

The Allison Algebra Project as an Agent of Change

Subsequently re-titled:

The Algebra Success Academy, Institutional Collaboration and Teacher-Driven Change

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This research was supported by the California Teachers Association Institute for Teaching.

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Abstract

Based on an action research model in which practitioners systematically conduct inquiry on their own practices, this investigation is linked to an elementary school pilot project that uses experientially-based pedagogical materials to promote math literacy. While we provide contextual information about the project to help frame the study, this paper focuses on institutional collaboration and teacher-driven change.

The Algebra Success Academy, Institutional Collaboration and Teacher-Driven Change

Let's be honest about the things that are working well, celebrate those, but also be honest about the areas where we need to grow and our concerns.” –Associate Superintendent (Ramona)

Few problems in education are as pressing as the severe crisis in urban schools. Although educators have tried a wide range of remedies, dismal results persist. Real improvements are not possible until we shift our focus from finding fault to developing partnerships, from documenting problems to discovering solutions. The Algebra Success Academy represents a unique teacher-driven change initiative supported by a collaboration of educational partners— a statewide teacher union, a public university, and an urban school district—who joined together to implement culturally relevant math literacy practices at a low-performing low-income elementary school in northern California. This paper shares some of what we have learned about collaboration, about teacher-driven change and about how educational systems can sometimes impede the very work they are charged with doing.

Context and Framing the Investigation

When Marlene Bell approached the University of California, Davis School of Education (UC Davis) in 2008 about partnering with the California Teachers Association (CTA), it was because she “felt there was a missing link between universities and school districts.” As the Assistant Executive Director of the CTA, a former Davis, California teacher, and alumni of the UC Davis School of Education she was well positioned to initiate a conversation around the benefits of collaboration.

It took a lot of meetings and according to one participant, “it sometimes felt like we were spinning our wheels,” but in 2009 a group representing UC Davis, the CTA, and the CTA Institute for Teaching (CTA IFT) placed several options on the table and landed on the work of Bob Moses and the Algebra Project Inc. Mary, who was at the time Executive Director of the UC Davis CRESS Center, recalled, “as Marlene described what Wendy Gallimore and the teachers at [the] Elementary School in the Twin Rivers Unified School District were doing, trying to get their curricula organized around the principles of the Algebra Success Academy, everybody just got excited. We wound up, everybody, saying, ‘Yes, let’s work on that.’”

At that point Frank, the Twin Rivers Unified School District Superintendent, was invited to the table. As a former union president and bargainer he acknowledges that there can be artificial separations between unions and district management. When he realized he had an opportunity “to recast relationships and overcome stereotypes that districts have about unions and unions have about districts,” he took it. As Frank explained, “CTA IFT seems to hold out a penlight – that the professional association of teachers can, in fact, focus on teaching practice and enhancing the practice of teaching, not just the financial well-being of teachers.”

Now, three years later, the institutional level collaboration between the teacher union, the university, and the school district is still firmly in place but two other project partners, the

Algebra Project Inc. and a non-profit organizing group, are no longer affiliated with the program. The Algebra Success Academy is expanding but at a very slow pace and there continues to be uncertainty both around sustainability (i.e., Will the district institutionalize the model or will it end if CTA IFT funding is eliminated?). There are also ongoing questions about the effectiveness or impact of the program, many of which appear to be linked to differing definitions of success based on the institutional partners, as well as the individual stakeholder's goals and expectations.

Data collection and analysis

We elected to adhere to the simple five-step action research model outlined by Johnson (2005). These steps included: (1) determination of what to study; (2) determination of what data should be collected; (3) data collection and analysis; (4) a description of how findings can be used and applied; and (5) a report of those findings.

Three members of the Allison Algebra Project contributed to this paper. Wendy Gallimore is a teacher in the Twin Rivers Unified School District and Lead Teacher for the pilot project. Marlene Bell is with the California Teacher's Association Institute for Teaching and is charged with directing the project. Joanne Bookmyer is the Director of Collaborative Projects in the UC Davis School of Education's CRESS Center and a co-author of two previous teacher action research studies related to the project. Vajra Watson, our fourth author, is the Director of Research and Policy for Equity in the UC Davis School of Education's CRESS Center. As a 'neutral party' she conducted all of the interviews for this study and added her perspective as an expert in urban school reform.

We relied primarily on semi-structured interviews with decision makers representing the key organizations involved in the collaboration (see Table 1). This list includes two of the authors (Gallimore and Bell) making us both participants and researchers. Interviews were recorded and transcribed. We then employed an inductive analysis process in which we organized data around recurring items, themes, or emerging patterns.

Table 1: Key Decision-Makers Interviewed, along with role in the Algebra Success Academy

Dick	Manager - California Teacher's Association Institute for Teaching
Frank	Superintendent - Twin Rivers Unified School District
Gloria	Assistant Superintendent of Educational Services - Twin Rivers Unified School District
Kathleen	District Math Curriculum Coordinator - Twin Rivers Unified School District
Marlene	Project Director - California Teacher's Association Institute for Teaching
Mary	(former) Executive Director - UC Davis School of Education CRESS Center
Ramona	(former) Associate Superintendent of Educational Services - Twin Rivers Unified School District
Vivian	School Principal - Twin Rivers Unified School District

Wendy	Elementary School Teacher and Lead Teacher for the Algebra Success Academy - Twin Rivers Unified School District
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We also drew upon the following qualitative data sources:

- Literature review – the results of which informed both interview questions and how we analyzed the data;
- Archival data – including a review of project evaluation reports, collaborative research findings (co-authored by project teachers and a university partner), program materials, records and communications; and
- Our own reflections, captured in dialogue and writing.

State and Local Collaborative Partners

The University of California, Davis (UC Davis) is a public university located in Northern California. The School of Education prides itself on interdisciplinary collaboration, deep and sustained engagement with communities and practitioners, and work that fundamentally integrates research and practice.

The Institute for Teaching is a 501c3 foundation affiliated with the California Teachers Association (CTA IFT). The IFT believes strength-based models for school change provide an asset-based approach that allows teachers to emphasize talents over weaknesses and strengths over deficits to create a learning environment that supports students' efforts in doing their best.

The Twin Rivers Unified School District (District), located in an urban, high poverty area of Sacramento County, has an ethnically and linguistically diverse population. The District is made up of four formerly independent school districts and now houses over 22,000 students. The district encompasses areas of high poverty, and meets the "high-need" characteristics as defined by the US Census: 82% of this population is categorized as Socio-economically Disadvantaged, determined by a combination of parents' income and education level and nearly all students are eligible for Free and Reduced meals.

The Intervention - Algebra Success Academy

Recognizing that algebra is a gate-keeper course for higher mathematics and postsecondary education, the purpose of the Algebra Success Academy is to support algebraic reasoning in the elementary grades; prepare students for middle grades mathematics and Algebra 1 by the eighth grade, thus, preparing students for college preparatory mathematics in high school, and the mathematical knowledge required for college entrance. The Algebra Success Academy is based upon Bob Moses' mathematics pedagogy (Moses and Cobb, 2001; Kress, 2005), but is distinct because of the nature of the partnership, the intensive teacher professional development model, and the unique instructional materials created by the lead teacher on this project. As a teacher driven initiative, this intervention is intended to steadily expand the cadre of confident, creative teachers who are able to create and sustain a successful algebraic learning environment.

Summary of the Findings

What We Learned About Collaboration

The fact that the Algebra Success Academy is still in place after three years is evidence that unions, districts, teachers and administrators can collaborate. That said, in this particular case, the purpose, positions, personalities, and the partnership itself have contributed to the emerging nature and quality of that collaboration. Among the lessons we have learned about collaborative relationships:

Collaborations are built on trust.

You can't come to the table and expect that work is going to be completed and that there is going to be automatic trust when you have all these outside entities coming together. –Kathleen, Math Curriculum Coordinator

During the first year of the project, CTA IFT had a contractual agreement with the Algebra Project Inc. to provide technical support and training. Marlene, the Project Director, told us that the team felt this was essential as the goal of the project was to “bring his [Bob Moses] concepts to this district, because we had finally found something that we knew was going to work.” As it turned out this relationship floundered from the beginning with the end result being a mutual decision to disassociate but not quite sever the relationship. As Wendy, the lead teacher, explained, we are now at the point where “we’re trying to be inspired by them but not be them.”

The project also contracted the services of a non-profit organizing group to assist in parent outreach. Most of the people interviewed brought up this entity as an example of a poor fit as an institutional partner. Dick, the IFT Manager, told us the whole community- and parent-organizing component of the project was not particularly successful, “We had a real divergence in our thinking along the way, and I think it came down to philosophically our organizations just work very differently.” Gloria (Asst. Superintendent) shared a similar sentiment, “We were the enemy...” Gloria went on to explain that the district is highly supportive of the parent engagement but the non-profit’s organizing methods caused some people to be suspicious of their intentions, “was it about needing constituent support for political purposes or about engaging parents?”

Institutional level collaborations require dedicated individuals at the ground level.

As I think about the personalities involved, Marlene brought a level of gravitas and credibility, representing the highest levels of the CTA. She systematically pursued and developed her relationship with the superintendent, and his buy-in paved the way for people within the district office to buy-in, the principal to buy-in, and to create a space for the teachers to do the work and the university to come into the work. –Mary, UC Davis

The Algebra Success Academy routinely engages teachers, a principal, several union organizers, a superintendent, multiple university researchers and evaluators, parents, executive

directors, and district administrators and curriculum staff in the business part of the project (e.g., contract agreements, memos-of understanding, program evaluation) as well as the curricular components (e.g. aligning content with district-mandated math curriculum, exceptions to the district pacing guides and testing schedule to accommodate the project's content). It's challenging work and while it seems to be getting easier, Frank (Superintendent) laughingly pointed out, sometimes it's an issue of whether or not "we [can] all be nice and play together." Wendy (Lead Teacher) provided a specific example in which she had to work through an instant negative reaction to a district administrator, "I didn't know who she was and [I thought] she was crazy and I thought wow! And now, I can call on her for anything."

Our interviewees provided insight into the role they played in the project. For example, when asked how other people involved in the project would describe her role in the project, Wendy (Lead Teacher) noted clear distinctions based on the institutional partner and/or the position of the person involved. From CTA IFT's perspective Wendy said she is viewed as a teacher and a leader, "I'm kind of the carrier of the whole program..." In contrast, she added that the district perspective can sometimes be, "oh God, here she comes again," while staff at her school tend to label her as "the algebra success girl" and parents "as a different kind of teacher." Among the other roles we heard described included: Frank (Superintendent) for his willingness to meet and his continued commitment to the project; Mary (UC Davis) for serving as a neutral convener and voice of reason; Dick (CTA IFT Manager) for providing stable funding and publicizing the program; and Kathleen (Math Curriculum Coordinator) for keeping open lines of communication and building trust between teachers and the district administration.

Collaborations can work through (or in spite of) ideological differences.

...parents like it. The parent feedback is very compelling. So anytime you can bring that kind of enthusiasm to scale – let's figure out how to do that. –Frank, Superintendent

While generally on the same page in that the people we interviewed recognize the Algebra Success Academy's potential as a parent engagement strategy, subtle and not so subtle, ideological differences surfaced in our interviews. The project uses mathematics as an organizing tool to ensure quality public school education. As such, it engages families and community members in ways that schools and districts can find challenging. Wendy, from her perspective as a teacher, continues to question if every member of the partnership is there to empower families, or if they are there "to keep them down and keep them in a certain place?" Dick (CTA IFT Manager) said that when parents get involved it changes and challenges the institutional dynamics as parents are a force that the district, "really have a hard time sorting out."

Collaborations can function despite differing definitions of success.

I think that student achievement was number one in the district's mind. Teacher driven change was number one in the union's mind. The success of students was a combined goal. –Marlene, Project Manager

There is general agreement that the Algebra Success Academy's pedagogy is a good match in terms of meeting the needs of the districts' students but there are variances in how the

institutional stakeholders define project success. Kathleen (Math Curriculum Coordinator) has been involved in mathematics education for decades. She told us that the first time she visited Wendy's classroom she was taken aback, "When I walked in the kids wanted to know who is this person? So I told them that I was the math coordinator and they cheered. I've never been cheered [by students] before." Kathleen describes a learning environment where math is celebrated and we believe that this represents a critical shift; for these students math was not simply something they were told to do, but was starting to become who they are. In fact, almost every adult who visits Wendy's classroom leaves saying something similar about the experience. "I've watched the students," Dick told us, "I mean, I've been up there enough times now where I can see, first hand, the transformation. You see it in their attitudes about school, their attitudes about math – those things are very gratifying."

Regardless of the many positive things the district administration has to say about the affective aspects of the project they are well aware that many students in the district are not as academically successful as they could be. In a data-driven district results, most importantly test scores, are important. The project does collect and analyze student achievement; last year's findings concluded that regardless of their starting math level or how long they had been exposed to the program, students who participated in the Algebra Success Academy on average performed about as well as similar students at similar schools (Keller, 2011). These results raise legitimate questions. However, the available data addresses a small population of students in a single classroom. Because of this the evaluators urge caution in interpreting the results and project staff remain optimistic that more significant results will materialize as more teachers sign-on and as students in the sixth grade treatment groups progress into high school algebra classes.

Collaborations must be valued if they are to be sustained.

And that's not a problem of collaboration; I think it's a problem of inadequate resourcing and inadequate commitment of a sustained nature. –Mary, UC Davis

Dick's (CTA IFT Manager) opinion is that it's easier to establish a partnership than it is to maintain it, whereas Wendy (Lead Teacher) and Kathleen (Math Curriculum Coordinator) disagree. They think the opposite is true, that it's easier to maintain than create a partnership. Regardless, institutions and individuals typically enter collaborative relationships with good intentions but those positive intentions don't necessarily preclude skepticism or resistance. Speaking about the current status of the project, Frank (Superintendent) said, "I do think the resistance is less. I also think there was, and continues to be, skepticism on both sides. It tends to get mucked up in union leadership, the local leadership and what their perception of what management does is. There is a whole set of things going on that have nothing to do with the [Algebra Success Academy]. So that's regrettable but it is what it is."

Dick (CTA IFT Manager) noted that while the project has bumped up against certain political realities that may limit its ability to be influential in terms of school reform policies and practices, he's optimistic that *if* the entire spectrum of stakeholders including teachers, administrators, university partners and association leaders continue to see the project as being of value it will continue, "I mean those stars may not align in a lot of different places. They happen to be

aligning here for right now.” Mary, in her role as the university partner believes that it will take more than the perceived value of the collaboration for the program itself to continue. It will also require adequate resources, “Ultimately I think the project itself will be in peril if it doesn’t grow to that level [of expansion] and get piloted at that level. It’ll be a very interesting generative experiment that we ran, but without sufficient ground covered to substantiate it in anybody’s mind as something that needs to go on.

Collaboration requires intentionality and keeping students at the center.

You can’t hope to get there unless you keep putting it on the table and doing that collaborative work. It takes time. It takes intentionality, and it takes a basic willingness to do it. –Mary, UC Davis

We consistently heard one particular message – everyone actively involved in the Algebra Success Academy is there for the same reason – they care about the students. We were told that it makes it much easier to come to the table and put together a project that works if the partner has that same belief in students. Gloria (Asst. Superintendent) said it this way, “We may all have sub-agendas or sub-needs as an organization but I think none of us really questioned that we were really all there for our students.”

What we Learned About Collaboration Among Educational Partners

If a university truly represents the cutting edge of learning and is on the cutting edge of what makes our schools fabulous places of learning they need to be out front, not coming to the table at the end of the meal, not stepping back and appearing only in a supportive role. –Marlene, Project Manager

The Algebra Success Academy was originally conceived as a way to “test the waters” of institutional collaboration between a statewide teacher union, a public university, and an urban school district. Not enough data was collected to adequately address the success of this effort; and regardless, it may still be too early in the process to draw any conclusions. We do believe that each of the institutional partners involved in this collaboration entered into the agreement with every intention of making it successful, and continue to do so to the best of their abilities. The Algebra Success Academy is not an off-the-shelf program, rather it started from scratch, meaning that a tremendous amount of work had to be done within an environment where trust had to be earned. In our minds the Algebra Success Academy is a testament to what can happen when educational partners are truly willing to commit to finding solutions.

That said we also believe that each of the institutional partners should take time to reflect back over the past years, to unpack what they have learned about institutional collaboration, and to look ahead toward what actions need to be taken to foster new and authentic efforts in the future. For instance, Marlene (Project Manager) shared her belief that the university needs to re-examine its role as a neutral party: “What is its role where underrepresented and underserved students are served? What is it doing to fulfill its own mission of credentialing students prepared to work in today’s schools? Is it providing course work that is informed by experiences such as the ones we have had with the Algebra Success Academy?”

What We Learned About Teacher-driven Change

Teacher-driven change is at the heart of the Algebra Success Academy but here again, there is at least the perception of on-going ideological tension between the district leadership and the union/teachers as they negotiate this new and sometimes uncomfortable relationship.

Ramona (Assoc. Superintendent) mentioned the value of a distributed leadership model, "...so administrators need to back up [and] understand that they are not the expert at everything and let the teacher leadership shine forward and we'll be in a much better place." Marlene (Project Manager) captured the essence of this tension from the union's perspective. "The collaboration between classroom teachers is probably the most powerful tool that you can provide a group of teachers. When you put the educational partners into it, that's where you begin to shift the culture. When you put a district administrator into the mix as a partner – and not as a driver – you have two bodies that are learning, relearning, how to work together. One that knows full well what is needed where students are concerned; the other that brings to the table systems and the role of budget and finance. But the driver is no longer the driver and the subordinate is no longer the subordinate. They become equals, and that is a powerful shift."

One interesting facet of this on-going negotiation has been that as the Lead Teacher (Wendy) works to expand the program's reach into other classrooms and other schools, her role is shifting from that of classroom teacher to that of teacher leader. Ramona (Assoc. Superintendent), speaking about this shift, said, "It's really interesting, the script has flipped to where our teacher who is the head of the project is looking more like an administrator. She has expectations and teachers are to meet them, and they are asked to sign-up to meet them, and if they don't meet them they don't get to continue to participate in the project. And so I'm watching that teacher leadership starting to look like collaborative administrator leadership."

Conclusion

Our goal in conducting this study was twofold: 1) to share some of what we have learned about building relationships between educational partners and, 2) to address the accountability of educational organizations and systems to classroom teachers and students. This investigation adds to a small but emerging body of literature that addresses how the organizations and systems put in place to support classroom teachers are held accountable to those same teachers. For example, Thornton (2010) places teachers at the center of all reform movements and Datnow (2011) uses Andy Hargreaves work on educational change to showcase the important differences between collaborative cultures and contrived collegiality, linking his work to data-driven decision-making.

As a result of this investigation we are convinced that state and local leaders can and must come together in meaningful and authentic ways to improve teaching and student achievement. We are convinced that we need to shift the paradigm on how we teach if we really expect to see high expectations for all our students. We will continue our work with the Algebra Success Academy with a much greater awareness of the ways in which personality, position, purpose, and partnership shape that work.

Following is a set of recommendations based on what we learned as we conducted this investigation as well as on our own experiences over the past three years that we offer to anyone engaged in or considering institutional collaboration between educational partners:

- * Collaborations are built on relationships and trust on the part of the individuals and the institutions they represent.
- * Collaborating institutions need to agree upon and coalesce around key priorities. It isn't necessary for each partner to be in complete ideological agreement. What is important is that the perceived benefits of working through those ideological differences outweigh the costs.
- * Successful collaborations require the buy-in and commitment of the institution's leadership and those leaders need to be willing to "stay the course" when it might be easier to acquiesce or revert to the status quo.
- * Successful collaboration requires staff that is willing to challenge the system on an almost daily basis (and that sometimes requires both a willingness to roll with the punches and to be seen in a less-than-positive light by their colleagues).
- * High-dose strategies, intense interventions that impact a large percentage of the target population, are more likely to lead to significant changes. An inherent challenge of any small school-based pilot project is that it's difficult to document any significant change in student achievement because the results don't always show up in the data.
- * While state and regional institutional partners may call for change and may provide the resources to allow it to happen, the reality is that real change happens at the local level (and so we must look to teachers' classrooms for evidence that change is actually taking place).
- * A stable and predictable funding stream is essential. It takes time for institutional change to happen and having the amount and/or the 'rules' for how resources will be allocated change along the way further complicates an already complex scenario.
- * When your ultimate goal is to "level the playing field for youth," institutions shouldn't have the option of trying to make it happen. Institutions need to keep students at the center of our work and find ways to eliminate the barriers that impede the very work they are challenged with doing.

This investigation has also strengthened our commitment to advocate for teacher-driven change models as the core of any school change effort. In this, we are not alone. Researchers (including Gordon et. al, 2006 and Darling-Hammond, 2007) suggest that improving teaching is paramount to school reform and they propose that innovative educators can curb school failure, especially for low-income urban students (Oakes & Lipton, 2006).

One additional hope we have is that the larger educational system, the universities, teacher unions and district leaders continue to provide the space, resources and time to allow this change

to happen. Reflecting on 16 years of school change, experts at Center X at UCLA agree: “Resiliency and persistence are paying off. Perhaps the most important lesson we have learned is that a partnership is not solely the formal work we do but the relationships we build as we come together on behalf of students to transform public schooling” (p. 313, Quartz, Priselac, Franke, 2009). We acknowledge that some consider the initial dollar cost of investment in this particular teacher-driven change effort high but given where the collaboration stands today in comparison to three years ago, it has been well worth that cost.

Finally, in the writing of this paper we came to the realization that the Algebra Success Academy still has much to teach us about school reform and teacher-driven change, particularly within the realm of mathematics education and the role of algebra as a social justice/equity issue. Research in this area builds a case for culturally relevant and engaging pedagogy (Leonard, et. al., 2010; Wynne & Moses, 2008; Enyedy & Mukhopadhyay, 2007; Roach, 2004) and for the role of mathematics in expanding education options or serving as a gatekeeper (Jacobson, 2000; Everson, et. al., 1996). We believe that as our work on this project continues we might contribute additional insights into the role of systems and organizations in promoting culturally relevant pedagogy and social justice pedagogy.

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