

**UNBoxed** A Journal of Adult Learning in Schools

A TEST THAT TEACHES TRUST don mackay

THREE INADEQUACIES mike amarillas

STUDENT CONSULTING anna chiles, ben sanoff, chloe larson, janie griswold, and julia rosecrans

A JOURNEY WITH VENETIA PHAIR jeannine west pauli

UNCOVERING THE WHY IN THE WAY WE TEACH aleya cunningham and roxanne tuong

DOES DEEPER LEARNING MAKE A DIFFERENCE? kristina zeiser, mette huberman, jennifer o'day and michael garet





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A Journal of Adult Learning in Schools

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Meals and Muppets Project. Photo courtesy of Edrick Macalaguim

cover image: Cyclic Machines Project; Photo courtesy of Mike Amarillas

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## Welcome

The Editors

hat happens when teachers build a rich foundation and then let students take charge of their own learning? This issue of UnBoxed is full of reflections on such unpredictable processes. Jeannine West Paull recalls an unexpected turn in an elementary astronomy project that she decided to let run, with surprising results. Sharon Fargason, Melissa Han, and Sarah Imbriaco reflect on what it means to be well behaved—in the adult world, and the world of elementary school. In a companion article, their student teachers, Aleya Cunningham and Roxanne Truong describe how their ideas about teaching and learning were turned upside down. A team of teachers and students from High Tech High Media Arts document how they disrupted traditional school hierarchies by using students as instructional coaches for new teachers.

Pam Baker shares suggestions for improved collaboration among teachers and students, and Don Mackay shares a devilish plot twist to impel such collaboration. Mike Amarillas reflects on the structural factors that kept students from succeeding in his previous teaching job at a large comprehensive high school. Finally, researchers from the American Institutes of Research report on results of a multi-year study of the impact of deeper learning practices on students and faculty, data we can all put to good use!

The UnBoxed gallery of "cards" in this issue offer glimpses of projects we find inspiring. These cards are freely available on the UnBoxed website in a printer-ready format. Simply print, fold, share and discuss. We wish to thank the teachers and designers of these projects for sharing them.

Thanks also go to the K-12 and university educators who have reviewed submissions for this issue and offered invaluable counsel. We invite all of our readers to join us in conversations about purpose, policy, and practice in education by submitting an article or serving as a peer reviewer. **Our next submissions deadline is October 1, 2016.** 

To learn more, visit www.hightechhigh.org/unboxed.

Read, enjoy, participate!

-- The Editors



Dear Jeannine West and all The children she teaches, the show It was \$ livery To hear from you and To have that winderful little born - l're never seen anyming like it. in had so many interesting questions , some I think scientists already have the answer - but very good questions They are, and perhap you'll be able To Ind out on p The internet or perhaps in class - I remember being taught why The sky is blue (but I dut p. hk I'd ever thinght of asking, as Theken did). Some other questions man be anchered by astronomers

# A Journey with Venetia Phair, the Girl Who Named Pluto

Jeannine West Paull Denver Public Schools

was in my fifth year of teaching in a Denver Public School—a school of choice with a "British Primary" label. This meant it essentially followed a model of the project-based "integrated day," (Katz & Chard, 2000) the term of choice before projectbased learning was known or well accepted. In my first and second grade classroom (family groupings where students stayed with me for two years), we studied two units in depth each year, digging deeply into content from every content perspective.

My students were from a variety backgrounds—some from very affluent families from the surrounding neighborhood and others who "choiced" in from other parts of the city. The school invited parents to make intentional and informed choices about the kind of education their children would be receiving. There were "regular" elementary classrooms as well as those with a "British Primary" tag in my building.

In British Primary, we were encouraged to follow our students' interests in developing rigorous units that immersed children in inquiry—following their own questions and developing plans to

uncover answers (and content) along the way. As you might expect, the discussions and directions each class took were often very different from their neighbors next door. As a teacher, I had great freedom in the way I delivered content. That is not to say that we didn't have "learning walks" by the district that didn't wholeheartedly endorse our practices. I remember, for example, being told once that my students' bird journals (documenting and observing birds in and around our schoolyard and at home including questions for research) didn't follow the district's literacy plan. Nonetheless, this was a program well supported by the community and had revitalized a neighborhood school where students were considered "high-achieving."

In the first semester of the year, my 1st/2nd graders were studying the solar system, specifically, the moon, phases of the moon, and how we perceived the moon from Earth. We learned about Native American legends, lunar calendars, and eclipses. Typical of six and seven-year-olds, my students were full of questions. Some already had a keen interest in the planets, having memorized the order in the solar system (nine planets) by heart.

One of our classroom rituals was to read something from the *New York Times* "Science Times" section each Tuesday. The Observatory section was always chock full of articles that tied to something we had either discussed in class or something that interested my students. In the September 12 edition, the lead article was titled "Pluto's Exotic Playmates." This article, by Kenneth Chang, described some of the details surrounding Pluto's demotion from planethood only the month before. It was now classified as only a 'dwarf planet'—one of the many icy bodies orbiting in the Kuiper Belt in the farthest reaches of our solar system.

My students were immediately fascinated by the article. Some, in fact, were distressed about the demotion of the ninth planet. We soon began to discover books and other resources about Pluto, the most notable being The Kid Who Named Pluto by Marc McCutcheon. This book recounted the story of Venetia Burney, who in 1930 suggested the name 'Pluto' for the newly discovered planet to her grandfather at the breakfast table. This is the element of the story that most interested my students—the little girl, Venetia Burney, who had named the planet. They wanted to know, as six and seven-year-olds do, if she was still alive, where she lived, how old she was—and had she become a scientist? This last question was one held in high regard in our classroom.

Although this was 2006, we had but ONE computer in our classroom which we used to search the internet. We discovered that Venetia Phair—nee Burney—was still alive and living somewhere in Surrey, England. Immediately, my students wanted to write to her to learn more about her life. They initially thought a letter would be right but then decided that they would like to add their thinking about the big scientific questions in their lives, especially about the universe.

So, a plan was made that we would write a book to send to Mrs. Phair in Surrey—made up of pages written by my students to share their thinking with her.

There was only one big concern with our plan. We didn't have an actual address. We found on the internet that Ms. Phair lived in Epsom, Surrey. I asked my husband who grew up in the U.K., and he explained that U.K. mail service wasn't like the U.S. If we had the correct village, it would probably get delivered—not returned because it was missing the correct post code. This was a relief. but, to be safe, the children and I decided to make TWO copies of our book—just in case the one we were sending got lost or was undeliverable in the big wide world of international mail.

In the days following, we set to work on our plan. The students wrote and illustrated their wonderings on individual pages (twice)—and then, the original book was put together in an 'origami' style with folded pages stacked on top of each other to complete the book. The second copy was a more traditional hand-sewn, hand-bound book. They titled it—*Our Book of Big Questions*. Every student worked to complete and illustrate his/her page. We included a class picture in the opening pages and an Albert Einstein quote for the epigraph:

The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when he contemplates the mysteries of eternity, of life, of the marvelous structure of reality. It is enough if one tries merely to comprehend a little of this mystery every day. Never lose a holy curiosity. In the Foreword, we wrote:

Scientists have big questions and big ideas. In our classroom, we are all scientists. We wonder about things in the sky, on the earth, in the water, and in the history of our earth. In this book we wanted to share some of our own 'big questions.'

Ms. Jeannine's Class September 20, 2006

On September 20, 2006, we wrapped our book up carefully and tucked it into an envelope addressed to:

Venetia Burney Phair Epsom, Surrey United Kingdom

And then, we waited ...

A month passed. And then, on October 24 I looked in my mailbox in the school office and saw a letter neatly addressed to 'Ms. Jeannine West and all the children she teaches...'

I couldn't wait to open it and share it with my students. The letter was handwritten, and in it, Mrs. Phair addressed many of the children by name in response to the questions they had posed in "that wonderful little book."

"I was intrigued by Mari's I wonder if space is a ginormous planet? but if it is, what lies outside that planet?"

Mrs. Phair said that she was fascinated by many of the children's questions and added she would love to know the answer to one written by Anna, "If alligators were alive when dinosaurs were, why didn't they die too?" In closing she said that she had "been lucky altogether in naming Pluto because so many interesting things have happened to me as a result—hearing from you for one—and at the age of 88 that is very nice." and "with love and good wishes to you all."

In the days that followed our classroom was abuzz with children talking about the letter—parents coming in to see it, and even an email

from a grandparent telling me about the excitement it had generated in the household.

Thus began a wonderful correspondence between Mrs. Phair and my students that spanned more than two years including numerous exchanges of long letters, Christmas cards, and another volume of a similar book written by a subsequent class of 4th/5th graders in my next school. Her correspondence included details of a visit by Alan Stern, from the New Horizons Project at the Southwest Research Institute at Boulder, Colorado in December of 2006. His project launched a space probe on January 19, 2006 and did a flyby of Pluto in the summer of 2015. It yielded many exciting photographs and new facts about the dwarf planet. He also brought news to Mrs. Phair that Asteroid 6235, discovered in 1987 was named, 'Burney,' after her.

The last card arrived from Mrs. Phair in January 2009 in response to a Christmas card sent by the class.

We were deeply saddened when we learned that Venetia Phair died only a few months later on April 30, 2009, at the age of 90.

This kind of real life, authentic connection made by my students is what engages and drives curiosity and learning in my classroom—even today. I could never have scripted such experiences, and I couldn't have anticipated the impact it would make on my students.

One of my mentors once said to me in a discussion about writer's workshop that "writing floats on a sea of talk," a quote by James Britton. I have come to believe that great discussions—the 'sea of talk"—in classrooms drives the great thinking and learning that goes on there. Without my students' curiosity, this correspondence would never have happened. The collective thinking of my students far outweighs any plan I might have for 'where a unit should go...' Although this was not a planned stop in our study of the solar system, it was one that had a profound impact on us all.

When students are able to put something out in the world, and it is received and responded to, learning is validated and therefore, valued.

In the current iteration of 'project-based learning,' I sometimes see teacher colleagues driven—and driving students—toward an "expected outcome," convergent thinking that pushes toward that big finish at the end—and somehow ALL classes in that grade level will arrive at that place at the same time with a similar 'product.' In reflecting on this experience with Pluto and Mrs. Phair, I am reminded how important it is to honor my students' thinking, questions, and the opportunity to negotiate and design the way they will demonstrate their understanding in any unit.

The path to learning—and the uncovering of content directed by the students sitting in front of me—is far more important (and relevant) that any plan I might have scripted for them. There is always an element of risk in a student-led approach; every unit doesn't have a guaranteed element of "magic." But, when those risks pay off, it is well worth it all.

### References

Katz, L. G., & Chard, S. C. (2000). *Engaging Children's Minds: The Project Approach* (3rd ed.). Praeger.

McCutcheon, M., & Cannell, J. (2004). The Kid Who Named Pluto: And the stories of other extraordinary young people in science. San Francisco: Chronicle Books.

# A Test That Teaches Trust

Don Mackay High Tech High International

s I prepared the final quiz of the semester, I began to reflect on what my students had learned, not just about solar cells, but also about life. I teach engineering to high school seniors and while you might think that an engineering teacher at High Tech High must have a class full of future engineers of America, it's quite the opposite. Engineering is not an elective at our school—every senior takes my class. The challenge is to convince my diverse students (a representative ethnic and socioeconomic cross section of San Diego County selected by lottery) that learning principles of design through the lens of engineering is relevant. I emphasize that most every modern career involves identifying problems, empathizing with clients, and creating innovative cost-effective solutions. But one of the most important life skills I try to instill is how to work well in a team.

Group work is a natural consequence of teaching at a school that practices project-based learning. As self-proclaimed progressive educators, we pride ourselves on constructing authentic multidisciplinary projects that demand a robust melding of students' communication, technical, and social skills. We know that establishing clear objectives, meaningful roles, and student choice into every project is crucial for success. But we also know that assessing group work is littered with landmines. How do you recognize that most of the work may have been done by one person? How do you get that person to release the reins? How do you convince the coasting student to engage? Reflections, portfolios, and peer reviews are essential parts of the group assessment process, but I recently came up with a radical idea for my final quiz that seems to have touched a nerve.

The content revolved around building a solar cell from white paint and raspberry juice. The quiz was straightforward: draw a diagram of the solar cell, label the critical parts, and describe each part's function. The problem was that I had unwittingly offered any student that participated in a Maker Faire project earlier in the semester a "free pass" for a quiz of their choice. More than half the students had earned the pass and saw this final quiz as the perfect opportunity to use it.

Fearing that my favorite lab would be summarily dismissed from memory by so many (an "old-school" weakness I find hard to relinquish), I devised a Stephen King-like plot twist. And all it took was adding one line.

At the top of the page just below their name, I added:

"The person for whom you are taking the quiz:\_\_\_\_\_\_." Each student would pick their quiz-gift recipient out of a hat. I explained that in group work, it was important to be able to trust that everyone would do their best, work their hardest, and contribute their all to the project.

"If the group leader doesn't trust her peers to do their part," I continued, "she will be tempted to do their work for them. If the designer doesn't trust the researcher to provide relevant design specifications, he will ignore the specs and design an inferior product 'off the top of his head.' Not trusting your teammates and not being worthy of their trust are two sides of the same coin."

But it's difficult to assess one's trustworthiness. That is what I was

hoping this quiz could do. "To see how trustworthy you are as a member of this class," I announced, "you will gift your quiz grade to a random student in our class."

As you might imagine, the startled looks of incredulity were everywhere. "This isn't fair!"

"Why should my grade go down if I learned what I was supposed to learn?"

"I might as well not even bother if my grade doesn't depend on what I do!"

"Can I use my pass if I don't like the grade I got?" (The answer was no, but I offered that if anyone felt guilty about bombing the quiz, they could give their pass to the person for whom they were taking the quiz. Yet another thoughtful twist.)

In an attempt to clarify, I continued, "think of the solar cell lab as a whole class project in which everyone had the assignment of learning how a solar cell works by building one. Not learning the content lets down the class community. We just usually never bother to assess who was letting down whom."

The "gift quiz" had in fact been inspired by real world events. Recently, my son had witnessed the unexpected firing of a team leader at work who had a reputation for doing not only his own work but much of his subordinates' as well. On the surface, it seemed incongruous that the overachiever should be fired instead of the "slacking" subordinates. However, as we talked we began to appreciate the deeper principle at play: doing your own job and someone else's is not sustainable. It not only leads to burnout, it also kills the camaraderie and growth we associate with effective teams.

Our conversation made me wonder how I can better facilitate deep teamwork in my practice? How can I get students to realize that each team member has a responsibility to build competency in and by each member. It's not acceptable for one student to do most of the work. Neither is it acceptable for a team member to ignore learning their tasks. As I considered how to get my students to take the learning of their peers as seriously as they did their own, it came to me: have them take a quiz - for someone else.

The conversation with the class continued as we reflected on what teamwork meant and what their complaints implied about their commitment to the class. Here are some of the questions we discussed.

"Would you really not help someone who didn't understand something as well as you?"

"What is more important, to learn how a solar cell works or to learn to not let a teammate 'get by' with an inferior understanding?"

"If you really don't trust your quiz grade to one of your teammates, how will you ever trust your future colleagues with your livelihood?"

"When should we help our teammates and when should we ask for help?"

"How do we develop trust in our teammates and how do we earn their trust?"

In the end, they had to admit they appreciated the twisted logic of this assessment even if they hated me for thinking of it. They were right about one thing; it wasn't fair to spring this twist on them last minute so I gave them 30 minutes before the quiz to review. You've never seen so engaged a group of students pouring over the details to sift the gross misunderstandings from merely superficial. I would clarify a principle to one student and watch expectantly as that insight percolated through the class. As I hoped, the prepared students jumped in and urgently tutored the less prepared. They were not about to risk their grade on some random misunderstanding.

What surprised me though was how earnest the less prepared were. They were terrified that they might be the reason a prepared teammate, perhaps a good friend, would be punished because they had neglected their learning. For the first time perhaps, they felt a visceral responsibility for their learning that went beyond the confines of their own mind (even if the circumstances were a bit contrived). After all was said and done, the average grade of the class was the highest of any of the semester. That is not to say that everyone aced the quiz, but that wasn't really the point in the end. What everyone did learn from this quiz is that we learn both as a community and from our community. And that was a lesson you may not have expected to learn in an engineering class.



Photo provided by Mike Amarillas

insight

## **Three Inadequacies**

Mike Amarillas High Tech High North County

tephanie C. was apprehensive to take physics, but her counselor placed her in my class for college application appeal. Stephanie approached me the first week of school, intimidated by the math component of physics and unsure of her ability to succeed. I encouraged her to stay and assured her she could achieve success with effort.

Stephanie ended up developing a real interest in physics and invested a great deal of time and energy in her work. I provided her occasional tasks or resources from the "honors" level physics course and eventually she took the SAT II subject test in physics. I was thrilled to see a young Latina excel in a male-dominated subject area. But in spite of her success and newfound enthusiasm for physics, there was no next step available to her for the following school year. She could not enter AP physics without having taken honors, and she could not enroll in honors since it would repeat the physics requirement. I believe she signed up for physiology.

Having relocated now to a new city where I teach at a different school, I find myself reflecting on my prior work at Stephanie's school.

Our school was progressive, well-funded, and staffed with passionate people. Yet with the gift of hindsight, I have identified three major inadequacies in the experience I delivered to students there. These failures span the scale from the classroom to the school district to the city hall. First, at the level of my own daily instruction, students completed meaningful tasks but were not deeply engaged in long-term learning. Second, as in Stephanie's case, our school and departments often tracked students in ways that inhibited equitable success. Third, historical and political factors shaped district boundaries to work against disadvantaged students.

#### I. Shallow Engagement

My students had no chance to invest in the long-term crafting of beautiful work and no opportunity to learn deeply over time. The experience I delivered was fragmented into bite-sized chunks agreeable to 90-minute blocks and five sections of up to 36 students each. Lesson-level structures and the management of supplies dominated my daily experience; delivering effective lessons and labs was my primary goal. I implemented thematic unit-level planning for organizational purposes, not for inspirational purposes. Students seldom sustained work on an enterprise for more than one or two class meetings, often with no peer critique and minimal opportunity for revision. On any given day they demonstrated engagement and all its trappings, but rarely did students invest more time or energy beyond a single period.

I had no conception of this deficiency until I encountered the notion of "deep engagement" from David Price. I began to see my old practice in a new light. My students were engaged enough to invest energy in tasks, have academic conversations, and create decent quality work. Their engagement, however, was not based in voice, choice, responsibility, or personal investment. It lacked principle and pervasiveness because most student learning developed around discrete tasks and not larger undertakings. I made the science content accessible and appealing from day-to-day and unit-to-unit, but student interest felt rebooted each meeting rather than carried through as part of some greater purpose.

This major shortcoming went unnoticed in part due to my district's teacher assessment methods. The administration employed rubrics and protocols similar to what Kathleen L. Gallagher describes in "Assessing Quality Teaching." My daily instruction satisfied her eight "characteristics of quality teaching," and indeed I scored well on teaching evaluations. These evaluations involved the observation of a single class period, conversation about the context of the lesson, and a debrief reflection conversation. The situation of learning in a larger pursuit does not appear in the metrics of such solitary or sparse evaluations. Across six years of teaching, I exhibited high quality instructional techniques without engaging students in deep long-term learning. Each day's lesson or task was well crafted but poorly situated in a greater context.

### **II.** Insidious Tracking

Many of our students most in need of support never even crossed my path. I only taught students who passed science as a freshman and then chose physics from among several paths through science classes. I didn't identify this practice as tracking because it gives an impression of furthering student choice, but it creates an environment where early performance strongly determines later success. Some students end up without access to high level courses. In virtually every discipline taught in the school, honors and AP options created desirable and undesirable course tracks.

Honors courses generally had stringent prerequisites, and passing honors gave access to AP courses. Given this sequence, a student's performance during freshman and sophomore year affected whether he or she could even qualify for the most advanced courses by senior year. Furthermore, top marks in both honors and AP classes bestowed five points on students' final GPA (one added to the usual four). As a result, a student's final GPA and college prospects were strongly determined by her performance three years prior. AP science courses were essentially unavailable to students who failed biology during freshman year.

Even students who reached my physics course faced additional constraints. I embedded numerous mechanisms for students to improve their performance within their course, but had no path for a "regular student" to reach the honors level. Worse, there was no further course of physics study for a successful "regular" student. Students who passed honors physics could enter AP physics, but "regular" students did not qualify and also could not enroll in the honors course. Zero options remained for them to pursue an interest in physics.

## **III.** Political History

The district's most disadvantaged students are segregated in a school inconveniently far away from their neighborhood. The situation arose when one of the district high schools was shut down in 1981, its campus leased to a private academy. The board re-drew the district boundaries with the net result of re-segregating the poorest students. The most recent data available shows my former school to be over 49% socio-economically disadvantaged and over 45% Latino. The nearest neighboring district high school of comparable size, a mere 1.4 miles away, is under 19% socio-economically disadvantaged and less than 18% Latino.



The city's zoning map reveals the least advantaged neighborhoods of the area are concentrated in the boundary of my former school. The boundary is roughly an elongated rectangle, several times longer from north to south than from west to east, with the high school situated at the southern tip. At the northern end of the rectangle are the poorer neighborhoods of the area, as indicated by the presence of low-income housing.

Type of Housing	# of Complexes in My	# of Complexes in
	Former School Boundary	Neighbor School Boundary
High Density	13	2
Very High Densit,	2	0
Mobile Home	5	1

Table 1: Low-income housing discrepancy in school boundaries.

Within both boundaries, home values to the south are up to 500% more than to the north, so that students in the least advantaged areas systematically have the longest commutes. Only the city bus system is available for those unable to secure a ride, and only a small percentage of students are able to acquire a free bus pass. Paid or free, students from the outskirts of the district who ride the bus face a 45-minute sojourn and a 7:30am start time. In retrospect, our administration's explicitly stated goal to "close the achievement gap" was doomed to fail.

These boundaries are not immutable. Only bureaucratic and political intractability stand in the way of change. I learned about our school demographics and picked up anecdotally that my former school was the "black sheep" of the district, but I never questioned the status quo. Some of my colleagues loudly derided the boundaries and pushed to raise awareness, going so far as to ride the student bus routes themselves in solidarity. I remained largely unaffected and ignorant, because the most disadvantaged students seldom reached my physics classes.

## Conclusion

In a system that explicitly encouraged discrete daily objectives, student learning lacked long-term investment. In a system that gives high priority to AP and honors courses, students who cannot access them are relegated to second-class status. In a system that allows boundaries to be drawn that segregate low-income students, some neighborhoods are winners while others are losers.

The three inadequacies I have identified were not mistakes or errors of omission. All three were propped up by policy choices and encouraged by the status quo. I am most bothered not by the three inadequacies themselves, but rather by my own ignorance of them. I feel emboldened to address these inadequacies, and hopeful about the deeper learning that is possible if we allow for a dramatic departure from traditional models of education.

First, project-based learning stands to deepen student learning and extend engagement beyond the classroom. Demanding daily academic deliverables discourages the devotion of multiple class meetings to a singular goal. This fails to reflect the adult world, where most professional endeavors take a great deal of time. We must prepare our students for the visionary pursuits of the 21st century. They must experience investing great time and energy on ambitious projects (that sometimes fail).

Second, integrating all students instead of tracking them can empower them more equitably. When certain course options are preferable or more prestigious, a rift divides those with access and those without it. Instead, we must bring all students together while embedding personalization in the classroom experience. We must find a way to grant students equitable access to the resources we offer.

Third, the mechanisms of school boundary determination demand attention and innovation. Some programs have found success using a lottery system to admit students, as the chance-based process avoids the political drivers of resegregation and can help create a diverse student body.

I am optimistic about these potential remedies to the inadequacies. The status quo is ours to change.

### References

Freemont High School 2013-2014 School Accountability Report. http://fuhsd.ca.schoolloop.com/file/1216320361749/1383982251068 /8956054242246870990.pdf

Gallagher, Kathleen. "Assessing Quality Teaching." UnBoxed: A Journal of Adult Learning in Schools. Fall 2014

Homestead High School 2013-2014 School Accountability Report. http://fuhsd.ca.schoolloop.com/file/1216320361749/1383982251068 /665765348267218662.pdf

Price, David. "Engaging Students." UnBoxed: A Journal of Adult Learning in Schools. Spring 2010



Photo provided by Randy Scherer

# Does Deeper Learning Make a Difference? Yes It Does!

Kristina L. Zeiser, Mette Huberman, Jennifer O'Day, and Michael S. Garet American Institutes for Research

Ithough many educators have implemented deeper learning approaches in their classrooms and schools for years, the research about the effects of these approaches on student opportunities and learning has lagged. To address this research gap, the William and Flora Hewlett Foundation funded the American Institutes for Research (AIR) to conduct the Study of Deeper Learning: Opportunities and Outcomes. AIR aimed to test the concept of deeper learning across a range of school models, and focused on high schools that had been at this work—using at least a moderately wellimplemented approach—for a minimum of four years. Did students in these schools actually experience greater deeper learning opportunities and outcomes than they likely would have had they attended other schools serving similar students in the same district or locale? Here, AIR briefly summarizes its five-year longitudinal study to answer this question.

#### Why Deeper Learning?

Advocates of deeper learning argue that academic instruction is not enough to enable students to successfully navigate a rapidly changing world, participate in a complex and increasingly diverse democracy, and engage fully in the ever-evolving 21st century workplace. Students must be able to communicate their ideas effectively, think creatively, work collaboratively to solve problems, and manage their own learning. They need to develop dispositions—or mindsets that empower them to confront new challenges, take initiative, and persevere through difficulties and setbacks.

This combination of (1) a deeper understanding of core academic content, (2) the ability to apply that understanding to novel problems and situations, and (3) the development of competencies such as people skills and self-control, is called "deeper learning."

### About the Study

For the Study of Deeper Learning, our research team examined a set of selected high schools associated with 10 established networks from across the country ("network schools"). These networks embrace the goals of deeper learning and promote instructional practices that their member schools believe are likely to lead to deeper learning competencies. Schools in the study serve a diverse and traditionally underserved group of students, including substantial populations (between 25 percent and 100 percent) of students living in poverty and, in some cases, large populations of English language learners.

To examine whether students in these high schools experienced greater opportunities for deeper learning and better outcomes than they would have experienced in other schools, we also included students from a set of comparison schools that served similar student populations and were in the same geographic locales as the network schools. Matched pairs of network and comparison schools were located in California and New York City. Each comparison school was purposefully selected to be similar to its matched network school in terms of the academic and demographic background of the students enrolled, but network schools (particularly in California) tended to be smaller in enrollment, reflecting the school membership of the ten networks. In addition, six of the sixteen matched network schools were charter schools, also reflecting the membership of the ten networks, while none of the comparison schools were charter schools. We conducted exploratory analyses revealing that school size and charter status did not account for the positive impacts of network schools.

Deeper learning network schools were more likely to implement specific strategies to develop deeper learning skills than were comparison schools.

Our research showed that deeper learning network schools applied a range of strategies to foster deeper learning competencies. These strategies, reported through interviews with school administrators and staff across 19 network schools, included the following:

- Project-based learning for mastery of core academic content and development of critical thinking skills
- Internship opportunities to develop connections to the real world
- Group work and long-term assessment such as portfolios and exhibitions to develop collaboration and communication skills
- Study groups and student participation in decision making to help develop academic mindsets and support learning how to learn.

Interviews with the principals in comparison schools suggested that some of the comparison schools employed these strategies as well, but that they were more common in the network schools. For example, the principal interviews indicated that project-based learning was implemented at nearly all 19 network schools to some extent, while it happened at 6 of 11 comparison schools in some classes, depending on the teacher and classroom, Network schools also employed school structures such as advisory classes and alternative scheduling to a higher degree than the comparison schools.

Students attending deeper learning network schools reported significantly greater opportunities for deeper learning in their classes than did students who attended comparison schools.

To measure students' opportunities to engage in deeper learning during high school, we administered a student survey to 1,762 students in 12 network and ten comparison schools in spring 2013. This survey

included the following opportunities for deeper learning measures that students may have experienced in the classroom.:

1. Opportunities for complex problem solving: The degree to which students engage in complex problem solving by analyzing ideas, judging the value and reliability of an idea or source, constructing new ideas, and applying knowledge to solve new problems

2. Opportunities for creative thinking: The extent to which students have opportunities to engage in creative thinking in their core academic classes, such as thinking of original solutions to problems and new ways to do things, creating new ideas, and using their imagination

3. Opportunities to communicate: The extent to which students have opportunities to practice written and oral communication skills

4. Opportunities to collaborate: The degree to which students collaborate on assignments, provide feedback on each other's work, and collaborate in other ways

5. Opportunities to learn how to learn: The degree to which students practice monitoring and directing their own work and learning

6. Opportunities to receive feedback: The degree to which students receive feedback on their work from teachers, peers, or others, and the form this feedback takes (written, oral, or both)

7. Assessments aligned with deeper learning: The extent to which students engage in various forms of assessment including assessments of problem solving, communication, and collaboration

8. Opportunities for interdisciplinary learning: The degree to which students engage in interdisciplinary learning, where two or more disciplines are combined to enhance inquiry and knowledge generation

9. Opportunities for real-world connections: The degree to which teachers emphasize real-world connections in instruction

and assignments, and the degree to which students perceive that those connections are taking place and are positive and valuable

For each measure, students in these network schools reported experiencing significantly more opportunities to engage in deeper learning than did similar students at comparison schools. These findings were evident among a diverse group of students, including students who entered high school as either low or high achievers and students who did and did not qualify for free or reduced-price lunch.

Across deeper learning network schools, certain teacher beliefs about teaching were strongly related to students' reports of experiencing opportunities for deeper learning in their classes.

We also examined which school features facilitated network schools' ability to provide deeper learning opportunities for students. Using data from the study's teacher and student surveys, we explored how teachers' beliefs about teaching, their sense of the professional culture among teachers (e.g., teacher collaboration, common expectations for teaching and learning), and their assessment of the principal as a leader were related to students' reports of experiencing opportunities for deeper learning in their classes.

Across the network schools, student-centered beliefs about teaching and teachers' sense of self-efficacy for teaching were most strongly and consistently related to students' deeper learning opportunities. The teacher survey measured student-centered beliefs about teaching using questions that asked about the extent to which teachers agreed with statements such as, "My role as a teacher is to facilitate students' own inquiry" and "Students should be allowed to think of solutions to practical problems themselves before the teacher shows them how they are solved." A student in one network school using a studentcentered approach described the experience this way:

[The teachers] give us time to think about how something works. You have to think and figure out why... how it works, and figure out the answer by yourself [in] different ways as much as you can... Sometimes you figure it out by yourself and sometimes with other students. Once you figure it out, it's kind of exciting. Teachers' sense of self-efficacy for teaching was measured using questions that asked teachers how much they felt in control of various aspects of student learning, such as getting through to the most difficult students, getting students to work together, and getting students to do their homework.

Our measures of teacher professional culture and leadership, on the other hand, were not strongly related to student opportunities. However, case study data suggested that some of these features, specifically teacher collaboration, shared leadership, and support received from the deeper learning networks might affect student opportunities indirectly through their influence on teachers' beliefs about teaching.

Students attending network schools demonstrated significantly higher levels of deeper learning outcomes than students who attended comparison schools.

Two primary goals of deeper learning are to develop complex problem solving and mastery of core content. To measure these competencies, we administered the OECD PISA-based Test for Schools (PBTS)—a test that assesses core content knowledge and complex problemsolving skills—to a sample of 1,267 students in 11 network schools and nine comparison schools.

On average, students in deeper learning network schools achieved significantly higher scores on the PBTS than similar students in comparison schools in all three subject areas: reading, mathematics, and science.

We also measured the following interpersonal and intrapersonal competencies using data from the student survey.:

1. Creative thinking skills: The extent to which students perceive that they can think of original ideas and solutions

2. Collaboration skills: The extent to which students perceive that they work well in a group (e.g., positive personal interactions; the ability to pay attention, share ideas, be prepared, and do their part) and cooperate to identify or create solutions 3. Academic engagement: The degree to which students agree that they have "interest and engagement in learning" and participate actively in classroom learning activities

4. Motivation to learn: The degree to which students are motivated to do well academically and to become more knowledgeable, measured by their "perceived importance of coursework as well as preference for challenge and mastery goals"

5. Self-efficacy: The degree to which students tend to view themselves "as capable of meeting task demands in a broad array of contexts"

6. Locus of control: The extent to which students feel they have control over what happens to them, rather than their circumstances being controlled by chance or fate

7. Perseverance: The degree to which students agree that they maintain effort and interest despite failure, adversity, and plateaus in progress

8. Self-management: The extent to which students feel they are able to independently manage their work and schedules to meet goals

Overall, students in deeper learning network schools reported significantly higher levels of collaboration skills, academic engagement, motivation to learn, and self-efficacy. However, we found no significant differences between students who attended network schools and similar students at comparison schools relative to reported creative thinking skills, perseverance, locus of control, or self-management. Students attending deeper learning network schools also showed more positive outcomes on traditional measures of achievement than students who attended comparison schools.

Although many practitioners, researchers, and policy makers argue for the need to develop deeper learning competencies or 21st century skills, critics contend that more traditional measures of achievement, such as standardized test scores and on-time graduation rates, still matter because they have real consequences for students. Does a focus on deeper learning competencies necessarily detract from student performance on these more traditional measures of achievement? Our study found that, in addition to demonstrating higher levels of deeper learning competencies, students who attended deeper learning network schools also earned significantly higher scores on statemandated English language arts and mathematics tests. In addition, using updated data through the spring of 2014, we found that network school students had significantly higher rates of high school graduation than students who attended comparison schools by approximately eight percentage points.

## **Unanswered** Questions

Although our study demonstrated that students who attended deeper learning network schools experienced greater opportunities for deeper learning and higher levels of outcomes on nearly all measures than did similar students at comparison schools, more research is needed in this area. Important questions remain: For schools that are not members of deeper learning networks, what can teachers and schools do to promote deeper learning in their classrooms? What has enabled practices that focus on deeper learning to emerge in pockets of classrooms in some comparison schools, and how can the work these teachers are doing be supported and expanded? Do experiences with deeper learning at the elementary and middle school levels have similar positive effects on student outcomes? In addition, how do experiences with deeper learning in high school affect long-term student outcomes, such as college degree completion and workforce success?

As instruction focused on deeper learning becomes more widespread in the American education system, it is important that research continues to document how, and for whom, experiences with deeper learning affect students' educational experiences and outcomes.

### About AIR

Established in 1946, American Institutes for Research (AIR) is an independent, nonpartisan, not-for-profit organization that conducts behavioral and social science research on important social issues and delivers technical assistance, both domestically and internationally, in the areas of education, health, and workforce productivity.

For more information on the Study of Deeper Learning: Opportunities and Outcomes, visit www.air.org/deeperlearning.

## **Project Gallery**

Teachers and Students High Tech High Schools and other Innovative Schools

n this gallery, we offer a set of *UnBoxed* "cards" that provide quick, concrete glimpses of projects we find inspiring and practices that support teaching and learning. These cards are now freely available on our *UnBoxed* website in a printer-ready format: *http://www.hightechhigh.org/unboxed/cards/*. Simply print, fold, share and discuss. As always, each card on the website refers the reader to a web address where further information is available.


#### The Haunted Arcade Interactive Halloween Carnival Games

Colin Monaghan, Technology The Evergreen School, Shoreline, WA

In preparation for the popular school-wide Halloween carnival, 7th graders challenged themselves to build and program entertaining carnival games. Working in pairs, students experimented with various ways to trigger MaKey MaKey circuit boards. Then they began developing carnival-style games that could be adapted to work with MaKey MaKey, Scratch and craft materials. Their primary goals for the project were to improve their programming skills, to improve their engineering/craftsmanship skills, and to practice a design process that includes prototyping, feedback and revision. After weeks of testing, students hosted their Halloween-themed games at the carnival. Popular games included pinball machines, ring toss, target games, a room escape activity, and whack-a-mole.

#### **Teacher Reflection**

The driving force of this project was the authentic audience. Since the entire school would interact with their project, the 7th graders were incredibly motivated to create an entertaining activity. One of the biggest design challenges was creating a game that would be fun for kids 4 to 14 years old, so whenever possible I had younger students play early versions of the games to provide feedback. This project gave students practice managing an openended, long-term project and quickly learned the importance of staying organized and productive.

#### **Student Reflections**

I learned how to make a pinball machine! The flippers especially were hard to make. I tried out numerous possible ways to make them before finding an outcome I liked (and one that worked). I know I can use the engineering and craftsmanship skills I learned in the future. —7th grade student

I am particularly proud of the rail sensor in the middle. It took a lot of different ideas that didn't work, but I created something that worked pretty well. —7th grade student



## **Cyclic Machines**

Mike Amarillas, 12th Grade Engineering High Tech High North County

Seniors at HTHNC received a simple prompt: "Create a machine or kinetic art piece that operates cyclically. Consider using a motor or human power to drive the mechanism(s)." Drawing inspiration from various real-life and online sources, students designed machines in a wide variety of domains. Some student groups made marble mechanisms with rollercoaster-like tracks, while others made gear-based art, and a few made motorized bicycles. After initial planning and prototyping, each group sat down with their engineering teacher to draft goals for the machine's functionality and aesthetics. During the build phase, groups utilized the resources in the HTHNC Makerspace that best suited their needs. Most relied heavily on the laser cutter and a handful incorporated 3d-printed parts. Some basic materials were available to all groups, with the option to source additional materials online and make requests for purchase orders. In the first iteration of the project in Fall of 2015, students had just four weeks to build and very few groups met their goals by the time of school-wide exhibition. The current semester of HTHNC seniors will have roughly four times that long and will exhibit their work in June of 2016.

#### **Teacher Reflection**

I hoped this project would allow students to express themselves through design and technical work. I appreciate when science, technology, engineering, art, and math are deeply blended and not merely set up to complement one another.

#### **Student Reflections**

It was really cool to see the differences in other students' projects as compared to mine and see the challenges and difficulties they faced. And it was a lot of fun. —Kira M.

The cyclic machine project was an opportunity to use hands on experiences and physics concepts to make machines that didn't just display learning but were fun to use. —Ryan G.

To learn more about this project and others, visit http://mamarillas.weebly.com/



## Syrian Refugee Simulation

Alec Patton, 10th Grade Humanities High Tech High Chula Vista

In this student-created and student-run simulation, community participants took on the roles of Syrian citizens forced to seek refuge in another country. Students began this project by studying all facets of the Syrian Refugee Crisis, initially planning to create either a play or an exhibition about the refugee crisis. After deciding that neither product would have the impact that they wanted to achieve, a group of students proposed a simulation. We analyzed existing simulations, video games and non-fiction accounts of refugee journeys in order to identify common routes and develop "character sheets" for participants to use. As students designed and refined the simulation, we carried out weekly "playtest" in which staff members and other students went through the simulation and then evaluated their experience.

#### **Teacher Reflection**

I knew this project would be logistically complex when we started, but the extent of the challenge only became clear once we were in the midst of it. Students figured out the complexities of European immigration law, worked out the going rate for smugglers under a variety of circumstances and the likelihood of gaining refugee status in a particular country, and then developed characters by creating composites of real people's stories. The students' commitment to their roles was inspiring, especially considering that the simulation took place in our school's outdoor lunch area, with barriers indicated by overturned tables, student-made fake barbed wire, hand-painted signs, and caution tape.

#### **Student Reflection**

Almost everyone that passed through the simulation and went to the debrief room told me what a great simulation it was and how realistic it felt for them. They also told me that even though it felt real, they knew they were going home afterward. But other people don't know that—this is their everyday life, and this is a reality for a lot of people. —Verenice

To learn more about this project, visit Alec Patton's Digital Portfolio at alecpatton.weebly.com



High Tech Middle Chula Vista - 7 West Productions

## The Meals and Muppets Project

Edrick Macalaguim and Kyle Linnik, 7th Grade Humanities and Math/Science High Tech Middle Chula Vista

In this interdisciplinary project, students looked at the essential question: "Should I eat that?" Inspired from student voices criticizing our school's lunch program, we dove deeply into a holistic investigation about the food we eat. The voices of our students were clear, they wanted to create a product that would have lasting value and impact. Students read *The Omnivore's Dilemma*, watched various documentaries, and explored the nutritional values and science behind the everyday food they were consuming. Using the magic of the Maker movement through muppet building and filmmaking, our students transformed their learning about food justice, urban farming, and making healthy food choices into a professionally produced movie, using muppets as a way to engage kindergarten students at neighboring school High Tech Elementary.

#### **Teacher Reflection**

We are always amazed by our students' craftsmanship and professionalism when given an authentic audience beyond our classroom walls. The result is attention to detail and motivation for learning that had previously been unmatched. Authentically engaged in their work, our students learned, not because they had to, but because they wanted to, and the results were far beyond what anyone expected. This has been a true deeper learning experience.

#### Student Reflection

Sharing the message of eating and living healthy using muppets was an idea that seemed far-fetched and wild from the beginning. Now, staring around the classroom, I marvel and bask in the glory of our beautiful work. I'm so glad to have been able to participate in such a wonderful and unique project, and to know that I left a positive impact on my Kindergarten friends and families, helps me understand that I have the power to make a difference. —Adrian S.

To learn more about this project and others, visit https://sites. google.com/a/hightechhigh.org/edrick-macalaguim-s-dp/projects/ the-meals-and-muppets-project



## The Complete Works of William Shakespeare (Abridged)

Jennifer Howard, 10th Grade Humanities High Tech High North County

William Shakespeare lived in the late 1500s and early 1600s, but his plays are now performed all over the world in nearly a hundred languages, and he is known as one of the greatest writers of all time. The fact that literature and other media borrow from Shakespeare's works, speaks to how important he is to a global culture. One dynamic way to experience Shakespeare was to work as a class to perform a show. After reading *The Reduced Shakespeare Co. presents The Complete Works of William Shakespeare (abridged)*, 10th grade students performed the entire play for Exhibition. Students choose to perform, direct, build sets, work on costumes/makeup/hair or marketing. Throughout the semester, students worked with Shakespeare is significant in the making of our culture, and debate whether he is still relevant today.

#### **Teacher Reflection**

I had fun getting to know my students in a new way and my students had fun getting to know me and each other, and this fun developed into strong pride in the finished products of the project. This project represented a truly collaborative process. We learned a great deal about ourselves during the stress of creating a public performance. We all now have a new sense of connection with Shakespeare and his works, which leads to an important step into a larger cultural world.

#### **Student Reflection**

Honestly, the performance itself was the best part of the project. It was the culmination of all of our hard work that we put into rehearsing, memorizing and staging the show, and I felt proud once it was all said and done. By holding it at the San Marcos Civic Center, our team had the opportunity to experience what it was like to perform out in the community, and impact people outside of the traditional school setting. —Robbie

To learn more about this project and others, http://mrshowardsdp. weebly.com/the-complete-works-of-william-shakespeare.html



### **Coded Structures, Decoded Identities**

Samara Francisco, Rachel Nichols, Margaret Noble, Dave Stahnke 12th Grade English, Mathematics, Art and Technology High Tech High Media Arts

HTHMA 12th grade students in Digital Arts, English, and Mathematics investigated the complexities of man-made structures found in urban/rural design and architecture. As part of this investigation, students explored the formal aspects of visual representation as well as the psychology and symbolism communicated by these visual compositions. As importantly, students learned to analyze critically how man-made environments affect the way we interact with each other and how this impacts our social world. All buildings, no matter how neutral or insignificant they appear to be, are designed to establish particular power relations between the people who use, work in, live in, or pass through them. Thus, students considered how our structures, cultural norms, and even our very identities are formed by design. The students' inquiries and research culminated into a final exhibition using projections and paper sculpture to simulate a large-scale paper city lit up by interactive and provocative projected art. In this city, the audience explored unexpected and disturbing intersections between mathematics, computer programming, social constructs, cultural identities, and architecture.

#### **Teacher Reflection**

We asked students to do very sophisticated and complicated intellectual and artistic work. This process was messy before it was beautiful. But the final culmination was intricate, elegant and thoughtful. We are very proud of our students' work.

#### **Student Reflection**

For me the most challenging and rewarding aspect of the project was having to make decisions about our physical art piece that insured our research was visible. We needed to be aware throughout the process that the aesthetic choices we made on our physical structure needed to have meaning and purpose. —Ilias

To learn more about this project and others, visit http://margaretnoble.net/educator/codedstructures

#### HIGHER EDUCATION PLAN

#### **Reach School**



UCSD is my reach school. It is my main school that I am reaching for because of the pretrigious Biology programs that it has and its reputation. It has the majors that I am looking into and are well know in them, making it the main school I would like to attend. UCSD browser is very competitive with an averge GPA or 23 km dAN to oro or 18sc. Applying for one of the schools most competitive majors, biology, access higher than average are agoing to be needed to get accepted to this annuing university.

#### Realistic School



SIBUI in sny fit school for me based off the locate of the school, it's scores, and its majors and macros. It is in San Diego, a location that I am highly encouraged to go to school in, and is a school that I have been looking at it for a while. It has General Biology undergraduate as well as graduate school. They also have a bachelor's degreen in Biochemistry and Molecular Biology, also another major in considering. It isn't as competitive as UCSD with an evenge GPA of  $2\gamma_{ad}$  and a SAT accore of rado. In confident with my scores and application that I will be able to get accepted into their nonzeros.

#### COLLEGE MAJOR AND MINOR

#### General Biology



The majors that I want to obtain in college, hover around the same subject, Biology. As of this point, I am going to major in General Biology because of its vastness in direction. Studying this major, I will have the opportunity to pursue a large variety of careers. My main goal for a career right now is to be a physician like an urologist.

#### General Chemistry



The minor that I would pursue is general chemistry. This is because of my interest in molecular biology. If I were to decide to not pursue my Biology major, I will then be able to continue on my interests in chemistry. In chemistry, I would however like to have some part of Biology if I pursue a Chemistry based career. Chemistry can also be an minor that may support my major depending on the path I follow.

#### SKILLS AND GROWTH IN COLLEGE

Keeping A Steady Hand One of the most important skills needed for a surgeon is study hands. It's greatly stressed with urological surgeons because of all the small precocious cuts that are needed to be made throughout all surgical procedures. This skill can be inherited from clinical studies.

#### Keep Calm and Proceed

When in a surgical procedure, it is stressed that physicians don t become extensively nervous. This can result in lifethreatening mistakes on a putient. This is something that can achieved through elinical studies however mainly more throughout experience gained throughout your career. Pag Attention in Class, This Info is Needed

A Urologist's job is emphasized with precise detail. When working with a sick patient, you need consider all the urinary systems functions and areas. Then you need to conclude what part of the system is dysfunctional and is needed to be done to correct the function. This knowledge is gained from the elassroom studies as well as clinical.

#### Notes Acknowledged From Interview

Dr. Ghaffary stressed the importance of being determined because the path to Urology is very long. He says to stay focused on your dream.



Vahid Ghaffarnejad, a former graduate of SDSU and UCSD informed me about the different class ratios from the two school. Also the point that after your receive your first job, your school that you attend doesn't really matter anymore, just your work resume.

#### MY BROADER IMPACT ON SOCIETY

When thinking about what I'd like to do for the rest of my life. I first look for different amenities and privileges that the career will offer. First, I have to be able to sustain my family and offer them with anything that they need or desire. This includes materialistic objects and will as time with me. Second, I want to go to work everyday knowing that what I'm doing is worth something. In other words, I crave an occupation that positively affects people's life. A career such as a Urologist. Urology is a well paying field of practice in which I will be able to take care of my family with. It's a career in which on average I will spending at least 40 hours out of the week assisting patients in need of my aid, fulfilling both the necessities desired by me to make a greater impact on society.

#### 48 UNBoxed

## **College Knowledge**

Matthew Leader, 11th Grade Biology High Tech High North County

In this project students looked at how current neuroscience research contributes to education models and how we learn. Using these findings, students determined pathways to a career that might be best for them as prospective college students. Students used resources such as seminal papers of cognitive science research at UCSD, neuroscience labs developed with the Salk Institute in La Jolla, the "Society for Neuroscience" resource sites, and researcher interviews to determine how brain based education can help them. Students connected this knowledge to college and career resources such as Naviance, and NACAC, along with interviews with college admissions staff, college alumni, and professors to help guide them to a beneficial college experience and rewarding career. The work culminated in a share-out of their plans with a creative piece in front of the student's advisory classes and in transitional junior presentations at the end of the year.

#### **Teacher Reflection**

The project really benefitted from the help of outside sources such as our college counselor, Tricia Abdullah, and the admissions staff and neuroscience researchers at UCSD. Student work has served a great purpose in reorienting how students go about the college process. A major highlight was students communicating with professors at colleges to understand whether classes they might take would align with their long term goals.

#### **Student Reflections**

This project made me take a critical look at the pathway of my education and career in a way I hadn't before. Connecting neurology to education in a broad sense was really interesting, and gave more context on complex brain information. —Thomas

I knew I wanted to be a lawyer, but I had no reference for the in between steps; I now intend to use the ways my brain learns to properly select a university and major. —Johana

To learn more about this project and others, visit www.leaderbiology.weebly.com



## Walk In Their Shoes

Heather Calabro, 9th Grade Social Studies Mid-Pacific Institute, Honolulu, HI

In order to learn the concepts of Imperialism and Independence Movements in a project-based atmosphere, 9th grade students created an exhibition of related issues using shoes. Each student chose to research an issue or event in the Congo that was somehow a result of imperialism. The students synthesized their research into an essay about their issue or event, and later created an illustration that would represent their research findings. The illustrations were transferred onto shoes which would be auctioned off at the exhibition's closing to benefit a charity in the Congo. The exhibition included the shoes hung from above for all to view, along with the students' research pieces, allowing guests insight into the history of imperialism and independence movements.

#### **Teacher Reflection**

My students asked me if they could create artwork on shoes, explaining to me that customizing shoes was trendy. I could see that it was truly something they were interested in, so I began to procure shoes for the project. The students were engaged as they knew their work would be publicly displayed at the exhibition, but also because they would be bid upon. I do believe that students enjoy a bit of competition! I was very proud of the project the students had so much choice and voice in, as well as the authentic byproduct of raising funds for charity.

#### **Student Reflections**

I enjoyed being able to see everyone's shoes being sold off at the auction. Hard work really does pay off! I also enjoyed talking to the crowd at the exhibition, especially my classmates and their parents. —Chaz

I sharpened my writing abilities through the prose component of this project. I feel like it is one of the best papers I've ever written. I now know I can write something that can make people feel emotion. —Michael

To learn more about this project and others, visit https://sites. google.com/a/midpac.edu/shoes/



## Mind The Gap

Melissa Cochran, Gail Gonzalez Coloyan, Janelle McCammack 11th Grade Humanities and Math High Tech High North County

In this interdisciplinary project, students examined data and readings to explore the ways in which our invisible privileges impact our opportunities and experiences in this society. Our goal was for students to learn to be more understanding and empathetic individuals who better understand the complex power structures we face. We launched our project with a walking field trip downtown to observe inequities that exist in our own city. During the next six weeks, students examined income inequality, gender inequality, and inequities in our education and criminal justice systems. Students then specialized in one of these topics in preparation for our exhibition, making infographics and designing interactive activities in order to share statistics and trends. For our culminating event, we hosted a symposium in the local community where students, parents, and community members engaged in meaningful conversations about race, gender, education, and income inequality.

#### **Teacher Reflection**

This project engaged our students in difficult conversations about inequities in society. Our goal was to expose students to new ideas and challenge them to consider perspectives different than their own. This created moments of discomfort at times, but we wanted students to be comfortable with their discomfort. With this project we planted a "seed" that will hopefully lead to further questioning and exploration by students as they encounter these topics as adults.

#### Student Reflection

Unlike a lot of projects that do not leave lasting impressions, I believe that this project left a lasting impression on both the audience and the students. I know for a fact that I put myself in a lot of perspectives that I have never even considered before. Without opening yourself up to situations in which you might not feel completely comfortable, you will never have progression in your beliefs. —From anonymous survey

To learn more about this project and others, visit http://mind-thegap2015.weebly.com



## Seed Dispersal Challenge

Kiki Contreras, Middle School Science The Evergreen School, Shoreline, WA

To push the plant reproduction lessons in my Botany unit beyond just memorizing and labeling plant anatomy, I developed a project to help students explore various seed dispersal adaptations. To begin, students were given several short video and text resources about different seed dispersal mechanisms (wind-blown, animal, water, gliders, fire etc.). Students put their understanding to the test by drawing several environmental factors out of a hat and designing a seed that could successfully disperse under those conditions. Plastic Easter eggs, beads, pipe-cleaners, popsicle sticks and other recycled materials turned into seeds that, for example, grow on a vine, live in a hot and arid climate, and are surrounded by herds of large, furry mammals. Students practiced their engineering skills by creating several iterations of their seed and testing them until they arrived at a product that worked. Students who drew 'aquatic environment' tested and improved their designs in a water bath, while students who drew 'windy environment' tested in a wind tunnel. Students were creative in conducting their tests, including using faux fur coats to represent large mammals.

#### **Teacher Reflection**

Plants are among the most overlooked and underappreciated life forms, but my students came away from this project with a sense of awe and respect for the wide range of seed dispersal mechanisms employed by plants. The skills that my students developed—applying general knowledge to a novel situation, perseverance, and resilience in the face of failure—made this project truly special.

#### **Student Reflections**

It was fun to build my own seed and create a dispersal method for it because I think it really helped us understand how cool it is that plants are able to adapt to distribute their seeds in different environments. —Else

I liked this project because it made me think of an ecosystem in a lot more depth. I also liked how we got to make the seed and go through prototypes until we had it perfect. —Nayan

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## **Explorers of the World**

Jen Schultz, Linda Salamanca, Diane Hawke High Tech Elementary Explorer, Kindergarten

This project introduced Kindergarteners to exploration, observation, mapping, multiple perspectives, critique, and collaboration. Students took observation walks around our immediate community, a village of seven charter schools within a residential neighborhood. They created draft maps of their classrooms and campus, and drew pictures from their observations from varying perspectives. One of their final products was to create three dimensional maps of our campus which were installed in each of our schools to guide our many visitors. To create these maps, children worked collaboratively in groups, and gave and received critique, with each group contributing to a larger whole product.

#### **Teacher Reflection**

This was a hard project! The students had to use a lot of perseverance and grit to complete it. It was their first experience with critique.The children gained a great deal of spatial awareness by mapping things from multiple perspectives. Often mapping is introduced when children are older, but Kindergarten is a good time to do it because that is when the neural connections for visual processing are developing. They also learned how people use maps in the real world.

#### **Student Reflections**

Mapping can take you to a lot of places.	—Arielle
Explorers do stuff in a kind way.	—Zynen
Mapping is about being precise.	—Aiden
My favorite part was making the 3D map.	—Athaniel
The hardest part about mapping was finishing all the drafts	

The hardest part about mapping was finishing all the drafts. —Chiyo

To learn more about this project and others, visit https://www. hightechhigh.org/schools/HTEX/?show=projects



Photo provided by Aleya Cunningham

# Redefining "Well-Behaved" in the 21st Century Classroom

Sharon Fargason, Melissa Han, and Sarah Imbriaco Baker Elementary School, San Diego

he authors, all part of a third grade team at a traditional public school, often engage in critical conversations about pedagogy and why things are done the way they are done in schools. They want to challenge the status quo that has been reproduced in education for so many years. Recently, they began talking with each other about being "well-behaved" in the elementary classroom and realized that this term is deeply connected with each of their experiences and development as educators.

#### Sharon

I had never given a thought to the term well-behaved until I heard another teacher use it recently when talking about my class, and suddenly, I paid great attention to the phrase. "I really like the ideas that her students have," she said after observing my science lesson, "but the students aren't very well-behaved."

Her last sentence replayed in my head hundreds of times. And suddenly it was joined by the voices of many others who had said similar things about my students. It was often written on substitute notes. "I'm sorry we did not get through all the work you left. Many students were not very well-behaved." Other teachers used it to scold students in the hallway. "Get into a straight line please. The younger children are watching you, and you need to be well-behaved." And I've heard it used many times by guest speakers or docents on field trips. "Wow! Your class was so well-behaved!"

Something happened the last time I heard it. Those words, which had always been fleeting to me before, clung tightly. I wondered what, exactly, that teacher's words meant, and if my students really did have a problem. The video of my class that she had observed showed my students engaged in a scientific discussion. They weren't raising their hands. They were sitting on their knees and moving around. And they were sometimes interrupting each other. But I thought they were behaving perfectly. They were behaving like scientists.

When I thought and talked about the definitions for the term, I realized that each is subjective and is a social construct. Who decides what is proper and appropriate behavior? It was when I really thought about this, that I realized my problem. My definition of being well-behaved includes actions like sitting on your knees, not raising your hand, sharing a comment with someone next to you, and even interrupting each other. This is what I do when I learn. This is what I do when I am excited about what my brain is doing. When I get excited about an idea, I turn and whisper something to a colleague and I might interrupt someone to present another side of an argument.

The difference between an eight year old and me is that I know how to do those things in a way that is still "polite." I keep my whispers short and I interrupt with only a word or two—just enough for the speaker to realize that I want to share—and then I let them finish their thought. I am able to do these things because I have many more years of practice than my students in how to maneuver academic conversations. I want to teach my students how to interrupt politely, and I want to join in their excitement as they grapple with a partner when it might not be the best time. I want to teach my students how to behave well in a way that supports and inspires their life-long learning and curiosity.

I know that students don't come to school ready to have perfectly well-managed collaborative conversations. However, because this is

something that I really value, I choose to make space in my planning to teach this to my students. I don't expect that they will start off perfectly, and I resist the urge to ask students to raise their hands because of this. For me, learning how to have a conversation is as important as the learning that comes from the conversation. So, we work as a class to notice and name the nuances involved in effectively talking with one another. And, we do this work every day of the year. We talk about what to do when two people start talking at once, how to ask for someone's attention, and how to interrupt politely. We make it a point to notice those students who haven't gotten involved and we invite their thoughts into the conversation. We learn to value equal air time by really listening to the thoughts of each other and learning from what they are saying, and we ask for clarification if we don't understand because that is what we really desire. This work is difficult. It requires that I often narrate our conversation and let the students know what is really working and why. But mainly, it requires that I leave space for students to make mistakes, that I expect they will, and that I welcome the teaching that can come as a result of it.

#### Sarah

I was fortunate to have powerful pre-teaching experiences with educators who created democratic, responsive classrooms. I learned so much from these experiences, and so I am passionate about creating a student-centered classroom where students have agency and are a valued part of the learning community.

I have found, however, that what I interpret as students being engaged in their learning is often interpreted differently by others. At the first school in which I worked, I struggled to enact the values and strategies that I had learned in my teacher education program because the people I worked with thought so differently. There were teachers at my school who had excellent classroom management that I was encouraged to imitate. Students in these classes sat in their assigned seats and listened while the teacher taught at the front of the room. They raised their hands when a question was asked. Their classes always walked in straight and quiet lines. They did have wonderful classroom management, but I yearned to create a different kind of classroom environment. Last year, in my second year teaching, I moved from fifth to first grade. It was quite an adjustment, but I was continuing to develop my democratic classroom approach to teaching. Creating this type of classroom environment takes many weeks and sometimes months (Charney, 2002). A week or two into the school year, my principal observed my classroom while we were practicing classroom procedures using interactive modeling (Wilson, 2012). While debriefing the lesson, my principal told me I needed to get my class under control. I explained why I did not want to control my class and talked about how the students were engaging in the process of learning how to behave in productive ways and to care about each other. My principal acknowledged that this had worked for me with fifth graders but may not work for first grade. She encouraged me to use a clip chart in order to have something concrete. She explained that young children may have more trouble selfregulating or understanding how to thrive in a democratic classroom. I reluctantly implemented the chart and a corresponding reward system since I felt this was the expectation. However, I felt I was not being true to myself, and I was not doing all I could do to help my students develop into kind and productive members of our classroom.

Later on, my principal told me she admired how I had grown as a teacher for making the change, but I wasn't sure I had, in fact, grown. I was unhappy about the mixed messages I was sending to my class throughout the day. On one hand, I was honoring my students' individuality and emphasizing the importance of student voice during Morning Meeting, and on the other I was showing them I was the ultimate authority figure who dictated where their clip went. I was trying to build a desire to learn and to behave in a way that promoted learning, and then I was rewarding them at the end of the day for finishing on the top of the clip chart. I wanted them to develop intrinsic motivation, but I was reinforcing their behavior with extrinsic rewards. I felt like a phony, and this made me deeply reflect on my philosophy of education.

I realized that during my first years of teaching, I was not allowed to engage in the involved process of teaching my kids to have agency and ownership of their behavior. Helping kids to develop as active learners requires time and space. I wondered why we expect students to meld with our behavior expectations right away. This should be something we teach and practice just as we do with academic concepts. My students and I begin each day with a Morning Meeting where we gather in a circle, greet each other, and either share events from our lives or play an inclusive activity. These moments are filled with joy and, at times, loud celebration. When we move into math, we are learning this requires us to engage differently with one another as compared to Morning Meeting. We create space to discuss this difference and share ideas on how to do this. We must leave room for this teaching in the beginning and all throughout the year.

#### Melissa

I spent a lot of energy my first years of teaching keeping students in line, sitting "criss-cross applesauce" for the fear that a colleague or administrator would walk by and see my students in chaos. Most of my language with students centered around ordering them to do things since I expected them to do the wrong thing. I believed teaching was about managing children because I feared losing control. If I didn't punish them, there would be chaos! I wrongly equated learning with being quiet. I began to wonder why I was asking my students to behave in certain ways.

I felt a need to control because I had a false sense of authority among my students. My students gave temporary compliance to either avoid punishment or receive a reward. None of their silent stares and "sitting still" revealed learning. Nor did it reveal trust. In the end, we didn't have community. Community is what I wanted, but I didn't know how to do this because everything I learned as a child and as a student in my teacher credentialing program was that children needed to be controlled. I began the long road of working towards community with my students. This meant I needed to be the one to change: change what I believed children were capable of, and change how I responded to students being themselves.

The day I took down my color-coded behavior chart, I knew I would need to begin to rely on my students, instead of an artificial system, to build community. In the beginning of the year, I invited my students to co-create how we needed to use the materials in our classroom instead of dictating how to use them. During those first weeks, my students had many arguments about sharing markers; glue sticks were left without their tops; and pencils were placed in various locations that other students couldn't find when they needed them. While all of this unfolded, I refrained from stepping in to tell the students how to take care of the materials. Instead, I observed how my students expressed their frustrations with each other, how others tried to solve their conflict, and thought of questions to ask them so we could create some solutions together. I needed to remind myself during those times that in order for my students to take ownership of their classroom and feel a sense of belonging in our community, they needed to be the ones to co-create it.

After the exploration of materials, we all sat in a circle. I asked them, "What do we need from each other so we can all use the materials to learn?" This time I chose to listen and stop commanding. I listened as one who was being taught. In order for my students to believe that their voices mattered to me, I had to respond to their voiced needs. This question helped our conversation focus on how we were a community that needed to rely on each other and find solutions that would help us work together. As students shared a variety of ideas on how to use the materials, I wrote all their ideas down and asked questions like, "What would that look like?" or "Would you explain what you meant by...?" After deciding on a few solutions, we agreed that we needed to test these ideas and check in with each other periodically to see if they were working or if we needed to make adjusts to them.

As my students and I began to trust one another and explore ideas together, there was still conflict and frustration. I needed to remind myself of what I really wanted with my students. If I wanted community, I had to understand that conflict and frustration were opportunities to make choices together, find various solutions, and create space for all voices to be heard and understood. The process was the point.

Each year thereafter, I've invited my students to make more decisions than the year before about what we needed as a community. I have learned to trust my students' voices. The democratic process of listening to their insight into problems we encounter and ideas to solve them works, not because I say so, but because it helps my students to experience the value of learning and caring since they feel cared for. My students feel cared for when their ideas are treated like they matter because they impact our learning environment. Our experiences are coming together to shape our new definition of the term well-behaved. We are learning that well-behaved looks different at different times, and that we must leave space to teach this throughout the year. Our world has shifted, and employers are no longer looking for factory workers who can passively follow directions, but instead want creative problem solvers, critical thinkers, and idea creators (Trilling & Fadel, 2012). Richard Riley, the Secretary of Education under Bill Clinton said, "We are currently preparing students for jobs that don't yet exist... using technologies that haven't yet been invented... in order to solve problems we don't even know are problems vet" (as cited in Trilling & Fadel, 2012, p. 3). As teachers, we have changed our standards and our pedagogy to prepare our students for these things, but have we changed the way we manage our classrooms? If we want our students to be 21st century learners who contribute to a global society, to be able to think critically and work collaboratively and be adept problem solvers, then we must not only redefine our standards of what and how we teach, we must work collaboratively to redefine the way that we teach students how to be well-behaved.

#### References

Charney, R. S., & Noddings, N. (2002). *Teaching children to care: Classroom management for ethical and academic growth, K-8,* (Revised Edition). Greenfield, MA: Northeast Foundation for Children.

Trilling, B., & Fadel, C. (2012). 21st century skills: Learning for life in our times (1 edition). San Francisco: Jossey-Bass.

Wilson, M. B. (2012). *Interactive modeling: A powerful technique for teaching children* (1st edition). Turner Falls, MA: Center for Responsive Schools, Inc.



Photo provided by Aleya Cunningham

# Uncovering the Why in the Way We Teach

Aleya Cunningham and Roxanne Tuong Baker Elementary School, San Diego

leya and I are currently enrolled in UC San Diego's Multiple Subject Credential/M.Ed. program. We both entered graduate school and student teaching with certain *ideas of what teaching should look and sound like. While* working as a tutor, I realized that my perceptions about teaching were heavily influenced by my experiences as a student in teacher-centered classrooms. Therefore, I hoped to learn how to deliver content to my students in a more meaningful way. Meanwhile, Aleya was eager to build on the strategies she'd collected from teaching English abroad and working as a classroom assistant. She, too, was looking to find more effective teaching practices. This piece is a collective reflection about our student teaching experience at Baker Elementary, where our ideas about teaching were not only challenged, but completely reshaped. As we grappled with what it means to be an effective teacher, we learned to release our role as the "star of the show" and turned the spotlight over to our students. This alternative model of teaching allowed us to redefine the idea of "good teaching" that we were raised with.

#### Roxanne

While completing my minor in education, I was introduced to *Teaching Children to Care* by Ruth Charney. This text is a guide to proactively teaching classroom management to promote a safe, respectful, and friendly learning environment. As I read the first chapter, I was immediately taken aback by the idea that there is a time and place to teach "social curriculum." Growing up, the rules were simply introduced by the teacher on the first day of school and we were expected to follow them. Even when I worked as an in-class tutor at different schools, behavior seemed like something students naturally came to school with and was only "dealt with" when a student's behavior was less than ideal.

According to Charney, the first six weeks of class is the prime time to get to know students, establish a sense of community, and decide on important community agreements. Furthermore, it is a time for the students to really practice these behaviors and for teachers to make note of students' positive behaviors (2002). Altogether, I thought these were very nice ideas but I had a hard time picturing how they would play out in a real classroom. I also doubted how effective it was to dedicate so much instruction time to "teaching classroom management."

When I entered the graduate program, my first student teaching placement was with Melissa Han and her third grade class at Baker Elementary. Though I was not there for the first six weeks, I could tell that the class had taken the time to foster a safe and positive learning environment. I was impressed by how autonomous students were in their behavior. I remember thinking, *Wow! Melissa has got it all figured out*. Having the classroom management part down makes teaching so easy. However, I discovered over time that the process of teaching behavior isn't as neat and seamless as it appears.

I distinctly remember the first time I witnessed Melissa take the time to acknowledge the class' behavior. It had already been a rough morning and she was trying to highlight a student's repeated addition strategy to no avail. Students were having side conversations, and even those who were engaged in the discussion were talking over each other. It got louder by the second and the tension in the room felt like a balloon about to burst. As the other teacher figure, I started to panic. What should we do?? How will we recover from this? My first instinct was to yell above everyone that they were all going to be in serious trouble. Suddenly, Melissa's firm and clear voice broke through. Thank goodness! She asked the students to stop everything they were doing, and she made eye contact with everyone to make sure they had heard her. She then announced that the math lesson was over for the day and that we would try again tomorrow. I was intrigued and surprised that she stopped the lesson, and could only wonder what was going to happen next.

Melissa had everyone move into a circle. She was direct in naming the problem and students were to give a thumbs up if they noticed something similar. She asked everyone to look at the conversation agreement chart so we could have a collaborative conversation about why we have these rules in place. Students took time to reflect on one conversation rule they needed to remember and practice for the rest of the day, and then each student shared their goal aloud. I was totally in awe at this interaction! Rather than responding with strong-fisted authority, Melissa held the students accountable by guiding them to assess their own behavior and determining what their next steps would be.

From this experience and others since then, I've learned that teaching behavior isn't a fixed process that only takes place during the first six weeks of school. The process of teaching social curriculum is continually developing and evolving throughout the school year, depending on the needs of the class at any given moment. In addition to the first six weeks, Teaching Children to Care also talks about three types of teacher talk we can use throughout the school day to teach behavior. Reinforcing language is letting students know what they are doing well so that they may keep up the good work. Reminding *language* is asking students to remember the expected behavior when they are starting to get off-task, or if we anticipate that they will struggle with a particular situation. Finally, redirecting language is for when the situation has gotten out of hand. With redirecting language, we ask students to stop what they are doing and redirect them to the expected behavior (Charney, 2002). The situation I shared previously is an example of how redirecting language was used to help the class remember our conversation agreements.

As much as possible, I try to be proactive about teaching social curriculum so that it doesn't detract from teaching content. In addition to protecting instructional time, teaching behavior also scaffolds student learning. Because we have established routines for what students should be doing and how they can solve their own problems, our class is able to stay on task and be self-sufficient during independent work time. Our students also thrive when they interact as a class because they have learned communication skills such as asking for attention, taking turns speaking, and building off of each other's ideas.

Teaching social curriculum has been both challenging and eyeopening. It's challenging because it takes time and effort to discuss behavior with students, especially when I know there is content to be taught. It can also be frustrating because I am relinquishing my control of the situation and can't always predict how things are going to turn out. However, teaching social curriculum has also shattered my preconceptions about teaching. I thought that teachers needed to be in control all the time and that teaching was only about the content. I've since discovered that engaging my students in discussion and reflection often leads to the same intended result as if I were to set all the rules, while also empowering students and meeting them where they are. Finally, by teaching content with community in mind, I've come to really enjoy interacting with my students because I believe they have ideas worth listening to.

#### Aleya

I was proud of the countless teaching strategies I had already collected before I began the M.Ed. program at the University of California, San Diego. However, it was only a few weeks in when my preconceived ideas about teaching were challenged. My cohort and I were spending the morning at Baker Elementary to observe the second grade team teach their students about subtraction. One of the teachers, Sharon Fargason, worked closely with my professors at UCSD, so I knew she would be an exceptional teacher to observe. Expecting that Sharon would model best practices had me full of excitement and ready to scribble down all of her strategies. However, within the first few moments of her lesson, I felt confused by what I was watching and embarrassed to witness Sharon's lesson fall apart so quickly. After asking just one question, all of her students started talking at the same time, unleashing a chaotic buzz that swept across the rug. The cohort and I looked at one another with great puzzlement as we were all wondering, wasn't she supposed to be good at this? One student's voice eventually broke through the chatter when she sat up on her knees and asked for her classmate's attention—I felt relieved that silence had been reestablished. Yet as she spoke, I realized her idea was wrong and was shocked that Sharon wasn't correcting her! By now, I had come to the conclusion that Sharon had lost control of her classroom and lesson and didn't even know how to subtract two-digit numbers. I tried my hardest to hide my look of disbelief and astonishment for fear of being rude.

Once the lesson was over, I asked Sharon why none of her students raised their hands to talk. I expected her to say that they were acting out because so many student-teachers were in the room watching them. Instead, she responded, "If people don't raise their hands to speak in the real world, why do we need to in the classroom?" (S. Fargason, personal communication, July 9, 2015). What a sensible justification, I thought. She was teaching like this on purpose! She continued to explain how she holds students accountable for their own learning and encourages autonomy, meaning they not only share their ideas, but also listen to their peers' in order to make sense of them. Sharon described her classroom as student-centered, where the teacher's role is to pose open-ended questions that guide students towards the learning objective through critical thinking.

By now I had realized that Sharon's lesson was not a disaster, but, in fact, my first exposure to a technique called "Responsive Teaching." With this approach, teachers are constantly changing their language, lessons and expectations to meet the varying needs of students throughout each and every day. This exposure taught me that becoming an effective teacher is not a destination, but a process. During this process, teachers must use their deep understanding of the content to reason how and why they do all things in the classroom. Considering this, I started to question my pre-determined ideas of teaching—why are student always expected to sit "criss-cross applesauce," raise their hands, and wait for the teacher to give them the right answer? When I began student teaching for Sharon, I was able to see how these practices don't work for all students in all situations. Responsive teaching
became synonymous with making learning relevant and engaging for the individual student.

One of the first challenges I faced using this new approach to teaching was being comfortable listening more and talking less. This was difficult because although it created more space for students to share their ideas, I had a hard time welcoming ideas that were flawed instead of seeing them as learning opportunities. However, I've learned that unearthing these preconceptions about topics is exactly where learning needs to begin for students. I can't guide students to conceptual understanding if I don't understand the thinking they are bringing to the problem. During the first lesson of the geometry unit, my third graders were working with pattern blocks to describe different shapes. I was expecting them to notice how triangles have 3 sides, squares have 4 angles, a hexagon has 6 corners, and things of that nature. However, our discussion took a completely different turn when one student was convinced a corner was the same thing as a side. I could not have planned for this student's preconception but it gave me the opportunity to turn the thinking over to the class. As they discussed their understanding of these terms, students listened and built upon one another's ideas. In the end, we had more questions than answers, and this was okay, because it exposed me to the preconceptions students were bringing with them to the new unit. I've come to realize that teaching is about slowing down and going deeper with content. Doing so allows us to listen to students' ideas and accentuate those that help other students make sense of learning-even if they are incorrect.

With this mindset, I have found that inquiry-based lessons help students make sense of what they are learning. This student-centered approach is dependent on the teacher expressing genuine curiosity in what students have to say. Rather than frantically attempting to answer their big questions, teachers show interest and encourage students to find the answers themselves. Common responses I find myself using include, "What you said is so interesting! How could we learn more about that?" Or, "I'm not sure about the answer, but that sounds like a great question to investigate." This language not only models strategies students can use to deepen their learning but also shifts the emphasis from teacher-directed to student discovery. One morning during another geometry lesson, a student asked what shape would be created if all sides of a quadrilateral were the same length. Rather than feeling like I needed to answer the question, I turned the learning over to the students. I expressed my genuine curiosity about the student's question and suggested he try to find an answer. All of a sudden students had their eyes squeezed shut, trying to visualize the shape, others were using their hands to make a model. Soon, voices started calling out, "A square, it would be a square!" In this instance, my role was to give students a space where they could explore their questions, instead of relying on my answers. While teacher-constructed information is an important part of teaching, it does not have to be the whole of it.

In our time as student teachers, Roxanne and I have embraced the process of taking on new approaches to teaching. Though the process is unsettling, we continue to question our teaching methods because doing so helps us think deeply about our impact on student learning. We can start by questioning why we teach a certain way. Are we doing things because that is how they've always been done? Are our methods rooted in evidence-based practices? Do they work best for our students' learning styles? The journey of restructuring our beliefs is not easy, nor is it ever complete.

#### References

Charney, R. S., & Noddings, N. (2002). *Teaching children to care: Classroom management for ethical and academic growth, K-8,* (Revised Edition). Greenfield, MA: Northeast Foundation for Children.



Photos provided by Pam Baker and Randy Scherer

# The Case for Collaboration

Pam Reynolds Baker High Tech High International

any have likened teaching to art. I think there's something to that. Both are creative, both intuitive, and both often solitary endeavors. Even though much of what we do each day as teachers is far from solitary, a lot of the creative work of lesson planning and project development is. But it needn't always be so. After a successful collaboration with Nicole, our 11th grade Math teacher, I, the 11th grade English teacher, learned a few things about the benefits and challenges of collaboration.

In our Mystery Code Encryption Project, my and Nicole's students wrote detective stories using math codes as clues. In my English class, our students read detective fiction by authors such as Edgar Allen Poe, Sherlock Holmes, and Dan Brown and then wrote their own stories using math codes as part of the solution to the mystery. Students were put into peer editing and revision groups and used Google Docs to give and get feedback from their peers. In math, students used backwards planning sheets and peer revision to create the codes and mathematical references for their stories, which included matrix encryption, function notation with symbols, shift ciphers, counting principles and "cryptarithmetic." Another colleague, the art teacher, had students create cover art for their stories. The art and stories, along with hyperlinks to a "how they solved it" section showing the math work behind the codes, were published on our project website. Finally, for exhibition night, each group chose one story to record in the style of an old time radio show, complete with sound effects.

There were several things I loved about this project. First, although many students struggled to incorporate the math codes into their stories, through the extensive feedback and revision process and with the help of their peers, they all ended up with something they felt proud of. Second, students were passionate about their stories and their characters, many of them going beyond the required number of pages as their characters became real people to them, with real personalities and quirks. But what I loved the most about the project were the collaborations I had with my partner teachers and the many things I learned along the way. Here are a few:

#### Students Benefit from Teacher Collaboration

The benefits of student collaboration are well known: continuity and connectedness, preparaton for life beyond high school, and growth in perseverance, motivation, communication and critical thinking skills. However, students also benefit from teacher collaboration. Because my colleagues and I critiqued each others' work in pursuit of a common goal, our plans were more thoughtful and, ultimately, more effective—a direct benefit to students. And as I became more aware of what worked in collaborating with my colleagues, I was then able to transfer some of this to support more effective and helpful student collaborations, from setting up peer critique to organizing recording sessions. And similar to how Nicole and I were equally invested in our project, as our students helped each other, they also became invested in the success of every other student in their class.

## Teacher Collaborations Across Disciplines Support Student Equity and Engagement

Because our integrated project contained so many different elements and had many different entry points, most students were able to find something that interested them or that they were good at. At our project exhibition, one parent commented how having an integrated project like ours helped students find areas where they could excel and where they could start to build on their success. Judith Warren Little (2012) talks about how we tend to categorize students and that "collaborative groups have a way of interrupting these taken for granted ways of thinking about what students are capable of, and instead creating opportunities that really allow students to connect with each other and with ideas" (34).

Moreover, our collaboration allowed for differentiation and personalization because it provided a variety of perspectives on the same task. For example, we were both able to help students with character development and storyline, as well as with the placement of the codes and the logic of the plot, but we each offered different lenses with which to look at each task.

#### **Collaborations Bring Teachers and Students Together**

During my collaboration with Nicole, I never felt so supported as a teacher. She echoed that sentiment, saying that she had been happy "to find an engaging interdisciplinary project that respected both subjects and the academic content equally. It never felt as though one class was the lead—it was truly a team effort." When things got dicey with the students, when they started pushing back due to the difficulty of the task, we supported each other and re-enforced the validity of our thinking. Nicole also mentioned that she "felt good about the fact that we respected student voice, that we scaffolded and provided supports wherever we could, and that we pushed them and challenged them at times when we could have otherwise given in." I can't help but think that our unified front and our willingness to listen to their suggestions created a safer space for our students to push themselves, to step out of their comfort zone-and for us to do the same. Our work on the Encryption Project created a deeper trust between us all (teachers and students) and improved the culture in both of our classes. This more collaborative classroom may challenge some of the ideas we have around what a well-managed classroom and a "good" student look like. Some great learning during our project happened in the midst of noisy and impassioned discussions as my students talked through a struggle they were having.

#### But Autonomy Is Also Important for Successful Collaboration

Psychologist Anders Ericsson has identified "Deliberate Practice" as a key to exceptional achievement. Deliberate Practice is working on "tasks or knowledge that are just out of your reach," and this requires intense concentration, which, he says can only be achieved when alone. (Cain, 201, pg 81). This is reminiscent also of Csikszentmihalyi's concept of "flow" as well as Pink's (2009) argument that mastery— "the desire to get better and better at something that matters" is something that greatly motivates us. (pg 109). Even in the midst of collaboration, I realized that it was important to value and support the need for autonomy or solitude for both students and teachers, as well as distinguishing between those activities that required extended concentration and those that didn't.

For example, writing a story demanded intense concentration. Thinking through the logic of code integration required intense concentration. Providing feedback on a story didn't take quite as much; proofreading for spelling errors took even less. Creating a quiet work environment that allowed students to immerse themselves in their stories and really concentrate was crucial. The same can be said about the work that teachers do. Though there is much to be said for encouraging more teacher collaboration and less isolation, we cannot forget that there is great value in solitary work. Some of my best thinking during the Encryption project came when I was alone for extended periods of time. At the same time, I loved getting input and ideas from Nicole, who inevitably had thought of something I hadn't. Both solitary work and collaboration are valuable—it's just a matter of balancing the two.

#### **Collaborations Can Challenge Boundaries**

Collaborating with Nicole, I felt more comfortable trying new technologies and new approaches to teaching because I knew that if I couldn't figure it out on my own, Nicole and I would figure it out together. Our collaboration also challenged me to let go of the tight grip I had on my curriculum in order to grab onto another kind of learning outcome, less testable but just as valuable. Developing perseverance, cooperation, and critical thinking had always been teaching goals, but working together and integrating our curriculum pushed this to a whole new level, complete with frustration and set-

backs, but ultimately culminating in the creation of something my students didn't think was possible.

Why? Because in working together we broke down some of the artificial boundaries we create by having subjects taught only in a specific class. In life, there is constant collaboration between scientists and artists and writers and mathematicians. Pixar encourages and even insists on what they call "smooshing." Executive Producer Darla Anderson goes so far as to say "If I don't see lots of smooshing, I get worried" (Lehrer, 2012, pg 152). Just as in successful and innovative companies like Pixar, an integration of disciplines can be developed in schools, leading to new ideas, innovations, and creations. The key is to maintain authenticity in developing projects by reflecting real-world problems or products.

#### Collaborations Are Not Always Comfortable, and That's OK

In teacher collaborations there's a lot of negotiation, especially at first, as each partner tries to figure out how to be faithful to the subject they love and maintain a level of rigor that will most benefit their students while leaving space for a new perspective and innovative work on their subject. But in the midst of those negotiations, collaborations provide opportunities for growth. This goes for both teacher and student. My perspective about what it meant to work with another teacher, what was most beneficial for my students and what rigor looked like were all challenged in this process, and that kind of challenge is not always comfortable and can lead to resistance.

For example, writing their detective stories and incorporating math codes wasn't obvious or easy for our students. Working through the logistics and schedule of a joint Englis/math project wasn't always obvious or easy for me and Nicole. When given a choice between comfort and discomfort, human nature pushes us toward comfort. And when we observe discomfort in those we care about, when we are witness to the struggle, our tendency is often to try to alleviate that discomfort. But we need to be OK with the struggle. Collaborations aren't always easy or comfortable, but they are worthwhile because they help us grow.

The trick, perhaps, is to create a space where every failure is seen as an opportunity to reflect and grow, and every student challenge is seen as an opportunity for students to find their own voice and learn to negotiate through difficulties.

#### Collaborations Are Not More Work

They are just a different kind of work. Sure there's a significant time investment up front since the planning process can take a while, but once the project is planned and in motion, there is a lot less work around classroom management and daily planning. Using a joint calendar allows everyone to know what each day holds and when the deadlines are, and this leaves a lot more time and mental energy for individualized instruction.

#### Recommendations for Teachers Wanting to Collaborate

So what's a teacher to do if she is looking to collaborate? I recognize that I still have a lot to learn, but I have taken a few lessons from my own collaborative experiences and observations. First, find a generous, dedicated, thoughtful teacher, one who is equally committed to the collaboration—it doesn't matter what discipline—and build a project together. The rest, it seems, is all about balance and communication.

#### 1. Find a balance between autonomy and collaboration

Just as collaborations should be nurtured, it's important to respect and create time for individual work. As Fullan and Hargreaves, (1991) remind us, the contributions of individual work are sometimes undervalued, but for both teachers and students, it's important to allow for individual creativity and reflection in the midst of collaboration. I first noticed this during Nicole and my brainstorming sessions. We would talk things out for a little while and then just naturally retreat to do our own thinking, take a few notes on our shared document, and then come back together to build on our ideas.

I noticed this also with student work especially in using Google Docs, which allowed for both autonomy and collaboration. And during class, it was supportive and productive to balance individual work time with collaborative workshop time, and then to provide time and space for reflection in order to think about what could be improved. While collaboration can be beneficial, it is also possible to "overcollaborate." Keeping sight of who you are and what you're passionate about is valuable and should be protected. You have to be willing to compromise and let go of a few things certainly, but if you let go too much, fragmentation and frustration will set in. We should create and support opportunities for collaborative work but respect and nurture individual work as well. Both are valuable and should be nurtured since both are part of our human make-up. As Susan Cain (2012) observes, "Most humans have two contradictory impulses: we love and need each other, yet we crave privacy and autonomy."

### 2. Help your students (and yourself) become comfortable with discomfort

There were times when I felt uncomfortable as my students struggled (and complained), but I was reminded that the struggle was the most important part of their learning and led to their incredible sense of accomplishment. Rigor, in this case, became less about the product and more about the process, the decisions we all made together in moving forward through a difficult project. And after each small accomplishment, after each decision that resulted in forward progression or a lesson learned, there was joy. Having a partner to go through this process with kept me on track and helped me keep my eye on the end goal.

#### 3. Build trust and communication

Sounds obvious, I know. But as in any healthy relationship, these two things are crucial. Trust needs to be established between partners if they are going to feel comfortable stepping out of their comfort zone and have uncomfortable discussions as they negotiate through the collaboration. This trust is built through open, honest dialogue, vulnerability, and generosity. In addition, being open to new ideas and being flexible without losing sight of your goals (or maybe even rethinking some of your goals) will allow for more innovation and creativity. By constantly checking in with each other, sharing our observations, and voicing our concerns and fears, we were able to make adjustments when they were needed.

This trust and communication is also important in creating a safe, stable structure for students to work and push their own boundaries. Though sharing their work made some feel vulnerable, in groups where members thoughtfully critiqued their classmates stories and communicated their feedback in a helpful, specific, and kind way, great trust was built and group members felt comfortable pushing each other and being pushed. And through the open conversations I had with my students, soliciting their feedback and listening to their concerns, making myself vulnerable and acknowledging mistakes, a great supportive classroom culture was developed and spilled over into their next writing project.

#### 4. Be willing to let go

Change is unnerving because we like the "familiar"—but we also lose out on incredible opportunities for growth when we avoid change. Opening up our classrooms and curriculum can be scary. We're afraid of judgment, loss of control, and failure. It's so much safer to retreat into our classrooms and have control of our little kingdoms. Safer, perhaps, but less interesting, fulfilling, energizing, or exciting.

Letting go of some of our content can also be unnerving. We feel the pressure and the responsibility of the task before us. We want to equip our students to succeed in their future educational and career goals. And right now, our culture tells us that passing tests is the best way to do that. But reality tells us something different. Ultimately our students are better prepared for the challenges ahead if they are critical thinkers, if they are resilient, if they are innovative and if they can clearly communicate. And tests don't measure that. Working with another teacher on an integrated project is one way to develop these qualities. So we have to be willing to let go of some (not all) of our content if we're going to open up to less conventional ways of teaching those skills than what we may be used to.

I also found that letting go of my more conventional ideas of what it meant to teach writing opened up possibilities for increased student engagement. One student said it best: "I love that my work can't be wrong because it's my story." That was a big lesson for me—letting go of one thing in order to get something so much more important.

#### 5. Take risks but keep it real

On a related note, don't collaborate on a project when it doesn't make sense to you. It will lead to a lot of frustration for both you and your students. But don't be too quick to throw an idea out. Sometimes a little tweaking or talking through an idea will lead to connections you hadn't thought of, and something really innovative and interesting will emerge. Be willing to take a risk. When students see that we are willing to take risks and that we celebrate not just the successes but the failures for what we can learn, they are so much more willing to push themselves and take those risks themselves.

#### 6. Technology is our collaboration buddy

Using Google Docs for planning and critique supports the balance between autonomy and collaboration. It allows for more choice in when and how collaborations will happen. And using websites for project documentation and resources creates a coherence and an authenticity to the project. Our website created one central place for our two classes to post resources such as handouts, calendar reminders, and instruction. so that students didn't have to go back and forth between teachers to try to find what they needed.

#### What Does All of This Mean for Schools?

To create more collaborative school environments, I see the benefits of "vulnerability-based trust" (Lencioni, 2012) where teachers feel comfortable taking risks and experimenting, where collegiality is actively supported and collaboration is expected, where staff development centers on growing and supporting the whole person, providing opportunities for continued education and development as well as supporting the many other facets of the teacher's life.

I also see the benefits of space and time in creating opportunities for collaboration—so that the physical space and schedules in our schools are changed to encourage and support more teacher interaction or "smooshing" (Lehrer, 2012, pg 152). I also see the importance of solitude in supporting "Deliberate Practice" and of autonomy in giving teachers power and confidence in their decision-making. So my dream school would honor and support both by having quiet spaces and collaborative spaces for teachers. It would provide time and structures for collaboration but also trust teachers to decide when collaboration isn't the best approach.

Through teachers working together, I see the creation of a community where students are known well and supported, where there are multiple entry points and opportunities for success, where we work together to create a safe place for students to push themselves, take risks, learn and grow from successes and failures. Judith Warren Little (2012) notes from her observations and research, that successful schools were those "that had built robust cultures of collaboration. They had norms of collegiality and experimentation, and these had to go together" (33).

In the end, collaboration matters because relationships matter—and building healthy, supportive relationships between administrators, teachers, and students is what school is (or should be) all about. That's where the learning is.

#### References

Cain, S. (2012). Quiet. New York: Crown.

Fullan, M. and A. Hargreaves. (1991). What's Worth Fighting For in Your School? New York: Teachers College Press.

Hargreaves, A. (1993). "Individualism and Individuality." *Teachers' Work: Individuals, Colleagues, and Contexts.* J.W. Little and M.W. McLaughlin, eds. New York: Teachers College Press.

Lehrer, J. (2012) Imagine: How Creativity Works. New York: Houghton-Mifflin.

Little, J. W. (2012) "Teachers' Work and School Change" UnBoxed: A Journal of Adult Learning in Schools. Spring 2012; 31-38.

Pink, D. (2009) *Drive: The Surprising Truth About What Motivates Us.* New York: Riverhead Books.

## Student Consulting: Disrupting Student-Teacher Hierarchies

Anna Chiles, Ben Sanoff, Chloe Larson, Janie Griswold, and Julia Rosecrans High Tech High Schools

uring lunch one day at High Tech High Media Arts (HTHMA), a team of two student consultants meets with a cooperating teacher to debrief a recent observation cycle. They start by giving the teacher encouraging feedback about his communication style with students and the way he seamlessly switched between slang and academic language. The conversation transitions to strategies the teacher can use to open up and connect with his students. Dialogues like these are what form the heart of the student consultant program piloted this year at HTHMA.

During the 2015-16 school year, nine HTHMA juniors served as student consultants to five teachers, all of whom were in their first year at the school. In collaboration with these nine students, Ben Sanoff, a school leadership resident, Anna Chiles, a humanities teacher, and Janie Griswold, director of new teacher development at High Tech High, formed a new student consulting program at HTHMA. This article details the origins of the project, the implementation process, and the impact of the program on the student consultants and cooperating teachers. This piece is co-written by the implementation team and two of the student consultants.

#### Origins and Inspiration for Student Consulting

Anna Chiles is a humanities teacher at HTHMA who served as a student consultant while she was an undergraduate at Bryn Mawr College. Anna describes the genesis of the program at HTHMA.

"I've been thinking ..." started the e-mail from Janie Griswold to me in Fall 2015. She proposed a meeting and a brainstorm about something that, frankly, I hadn't thought about for quite some time: student consulting. The work she wanted to discuss and potentially bring to the High Tech Village was work that I was deeply engaged in during my years as an undergraduate at Bryn Mawr College. Janie's request transported me to the rickety old classroom in the English House at Bryn Mawr, where I would sit around a table with other undergraduates doing the same kind of work that I was doing: consulting with college professors to enhance their pedagogical practices and improve classroom culture, engagement, and learning.

Over the course of four semesters, I was paired with six different faculty members. Each week, I would attend their courses for an hour, take notes feverishly, and look for evidence of engagement, relationships, and learning. I would also meet with my fellow student consultants to debrief our observations, strategize about our dilemmas, and plan how to thoughtfully, respectfully, but honestly bring our feedback and ideas to the professors who had allowed us into their classrooms.

Alison Cook-Sather developed this student consulting program, which has since spread to many institutions of higher learning where educators and administrators want to bring meaningful student voice into the classroom. Janie wanted to bring student consulting to HTH to empower student voices to support teachers new to the organization.

#### **Implementing Student Consulting**

Soon, the three of us, Ben, Janie, and Anna, met to begin designing our student consulting program. When we did, we began from the model that Alison Cook-Sather, Catherine Bovill, and Peter Felten (2014) had developed at the undergraduate level. We started by identifying a group of nine HTH juniors who had experienced varying level of academic success, engagement, and positive relationships with teachers. It was important to have a range of perspectives in the student consulting pool, in order for teachers to see how different types of students might experience their classes.

We diverged from the Bryn Mawr model by adding student training, working with students for six weeks to help them develop the skills to be effective student consultants. We felt that high school students needed additional support, scaffolding, and confidence in order to disrupt traditional teacher-student hierarchies. The course consisted of watching videos of teaching, attending an instructional coaching training, observing teachers at our school site, and practicing effective debrief techniques.

In addition to these technical skills, we focused on developing a culture within our student consultant cohort of reciprocity and mutual respect between consultants and teachers. Cook-Sather et al. (2014) highlight that the foundations of an effective student consulting program are "the guiding principles—respect, reciprocity, and responsibility" (p. 169). We knew we were ready to start the program when, during the last week of training, a student consultant wrote, "It [student consulting] means that you help your teacher grow and that you build a relationship of trust and respect with each other."



Between October and December 2016, each student consultant team conducted weekly observations and engaged in several debrief conversations with their cooperating teacher. In addition, all of the student consultants met together biweekly for forty minute sessions during High Tech High's X-block (an elective class). During these meetings, we sought to create a safe space where student consultants could share how things were going with their cooperating teacher and pose dilemmas or questions to the group. We also organized a checkin meeting with the cooperating teachers roughly half way through the semester to determine how the program was working from their perspective and to gather feedback. Here is what we learned from students and from teachers.

#### Student Consultants Grow Their Voice

The goal of this program was to foster dialogue about the student experience between student consultants and cooperating teachers. At the end of the first semester, seven of the nine student consultants completed a survey, in which all those who responded reported that their cooperating teacher listened to them always or most of the time. Six of seven respondents reported that their cooperating teacher made changes to their practice based on the consultant's feedback.



Students' responses also confirmed past research suggesting that when students feel listened to and have a voice in the practice of teachers, they experience a stronger sense of belonging (Toshalis and Nikkula, 2012; Cook-Sather et al., 2014). Reflecting this increased sense of confidence and agency, one student explained that for her, the highlight of participating in the program was "Becoming confident in my ability to be professional. And I also believed that I was seen as more than a student by my teacher, I was truly seen as a colleague." This ability to disrupt traditional student-teacher hierarchies is an important outcome of the program.

#### Increased Empathy for the Role of Teacher

Another big impact on student consultants participating in the program was increased empathy for the challenge of teaching. All seven student consultants who completed the survey responded to the open-ended question "How has your participation in the student consulting program impacted you?" by explicitly mentioning that they gained empathy for teachers. One student explained, "I now have a better understanding of the difficulty in teaching, more respect for teachers (new ones especially) and better communication and coaching skills." Student consulting required students to put themselves in the shoes of teachers in order to understand and improve classroom dynamics.

This experience of shifting roles and imagining the teachers' experiences helped change the way that students conceptualized school. As students gained a sense for teachers' perspectives and struggles, they expressed more appreciation for teachers' efforts. As one student explained, "I feel like because I have participated in this program I appreciate my education more as well as the amount of effort teachers put into their classrooms." Echoing this same theme and expanding upon it, one student explained, "It made me a better student through perspective. Being a student consultant you spend a lot of time with your teacher and you see education through their lens. It makes you change because you realize everything you are doing is for a reason." Students' recognition that teaching practices are not arbitrary helped them deepen their appreciation for the value of school. This might be the reason that several student consultants also reported becoming better students. The same findings are confirmed in other research. For instance, in an executive summary of findings about student agency, the Carnegie Foundation (2015) reports, "Encouraging students to find value in what they're learning can lead to increased engagement in the classroom, better performance on tests, and more interest in the topic you are trying to teach" (p. 10).

#### The Student View

Julia Rosecrans, a student consultant, offers a play-by-play of the conversation that occurred in one of her debrief meetings.

We started by offering the teacher warm feedback about the classroom environment, along with their general teaching practices during the period we observed. We expressed our appreciation for the way she engaged with the students during project work time by asking questions to the students that made them think more deeply about their topics. Later in the debrief, we transitioned to some cooler feedback. We observed a need for greater student engagement during the majority of project work time, and how the classroom culture changes when she steps out of the room. This led to an inclusive dialogue about why this was happening, and we brainstormed strategies she can implement in her classroom to reach her goals as a teacher. This reflects the value of the program where we as students build a mutually respectful relationship with our teacher and generate an honest conversation about the student experience in the service of improving teaching practices at HTHMA.

Chloe Larson, another student consultant, adds that for her the program led to a greater sense of her own importance, and of mutual respect.

The student consulting program has had a huge impact on my respect for teachers and my ability to have professional conversations with them. I have gotten to see first hand what goes into being a successful teacher and all the behind-the-scenes effort that we students often miss. In one of my debrief meetings last semester with my partner teacher, he mentioned that whether or not I offered a clear solution to the dilemma he was facing, it was beneficial just to have someone with a new perspective to talk it through and pitch ideas to. I was thrilled and relieved to hear this. Being a student consultant does not mean we will always have the perfect solution to a problem a teacher is facing. However, by asking probing questions, discussing what has worked for us in the past, and offering ideas to implement, both the teacher and student can grow from the experience.

#### **Cooperating Teachers Change Their Teaching Practices**

Teachers also grew from the experience. In a survey at the end of the first semester, all five cooperating teachers reported that the program was beneficial for them and that they changed their practices based on the debrief conversations with student consultants. Through such conversations, cooperating teachers reported they developed deeper relationships with students, interacted with students in a more positive way during class, communicated information about projects and assignments to students more clearly, generated better questions to stimulate student dialogue during socratic seminars, and created more collaborative learning environment for students.

For example, one cooperating teacher explained that his student consultants' feedback helped him form more productive student groups. His student consulting team told him: "I think you would have more effective conversations if you changed your seating. You know, you have a bunch of kids who are reluctant to speak here and you have kids that embody the same mentality all sitting at the same table and they're dominating conversations and you could break them up." After changing the seating, he reflected, "my student consultants really helped me generate a culture in my classroom that elicited and fostered growth, communication, and discussion." This type of specific suggestion from student consultants often helped cooperating teachers be more responsive to student needs.

In addition, the ongoing dialogue between student consultants and cooperating teachers motivated teachers to continuously reflect on and develop their teaching. One teacher described how his student consultants pushed him to improve, "Knowing that I had students that were on my side trying to make me better—it was really encouraging. They were there to listen when I voiced my frustrations and there to encourage me to continue to do things I was doing well. You know, it was a very collegial relationship, because they didn't just pat me on the back and say, 'Great job; see you next week.' It was always, 'You are doing this really well. I saw you trying to do this. Think about doing that.' And I was constantly reflecting on what I was doing in the classroom the more we had those conversations." Another cooperating teacher explained how: "It adds a level of accountability and authenticity that you don't get when you have an administrator or another teacher in your classroom because students can actually envision themselves in your room and in your lesson." The authenticity of students' perspectives pushed him to grow more than traditional top-down feedback structures.

#### Increased Empathy for the Student Experience

Just as students felt increased empathy for teachers, cooperating teachers also reported greater empathy for the student experience. According to Cook-Sather et al. (2014), this recognition of the other's perspective is a consistent outcome of many student consulting programs. They explain, "One of the most consistent research findings in this field is that faculty and students alike expand their perspectives on one another's and their own work" (p.110). Underscoring the extent to which the program helped teachers see their role from a student perspective, a cooperating teacher wrote, "The conversations that we had almost exclusively centered around student experience." As teachers, we often forget about the experience that students are having in our classrooms, so refocusing attention on this critical perspective on teaching and learning can yield large dividends.

A different cooperating teacher explored the cumulative impact that paying attention to the student experience had on his practice, reflecting, "Students are the ones who are going to be in this class. They are the ones this experience is going to matter to. They're the people we are doing this for. We're not doing this for the administration; we're doing this for the students." This recognition that teaching should be oriented towards students helped teachers reconceptualize their role as one of collaboration with students. One of the teachers began to realize that, in fact, all of his students could be collaborating with him to improve the experience for both parties. He explained, "I realized that these two student consultants are helping what I'm doing with my tenth graders, and it just took a nudge for me to say I should ask my tenth graders what I need to do. And then it turned from having two student consultants to having 52. So that really impacted my teaching, because I just have much clearer pathways and means of communication with my students." When teachers see themselves as collaborating with their students towards a common goal, it represents a powerful reframing of the teacher-student relationship.



In the coming years, we hope to help more teachers transform their relationships to students by expanding this work to other HTH schools. We are particularly excited about the possibilities of weaving the work of student consultants into the experience of teachers who are enrolled in HTH's Teacher Intern Program. Teachers in the Intern Program teach full-time while completing coursework and collaborating with a mentor at their site in order to earn a California credential.

In other contexts, such as working with younger students, in a more traditional school setting, or with veteran teachers, this model of student consulting might have to be adapted. One alternative structure would be to have older students serve as student consultants at the elementary school level and middle school level to ensure an appropriate level of maturity and sensitivity. In traditional school settings and with veteran teachers we could envision the program being voluntary and scaling up organically based on the positive reports of teachers who choose to participate.

Providing teachers with student consultants is one way that we can emphasize the importance of student voice in shaping classroom experiences and teacher reflection. We see student consulting as mutually beneficial for participating students and teachers, helping each group transcend the divisions inherent in their roles and recognize teaching and learning as a truly collaborative process.

#### Rerefences

Carnegie Foundation (2015). Student Agency Improvement Community (SAIC): Core Concepts Description.

Cook-Sather, A., Bovill, C., & Felten, P. (2014). *Engaging students as partners in learning and teaching: A guide for faculty. San Francisco*, CA: Jossey Bass.

Toshalis, E., & Nakkula, M. (2012). "Motivation, Engagement, and Student Voice." *Jobs for the Future, Students at the Center Series*. Retrieved September 13, 2015, from http://www.studentsatthecenter. org/sites/scl.dl-dev.com/files/Motivation Engagement Student Voice\_0. pdf

For a more detailed literature review consult http://mobilizelearning. org/?page\_id=315

To learn more about our methods and the role of improvement science consult http://mobilizelearning.org/?page\_id=320



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**Ben Sanoff** has been a high school teacher and school leader for nine years, primarily at Berkeley High School, and is currently a fellow at High Tech High Graduate School of Education. Inspired to become an educator as a result of his educational experiences growing up in Cambridge Massachusetts, Ben attended Colby College and received a masters of education from the University of Massachusetts, Boston. Subsequently, he served as a social studies teacher, technology coordinator, and teacher leader at Berkeley High, where he was deeply involved in program design and implementation to help address issues of equity. He is passionate about integrating technology and project-based learning, and providing young people opportunities to participate in entrepreneurship and financial planning.

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