights Activist Bob Moses. For a better understanding of The Algebra Project Inc. we suggest his book, *Radical Equations* (2001). Our project deviates in significant ways, including the fact that while AP Inc. typically works with middle and high school students, our work is with elementary students (5<sup>th</sup> and 6<sup>th</sup> grade). The Allison team worked closely with AP Inc. to select developmentally appropriate lessons within the selected Algebra Project modules and then align those modules to 5<sup>th</sup> and 6<sup>th</sup> grade California Content Standards. The corresponding topics found in the district adopted math text, enVisionMATH, were then identified and the curriculum was reordered so that the topics taught coordinated with the same topics addressed in the Algebra Project modules. Finally, a pacing guide showing the integration of the two programs was developed. All of these actions, we believe, contributed to a unique but well-grounded, context-specific program with the potential of meeting the needs of our students.

### ***Question 1: What is the relationship between mathematical instruction and students' motivation to learn?***

To answer this question we reviewed research on motivation to learn, looking in particular at the relationship between motivation to learn and mathematics achievement.

Becoming confident and capable mathematics learners, developing a positive attitude toward its use and becoming autonomous learners are important goals of mathematics education (NCTM, 2000). There is a growing body of research that addresses the importance of providing instruction, in particular mathematics instruction, in ways that motivate students to learn (Turner, et al., 2011; Ames, 1990; Guthrie et al., 2004; Reeve et al., 2004). For instance, Ercikan, et al. (2005) found attitudes toward math as the strongest predictor of student participation in advanced math courses.

Self-efficacy beliefs influence how students think, are motivated, feel and act and are a valuable tool in the instruction of students (Pajares & Kranzler, 1995). Self-efficacy is not an innate or fixed quality that individuals either have or do not have, but is an outcome of cognitive processes and are constructed from four main sources: personal experiences, modeled behaviors observed and interpreted in others, verbal persuasion, and physiological and affective states. Individuals are capable of self-directed change and of altering their behavior depending upon the reciprocal influences between their personal abilities, expectations of success, and self-efficacy (Banduara, 1997).

A contributing factor to low achievement may be that classrooms fail to develop personal characteristics and behaviors that motivate students into taking advantage of learning opportunities (Malloy & Malloy, 1998). Students are often not aware that ability in mathematics is not solely critical for achievement in mathematics (Lopez, Lent, Brown, & Gore, 1997; Pajares & Kranzler, 1995; Randhawa, Beamer, & Lundberg, 1993). The concept of confidence in a personal capability to cope with particular

situations has been placed under the construct of self-efficacy (Bandura, 1986, 1997), an attitudinal variable with a strong correlation to mathematics achievement (Lokan et al., 1996).

As part of their framing of and investigation of how and why teachers' beliefs and practices related to motivation and mathematics were impacted by a 9-month collaboration, Turner et al. (2011) summarized four research-based motivation principles, along with relevant literature. Based on an extensive review of the literature the authors describe four constructs or principals linked to self-efficacy and motivation to learn:

- Competence and the role of prior experiences - Competence includes understanding how to achieve certain outcomes and feeling efficacious in performing the required actions;
- Autonomy and the role of emotions - Autonomy refers to self-initiating and self-regulating one's own actions;
- Belongingness and the significance of observing others - Belongingness is the need to be an accepted member of a group and to have strong, stable relationships with others; and
- Meaningfulness - Meaningfulness is related to students' value for learning, particularly an awareness of the role of learning in improving the quality of one's life.

The research we reviewed confirmed for us that there is a strong relationship between motivation to learn and mathematics achievement. What we really wanted to know though, was "how" – how could we do a better job of ensuring our students' become confident and capable mathematics learners?

We found a very practical answer in the resource materials of several nationally recognized professional development providers whose work focuses on classroom management.

Below is a list of variables associated with fostering positive classroom spaces, from the website of Bobb Darnell (Achievement Strategies, Inc. [www.achievementstrategies.org](http://www.achievementstrategies.org)) who adapted it from a document originally created by S. Peak Rogers in 2005 (Peak Learning Systems, [www.PeakLearn.com](http://www.PeakLearn.com)). These variables are things any teacher can work toward and they are all embedded within the Allison Algebra Project model.

**1. Safety:** People need to believe that they are safe from fear of embarrassment or physical harm.

**2. Success:** People need significant evidence of meaningful progress toward a goal, mastery of significant challenges, valued competence, creativity, or skillfulness.

**3. Love & Belonging:** People need to feel valued, protected, accepted, respected, cared about, supported, and held truly accountable and included.

**4. Fun & Enjoyment:** People need to feel their situations are pleasurable, satisfying, challenging, successful, caring, interesting, meaningful, and/or enjoyable.

**5. Freedom & Independence:** People need to feel included in meaningful choices, decisions, options, and direction setting in addition to believing their opinions are valued.

**6. Valued Purpose:** People need to be involved in worthwhile, valuable, meaningful, interesting, and fun objectives and activities.

***Question 2: What are the specific tools and strategies built into the Allison AP model to support the self-efficacy of our students?***

Over the past two years Allison AP teachers and staff created and/or modified Algebra Project Inc. materials for use in implementing the AP curriculum. One result of this is that we now have a set of documents that collectively reflect the core values, expectations and desired outcomes of the Allison AP, as well as a methodology for teaching the AP content.

These materials include, but are not limited to:

- Original pilot project proposal submitted to CTA-IFT, along with subsequent modifications and revisions
- Statement of Algebra Project Teacher Core Values, Expectations, and Outcomes
- Algebra Project Work Plan showing alignment to Fifth and Sixth grade Math Standards for the State of California, alignment of key standards for the district adopted curriculum (EnVisionMATH), alignment of the standards strands to the AP modules, the alignment of the After-School Module and the family math nights, and the incorporation of Jiji Math as an additional method of support.
- Four AP Modules (Zodiac, Trip Line, Road Coloring, Race Against Time), with Pacing Schedule, identified (content specific) learning outcomes, modifications for special education students, curricular materials, assessment instruments).
- Results of our own collaborative research conducted in Year One of the Pilot Project
- Evaluation of year one findings compiled by the UC Davis Center for Education and Evaluation Services

Table 1 provides a summary of how the four motivational constructs identified above are supported in the Allison Algebra Project. The table provides examples of instructional practices and the requisite teachers' attitudes and behaviors to effectively carry out those practices.

**Table 1: How motivational constructs are fostered in the Allison Algebra Project classroom**

Competence and the role of prior experiences	Autonomy and the role of emotions	Belongingness and the significance of observing others	Meaningfulness
<b>Examples of instructional practices</b>			
<p>* Mastery experiences around algebraic reasoning and mathematical literacy (adhere to 5 step curricular process in which students build mathematical symbols and objects using familiar and shared experiences as a foundation)</p>	<p>* Student-centered approach that focuses on intellectual development, eagerness to learn and overall maturation            - Frequent focused formative feedback            - 2<sup>nd</sup> Chances (opportunities to identify and correct wrong answers)            - Encouragement of different ways to find answers</p>	<p>* Use of small group work with assigned roles and frequent opportunities for students to present and take on leadership role            - Peer models            - Ropes Course            * Build and foster community base            - Parent Engagement (Family Math Nights, Field Trips)            - Afterschool component</p>	<p>*Development of a context for learning (ongoing discussion around creating mathematics and integrating mathematics with physical world)            - Mathematics integration into other subject areas            - College field-trips            - Culturally responsive pedagogy</p>
<b>Attitudes and behaviors</b>			
<p>Success</p> <p>* Build on what students know            * Teach specific learning strategies – a concrete plan of attack for working on assignment – this may apply to overall study skills or to a specific assignment or project.</p>	<p>Freedom and independence</p> <p>* Provide consistent, credible and specific encouragement, such as “you can do this!”            * Encourage emotional resilience (perseverance, optimism, belief in your own strength and a sense of humor            * Encourage accurate attributions – students don’t fail because they are dumb, they fail because they don’t follow directions, spend enough time on task, follow through</p>	<p>Safety            Love and belonging</p> <p>* Notice, analyze, and celebrate group successes            * Recognize the importance of supportive friends and family.            * Have meaningful conversations and provide opportunities to listen and learn from each other            * Trust is the “glue” that holds groups together</p>	<p>Fun and enjoyment            Valued purpose</p> <p>* Capitalize on students’ interests            * Explain why what they are being asked to learn is relevant to their lives</p>



Question 3: Is the Allison AP helping students to be self-efficacious (to believe in themselves as learners)?

We are of the opinion that everyone directly involved in the Allison Algebra Project over the past two year would answer this question with a resounding, “yes.” The real question of course, is how do we KNOW that this is actually the case. To answer this question we gathered information about what was taking place in our classrooms. This ‘evidence file’ provides documentation that we recognize as being largely anecdotal but nonetheless compelling.

**Source 1: Masters’ students observations:**

Two University of California, Davis Masters’ students completed an internship in Wendy’s class this year. As part of the experience Wendy asked them to observe her teaching and to identify the different ways she “taught” efficacy.

The following table lists the comments provided by the Masters’ students, along with our interpretation of where they might fall within the four motivational constructs (competence, autonomy, belongingness, and meaningfulness).

**Table 2: Comments and motivational construct they represent**

<b>Comment</b>	<b>Construct</b>
Provided support for correcting wrong answers (helped them understand why the answer was wrong)	Competence
Solid foundation of community expectations of support for others that allows students to feel comfortable taking risks	Belongingness
Students aren’t afraid to voice their opinion, even if it ends up being wrong because rest of class doesn’t ridicule incorrect answers	Autonomy/ Belongingness
Work through questions to get to right answer	Competence
Validates thought process for each student	Autonomy
Encourage different ways to find answers	Competence
Emphasis on group work even low students can experience success within group	Competence/ Belongingness
Group work with assigned roles so one doesn’t dominate whole group	Belongingness
Kids like to share their answers – validates their efforts, their “unique” ideas	Autonomy/ Belongingness
Positive mood regarding AP/math time. Teacher modeling that they should be (and are) proud to be the “math class” at the school. It’s seen as a good/cool distinction	Competence/ Meaningfulness
2 <sup>nd</sup> chance to fix work – kids see they can do it correctly	Competence/ Autonomy
Not lecture style – more conversational and engages students in the learning process	Autonomy/ Meaningfulness

## **Source 2: Kim's approach to teaching efficacy to her students**

(Note: This is a re-creation of an interview with Kim conducted by Joanne at the end of the 2011 academic year in which Kim's comments are organized around three of the motivational constructs: meaningfulness, autonomy, and belongingness.)

*I approach my teaching from a whole-child approach in that I want children to be well-rounded people with ethics and good work habits and self-worth. There isn't any one thing that I do to motivate students to learn—it's embedded in every single thing I do.*

*Here are several examples of strategies and some examples of what that looks like in my classroom.*

### Meaningfulness

*We have a payment/reward system; essentially do your job and you will get a reward. You wouldn't believe how hard my kids will work for popcorn and red vines.*

*I tell my students that school is training to be an adult who makes a difference and I give them concrete examples (e.g., deadlines, assessments/tests, life long learning). The reality is that you can't separate school from life—school is training (practice) for life and developing those foundational skills is what gets you from training wheels to triple flips.*

*Here is an example of what I mean by that. We plan parties. I give students \$20 and tell them we're going to the store to shop for the party. I tell them that they need to be able comparison shop if they want to be able to purchase everything they will need and that they better be able to estimate how much they are spending so they don't get ripped off.*

*I try to make my teaching as relevant to my students as possible. Right now anything that involves video games will engage students, next year it may be something else that they relate to.*

### Autonomy and the role of emotions

*I always try to make learning fun. For example, students learn multiplication by song. We just "do" so many things but it is always better if you actually enjoy it. The result of not enjoying something is avoidance, things taking longer to complete, or acting out as a way to get out of it.*

*You will hear me ask students, "R-ya?" – as in are you a responsible young adult? Asking them, "Who made the choice or what do you think?" is a way to put students actions back on them, they need to understand that they are accountable for their own behaviors.*

*You need to find students' potential and then make sure they don't sell themselves short. Maybe they are good at math but struggle in reading. In that case I focus on the math, I tell them "if you can do this (math), trust me you can do the reading too."*

*It works. [student] is now doing multiplication at the 4<sup>th</sup> grade level but he reads at the 1<sup>st</sup> grade level. When he came in at the beginning of the year we figured out he could add so that was his strength that we built on.*

*Challenge is a motivation. Success + challenge = a good student (one who says I know I'll have to work but I can do this). [Student] is the youngest of six children. Because he has learning disabilities he has always been told, "you poor baby." So now he's learned to say, "I can't do it." Well, I don't let him get away with it. I say to him, "Is this your best? Where will this get you in life?" I've been working with him on this all year but now his response when I ask is, "I know, I know, I didn't try very hard," followed by his trying again. Last week I said to him, "Are you sure this is what you want to turn in?" His response was, "I guess maybe I did read it too fast." The other day he brought in some papers he wrote and said to me, "I know these aren't right but I want to give them to my mom. Can I make them better?" In other words, he applied himself and took responsibility for his own actions.*

*Here is another example. [Student] tells me that he prays to get out of special education classes. He is a drama queen but he is so charming he tends to get away with a lot. Instead of letting it go, I say, "Do the work." Well, last week he asked for extra work over the break. He said, "I almost have this down [compound words]. I know I need to be able to do this to get out of special education classes."*

*One more example, [student] and [student] tend to rush. I tell them you will not get an F in my class, you will get an A or a B even if it means you have to do it 27 times. It is their choice but I put in controls that will help them to make better choices.*

*Here's another thing. Teachers tend to give up when kids act out or act like they don't care. I make them realize there are consequences—ok, now you get to do it at recess. This is cool—now we can take some more time to figure out your math homework. I'm persistent and consistent and eventually we get to the point where they say, "maybe I better change" because she isn't going to. I hold them to high standards.*

*Take [student]. She is so angry at the world that she wants everyone else to be angry too. She's really bright so she is good at it, at making everyone around her angry too. But she's finally given up on that behavior, at least in class.*

*[Student] was suspended for 23 days in one quarter – that's crazy. So I finally told him I wasn't going to suspend him, I was giving him detention. I ended up sitting with him every day after school. I was taking a class so I used the time to do my homework but it was as hard for me as it was for him. Sometimes that is what it takes.*

Belongingness and the significance of observing others

*Every year I do three things but they are never quite the same. I have a prize box, we do a Reading Celebration, and we pick a class name. You have to look at the kids – figure out what they love/hate, and what is a real disability and what is a learned helplessness. We also vote on major decisions that impact all of us. I tell students, “If you don’t vote you don’t have a say.” It is a simple way of teaching civic responsibility.*

*The bottom line is that if you feel safe it is easier to learn. The only time I come down hard on my students is when they are hard on each other. I set up norms and expectations from day one. Our class motto is, “whatever you say, whatever you do, sooner or later will come back to you.”*

*This year I had the kids tell their parents the tale of Peter Rabbit using hand puppets. Then I had them teach it to the new kids. I tell them this is your job – to help the babies. The other day [student] showed up with her own Peter Rabbit. During silent reading I saw her give it to [student 2]. She told [student] to practice so that she learned it really well. Then she would be able to teach it to her so she could do it too. This was a huge success for [student] who was non-verbal student at the beginning of the year.*

*I tell my 6<sup>th</sup> graders they are the top dogs and I tell my 5<sup>th</sup> graders they are in training to be top dogs. I have my 5<sup>th</sup> graders practicing life skills. I have them answer the phone when it rings and take messages to the office, things like that. [Student], who is in 5<sup>th</sup> grade had to take an envelope to the office the other day. I sent [student 2] (who is 6<sup>th</sup> grade) along for security. [Student] came back with the envelope undelivered. He’s so shy he just couldn’t do it. Without me asking, [student 2] sat down and told him what to do. She said, “Talk to me first, then practice talking to other students.” She has come so far. [Student] started the year as selective mute. She is now reading to the class.*

*Another example of giving students a second chance. Morning math. This is where everyone runs laps. We come back and one student is in charge of adding up the total number of laps and dividing by four to see how many miles they’ve run. Even now some kids say, “I don’t know how to do the math,” so I have them go back to what they can do, addition maybe. This is a teaching tool.*

*It also gives them a chance to identify their own mistakes. If [student] gets it wrong I can say, “What happened? Where did you go wrong?” She’ll realize that she forgot a step because she’s always trying to rush. I’m very into the idea of “show me”? Where did you find that answer? I ask and they go look, then come back with, “Oh, the book is right and I was wrong.”*

**Source 3: Wendy’s journal reflections on the prompt: Is the Allison AP helping students to be self-efficacious (to believe in themselves as learners)?**

Example 1: Six students from the 6<sup>th</sup> grade class presented at the UC Davis Academic Literacy Summit in February 2011. When asked why they liked their class, the students

overwhelmingly said that math was “different.” When asked what was different students were able to articulate that the program was not just “pencil and paper work.” One of the students said that she liked the class because, “Ms. Gallimore spices it up.” Another student, who excels in most academic areas, said that he was interested in learning more because he was challenged in working with a group. They all spoke about how math used to be just problems out of the book, but now it is fun, they get to draw, talk and even argue with each other about problems and their solutions.

Example 2: One student, who has always struggled in school, receives RSP services, and works about two full grade levels below her current level, was able to solve problems adding and subtracting positive and negative numbers. When asked how she did this, she simply said, “I see the solution on my Trip Line”. (Trip Line is a module which teaches students about positive and negative numbers, including addition, subtraction, and greater/less than. More than what she said was the smile on her face at the fact that she was correct in her solution. This student has consistently struggled with even the simplest of math concepts. Now, as a result of this success, her eyes light up when it is math time. She is not daunted by difficult tasks. She is motivated to work through a problem. When she is stuck, she asks for help and continues. She does not give up as she had learned to do before.

Example 3: One of the mottos in our class is that, “it is not always about what you want to do, it is about what you have to do.” One student was very good at reciting this, but not so good at remembering to do it. One day, I reminded him of the motto, he rolled his eyes and proceeded to tackle the task at hand. As I watched him work through the problem with his group, I watched his face turn from an expression of stubbornness to eagerness to finish. Up until the end of the year I still had moments when this student did not want to do the work, but I can remind him of this day now and he will remember how it felt to complete a task. Overall, he seems to be moving in the right direction.

Example 4: On our Sixth Grade Science Trip to Shady Creek Outdoor School, we played a simple game called Head and Tail. In this game, similar to dodge ball, the students form a circle and try to hit the “tail” while the “head” tried to protect it. In order to play this game, the students were taught to lower themselves into a “ready” position and when the teacher said, “Get in the game” to say all together, “In the game!” After playing this game at camp one of the students calmly looked at me and said, “You want us to be in the game for life. You want us to go to college and be successful. I want that too.” This simple game reinforces what we have learned all year. I ask my students regularly, “How is that helping you get to college?” anytime I see them doing something non-productive. I praise them for acting responsibly when they complete their assignment and strive for excellence.

Example 5: When a new student entered our class this past winter she very loudly proclaimed that she did not like me. She stood right up in the classroom in front of everyone and said, “I don’t like you.” I looked at her and calmly said, “That’s ok.” I was ready to let it go, but the students would not have it. They immediately answered back to her. Their responses were along the lines of, “Are you crazy? We love Ms. G.”, “ Ms.

G. is the best teacher because she will never give up on you,” and “Ms. Gallimore will teach you to be the best you can be.” I did not say anything to that student about that conversation again. I just treated her like the rest of the students. In the spring she told me that I was her favorite teacher. She became a class leader and actually helped set a new bar for excellence in the classroom. She made the Principal’s Honor Roll with straight A’s.

**Source 4: Student responses to prompts (Wendy’s 6<sup>th</sup> grade class and Kim’s resource class)**

Part of the Algebra Project strategy is to integrate the Algebra Project pedagogy into the entire school day and to ask students to think about themselves as learners. In keeping with this, Wendy and Kim asked students in each of their classes to respond to a number of prompts designed to elicit student’s thinking about self-efficacy (both their own and for students in general). Prompts were assigned between January and March, 2011.

Wendy and Kim’s students’ responded to three prompts:

- What makes a subject fun and interesting?
- Think about a student in your class. What makes him or her successful?
- After you graduate from high school what do you plan to do? What kind of education will you need?

Wendy’s class responded in writing (transcribed here exactly as written by the students). Kim’s class responded orally and she recorded their individual responses. A representative sampling of responses is included in the Appendix. What follows is a bulleted synopsis that captures the range of students’ comments.

*Prompt 1: What makes a subject fun and interesting?*

- If you comprehend your subject (i.e., “know it”) it is fun and interesting
- “Hands-on” lessons are interesting and fun
- When teacher cracks “funny little jokes” (as “it lightens alot of tention”)
- When teacher lets students check their work (“which helps them with responsibility)
- When you have a teacher who doesn’t “put nobody down” (instead “she always likes to bring somebody up, to make them better”)
- When we have a project or game to go with that subject (as they make “things interesting and when you work on projects you feel like you understand more”)
- Group work (“because you get to work with other people and because you can ask questions if you need to”)
- “You are the one who make a subject interesting and fun.”
- When the teacher brings things to show what she is talking about
- When the teacher includes builds interesting facts into the subject she’s teaching the class.
- When you get to read in front of all the people

- When we work on the Smart Board with math
- When we use technology (“the computer is fun – Gigi”)

*Prompt 2: Think about a good student in your class. What makes him or her successful?*

Good students:

- Are successful because they get their work done all the time, on time and stay on task
- Are motivated to get their work done (“Because there is no reason why you shouldn’t. Other than you don’t want to do it.”)
- Pay attention in class
- Are respectful and very responsible.
- Pay attention, get good grades, focus, and are always good in class.
- Pay attention and do their work carefully (and “then check it before they turn it in”).
- Do their best and follow directions.

Responses to the prompts suggest to us that our students are aware of their environment. For instance, one student wrote, “Some students are good in behavior but not in work” and went on to add that “some good students act like they know what they’re talking about but they actually cheat off their friends paper.”

Our students are also making the link between their own actions and their likelihood for success. For example, one student wrote that good students understand that they are the ones that “will get a higher education” and finished the prompt with a clarification that this means, “that they are going to get good houses, cars, and a lot of other stuff.”

*Prompt 3: After you graduate from high school what do you plan to do? What kind of education will you need?*

Most students seemed to struggle with this particular prompt in that they had vague responses in terms of what type of education they will need, but all of them had at least a tentative career path in mind.

For example, students indicated an interest in the following careers:

- Student 1: *I was planning on being a doctor and a lot of other things. I know that I have to choose only one career, but I still haven’t decided yet.*
- Student 2: *After High School my goals are go to Culinary school, become a Pastry Chief and have my own apartment.*
- Student 3: *After High school I will at least go to the Marines.*
- Student 4: *I want to have a daycare and help little kids.*
- Student 5: *I want to become a defense lawyer. I want to help people, who did not do anything wrong, to stay out of jail.*

Of interest to us are some of the other types of comments made by the students. Many of their comments reflect an awareness of what it means to be an adult and a contributing member of society. For example, one student wrote, "My third plan is I want my own apartment. I want it because it is a sign of growing up and I want to be grown up and live on my own." Another wrote, "I want my credit to be good and to pay all my bills on time" and a third that, "I also am going to help my parents with their bills." For the record, this student also wrote that they wanted to play basketball or football, "I want to become just like Michael Jordan, or Ray Allen but it depends. It all depends on my grades and graduation."

### **Conclusion**

Allison Algebra Project students routinely return to Allison Elementary school after they transition to middle school. They have serious conversations with current students about the importance of doing their best. They tell the students to believe in themselves and to "ask questions" because Mrs. G and Mr. Rohall "will help you." They are also happy to talk about their current success. For example, here's what three students who were in Wendy's class as 6<sup>th</sup> graders recently had to say about their math classes (they are currently 7<sup>th</sup> graders):

- *It's easy. We have seen this already in the Algebra Project.*
- *When the teacher talks about positive and negative numbers, I can see them on the Trip Line in my head.*
- *Hey, Mrs. G. You were right. The answers to the questions really are in the book. I read it and I found them. Now I know I can find any answer.*

We continue to believe the true test of student academic success will be seen as students progress to the 7<sup>th</sup> grade and beyond, especially in Algebra 1 (8<sup>th</sup> grade). In the meantime, the results of this year's investigation highlight the significance of the fourth essential component of the Bob Moses Algebra Project (an expectation of achievement). Our conclusion is that the Allison Algebra Project has been highly successful in setting an expectation of achievement for participating students. One student, who was involved in the afterschool component of the project in the first year of the pilot, came to visit Wendy at the beginning of the 2011/12 school year. She is now in 8<sup>th</sup> grade, taking Algebra I. She spoke to Wendy's current group of 6<sup>th</sup> graders, telling them that she has straight A's and has advanced on the CSTs due to the fact that she "learned to believe" that she is smart. When she was in the 5<sup>th</sup> grade, she was a C/D student and tested at Below Basic in math on the CST. Her brother and sister are currently in Wendy's class and part of the latest cohort of students. That means we are one step closer to creating a community in which students can learn to believe in themselves.



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