



PROFESSIONALISM IN PRACTICE

ISSUE THREE

WINTER 2009

A QUESTION OF MOTIVATION



Setting the Standard (and the Table)
Sharon Cormany Ornelas

The Kara Walker Experience
Nonie Kouneski and Cecily Spano

Teachers Creating an Atmosphere of Achievement
Anna Beal, Torrey Lau and Natalie Rasmussen

Understanding by Design: A Math Teacher's Balancing Act
Laura Myers

The Professionalism in Practice Journal

Mission Statement

Professionalism in Practice is a teacher-driven professional journal, centering discussions of theory, research, and practice around the people who bring all three together in the classroom everyday.

Winter 2009

Vol. 3, No. 1

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Special Thanks to Minnesota Writing Project

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SETTING THE STANDARD (AND THE TABLE)



SHARON CORMANY ORNELAS

About six years ago, a small group of teachers who had been working together in an action research group at Patrick Henry High School in Minneapolis got the idea to start our own professional journal. Having experienced the transformative power of action research in our own practice, we wanted to find ways to share what we had learned, and to learn from other teachers experiencing similar insights through examining their own practices. With the opportunity to present our work at several national and international academic conferences and publish in an edited volume, we had unearthed an even deeper layer of the action research process. At one level, articulating our findings and conclusions helped us expand our learning and insights. Beyond that, sharing our work with the broader community of scholars brought a feeling of empowerment and made us view ourselves as true professionals with something significant to add to the dialogue about teaching and learning.

We brought this feeling of empowerment back to our school, along with questions about how teacher research fits into the broader scheme of educational knowledge. We pondered how to help more teachers learn from themselves and each other while taking ownership of the conversation about teaching. We also wondered why most of the participants in the public, formal—and, therefore, respected—conversations about education were not the same people carrying out the work of teaching kids everyday. Why weren't more teachers at the educational table? Should we pull up a chair, uninvited, or set our own table? We decided to set our own table by creating our own teacher professional journal.



It took us three years to publish the first issue of *Professionalism in Practice* in the spring of 2005. The editors wrote most of the articles, since few other teachers seemed ready to visualize how to share their work through this type of local, in-house professional journal. It's not that innovative and high-quality work wasn't taking place in our school—quite the contrary. But write it up for a journal? How? And, perhaps more importantly, why? Thankfully, after seeing our first issue, more teachers got excited about writing for the journal. A year later, we published a second issue with a theme of collaboration, again focused on work being done at Patrick Henry High School.

In that issue, two teacher leaders co-wrote an article about the transition to small learning communities (SLCs) at our school. They turned this in to the SLC grant administrator as their

HOW CAN A PROFESSIONAL JOURNAL BE A RELEVANT AND USEFUL TOOL TO INFORM TEACHER PRACTICE?

annual report, who approached the PIP editors about using grant funds to expand the journal district-wide. We recruited high school teachers from around the district to join a Reflective Professional Writing group to craft articles about the exciting work we knew they were doing to support student learning. Almost two years later, the fruit of those labors is the journal you are currently reading.

As a participant in the Reflective Writing Group, I wanted to conduct action research about a burning question in my practice. Although I had plenty of questions about my own classroom, the question that was really nagging me at the time was about the journal itself: now that we have the funding to expand the journal to the entire Minneapolis district, how do we make sure that teachers—especially Minneapolis teachers—actually want to read it? How can a professional journal be a relevant and useful tool to inform teacher practice?

The same Do-It-Yourself spirit of teacher empowerment and knowledge sharing that led us to create this journal—along with the realization that we wouldn't be ready to publish an issue of the journal that year—led us to convene the first annual *Professionalism in Practice* conference last August: "Practice Made Public." Not only did this give teachers in the writing group a chance to share their preliminary findings, it allowed us to hear from more teachers about their research and practices. More pragmatically, it gave me an opportunity to collect data from a broader sample of teachers about which factors and sources were

important in their professional learning.

The data from the conference showed that most of the 63 respondents valued informal learning over formal, especially interactions with colleagues and self reflection. They wanted choices about how, when, and with whom to engage in learning. At the same time, respondents rated scholarly/academic articles lowest in significance among professional learning sources. Although practitioner articles were not rated much higher as a source of professional learning, the professional/classroom experience of the presenter was very important to 70% of respondents (as opposed to academic credentials, which were only important to 15%). They reported the honesty of the author/presenter and thought-provoking ideas as the most important factors in their learning. These respondents clearly want to learn from each other, but perhaps don't have a clear sense of how a journal can help them do that.

So, given this data, how do we make a professional journal a meaningful and relevant tool to inform teacher practice? The answer may be that there is no one answer; like our students, teachers have different learning preferences and styles. In this issue of *Professionalism in Practice: A Question of Motivation*, six teachers from the Reflective Professional Writing explore the question of how to motivate diverse students to learn at high levels. In "The Kara Walker Experience: How Two Teachers' Focus on Relationship Building and Arts Integrated Curriculum Helped Students Learn," Nonie Kouneski and Cecily Spano peel back the many layers of relationships that motivated student learning in racially-charged Social Studies/Art collaboration. In "Teachers Creating an Atmosphere of Achievement," Natalie Rasmussen, Anna Beal, and Torrey Lau investigate their students' attitudes about what affects their achievement in science classes, and what happens when teachers make intentional efforts to communicate positive messages about student potential. Laura Myers looks at how finding a middle ground between traditional and reform math curriculum can reach a broader range of students. These teachers show how motivating students to learn involves a complex set of variables and interventions that go beyond content to recognize students as individuals.

A similarly diverse array of needs and preferences characterizes teacher learning. According to my data, educators also report that content alone does not create meaningful learning—the relationship with the purveyor of the content matters. The *Professionalism in Practice* conference is a way to give teachers an opportunity to interact with and learn from respected colleagues and dialogue about effective practice, but it is only one day a year. It is no great revelation that one day a year is not sufficient to make serious inroads into truly vexing educational problems. The conversation needs to be ongoing, dynamic, and

grounded in both research and practice.

We hope that this journal can advance conversations about the issues all of us are facing in our classrooms everyday by showcasing teacher inquiry and knowledge in a more permanent fashion that can be accessed repeatedly by a wide variety of educators. Teachers who are writing articles for the journal, like those in this issue, may present their work at the conference first as a way to hone their ideas. Or, a teacher may be inspired by an idea at the conference and choose to explore it in further in their practice and contribute their own insights to the conversation by writing an article for the journal.

However, from the data I collected and current educational research (DuFour, Eaker & DuFour, 2005; Schmoker, 2006; Freeman, 2000), we know that the most meaningful learning comes when teachers have an opportunity to learn together. For this reason, we plan to build professional learning communities that rise out of the ideas shared in this journal and at the Professionalism in Practice conference. The teachers who take the lead as authors/presenters could expand this leadership role into

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facilitating ongoing groups of teachers who want to explore those ideas more deeply and implement and study the impact on their own practice and students. As more teachers begin to implement and research effective practices in their own contexts, we will deepen our understanding of what works with a variety of students, and broaden the knowledge base of teaching as we add more practitioner voices to conversations about how to help all of our students learn.

We hope you'll join us at this new table by reading and responding to these articles, joining a professional learning community, presenting at the conference, or writing an article of your own. As educators, we already know that many of our most meaningful learning experiences come from each other. By articulating your learning about your practice, you will extend your own understanding as well as make a bold entre into the public conversation about education. Please pass the salt! 🧂

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THE KARA WALKER EXPERIENCE:

HOW TWO TEACHERS FOCUSED ON RELATIONSHIP BUILDING AND ARTS INTEGRATED CURRICULUM TO HELP STUDENTS LEARN



Nonie Kouneski & Cecily Spano

“**I** feel like a stranger in other classes. In this class we know each other and respect each other. They’re the only classes I go to and pay attention.” — Student in the Annenberg Arts integrated Social Studies and Visual Arts class at Southwest High school.

At Southwest High School in Minneapolis there is a group of students lovingly called “Annenberg kids.” An “Annenberg kid” can be found at most high schools. They are smart and creative, but do not “buy into” school. These kids work if and when they see value in what is asked of them. They do not work for grades or credits. They are very social, and building relationships is the key in helping them see value in class work. Southwest is committed to arts education and arts infused curriculum. The first funding source for such curriculum came years ago from the Annenberg Foundation. Now the program is funded through Arts for Academic Achievement (AAA) grants, but the Annenberg name stuck. The school’s commitment to this type of curriculum stems from the recognition that some kids need a different kind of educational delivery. In previous years, ninth and tenth graders had the opportunity to meet their core academic requirements in an arts integrated curriculum. The 2006-2007 school year was the first time that option was given to juniors.

We are the art/social studies team of Cecily Spano and Nonie Kouneski, and this article chronicles our experiences with the 11th grade Annenberg class. To help with this research we worked with Cheryl Olstrom, Nancy Hauser, and Byron Richards from the Perpich Center for Arts Integration. They helped by videotaping the experiences with students and teacher debriefing sessions, setting up research questions, and interviewing students throughout the process; many of their responses are included in this article. They also helped us align our curriculum to state standards.

Relationships: The Emotional Hook

We had a hypothesis that to motivate this type of student we had to work very hard at developing relationships. No matter what we were studying, if we didn’t engage the students on an emotional/social level by building strong relationships, as a group they would not connect with the curriculum. Cecily had worked with

these students the year before and had found that to be true. When she thought back on the assignments and projects that really worked for them, they were projects that required them to interact with each other, either by working with one another, or by telling their own stories in an environment that was safe.

There was a particularly powerful project the year before in which the students made altered books. They had to choose a song with lyrics they really identified with at that point in their life and alter an old book to illustrate that connection. Students shared their work with the class by playing their song and showing their book. They did not speak, but the images they showed as the songs were playing told stories of a difficult break-up, a rape, a parent's abandonment. Students cried and told about the things they saw in each other's work. Not only did they connect on an emotional level, these were the best pieces of artwork the students produced that year.

Conversely, when these students were asked to work on drawing skills without having any emotional hook, many of them were not engaged. Only those who liked to draw performed for the assignment. Nancy Protheroe (2007) describes learning as "an emotional activity... In general, how a person feels in a learning situation determines the amount of attention he or she devotes to it—and increased attention is more likely to result in learning and retention" (42). Similarly, she says learning is a social activity that relies on interaction between the learner and the "larger social environment." It is that interaction that engages the emotions that then engages the cognitive process, and "increased attention is more likely to result in learning and retention" (42). Principles such as authenticity, relevance, student choice, cooperative learning, student as learner, teacher as coach, integrative/negotiated curriculum are all very well researched and shown to be very effective in supporting student learning. We use these principals in our teaching but for this group of students, because of Cecily's experience with the altered book assignment, we wanted to focus on the emotional/social aspect. We wanted to plan curriculum that supported both of our content areas and engaged the students; we would use the relationship hook to reel them in.

We had a good set up for research. Nonie had these students in a class first semester but not on team; the curriculum was the traditional delivery of high school U.S. History, and was not necessarily geared toward a high level of emotional engagement or interdependence. We thought of the first semester as our "control group". In other words, we had the same kids in a different situation. Second semester Cecily came on board and the class became a two-hour team class. Before second semester started we reflected on what inspired effort from this group of kids. We kept coming back to the fact that they were incredibly social and emotional. In that conversation we identified a variety of different types of relationships and how they were important in the motivation of the students: student to student, teacher to student, student to artist, student to the anchor work (a work or body of art

the curriculum is built around), and student to curriculum.

We started by planning our curriculum. We knew we needed something that would speak to the students, something that they would see as worthy of their time and energy, something they could relate to and have an emotional response to. We decided to design the course around an anchor work, and build our art and history competencies in the context of that anchor work. We also knew we wanted the students to demonstrate their learning in a final presentation of student created art, which would be shown to a wider audience beyond the classroom. Kara Walker's work was scheduled to be exhibited at the Walker Art Museum later in the school year. Cecily described the work as controversial, centered on issues of race, and set in the antebellum south. For Nonie this fit perfectly with U.S. History curriculum and standards. Minnesota state standards for U.S. History are content based and require study of the whole Civil War era. She also had a unit she taught each year in her U.S. History course on race, as a way to address issues of slavery, immigration, housing or current life experiences of the students themselves. Hitting this topic hard, with a look at some compelling art, would help create value for the group of students we would be working with.

We proceeded to meet with artists, plan with the art museum, and figure out how to integrate the Race and Civil War units into the process. We culminated the project with a student art exhibit that took place in the galleries of the Kara Walker exhibit. Visitors saw both Kara Walker's work and the student's work -- which was their response to her exhibit. Parents, friends, teachers, and artists were all invited to the showing. Student work included poetry, installation, photography, music, sound, video and more.

The entire process was incredibly emotionally charged. Students were fully engaged during the entire unit. We had perfect attendance and all students earned passing grades, even though several had failed during the first semester. They clearly found value in the work we were asking of them. And we found evidence that each of the relationships we had identified were important in some way; that generally the level to which a student engaged in a particular relationship was the greatest indication of how important it became to that student. For example, some students really related to the anchor work, so that is where their emotional connection was evident in the work they did.

Student to Student

Anyone who has worked with adolescents knows the power of peers and social groups on their development. Learning is part of their development and we tried to figure out how to positively manipulate that peer relationship to create learning opportunities. Out of necessity, this started first semester in Nonie's class. First semester students fit into our typical adolescent archetypes: the class clown boy, underachiever, easy A "I want an easy A without working" kid, misunderstood moody boy, "this is boring" girl, painfully shy kid,



absent minded artsy girl, and the list goes on. In the history class first semester, having all these kids together and no “hook” was impossible. Nonie had to make changes in her curriculum early on to keep sanity in the class. She transformed her Westward expansion unit from an individual research project to a group effort centered on an Oregon Trail group activity. Student groups became wagon trains and as they worked on their research their team progressed westward and earned a common grade.

That project brought out a different side of each student; the class clown boy and the absent minded artsy girl became leaders, the underachievers, shy kids and bored kids stayed awake, the easy A kid did a bit extra, and they all really cared about their team. They really wanted to make it to the end of the trail! Somehow the sitting in a circle, taking direction from each other, working out problems with each other made many of the classroom discipline issues disappear.

The Kara Walker project just took that to the 10th degree: there was one team — the class — and everyone’s voice and contribution was valued. They wanted to produce work they could all be proud of. We purposefully had students work out their responses to the Kara Walker show in groups. A guest artist had them create human sculptures of their emotional responses to the work: they took turns looking at each group’s sculpture and telling what they saw. A lot of time was spent on developing trust and relationships between the students, and for many of them, it was the biggest motivator. At the end of the anchor work project, interviewed students stated things such as:

- “Everyone else was great motivation, I can’t really talk about it enough...the chemistry our class has was really motivation for me. Knowing I had all of those people to back me up if something went down...I mean we are a very obnoxious class, and to see us all come together and help each other out when the help is needed, I think that’s such a good quality to have, and to have in a group of kids like us is really cool!”
- “The best part was getting to know my classmates in a way I didn’t know them. It drew us together in a way I will not forget.”
- “The group experience, there was both individual and group understanding. There’s a lot more respect and trust in the class now.”
- “We talked about racism and got over being awkward. Finally we were talking straight to the point. We had to dig deep into what we thought. We knew we were safe to do that.”

Student to Teacher

During this artistic collaboration in the team model, we were able to step out of the traditional teacher role. We were more coach-

es than knowledge givers. Students began to see us as advocates. We were there for them. There is a dynamic we have observed many times when we bring in guest artists to work intensely with students. Physically we are no longer at the front and center -- we are in the “audience” with the kids. We get a student’s perspective and they get a perspective of us that is more egalitarian; we are next to them, not in front of them. We are in many ways participating in the process right along with them.

They also knew the level of risk we had in embarking on a project that was so volatile and so public was very high. Students both respected the risks we were taking and felt safe challenging us in our own experiences of the work and process. Nonie was particularly challenged by Kara Walker’s work and by the students. Several weeks into the process, while leading the students in a seminar discussion, she admitted to the students she had not viewed the videos in Kara

WE KNEW WE NEEDED SOMETHING THAT WOULD SPEAK TO THE STUDENTS, SOMETHING THAT THEY WOULD SEE AS WORTHY OF THEIR TIME AND ENERGY, SOMETHING THEY COULD RELATE TO AND HAVE AN EMOTIONAL RESPONSE TO.

Walker’s exhibit. One student immediately said, “Miss K, if you didn’t see the videos then you don’t get it – you missed the whole point.” Her statement was made during discussion after reading an excerpt from *The Autobiography of Fredrick Douglas*. They read a couple of passages where he describes overhearing his master telling his wife not to teach Douglas to read, that it would be dangerous. Douglas writes that those words taught him much about power and the relationship between the white man and the slaves. It convinced him that learning to read was a very powerful act of personal power. One of the videos Kara Walker created was inspired by her research into the lives of several slaves in the Antebellum South, Douglas being one of them. The imagery of one of the videos is that of a black man lynching a white man. There is violent sexualized imagery. The students’ first discussion after seeing the video was very focused on their disgust of the sexual violence, and their questioning of Kara Walker’s choices. The student’s declaration that Nonie didn’t get Walker’s artwork, which was backed up by several other students, meant the students got their history lesson. In a typical educational setting it would have been seen as inappropriate for a class of students to tell their teacher she did not understand the material. For us, it felt like a victory. The students had come to a deeper understanding of the history of our country. They moved from superficial disgust of a piece of artwork to a feeling of getting the intended message of the artist, in the context of a history lesson. This was evidence of the most authentic kind of understanding we hope to



see in students. The students knew we put great trust in their abilities; they trusted us that they really were allowed to make meaning of the content right along side of us, and they rose to the occasion.

- “I was surprised [teachers] trusted us to do this. It was really heavy and hard to deal with.”
- “What made me keep going were my other peers and Spano and Ms. K. They showed me much respect and believed I could do it.”
- “Spano really kept me going because it seemed really important to her.”

Student to Artist

Bringing a new adult into a classroom is always a complicated situation. On the one hand bringing in an artist can breathe new life and give much needed outside perspective on an issue and a topic. On the other hand, it sometimes takes quite a while for those not used to the pace and culture of a school building to become accustomed to certain inevitabilities that arise in a public school setting: pep fests, fire drills, 55 minute class periods being taken very literally. Guest artists and speakers always need a heads up that when the bell rings their audience will disappear. We had some very mixed responses to working with our artist. Students are often nervous before they meet the guest artist: will the person be real, and will the person be reasonable? Our guest artist was genuinely open to hearing the student’s opinions, but a deep level of trust did not develop for all of them. She brought in many

THE CLASS CLOWN BOY AND THE ABSENT MINDED ARTSY GIRL BECAME LEADERS, THE UNDERACHIEVERS, SHY KIDS AND BORED KIDS STAYED AWAKE, THE EASY A KID DID A BIT EXTRA, AND THEY ALL REALLY CARED ABOUT THEIR TEAM.

different artists, which gave students multiple perspectives, but made it more difficult for them to bond with any one of them.

- “When I met Leah I really did get excited, she knew it was our response and she didn’t make us do anything we didn’t want to do”
- “I was really interested in what all of Leah’s random people had to say. It was always something new.”
- “I got really mad at the end of the program when Leah kept talking, like she was the star of the show.”

Student to the Anchor Work

We chose to revolve our study around the Kara Walker exhibit at the Walker Art Center. There couldn’t be a better, more engag-

ing, and more historically connected show to use. But, as mentioned, it had very mature content. Nonie’s first response to it was shock and disgust. Kara Walker’s work is very visually beautiful, but the images are violent, sexualized, and the interpretation given by the docent made Nonie conclude Walker’s work was misguided. Cecily had a student teacher at the time, and seeing Nonie’s reaction he asked, “Are you sorry you agreed to do this?” Nonie immediately replied, “No.” She felt that true learning, deep learning, learning that is life changing, only happens when we are uncomfortable and challenging ourselves. And Nonie was plenty uncomfortable.

We were both very nervous when the time came to take this boisterous group of sixteen year olds to the show. They were completely silent for an entire hour and a half, just looking at the work. Walker’s work provided the perfect backdrop to get the students to start asking questions about both history and art topics. Her images really provided us with that emotional connection to get the students engaged. Here are some of their initial comments, which illustrate the level of emotional effect her work had on them.

- “I didn’t believe it. I thought her work was an over-reaction.”
- “I didn’t know what to think. I didn’t want to be a part of it. I was ashamed to be part of it.”
- “Why did a guy have a baby and what is her obsession with guy on guy action. . .to me if she were trying to do art on racism and slavery make it more realistic on what happened, not guys having babies and stuff.”

Through the course of the project, student’s depth of appreciation and understanding of the work transformed. They saw the exhibit several times, read reviews of Kara Walker’s work and read Kara Walker’s response to the reviews. By the end of the project students had this to say about the work:

- “The [Kara Walker] show expresses the hatred in a very clear way . . . maybe her goal is to lead people into this emotion.”
- “You have to make the meaning for yourself. The purpose of the exaggerated [sic] is to bring attention to what it was like. If it wasn’t vulgar, shocking, violent it wouldn’t make a statement.”
- “I know what I am talking about when I see art. It taught me a way to look at art.”

Student to Curriculum

As we began to work longer on some of the themes and references made in the work, the students’ thinking about Kara Walker’s art began to deepen and transform. They began to understand the artistic intent and the historical significance of some of the things referenced



in her work. In Nonie's class they studied historical racism referenced in Walker's work such as: antebellum South, *Uncle Tom's Cabin*, and *Gone with the Wind*, as well as more current social and scientific topics in race. She gave them opportunities to see how race played out in their own lives by having them tell their own race stories. Sharing their stories with one another gave them a more in-depth appreciation for each other as well as what they saw in Kara Walker's work. Excerpts from student notebooks expressed their reactions:

- "I knew what racism was and how it affected people...but I saw racism in a different way after going to the exhibit. I never realized how harsh and sexual and creepy it was. Well I did, I just never saw something like this, when it was big, and displayed on the wall like it was, it was so strong that now I understand a little more about the history of slavery and racism."
- "I used the stereotypes and things [in my work] that we use today about racism, and Kara Walker used the Stereotypes from way back, and it kind a came out to me as like present to past stereotypes in the world."
- "I know that the history of racism was bad, filled with anger, people killing each other and so on. But what I've learned is that it goes farther than what we know about it today. It kind a woke me up to the real world that was kind a been hidden from us."

Case Studies

Two students in particular stand out for us in the depth of their growth during this experience in class.

Valerie:

Valerie wanted to write, but not read her work out loud, and maybe not even write anything at all. She had a very personal reaction to Walker's work, and if she was to make art, it too would be personal. She was not sure she was prepared to take that step. It was a big risk for her. She drew support from her peers as well as us, her teachers.

Ultimately, Valerie decided to write a poem about rape, but the guest artists turned her off and she was not sure she wanted to move forward. Valerie had been "turned off" by Nonie several times in the beginning of the year, but they got through that. She had worked with Cecily the year before and already had a strong relationship with her. The guest artist who worked with the writers' group was there for only a short period of time and did not get to develop any rapport with the students.

Valerie sought out and spoke to both of us about her fears. She said she was worried about writing about rape, "because most people do not get it." After talking to her for awhile Nonie finally just

asked her, "Have you been raped?" She said yes, that she was very worried it might end up being too personal and not be something she wanted to share. Nonie encouraged her to write something and that once it was written she could decide if anyone else would get to see it. She said, "Maybe," and left. This happened on a Friday. She came back to school on Monday with a poem. In art class she, two others peers, and Cecily talked about whether or not Valerie would read her poem. Her friends said they would read it with her. The three of them then came to history class having worked out the speaking parts and performed it. It was incredible! They repeated that performance at the

IT WAS THE RELATIONSHIP THAT KENNY HAD WITH THE CURRICULUM, AND THE SAFETY OF THE GROUP THAT ALLOWED HIM TO EXPLORE THAT RELATIONSHIP, THAT SUPPORTED HIM TO SUCCEED AT SUCH A HIGH LEVEL.

Walker Art Museum.

For Valerie this class was all about the trust she was able to build in her relationships with her peers and her teachers. "The best part was getting to know my classmates in a way I didn't know them. It drew us together in a way I will not forget. Also, allowing Spano and Ms K to get to know us . . . things that most teachers wouldn't even try to see about us."

Kenny:

Kenny was what you might call the class clown. He was always more interested in being in the limelight than he was in true learning. In art class, he interrupted critiques and discussions with comments made to take the attention off of the person whose work we were looking at, and on to him. His projects were completed merely to achieve a passing grade so that he could stay on the football team. When we started this project, things changed. During the initial discussions after viewing the show at the Walker, Kenny was almost completely silent. He was definitely listening intently, but he wasn't commenting on what he saw. The old Kenny would have jumped in with a comment, even if he didn't believe what he was saying. It was as if he didn't trust himself at first, and had enough respect for the content that he didn't want to say anything. Eventually, Kenny began to understand the visual language of Kara Walker, and the historical background of what she was speaking about. He started to become more vocal in discussions, only now he really had something to say. Kenney was one of only four African American males in the class, and he began to understand how important his voice, his true authentic voice, was for the discussions.

There was a discussion in history class in which the students were discussing a quote by another African American artist who was critical of Walker's work. She cited Walker as writing, "All black



people want to be slaves just a little bit because it entitles them to heaping spoonfuls of self respect.” Kenny really latched on to this comment and refuted it with integrity. Many of the other students in the class were trying to interpret this comment for him, but he would not let go of it. He related what she said to his own experiences in the discussion. He kept saying, “You don’t understand. She is saying here I want to be a slave. I DON’T want to be a slave!” Cecily believes it was this discussion that prompted the art piece he eventually made for the show.

Kenny made a puzzle from 4’ x8’ pieces of pressboard for the response the students did at the Walker. The piece was interactive. The puzzle pieces were placed in different parts of the gallery. Participants were told to look for the pieces as they were viewing the show. At the end, the participants were asked to see if they could put the puzzle pieces together. On the one side was a recreation of one of Kara Walker’s pieces in which African American silhouettes are depicted as barely-dressed fun-loving slaves. Kenny really attached himself to this idea that there may be people out there who saw him as this type of person. On the back side he wrote words that he thought people may see in him, and indeed some of his teachers DID see in him: underachiever, dumb-jock, clown. However, he purposely hid a piece that was too difficult for the participants to find. On this piece he had written some of the positive words of things he began to show during the project: Leader (indeed, he often had up to six people working on his piece with him at various times during the collaboration), Learner (much of his project happened in stages as he began to discover things about himself, and who he is in society), Artist (with each realization about himself there was a visual aspect that was expressed in his piece). Kenny was describing these attributes that may be hidden to many people, but are also a large part of who he is. This piece was unveiled at the show after all of the other pieces had been found. Later at a football dinner in his honor, Kenny had a discussion with a curator from the Walker; his foster father expressed amazement at Kenny’s eloquence and confidence in discussing his own art.

It was the relationship that Kenny had with the curriculum, and the safety of the group that allowed him to explore that relationship, that supported him to succeed at such a high level. Kara Walker’s work and the discussions we had about race caused him to see a reflection of himself that he could choose to accept or deny.

Conclusion

This group of kids became different people during the Walker project. Sustaining this type of teaching, however, is no easy feat, and we both felt like we could not top the Kara Project for the rest of the year. We had opened the door to student engagement and now we suffered the consequences: we had monsters on our hands.

The students were very aware that they had done something special, so that everything else that we tried to do with them, the regular

school stuff, didn’t seem worthy of their time. Some students remained engaged, because they learned that being fully engaged in their work was more rewarding than not, but others, such as Kenny, went back to the old way of operating. He asked to go the bathroom and wouldn’t come back for 20 minutes. In art, he did barely passable projects. In many respects, things were very much the same as they were before we began the collaboration. The only difference was that they knew--and we knew--that they could be different. There were knowing glances, and apologies for not working to their potential: “Sorry Ms. Spano, but it’s the end of the year, and you know I’d rather be in the gym than work on this drawing thing.”

This type of pedagogy takes an enormous amount of intensity and energy, and it cannot be sustained with all students, all year. We were tired, and “regular school” wasn’t enough to wake us up. This work left us with many questions. Should education always be this engaging? Are traditional public schools organized in a way that can tolerate this level of engagement? How can a high level of emotional and intellectual engagement be sustained?

We have no answers to these questions, but we do feel that these students are better for the experience. We just recently watched an overwhelming number of these students graduate. In their senior year, they stayed together as a group and were supportive of each other. Many of them took higher level Advanced Placement and International Baccalaureate courses for their social studies and art courses senior year. Many would check in with us during the day. They felt they had created a family at Southwest, and through this family, they were able to find the emotional hook to allow them to make it through a system that cares more about their GPA than personal experiences and life lessons. ❏

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TEACHERS CREATING AN ATMOSPHERE OF ACHIEVEMENT



Anna Beal, Torrey Lau and Natalie Rasmussen

The Context: In an article published in the February 2007 issue of the Mpls. St. Paul Magazine, Councilman Don Samuels, who represents the North side of Minneapolis, was quoted as saying:

My children will not darken the door of a Minneapolis public school in this city at this time under these conditions. I've said burn North High School down! I can't be paying as a taxpayer for the education of my neighbors and 72 percent of them are failing—meaning black boys. Something worse than vouchers could come along. If it works, if it sacrifices the entire school system, fine! Get rid of the damn thing! It hasn't worked!

While this type of incendiary rhetoric offended the North High School community, it certainly did not surprise us. Unfortunately, we are all too used to being the scapegoat for all of the North-side ills. Not only were Councilman Samuel's comments incorrect, they served to fuel a fire that has burned against public education, particularly in North Minneapolis. These false statistics are what remains in society's mind and conjures up visions of knifings in restrooms and gang wars in school corridors. Actually, the war that we wage at North High School is the one against negative public perception. This is not a new phenomenon. North High has had to deal with this stereotype for decades. We, as North High staff, find this labeling unfair and inaccurate. We realize that the only way to change public perception is to invite the public in to see firsthand the amazing things that occur on a daily basis. We know this to be true because anyone who has ever visited our classes has commented on what a pleasant surprise the school turned out to be. The typical response is "Wow! This was not what I was expecting." We, as teachers, wanted explore the possible reasons for this negative public perception and what we could do to change it.

On the outside, North High School is not very different from any other 9-12 inner-city school. The student population is predominately African American (69%) with the next largest population

being Hmong (23%) with a small population of Caucasian (3%), Hispanic (3%) and Native American (1%). Eighty-two percent of North's population is eligible to receive free or reduced lunch - a national indicator of poverty. Currently, 22% of our students receive special education services. North has three Small Learning Communities or SLCs: Summatech, ITECC, and Arts and Media. Summatech emphasizes math and science. ITECC focuses on informational technology, engineering, computers and construction. Arts & Media concentrates on visual and fine arts, dance, music, radio and television production and broadcasting. North also offers eight Advanced Placement courses. In the past five years, the school has seen a sharp increase in the numbers of students choosing to take AP courses. While this trend is encouraging, the number of students earning a passing score of 3 or better out of a possible 5 has been less than optimal. These results look even less impressive in light of the stellar AP scores of neighboring, predominately white suburban schools.

Who We Are

We are science teachers committed to urban public education. At the time of this study, Anna Beal taught AP and pre-AP Biology courses and had taught at North for six years. Torrey Lau taught the Summatech Honors Biology classes and was also at North for six years. Natalie Rasmussen taught chemistry and AP Chemistry and has been at North for eighteen years.

We are not only teachers, but we also are advisors in many school activities such as National Honor Society, Senior Board, Student Council, Science Club, after school credit re-

NO ONE WOULD EXPECT TO RUN A 26-MILE MARATHON WITHOUT EVER HAVING TRAINED FOR IT. BUT SOMEHOW WE EXPECT STUDENTS TO KNOW HOW TO WORK HARD AT THEIR STUDIES WITHOUT BEING TRAINED TO DO SO.

covery (ALC), and coaching softball and volleyball. We also run tutoring programs for students after school and on weekends. We are highly committed to North High and to the students in our building. As a result of our interactions with our students outside of the classroom, we have had the opportunity to gain a more holistic perspective.

While the authors find teaching at North a rewarding experience, we do realize that the school regularly receives unfair negative publicity due to unfortunate events in the surrounding community. The community is fraught with many of the issues

that one would expect from any inner city. North Minneapolis is frequently in the news because of crime and violence. Negative Northside issues are often attributed to North High even though these unfortunate events do not involve our students, staff or alumni. We fail to understand this association; when there are negative or violent issues on the south side of the city, South High School is not implicated. Major colleges and universities in the area send us student teachers that come pre-programmed to fear the building and its students. When asked where we work, most North staff have to endure questions and comments such as "Isn't that a rough school?" and "Wow! I could never deal with those kinds of kids."

This type of attention creates an atmosphere of resigned defeat in our school. When our test results and student achievement are compared to wealthy, predominately Caucasian, suburban schools, we come up sorely lacking. As a result, many of the teachers (and students) have developed a chip on our shoulders. We have become very defensive about our students and school. We, as a staff, are tired of being inundated with negative propaganda. It seems as though no matter how hard we work, it won't matter because we are expected to fail. We rarely are recognized for all the positive things that we accomplish. We have students who come to us at an elementary school reading or math level or who are newcomers to the United States and are English Language Learners. We have been able to help them raise their test scores from an elementary to a middle school level—a gain of the equivalent of four years. While this is an incredible achievement, these students have not technically passed state tests and are therefore considered not having made adequate yearly progress according to the federal No Child Left Behind Act. We are compared to suburban schools that routinely score at a 93% and then raise their test score to a 94%. Based on this type of data, which school is doing the better job of educating?

The Power of Negative Thinking

It is only natural for teachers and students who constantly see low test scores published in the paper and hear hurtful and often ill-informed comments made by public officials, such as the well publicized comments by councilman Don Samuels, to start to believe the hype. We internalized the bad reports and started to see our students as deficient. Even if we are too professional to ever utter the words to them, we subconsciously project silent attitudes that speak volumes. Many teachers share a common lunch period in which we frequently bemoan the poor attitudes and work ethic of our students. Although it is awful to say, we were embarrassed by our students' performance

and the negative attention we received. We compared our kids to what we knew other teens were accomplishing and forgot the wonderful strides our kids were making. We complained about their lack of motivation and poor study skills. We beat ourselves up about why we couldn't seem to motivate our kids to produce stellar results that would be recognized by the media. By the end of our lunch period we were exhausted by the negative energy we had created. We would then go into our afternoon classes and silently spew it on them, only to have students recycle this energy in the form of apathy, poor performance and lack of self-confidence.

We recognized that there was a problem but we didn't have an answer. The authors discovered that we each had serendipitously and independently realized that we must do something more positive in and of ourselves to effect change

BY THE END OF OUR LUNCH PERIOD WE WERE EXHAUSTED BY THE NEGATIVE ENERGY WE HAD CREATED.

in our students. We happened to mention the discovery to each other one day during lunch and we felt that we had come across a possible solution.

Where Do We Go From Here?

We realized that we were purveyors of a self-fulfilling prophecy. We had certain expectations of our students and they fulfilled them. We realized that the problem resided not in the students but in us as educators. We began to understand that we were the thermostats that set the climate in our classrooms. We realized that if someone thought less of us, however silently, we were still thought less of. We needed to change the way we thought about and communicated with our students.

Our lunch conversations began to change from complaining sessions to strategizing sessions. How could we as teachers change the atmosphere from one of apathy and failure to one of achievement and positive behaviors? Much of our previous complaining had been centered on what we perceived as our students' lack of effort, inferior talent, and poor attitudes. We decided to survey our students as to their perception of these three traits and their impact on learning.

What Students Said

In order to better understand their perceptions, we developed a 27-question survey that asked about our students'

science educational experiences in and out of the classroom. When we looked at the major reasons our students were failing, we agreed it was because they either frequently skipped class or didn't turn in work. While this spoke to the failures, we wanted to understand the students who were passing but not reaching their potential. We administered this survey to our AP and Honors classes because we wanted to hear from the students who had intentionally chosen rigorous classes.

During the analysis of the survey results, three pertinent themes emerged, centered on student perceptions of effort, talent and attitude. Our students' answers and honesty surprised us. The following is a brief summary of our findings:

- Students felt that they had the intellectual capability for the class
- Students admitted lack of preparation was the cause of poor performance
- Students attributed academic success to study rather than natural talent
- Students' attitudes about science classes depended on how they felt about their teacher
- Students reported liking science class even if they did not perform well
- Students said that they realized what was required to earn good grades
- Students said that they and their families saw the value and importance of having an education

Clearly our students knew, at least intellectually, what was needed to be academically successful. They knew that they needed to work harder in order to reach their goals. It became apparent to us that many of our students had been deceived by well meaning teachers into thinking that they were good students because they had been awarded high marks for mediocre work. This type of message, however well intentioned, defeated the purpose of effort. These students were robbed of the dignity that resulted from a job well done. In the comment section of the survey, many students were brutally honest in their responses. Some stated that they passed middle school science classes while doing very little work. Others admitted to frequent cheating or copying. Still others who said that they failed middle school science didn't think it was a big deal because they knew that they would be passed along to high school regardless of their performance.

Learning takes time and practice. Learning to work hard is no exception. Everyone knows that a marathon involves running. No one would expect to run a 26-mile marathon without ever having trained for it. But somehow we expect students to know how to work hard at their studies without being trained to do so. We began to teach our students not only science but



also the skills and attitudes needed to improve their work ethic. Our students knew that they should devote more time to their studies but when they became bored or discouraged, they lacked the motivation to keep them engaged in their work. The kids who experienced success knew that it came from their efforts rather than their talent.

We believe that effort-based learning is the answer to closing the achievement gap and leveling the playing field. Lauren Resnick (1995), founder and director of the Institute for Learning at the University of Pittsburgh, outlined five essential features of an effort-oriented education system: 1) clear expectations for achievement, well understood by everyone; 2) fair and credible evaluations of achievement; 3) celebration and payoff for success; 4) as much time as is necessary to meet learning expectations; and 5) expert instruction. We made deliberate, ongoing efforts to provide these five features for our students.

We knew that if our students felt positive about their prospects and actually put forth the necessary effort, there would be no reason for them not to succeed. The question remained then, why were they not doing so? Could it be their response to our tacit disapproval? Had we as teachers so fouled the atmosphere of learning that the students were unable to perform to the best of their abilities? Were the students somehow mirroring our expectations? We knew that there was nothing we could do about the students' families of origin or financial situations but we could change the way we interacted with our students. We began to be intentional about positive speech, purposeful actions and intrinsic rewards.

A New Attitude

We had frank conversations with our students about producing rigorous, high quality work. Most of our students admitted to not putting forth the necessary effort required to do quality work. We started to focus our attention on students demonstrating effort. These students received the lion's share of our attention and accolades. We were not as concerned with grades as we were with their work ethic. We used the following strategies:

- We avoided any negative speech
- We prohibited negative speech from our students
- We required that students say positive affirmations before each test
- We consistently praised effort and ignored students that were off task
- We avoided using insincere or non-specific praise
- We publicly praised students showing an improvement in their efforts

This approach proved to be successful. We realized that it was not about being punitive in nature, but rather using constructive criticism aimed at cultivating a stronger work ethic. As we became more reflective about our role as creators of a positive atmosphere, our students became more reflective about their work as well. As the year progressed, we challenged our students with increased rigor and raised expectations. Many of our students accepted our challenge. By the end of the year, we had students owning their learning and efforts. They admitted when they worked hard and when they didn't. We as teachers admitted when we were positive and when we were not. The atmosphere that we created in our classrooms was conducive to honest dialog and self-assessment. Reflection and ownership are the beginning of academic success. A mutual commitment to effort and positive expectations from both parties is what is needed for lasting change in learning and achievement.

What Next?

After further reflection on our practices, we found that small but powerful changes in our interaction with students had a profound effect on the climate of our classrooms. Students and teachers usually have little (or no) control over the state of educational policies and initiatives, but we do have control over what happens in our classrooms. Positive words and empowering behavior helped our students realize some of their academic and personal goals. There were fewer missing assignments, the quality of work improved, and when students did not perform to their abilities, they attributed their poor grade to a lack of effort rather than making excuses.

We think that the best way to improve student performance is to make a concerted effort to recognize and celebrate increased effort while simultaneously and incrementally requiring more of our students. It is a bit like the proverbial boiling frog: if you put a frog in boiling water, it will immediately try to jump out. But if you put the frog in comfortable water and then gradually turn up the heat, it will stay in the water until it boils. Our students expressed a certain amount of fear and trepidation concerning taking an upper level science class – routinely known as science anxiety. This anxiety will sometimes manifest itself in kids dropping or choosing not to take the more rigorous science courses or, even worse, kids shutting down and choosing to do nothing while in the class. Once we welcomed them and maintained an inviting and positive atmosphere while routinely raising the bar, our students performed much better than they had previously. Even though focused on our AP and Honors classes for our data, we employed the same strategies in all of our classes. The increased number of general science



students opting to register for AP and Honors classes for the following year particularly surprised us. Perhaps these students were motivated by the changes they saw in themselves as a result of a better atmosphere.

As any teacher can attest, there are times when we become frustrated with our students. We may feel that they are lazy and unmotivated. However, we must never let ourselves come to the point where we become jaded and expect less of our students. We as educators must consistently check our respective climates. Are we speaking life or death to our students? Are we creating an atmosphere of hope and high achievement?

The educational system must realize that despite their apparent resistance, our students want to be challenged and held to high standards. Making things easier on students in hopes of reporting higher grades or raising graduation rates has done the exact opposite. It is only through effort and hope that any of us weather the difficult times. We as educators need to create an atmosphere of academic hope that will enable our students to be resilient and persistent in their pursuits. We think that a quote from Haim Ginott (2003) sums it up:

I've come to a frightening conclusion that I am the decisive element in the classroom. It's my personal approach that creates the climate. It's my daily mood that makes the weather. As a teacher, I possess a tremendous power to make a child's life miserable or joyous. I can be a tool of torture or an instrument of inspiration. I can humiliate or humor, hurt or heal. In all situations it is my response that decides whether a crisis will be escalated or de-escalated, and a child humanized or de-humanized. ❏

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UNDERSTANDING BY DESIGN (UBD): A MATH TEACHER'S BALANCING ACT



Laura Myers

“**I**f we get rid of IMP (Interactive Mathematics Program) I am getting out of Minneapolis!”
“There is no way I am going to teach IMP or anything like it!”
“I am not going back to drill and kill!”

As in most disciplines, mathematics curriculum is not without controversy. In the Minneapolis district, this conflict was verging on an all-out math war. It has always bothered me; I don't like to see my friends and colleagues fight over what math curriculum we teach. For me, the question was not only which curriculum the teachers prefer, but which one actually helps students better understand math?

Understanding by Design

Following the district's adoption of a more traditional math curriculum, my building's staff development focus for 2006-2007 was for departments to design and implement an Understanding by Design unit (UbD). Understanding by Design is “an approach to curriculum and instruction designed to engage students in inquiry, promote transfer of learning, provide a conceptual framework for helping students make sense of discrete facts and skills, and uncover the big ideas of content” (Wiggins & McTighe, 2005, p.4). Teachers look at their methods, reflect on areas of students' misunderstandings, and then design their unit backwards. This means teachers start with the assessment task aligned with their course or content standards and then outline their unit to teach the understanding that students need to successfully complete the assessment task.

I am a math teacher at Roosevelt High School in Minneapolis. I have also taught at Edison High School and Washburn High School in Minneapolis. The process of designing a UbD unit reminded me of the Interactive Mathematics Program (IMP). Minneapolis schools chose the IMP reform math curriculum in 1994. Most Minneapolis high schools have taught a mix of individual reform and traditional math courses since then. A few high schools chose to offer only the IMP curriculum.

IMP units are taught over nearly a two-month time period. Our UbD unit, however, was to last a

week or two including assessment time. IMP units are taught around a central problem or big idea like UbD units are designed to do. The IMP curriculum is currently being phased out in our district in favor of one district-wide curriculum that I consider a compromise to an all reform curriculum, like IMP, or an all traditional math curriculum. The curriculum series chosen by the district was the “Discovering, Algebra, Geometry, and Advanced Algebra” by Key Curriculum Press, publisher also of the IMP series of high school math curriculum. I find this new series offers the teacher a choice of teaching certain math concepts and skills in a more traditional manner or around a more reform math teaching approach.

Reform and Traditional Math Curriculum and Instruction

In 1989 the National Council of Teachers of Mathematics published a list of standards to influence new math curriculum projects. These new reform curriculum guidelines included integrated curriculum, extensive use of calculators, de-emphasis on basic arithmetic, emphasis on statistics and discrete mathematics, emphasis on problem solving, and support for the concept that students must construct their own knowledge in order to learn, a constructivist approach. By contrast, the traditional curriculum is best described as the way we were taught math in school with emphasis on skills and procedures.

If you were to walk in a reform mathematics classroom, you would see heavy use of calculators, particularly graphing calculators. You might hear more questioning and discussion about the math or the problem that’s being solved. You may see students grouped together rather than in traditional rows of desks. And you may see students struggling, trying all sorts of methods to get at an answer. In fact, you may never see the teacher teach the “right” way to solve a problem as we were used to back in the day.

There are other differences between traditional and reform curriculum that one would not see on a quick visit to a math class. Reform curriculum now includes probability and statistics that may not even be in traditional texts. Students in reform classrooms may all be at different math ability levels. Therefore, many methods of instruction are used to reach all the students. This differentiated instruction in reform classrooms is designed to have students think and understand concepts, not just learn one correct way to do a problem as in the traditional classroom.

Another way to describe a reform classroom is one where students gain conceptual understanding through group work. The reform curriculum is constructivist in nature; making math connections between concepts is stressed. The traditional curriculum is aligned to MCA-II and ACT testing. It is considered to be geared toward college bound students. Traditional curriculum includes more algebra skills and procedures than the reform curriculum incorporates.

The Math Pendulum

Researching the history of math curriculum in the United States, I found that the pendulum has swung back and

WHAT WOULD A COMBINED CURRICULUM MEAN TO A TEACHER, TO THE STUDENTS AND THEIR MATHEMATICAL GROWTH?

forth between traditional and reform curriculum for decades. (See Figure 1) One important thing to note is that, over time, we have never been in the middle between traditional and reform curriculum. It would seem the middle would be a point of compromise between both of these approaches. That gave me an idea. Teaching math curriculum with a blend or balance of traditional and reform methods could be a possible best solution to math education and end the back and forth swing of methods and ideology. And the new math curriculum series adopted by the district contains ideas for math concepts and skills with both reform and traditional teachers in mind.

“But what would a blended math classroom look like?” I wondered. “What would a combined curriculum mean to a teacher, to the students and their mathematical growth?” I personally miss the IMP curriculum and its teaching methods. But at the same time I am concerned that my students have the knowledge and practice to succeed on high stake assessments. I also wondered whether a blend could cool the math methods divisions in our district’s corps of math teachers.

However, with a new textbook/curriculum in all our math classes, doing a whole IMP unit would take up too much time. Could designing a two-week long UbD unit using a more reform-minded approach supplement the traditional format in the text for concepts that are best taught from a “big idea” approach? Would teaching that UbD unit show a rise in student achievement and understanding?

The Unit

I remembered a stand-alone unit put out by Key Curriculum Press, the IMP people, called “Baker’s Choice,” a 3-4



"Swings" in American Mathematics Education

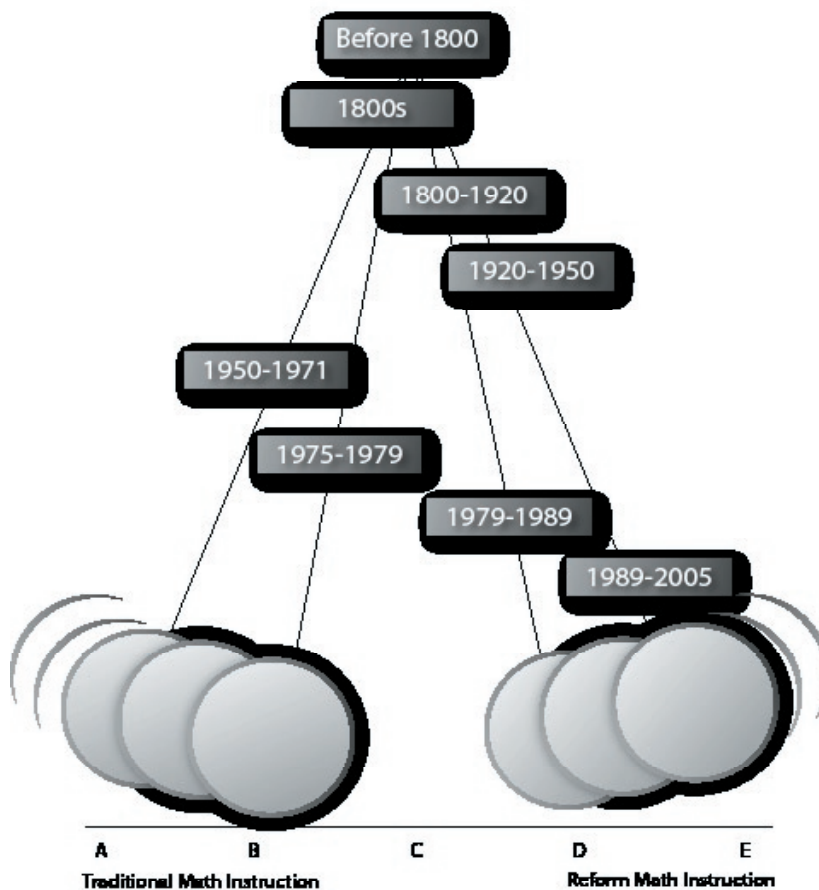


Figure 1: Historical Changes in Favored Math Approach

week unit on linear programming. In general, a linear programming problem is a problem whose goal is to minimize or maximize a linear expression in certain variables, subject to a set of constraints. These constraints are linear inequalities or equations involving those variables. Such problems occur constantly in everyday business settings. The linear programming problems that students deal with in this unit involve only two variables and only a small number of constraints. The unit problem or big idea focuses on helping a baker discover how many of each kind of cookies to bake each day to maximize the bakery's profit. The constraints have to do with limited cookie dough, icing, oven space and time the baker has each day.

Linear programming is a math concept that is also included in the state standards and assessed on the Minnesota Comprehensive Assessment II for math. This concept and skill needs to be covered in advanced algebra, the third required year of high school math. Looking at our new text, I saw that only 2 sections of a chapter were devoted to linear programming. I know from experience that this is a hard concept for students to learn. I did not think that 2-3 days were going to be enough to teach this concept well. I had used the Baker's Choice drop in unit years ago in an advanced algebra

class with great success. So my study group of math teachers decided to go with this idea and create an UbD unit tied to linear programming.

Design Expectations

Our school had a district curriculum specialist from the social studies department come out to help us get started designing UbD units. The social studies department has set up resources on their web site for learning about Understanding by Design or UbD (I have included the address to this site in the bibliography.) There are many forms or templates to choose from for organizing the designing of an UbD unit. Our study group was having trouble giving up 3-4 weeks that it would take to cover the Baker's Choice unit versus what the text covered in 2-3 days. We knew we needed more than 3 days, but 4 weeks was going to be too much time. We decided to condense the time line of the original Baker's Choice unit. Using some of the UbD planning forms, we designed and redesigned the Baker's Choice unit into a shorter UbD unit.

I wanted my inquiry on the impact of the UbD unit to go further than just trying it out. I wanted to see if the reform approach to teaching this concept of linear programming was better than the traditional approach found in the new text and curriculum in terms of student understanding of linear pro-
PROFESSIONALISM IN PRACTICE



gramming. First, I had my students in two advanced algebra classes take the pretest on a linear-programming problem. I then taught my students from the text, using a traditional approach. This took three days. They had the posttest problem as part of their chapter test. Third, my students then went through the UbD unit. With the post assessment, the unit lasted 2 weeks. I used the same problem on the pretest and posttests for both the newly created UbD unit and for testing using the traditional approach from the text. Only the numbers were changed in the problem from the pretest to both posttests.

The first day in the UbD unit, Baker's Choice, students were introduced to the unit problem, the baker's dilemma of how many of each kind of cookie to make. Students read the story in their groups and then came up with possible solutions. This was a way to get all students involved right away because they were just guessing at different combinations to see how much money they made with each guess. On day 2, students worked on graphing linear equalities and shading solutions. Days three, four and five had groups working on writing linear inequalities and then graphing them. The inequalities came from short story situations. Students got to see from their graphs how the right maximums or best profits in these stories were being found. Students soon discovered they could find the solutions quickly on their graphs. I then led them to find these same solutions without graphing but by using algebra. Day six, students had a formative assessment of yet another short story problem. This time they were asked to try this problem on their own. Students still had access to graph paper and colored pencils if they wished to solve the problem that way first. Day seven and eight, students worked on the unit problem in their groups. Student presentations of their group's solution were on day nine followed by a unit summary given by the teacher. Presentations included each group's stand alone posters and their verbal description of how they solved the problem. Day ten was their individual summative assessment, the same problem that they had seen in their pretest with different numbers in the same constraints.

During this unit, there was less lecture; students primarily worked in their groups. I would walk about listening to students questioning each other and helping each other complete their tasks. The big moment for me is when students see the maximum on the graph and quickly sum up the procedure for solving these linear programming problems in their own words. Students were discovering the connections from the graphs to the situations presented in the problems. They were seeing the math have a real connection in the

world. If it weren't for the time spent on letting students process this connection on graph paper, just having them do the algebra would be meaningless. From experience many of my students still need this time even in their third year of high school math.

The Results

Sixty students were tested. I used a rubric score of 0 to 5 to grade the pretest, textbook unit posttest and UbD posttest. Because nearly half my students in all classes are English Language Learners (ELL) and their learning is a big concern for me, I decided to disaggregate my data between ELL and my other students. I had thirty-nine ELL students and 21 non-ELL students. From this data the slight differences between the two student groups are of little significance. Since the rubric scores went up after the pretest and the scores were even higher after the UbD unit, I feel I had success using the Baker's Choice unit in terms of student understanding of linear programming

Student's Perception of the Two Approaches

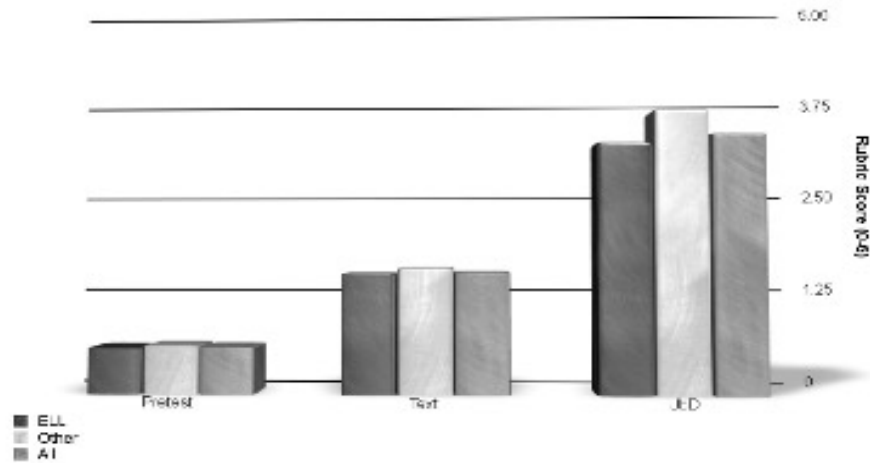
Although I was pleased with this result, I realized the test scores were just one piece of the puzzle. I wondered which approach was more motivating to students, so I surveyed my students in these two classes to see which teaching method and curriculum method they preferred. I used a 14-question survey but have selected just a few statements from the survey to highlight here. In my survey, students rated a statement as Usually, Sometimes, or Rarely. They were asked to rate the same statement as it related to the text book learning and then the Baker's Choice learning experience. I gave the Usually, Sometimes or Rarely scores of 3, 2, and 1 respectively. I then reported the difference between students' score of the textbook unit and their score of the Baker's Choice unit in the table. Forty-two students took the survey; thirty-one were ELL students and eleven were non-ELL students.

Statement two, "I solved the problems accurately," showed my non-ELL students felt they had a better success during the UbD Baker's Choice unit than the ELL students, but both groups reported more success with the UbD unit. Statement eleven, "I learned the concepts using this approach," showed that my ELL students reported they felt they learned better with the UbD unit. Non-ELL students found the units about the same.

Looking at Statement 4, "I worked well with my table group," my non-ELL students did not prefer the UbD unit, while ELL students preferred it slightly over the textbook



Summative Scores for Action Research on Linear Programming



unit.

Statement 9, “I am confident of being able to solve problems similar to those solved in this unit,” my non-ELL students did not prefer the UbD unit, and seemed to feel more confident with the traditional approach used in the textbook. The difference in my non-ELL students’ opinion about being able to solve the problems better during the UbD unit and their lack of confidence in their ability to solve similar problems after the UbD unit is bothersome. If they did better, why do they think they are now less able to repeat their success on similar problems after learning with the UbD unit?

I also had asked my students what they felt were the reasons for doing better using the Baker’s Choice unit. One ELL student wrote, “It’s easier and gives you a better visual on how to solve the problems.” Most of my ELL students’ statements shared that sentiment. Even my non-ELL students had the same opinion: the Baker’s Choice unit made more sense.

My students knew that the Baker’s Choice unit had been a revised and shortened IMP unit. Since they had clearly found success with the UbD unit, I asked students why IMP was not their math selection in ninth grade. One ELL student wrote, “My 8th grade teacher said algebra was better for me. It (IMP) doesn’t explain how to do the problems really well.”

Another student said, “Because [IMP] doesn’t prepare you for college.” My non-ELL students concurred. “IMP was not a really good math program.” And, “My mom said it was too easy.” I had one student that said the UbD unit made the math concepts more understandable, but it was his mom who said IMP was too easy!

It is interesting to see how the partial knowledge of parents and students about the two curriculums, reform and traditional, affected students’ choices back in 8th and 9th grade. It is also interesting to see how my students view the different teaching methods even now after they showed success using the reform, IMP-like, UbD unit. This just leads to more questions about why the people of influence in a child’s life, like counselors and parents, have these negative perceptions of reform curriculum, even though teachers like me have data both quantitative and qualitative showing student success in understanding and higher achievement scores using the reform approach.

Reflection

Christian Hirsch states in the introduction of *Perspectives on the Design and Development of School Mathematics Curricula* (2007) that mathematics curriculum materials are a strong determinant of what students have the opportunity to learn and what they do learn. Textbooks have been synonymous with curriculum in the math classroom for decades. Textbooks are where teachers and students go everyday to teach and learn math. Many in mathematic circles know that changing the textbook is the best way to change the curriculum in math classes.

So the question now is if the reform curriculum, IMP, is really

Statement	ELL difference between approaches	Non-ELL difference between approaches
2. I solved the problems accurately	0.13	0.35
11. I learned the concepts using this approach	0.35	0.03
4. I worked well with my table group	0.07	-0.17
9. I am confident of being able to solve problems similar to those solved in this unit	0.05	-0.23




the best solution for my math classes Sherry Fraser, one of the authors of the IMP curriculum, thinks that mathematics curriculum is a vehicle to create change in the mathematics classroom (2007). But the curriculum is only one piece of the effort. Alone, it is not enough. IMP has ongoing professional development regionally and locally in large districts, which teachers find extremely important. But barriers to IMP are the belief by many players (teachers, administrators, parents, and state politicians) that this curriculum would not work in mixed ability math classrooms. They feel IMP should be for low-level math students and not for the college bound. Therefore, many students were steered to the traditional track. Another problem with IMP was the time and money for all the continuing development for teachers. All of these factors impacted the decision to drop IMP here in Minneapolis.

So if the all reform curriculum, IMP, is too costly and out of favor, should another reform curriculum be the solution? But wait- let's go back to the pendulum. What about a balance between reform and traditional math curriculum? That has never been tried in Minneapolis. Could the differentiation in mathematics instruction found in reform curriculum blend with the mastery of arithmetic and algebra skills necessary to pass state assessments, college placement tests and college entrance exams? Is there a balance to be found? McTighe & Brown (2005) answer the question as to whether differentiation and standards can coexist. They contend that all educators should understand their content standards and be proficient in designing and implementing balanced instructional strategies and assessment approaches, in order to maximize student achievement while accommodating individual students.

From my study using a UbD unit to guide students in understanding a difficult concept instead of following the text to teach my students this concept, I am a believer that a balance between the all reform and all traditional curriculum can be found. Using the method of designing small units in place of some of the textbook content can be an answer to the math wars. Understanding by Design can give the reform-minded math teacher a tool to use those "reform" techniques and curriculum changes to replace a traditional format in our current math text, in order to present the material in a manner and sequence that reform teachers know works best for their students. Understanding by Design is an excellent approach and guide to create units that will increase student understanding and in turn their assessment results.

Since I am convinced that a blend of instructional methods and available math curriculum would work better for my students in my classroom, I have used this unit again in 2007-2008 instead of the text for teaching the linear programming concept. I have also created another UbD unit, using another shortened IMP unit on quadratics to better teach and guide students to understanding this function family and its applications in our real world.

My hope in presenting this information and data is that other math teachers can consider a blend of methods for their classrooms. I do not like the division among our district math teachers and the bitterness over the change in curriculum. I believe a balance of teaching and curriculum choices will benefit all our students. I think having our students understand the math is just as important as mastery of algebraic skills and passing state and national assessments.

View our math teaching as a clear canning jar filled with layers of ingredients for chocolate chip cookies. We teach our subject concept-by-concept, layer-by-layer. We know how all the concepts blend together. But will our students? If we only teach layers and assume students get the connections, many will never get the cookie, the big idea, the big picture--the understanding. I want my students to get the cookie. Let's sign a peace treaty and stop the math wars. 

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