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Digital Tools in Urban Schools

Mahiri, Jabari

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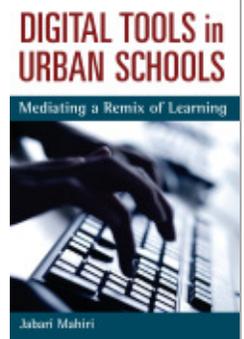
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Ms. Foster's use of digital media for learning in her journalism class reflected her developing competencies to design and implement instruction in new ways. In addition to efforts of teachers, administrators, parents, and community members to create a culture of caring at V-Tech, students also needed to be engaged in a range of dynamic learning activities guided by principles of effective teaching. As illustrated in chapter 2, Ms. Foster's use of technology was ultimately in the service of more comprehensive goals for academic and social development of her students. Importantly, she was also instrumental in the development of her fellow teachers, through her willingness to try and share new things she was learning both in conjunction with the TEACH Project and via her connections to Youth Radio. In the recursive process of learning to use a variety of digital tools, for example, Ms. Foster readily volunteered her teaching experiences for review and critique regarding both the possibilities and problems that were encountered in her journalism and Spanish classes. Other teachers eventually became comfortable following Ms. Foster's lead, experimenting with new approaches to teaching using various digital tools they had learned about in professional development as well as sharing their experiences with the other teachers in subsequent sessions.

A process of teachers learning from teachers was central to our approach to professional development in the school. We agreed with Stigler and Hiebert (1999) that for teachers to significantly improve their practices, more professional opportunities were needed for them to learn on the job with and from each other. For this to happen, however, teachers needed significant time and systematic support to work and learn together. The principal committed substantial blocks of time by scheduling 90-minute PD sessions approximately every other week, and the TEACH Project provided a structured program of both guidance and support. A key aspect of the program was to focus on the actual curricu-

lar work and pedagogical challenges occurring in the participants' classrooms. Another key aspect was to structure the learning of the teachers in the PD sessions in ways that modeled approaches they could use with students in their classrooms. The project's focus was larger than just informing teachers about instructional uses of digital tools; it was also focused on helping the teachers develop a common vision and language framed by effective principles of teaching and learning as well as an understanding of how these principles could be powerfully enacted with appropriate digital tools.

From this perspective, knowledge and skill with technology are only part of what is needed for effective instruction. In my work with educators across the country, it became important to emphasize the need for teachers to continually develop four types of knowledge and associated skills: disciplinary knowledge (and proficiency with methods for creating, accessing, and synthesizing knowledge in specific disciplines); cultural knowledge (and understanding of the cultural logics that underlie situated social practices and meaning making); technological knowledge (and skills to operate and appropriate technological tools for instruction); and pedagogical knowledge (including understanding sociocultural theories of learning as well as strategies to incorporate the other three kinds of knowledge to achieve desired learning experiences and outcomes). These four areas of knowledge are intricately intertwined in teaching practices, and deliberate instructional designs for their deployment determine the quality of students' learning. The effectiveness of these instructional designs is determined by the quality of teachers' learning.

This chapter describes V-Tech teachers learning to expand their pedagogical perspectives and strategies through developing knowledge and skills in the use of digital media to more effectively incorporate the backgrounds and experiences of their students into academic learning. I begin this discussion with an example of one teacher's use of Google Earth in his math class, to illustrate the intricate connections between disciplinary, cultural, technological, and pedagogical knowledge as well as connections to CREDE standards. After that, I describe how we used the PD sessions throughout the school year to continue developing relationships and methods of professional collaboration that facilitated acquiring the teaching perspectives, strategies, and skills to more effectively mediate student learning.

MATH ON GOOGLE EARTH

One PD workshop in the spring of 2008 focused on teachers exploring Google Earth with its extensive maps, satellite images, and other tools that let users “fly” anywhere on earth to view the geography and architecture of selected sites. Mr. Guy, the math teacher, immediately saw ways to utilize this web-based tool in his class and began designing a project to develop his students’ understanding of the tangent function in trigonometry. The tangent, sine, and cosine are fundamental trigonometric functions that describe relationships between the sides and angles of triangles. For a given angle in a right-angled triangle, the tangent is the trigonometric function equal to the length of the side opposite the angle, divided by the length of the adjacent side. In figure 1, $\tan A = \text{opposite}/\text{adjacent}$, or a/b . This figure is useful in visualizing the particular way that Mr. Guy’s math project helped his students have a more tangible and meaningful experience in learning the tangent function. Essentially, the project he designed challenged his students to use Google Earth and trigonometry to calculate the height of prominent objects near their school and in their world.

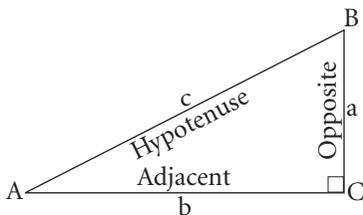


Fig. 1. Triangle

The math project had four phases that took place over two days: priming activities in the classroom to review and practice sine, cosine, and tangent functions; working in the school’s computer lab to learn to use the various tools on the Google Earth website; going outside on the street to physically measure angles of prominent objects; and going back into the computer lab and then to the classroom to work on calculations to determine the height of selected objects. In the priming phase, the students reviewed concepts and problems that they had worked on with sine, cosine, and tangent functions from the past week. They had considerable background knowledge before they did the Google Earth lab project, but Mr. Guy said that he wanted to make trigonometry more

immediate and personal for them by providing real-world applications and challenges.

When the students went into the computer lab for the second phase of the project, Mr. Guy gave them a lab assignment sheet that walked them through all the steps of moving around on Google Earth and using the various tools to establish and fly to coordinates, to zoom in and out on objects and sites, and to measure distances between selected coordinates. Initially, the assignment sheet directed them to nearby familiar sites; then it gave them sites and objects to find and fly to all over the world, like the Great Pyramids of Egypt and the Great Wall of China. “They played around a lot,” Mr. Guy told me in an interview about the project. “Sometimes it was hard to keep them on point with the assignment because they would want to go to their friends’ houses in the neighborhood or go see a nearby mall.”

The last step on the computer lab assignment sheet was for the students to consider how they could use Google Earth and trigonometry to calculate the height of the flagpole on V-Tech’s campus. Most of the students were able to see that the “opposite” side of a triangle like the one depicted in figure 1 could represent the flagpole and that Google Earth could be used to mark and then determine a distance for the “adjacent” side. Consequently, it was clear that if the angle at “tangent A” could be determined, they would have the values needed to use the tangent function to calculate the height of the flagpole. When they reached this stage in their reasoning, Mr. Guy showed them an altimeter and explained how it could be used to determine the tangent A angle. Afterward, he took the class outside to actually use the altimeter to get the angles for selected objects to use for their calculations of the objects’ heights. One technical note is that the altimeter could also be used to determine the height of an object. To do this, however, the person using it would need to be exactly 150 meters away. So the need to be an exact distance from the object gives this way of getting the height significant limitations. Mr. Guy instead set up the project so that the students had to use trigonometric functions to make the calculations of the height, with the altimeter providing one needed value and Google Earth providing the other.

In the third phase of the project, the class went outside on the corner across the street from the school to get data on a number of prominent objects (tall buildings, clock towers, telephone poles, etc.) to take back to class and use in their calculations. The altimeter looks like a big pistol, with a trigger near the handle and a crosshair site at the tip of what looks

like a barrel. It is made of bright blue plastic and would not be mistaken for a gun. Yet it is aimed like a gun, and when the trigger is pulled, it has a gauge on the side that displays the angle of the line that goes to the point at which it was aimed. As each student took a turn using the altimeter to determine the angle of a selected object, drivers slowed down to stare at the sidewalk scene. One student initially held the altimeter in an “execution style” (pointed down) but then quickly aimed it the right way. Another student talked on his cell phone as he waited in line for his turn, while another balanced on a skateboard. A bus pulled up to its stop on the corner, and its passengers peered out at Mr. Guy and his students. A couple of drivers honked their horns as they passed. At one point, a police car slowly cruised by; the officer gave a short metallic blast on the car’s amplified sound system, then continued on.

In the final phase of the project, the students returned to the computer lab and eventually to the classroom to do their calculations. They were given another assignment sheet with several problems on it that reinforced the concepts needed for working out each stage of the main problem of calculating heights of objects. During this time, Mr. Guy went around the classroom and engaged small groups of students in instructional dialogues about their work. One of the considerations was the need for a correction factor based on the height of each person using the altimeter. This added a small personal dimension to the students’ work.

Although Mr. Guy had a sense that using Google Earth would increase student interest in learning trigonometry, he noted that he was still “surprised to see how into it the students were.” Through this project, his students understood more about the practical uses of math, rather than seeing it mainly as a school-based learning activity. Importantly, it was his disciplinary knowledge that allowed him to see specific applications of the technology to learning. He had to develop his own skills with the digital tools—his own technological knowledge. Yet it was not the nature of the tools themselves that determined their efficacy. Instead, the efficacy was in how he designed pedagogical strategies for using the tools to facilitate his students acquiring knowledge in the discipline. This pedagogical design incorporated his cultural knowledge of the students, and the project allowed them to see and visually experience something of the geometry of their lives and neighborhoods in the context of the larger world.

In this regard, Mr. Guy’s approach reflected several of CREDE’s principles of effective pedagogy. It engaged the students and the teacher in

joint productive activities, situated academic content in contexts that were familiar to the students so that they might connect it to their prior knowledge and experiences, and used challenging, complex tasks for learning. According to Mr. Guy, “It also changed their perspective as the kids started flying around. Some of the kids have never left their neighborhoods. Now, they could fly to places like Egypt. You could see the light going on as they begin to open a bit of the global perspective.”

In part, this example of math on Google Earth illustrates the significance of the role of teachers in mediating between the learner and various learning materials or tools. Other teachers in the school also found a variety of ways to enhance learning through Google Maps, like site explorations, text mapping, mapping words and places, and creating maps connected to sections of texts. I have noted earlier that because of the material intelligence in digital tools considerable learning can occur without formal assistance. However, teachers are clearly able to facilitate students interacting more productively with various materials and tools by systematically designing and guiding their learning experiences to go well beyond the direct learning they can achieve on their own.

TEACHERS' JOINT PRODUCTIVE ACTIVITY

Before becoming a university professor, I taught high school English for seven years in Chicago public schools. Perhaps the worst part of the job was attending required teacher PD workshops. Most often, a presenter would “stand and deliver” some aspect of his or her area of expertise, and teachers would endure the monologue for the allotted time. The way this corresponds to traditional structures for teaching students is not coincidental. In the TEACH Project, we wanted to support teachers in disrupting these kinds of structures that clearly have not been productive for their students. We wanted to design learning for teachers in the PD sessions in ways that modeled approaches that they also could use to activate and excite student learning in their classrooms. The first of CREDE’s five standards, joint productive activity, provides an essential framework for how teachers as well as students can learn challenging content and complex skills. It suggests, along with a number of other transformational approaches, that people learn best through active, collaborative work on common goals realized through relevant learning projects. In this section, I further discuss why TEACH incorporated

CREDE, and in the following two sections, I discuss our initial work to create the “relationships” and “perspectives” that would ground our PD activities throughout the school year.

We were attracted to the CREDE standards because they were designed to transform the most fundamental relationships between teachers and students as well as between students and students. Their main focus is on shifting away from solely the teacher as the central repository of knowledge toward more collective production of knowledge and broader resources for learning. In working with these standards, it is clear that effective implementation of a given one requires significant integration of others. For example, dialogic instruction affords increased opportunity for language development, and it also affords the teacher greater understanding of the skills and interests of students, thus allowing greater contextualization to connect to students’ prior knowledge in the learning of challenging content and complex tasks. In addition to the contribution of the CREDE standards to a common language and systematic set of approaches to teaching and learning, there is growing evidence of the effectiveness of implementing the standards.

A series of research studies, using both qualitative and quantitative methods, have demonstrated that students in classrooms that effectively implement CREDE standards show significant gains in reading, mathematics, and science achievement. Also, teachers’ use of the standards has been positively linked to factors critical to school performance, such as motivation, perceptions, attitudes, and inclusion (Estrada and Imhoff 2001; Hilberg, Chang, and Epaloose 2003; Tharp et al. 2001; Saunders and Goldenberg 1999; Saunders et al. 1998; Stoddart 1999). Several studies recently conducted at CREDE’s research and demonstration schools serving low-income Latino LEP (limited English proficiency) students showed significant positive effects of teachers’ implementation of the standards on SAT 9 standardized tests and other performance measures (Doherty and Pinal 2004; Stoddart 2005). These studies demonstrate that classroom implementation of five CREDE standards is a powerful model for improving the achievement of students, particularly those at risk of academic failure.

Beyond the focus on digitally mediated learning, we wanted teachers to consciously synthesize their work around key perspectives in their educational practices, like the need for extensive collaborations with and among students on real-life projects and problems utilizing rich, dialogic language that incorporated and modeled specific disciplinary

discourses. During the summer before the PD program began, members of the TEACH “core team” (I along with the principal, Ms. Foster, two graduate students, and a postdoctoral student) all participated in a two-day workshop on implementing CREDE standards that was conducted by several highly experienced CREDE trainers. A number of members of the TEACH Project also met during the summer before the implementation to discuss various scholarly works that helped us develop our approach in terms of the kinds of new models and new language that we felt would be needed to transform learning. Just before the fall semester began, the core team created a blueprint for the sequence of PD activities to be implemented over the coming academic year. These and other activities were important for the knowledge gained, the planning that was completed, and the initial forming of relationships with each other as we came together to engage in joint productive PD activities.

BUILDING RELATIONSHIPS

Thus far, I have discussed three of the V-Tech teachers: Ms. Glide, Ms. Foster, and Mr. Guy. Ms. Glide (an English teacher) and Ms. Foster (the Spanish and journalism teacher) are African American, and Mr. Guy (a math teacher) is white. They worked on professional development in the TEACH Project with five other teachers: Ms. Church (an African American who taught English), Ms. Kim (a Korean American who also taught English), Ms. Rivers (an African American who taught social studies), Mr. Roy (an African American who taught science), and Mr. Elder (an African American who taught math). As noted earlier, all but two of these teachers were under 35 years old. They were all recruited by the principal, a 41-year-old Latino, during his first two years at the school. This immediately preceded the academic year during which the TEACH Project took place. So all of the educators at the school were relatively new.

In chapter 1, I noted the importance advocated by Dewey (1938) and many others of building on student experiences for learning. We felt it was just as important to source the experiences of teachers for their learning. This perspective already existed in the school’s focus, and we used the same focus of relationships, rigor, and relevance to guide our PD activities. Ms. Kim and Ms. Church volunteered their classrooms for the initial PD sessions, and when the computer lab was completed later

in the first semester, the sessions then took place there. The first PD session, on September 7, 2007, was devoted to continuing the development of our relationships with each other as we also worked on consensus for our goals for the school year. We moved the desks in a circle and faced each other as we talked in our first formal session. I began by framing the context of our work together with the following statement:

What we are trying to do is actually synthesize all the things that go into the learning outcomes for the students. These kids have kind of been cast off. We understand that there is a much more complicated set of circumstances. Yet the most important thing is the teaching. With the whole notion of V-Tech being able to continue its development using more digital mediation, we are in a position to create a model . . . where resources from the university, the community, parents, teachers, and students can come together around the same set of goals.

That's kind of our overall vision, and what we would like to do in the context of teacher professional development—and we will talk a little more about this—is use this session to sort of get ideas from you guys about the kinds of things you might see being able to be supported in. At the same time, we can talk about some of the kinds of things that we [the TEACH core team] have been developing that we think might have a place once we see how all of these things can be synthesized.

I shared what the core team was initially proposing for possible PD activities during the first semester including learning about and implementing CREDE standards, developing activity centers, providing demonstration lessons on effective teaching strategies, teachers presenting to each other on the progress of their work, and trips to successful youth organizations like Youth Radio. After these PD experiences, we would then get more directly involved in learning to use various digital tools in teaching.

I asked the teachers present if the graduate students working with the project could meet with them individually some time before the next PD session to get a more in-depth sense of the teachers' ideas and desires for what could be accomplished in our collaboration, and they all agreed. We wanted to make sure that the teachers' voices were heard (though they might not speak out in the whole group) and that their particular desires for development were recognized and incorporated into the PD activities. I also talked a bit more about how this effort drew a page or two from an earlier university/school research collaboration that I had been one of the principal investigators for at the comprehensive high

school that sends students to V-Tech. I noted how we could have a much higher level of impact at V-Tech with our concentrated effort on 100 to 150 students in contrast to the much larger student body of more than 3,000 students at the other school. I closed by talking briefly about my own background, including my experiences as a high school English teacher in the Chicago public schools.

For the rest of this first meeting, each teacher, the graduate students, the postdoctoral student, and the principal shared things about their backgrounds and what brought them to teaching along with their ideas for our work together. We found that we had much in common. I will give a sense of the backgrounds and goals of the teachers and the principal through their own voices. Mr. Roy, the science teacher, volunteered to talk first. “I’ll just get it out the way,” he began. He had received his teaching credential in the previous year, and he talked about how he was always interested in supporting youth development. Initially, he had done quite a bit of informal volunteer work in schools before becoming a teacher. “I used to do a lot of just dropping in on schools to help out. It was nothing formal,” he said, observing,

I saw a lot of students of color doing really, really bad in school—just really bad. I received no encouragement from my family whatsoever about returning to [teach] school. As a matter of fact, they still laugh at me. Things like “You were helping out kids more before you were a teacher”—they were saying things like that. And my dad was like, “You ain’t gonna make no money.” You know, other cultures, they come here and they knock out the economic thing first. Then they send their kids to school for real degrees—engineering, medicine, and things like that.

The only reason I overcame all of that was I started subbing [at the comprehensive high school], and the kids just wanted me [to be a teacher there]. It was a lot easier for me there than here. There was this whole big thing and the administration wouldn’t hire me, and the kids signed all kinds of petitions. But when I actually started teaching here, I saw that there was a big gap between where I was and where I wanted to be. I don’t have no background with professional development. So I’m here, and I’m ready to work.

Interestingly, Ms. Kim, a Korean American, had the kind of immigrant experience that Mr. Roy alluded to, but it was more complicated than it appeared on the surface. This became clear as she talked about why she came to work at V-Tech: “I grew up in LA, and it’s interesting because I identify with struggle because my parents have struggled

even though I grew up in a middle-class house.” She talked about wanting to be a teacher to serve the kind of community that she can identify with because education is so important for increasing opportunities. Ms. Kim received her bachelor’s and master’s degrees and teaching credential from Stanford, but she noted how she felt “a little lost” there, especially during the first couple of years because so many of the students were from such wealthy backgrounds. “Most of my friends are actually immigrants or their parents are immigrants, and I feel like that immigrant experience is so central to my life. I can’t really identify with people who haven’t had those kinds of experiences.” She said a bit more to clarify what she meant.

I never had to worry about what I was going to eat. I never had to worry about money really. But my parents just worked every day of the year. I would go into the store and help them work on the weekends. And even though I, like, never needed anything, it was always in the back of my mind and in my parents mind that, oh, we should hang dry the clothes so that we don’t have to use up energy with the dryers, and we can save on the electric bills. It’s these random little things that I learn from my husband that other people don’t even worry about. Like he uses a paper towel to wipe things up, and I will be, like, use a cloth that you can wash . . . you know, to save money. I just realized that there are a lot of people who don’t have to ever worry about those kinds of things.

In college I lived in a co-op to save money. We had to cook for everybody and clean the bathrooms, but it was also a real life-changing experience for me and just realizing all of this about class and how my parents experience influenced my own experience. The funny thing is that my parent’s culture is really all about, like, becoming a lawyer or a doctor, and instead . . . I became a teacher. So that’s one of their disappointments since I was the high achiever of the three children they had. But I chose to become a teacher because I don’t want to be one of those people who is disconnected from their roots and what they’ve been through.

These considerations of being able to identify with the experiences of their students and wanting to use education as a vehicle to help transform their lives were dramatically reflected in the principal’s story also. “My perspectives as an administrator come from my own experiences in school,” he told us. “I got kicked out of high school when I was 16, and . . . I cannot recall a single person that not only would advocate for me but would advocate for Latino boys in general.” He went on to tell us that neither of his two siblings finished high school and that his mother

did not finish either, after having her first child at 15. Then he shared the following:

We are not the family that came across the border at four in the morning, and nobody spoke English. My family has been here for generations. I think there is just this expectation, you know, of poverty. I think we came to think that this was just what was expected. . . . And when you see a 16-year-old rapper on a yacht with eight bottles of champagne, I can identify with that. And you kind of grow up with this mentality that you want to go from here to there, but not go through all the steps in between.

So I don't want one Ms. Foster or one Mr. Roy; I want, like, 50 of both of them. I want to build this program . . . , and I want the students to feel good about this school. But the shadow of [the comprehensive high school] is pretty broad. We still get students now who don't want to put V-Tech on their job applications. People at the district look at my requests [for resources] and say, "You have enough, so just stop." They question why we need tech equipment when this school hasn't needed anything like this for, like, the last ten years. Unlike my staff, I'm exhausted right now. . . . This is becoming like therapy. I need all the gods to help me and give me some strength. Anyway, I will be back here next Friday—on the couch.

There were echoes of these kinds of considerations in what other participants shared. Ms. Rivers, who teaches social studies, noted, however, that being hired to work at V-Tech this year brought her teaching career back to life. She noted that she had just about burned out teaching in a difficult urban school district not far away: "I didn't know that something you loved so much could hurt so much." With a nod to the principal, she said, "An angel brought me here." Teachers also talked about other positive aspects of the school as well as their desire to learn to use more technology in the coming year. Ms. Foster noted that the students bring such positive energy and how she's excited to begin working with Ms. Young to help with the tech piece. For her Spanish class, she wondered what it would be like to use Second Life "so that we can go to other countries to speak Spanish and go all around the world." Ms. Church, the English teacher who is in her second year at V-Tech, talked about her enthusiasm to try out some of the many ideas received in a summer workshop of the Bay Area Writing Project. She also noted,

In terms of technology, I do want to collaborate on how to use what students are already using outside of class, especially the Sidekicks [cell

phones]. If there was a way to use the Sidekicks for some sort of assignment, then that would be a dream come true. And I'm also thinking of doing, I don't know when, but I want to do some kind of blog to have them write. I just think it would be a good idea to get them on the computer and to get their stuff out there to get some type of recognition from outside the school. I'm not sure about the topic yet. But we're going to be talking about education and equality.

The teachers and principal shared both excitement and frustration in working at the school. Teachers like Ms. Church and Ms. Foster noted that they had already been thinking about ways to incorporate more technology into their teaching, like using blogs for wider publication of student writing or using Second Life for Spanish conversations with people around the world. Ms. Church also wondered about pedagogical possibilities for cell phones. All of the teachers indicated at least a willingness to try something new. They also identified structural and institutional constraints on their desires to provide rigorous and relevant learning experiences for the students. Clearly, there were many actions of the comprehensive high school that indicated they didn't really want V-Tech to succeed academically with its students. For decades as a continuation school, it had been operated essentially as a containment space for students that the main school did not want to deal with. Some teachers and counselors at the main high school have indicated that students there actually got profiled as "looking like he belongs at V-Tech," and as a result of relatively minor infractions, the main school's administration could force involuntary transfer of students at any time during the school year.

The earlier positioning of V-Tech as a continuation high school was a consequence of a pedagogy of poverty and its normalization of failure stemming from low expectations for certain students and, in some cases, fear of them. Added to this was an absence of a wider range of pedagogical options. Consequently, the school's demographic makeup is not coincidental. Rather, it is a reflection of rigidly tracked and intractable structures of inequality that may not be significantly countered by something like a well-intentioned PD program. The other side of that argument, however, is that a setting like V-Tech's with its visionary leadership and committed teachers and staff, could be highly viable for achieving significant social and academic development with its students. These educators certainly understood key challenges their students face.

A couple of decades earlier, the principal himself might have been one of these students. So our work together on the project was an attempt to affirm the latter argument—that opportunities for learning could be created that didn't merely compensate for the schooling practices these students had been pushed out of. Instead, learning at V-Tech could model more productive and relevant ways for all students to learn in school.

Additional PD sessions during the fall semester focused on developing teaching perspectives that utilized CREDE principles as a beginning framework and language for synthesizing practices across disciplines. As we moved toward winter, the focus of the sessions shifted to the teachers actually learning to use an array of digital tools. As we moved toward spring, the sessions extended a focus on teachers learning to incorporate guidance and support for their attempts to teach with and through various digital technologies. As we moved toward summer, opportunities were provided for teachers to reflect on what they had learned and how they had put their learning into practice along with how these experiences might shape their approaches to teaching in the next academic year.

DEVELOPING PERSPECTIVES

In the second PD session of September 2008, we continued building relationships between the teachers and the university participants through activities designed to further ground us in understanding and implementing CREDE standards. We reviewed the standards and looked at several examples from CREDE documents that showed how they had been implemented in teaching practices. The examples showed how to plan with students, how to use their prior knowledge, how to make lessons meaningful, how to design group work, and how to engage students in dialogues with the teacher and other students to significantly increase student talk in the learning process. We talked about how students themselves could become more expert to also facilitate the growth of fellow students and referred to examples of young people's work at Youth Radio. I noted that I would do a demonstration lesson in the first PD session in October to further illustrate ways that the standards could be revealed in instruction.

We then formed five dyads—each composed of a teacher and a university researcher—to discuss individual standards from the standpoint of how each could be actualized (or more fully actualized) in V-Tech

teachers' current practices. I paired with Ms. Church, and we talked about how the project of creating multitextual personal profiles in which her students created and documented something that was integral to who they were could be used early in the semester to establish and share more of the students' backgrounds and experiences. The graduate students in my urban education class were doing a similar project, and Ms. Church and I talked about how writing letters describing the completed projects could also be a way to initiate a writing exchange between my graduate students and her high school students. She and I decided that we would do a series of four writing exchanges to give both groups of students real audiences and genuine motivations for writing. Ms. Church and I felt that the projects would also encourage our students to experiment with making meaning using multiple textual modes as they learned what they needed to know to accomplish the objectives of the project.

When we reported back to the whole PD group, Ms. Church talked about how we saw these projects in and between our classes as a form of joint productive activity. Ms. Church also noted how her task of responding to each student's essays could be improved as a result of the graduate students writing extensive, specific responses to her students' writing in their exchanges. She saw that this would ultimately help her students prepare both for the writing portion of the high school exit exam and for any college application letters they would write.

Participants in the other dyads also reported to the whole group on how the standard they were assigned to discuss reflected or could reflect something occurring in each teacher's actual classroom. Ms. Kim shared her dyad's discussion of ways to plan some of her class activities together with her students. "I have very structured assignments," she reported, "but I'm now going to try to open them up a bit for more student input." Mr. Roy shared his dyad's discussion of ways to effectively design group work. He had struggled with discipline issues in his science classes as well as with keeping his students on task, and he reported that working in groups sometimes helped: "In small groups the kids worked to keep each other in line and focused on the work. There were cases when the students received each other even better than they received me."

Ms. Rivers reported that in discussing with her dyad partner how to keep her class activities as challenging as possible the importance of the overall design of the instruction became key. She shared a successful curricular design, focused around the refugee experience that she had

implemented in her social studies class. “First, they had to brainstorm about leaving home,” she told us. She then provided more details.

What it is like to leave home even if it is a positive experience. They had to consider what they were going to take with them and what they would leave behind and why. Then they read a work of fiction on the refugee experience. Then they wrote an essay where they had to make connections with the reading, their notes, and considerations of geography that we also went through. Next, we are going to go into globalization and segue right into that while still focused on the same theme.

Linking CREDE standards to work in the teachers’ classes and continuing to get to know each other individually while learning from each other were how we attempted to develop core perspectives and common language for our work during the school year. In our second PD session, after teachers reported on their dyad discussions I passed out typed comments summarizing individual conversations that I or my graduate students had with them since the previous PD session. As mentioned earlier, this was to be sure that the teachers’ voices were heard regarding their specific desires for professional development that they may not have verbally expressed to the whole group.

Ms. Kim’s comments indicated that she was very interested in either bringing in teachers who did good work or even going to see them teach in their classrooms. She also noted that although she had significant training in project-based learning in her teacher preparations program, she was not yet doing it very much in her classes. Ms. Church’s comments indicated that she liked the idea of planning together in the PD sessions and maybe doing more interdisciplinary projects—for example, between social studies and English. She also indicated a desire for the sessions to help her keep informed on new forms of technology integration into schooling, like work going on in a few places to develop curriculum that utilizes design principles of video games.

Mr. Roy’s comments indicated that he liked the idea of working directly with other teachers to get help on incorporating technology into his science curriculum. He also noted that he would like to be able to take his students to UC Berkeley to sit in on college-level science classes. He did not want to see another PD program begin with good intentions and then be gone by the middle of the year. Ms. Rivers’s comments echoed the need to go beyond the walls of the school on field trips. She

also wanted to learn additional techniques to make her classes more interactive, including learning about the viability of educational games. She thought educational games would be interesting for her students, but she noted that she personally shied away from using technology in her teaching.

DEMONSTRATION LESSONS

In our third PD session, which occurred at the beginning of October 2008, I presented an initial demonstration lesson. Its purpose was to illustrate how a number of the CREDE standards could be utilized in instruction. Specifically, I wanted to model strategies for how teachers could access and utilize their students' prior knowledge to make learning more meaningful and for how to engage students in dialogues with the teacher and with each other to increase student talk and idea generation about academic topics. The term *idea* is here used to refer to each view held by the learner that includes visual, analogical, and mathematical views as well as descriptive views.

I also wanted the teachers to see the viability of using a variety of teaching tools and textual mediums to increase opportunities for their students to become engaged in talk about ideas. One central set of teaching tools was the collection of Thinking Maps developed by Dr. David Hyerle to facilitate teacher and student thinking. There are eight Thinking Maps that are visual tools for accessing eight distinct cognitive processes, and I employed four of them in this demonstration lesson: the circle map, for defining in context; the flow map, for sequencing; the multi-flow map, for showing cause and effect; and the double bubble map, for comparing and contrasting (see fig. 2). These maps are used extensively in the professional development of educators that is conducted around the United States by the National Urban Alliance for Effective Education.

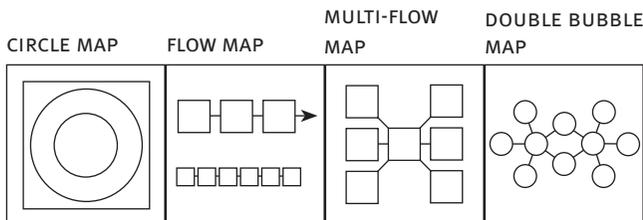


Fig. 2.
Thinking maps

Finally, I wanted to model how the V-Tech teachers could use the PD sessions to pilot their developing curriculum designs in order to get ideas and input from fellow teachers and university participants. In this regard, the teachers' presentations of lessons could be more informal than my demonstration. My goal was to formally take the teachers through a process to show how particular strategies could be utilized to help students increase the quality and sophistication of their thinking and writing. I positioned the V-Tech teachers as students in this demonstration lesson, so that they could experience the strategies the way their students might experience them in their classrooms.

I built the lesson around the theme of discipline and used Robert Hayden's six-stanza poem entitled "The Whipping" as the central text. First, I asked the teachers to write the word *discipline* in the center circle of a circle map, which is used for defining in context by brainstorming ideas from prior knowledge. I next asked the teachers to write in the larger circle all the words, ideas, or beliefs that defined or were associated with this word in their minds. Then I asked for several volunteers to read what they wrote out loud, and I wrote their ideas on the board. We immediately noticed ideas we shared as well as new ideas that we had not individually considered about the word *discipline*. Next, I asked the teachers to think about where their ideas about discipline came from and to write the sources inside the square frame of the circle map; they were using the frame to identify the sources of the information they had already provided in the large circle. In this way, they had to explore and make explicit some of the social and cultural contexts that framed their ideas about the theme. Again, volunteers read and I recorded on the board the additional ideas that this part of the process had generated.

Next, I played 30-second clips from three songs that revealed very different takes on approaches to discipline: Luther Vandross's "Dance with My Father," James Brown's "Papa Don't Take No Mess," and Tupac Shakur's "Dear Mama." The purpose here was to extend the strategy involved in using the visual text of the map to musical texts that also offered ideas and perspectives about the theme of discipline. A short, lively discussion of these clips generated more ideas about discipline, and as additional ideas came up I recorded them on the board.

After these priming activities, I passed out copies of "The Whipping" and asked for a volunteer to read the poem out loud. I asked the teachers to use a flow map to record what happened in the poem—just the sequence of events. At this point, Ms. Kim stated, "I don't understand the

difference between what we are doing now with the flow map and what we did before.” Rather than attempting to give an immediate answer, I asked her to go through this step to experience what happens. She decided to work with Mr. Roy to map the sequence of events, and they had an animated discussion as they tried to come to consensus. After the teachers finished this activity, volunteers were asked to read the sequence that they had mapped. We noted key differences in the way the poem was mapped by different teachers. We discussed the differences and went back and forth with the text of the poem itself in order to come to agreement on an accurate rendering of the sequence of events that Hayden had described. Ms. Church told the group that using the flow map had substantially changed her interpretation of the poem. She said, “Having to get things into the boxes pushed me to isolate different occurrences in ways that helped me more clearly see their relationship to each other.”

The teachers quickly realized that many of the differences in their accounts were tied to the fact that they had included their own interpretations of the meaning of the poem rather than just describing the events that had occurred. After this consideration was established, I had the teachers use a multi-flow map as an aid to further expand and concretize their interpretations. This map was designed to elicit cause-and-effect relationships, and by putting the word *whipping* in the center box, the teachers were able to see how they could generate ideas from textual evidence in the poem that contributed to the cause of the whipping in contrast to ideas based on textual evidence that could be connected to effects or consequences of the whipping. Essentially, this process offered a way to systematically extend interpretations based on textual evidence that could also be compared to other emerging interpretations depicted in the multi-flow maps of other members of the group. When the teachers were finally able to engage a more open interpretative discussion of the poem, it had the effect of sourcing all of the ideas that had been generated and expanded from the various multimodal prompts, actively sorting and evaluating those ideas based on justifications from actual textual evidence, and thereby enabling participants to synthesize the best ideas from all sources into an integrated understanding of the poem. The discussion of the possible meanings of the poem was quite lively, but it was also at a high level of interpretative sophistication, and the ameliorative roles that the various prompts had played was apparent.

Next, I passed out a copy of a single page from Alice Walker’s *The Color Purple* on which Celie talks to Harpo about marriage and also

describes how her husband had treated her: “He beat me like he beat the children.” I asked the teachers to use a double bubble map to create a visual documentation of the points of comparison and contrast between the two texts. More ideas around the issues surrounding discipline that came up in this part of the discussion were recorded on the board. Finally, I showed a four-minute clip from the movie *Glory* in which the black Civil War soldier played by Denzel Washington is punished with a public whipping. We concluded our discussion of the theme with additional ideas that were generated by this provocative video text and completed the recording of ideas on the board.

I ended the demonstration lesson by passing out copies of two well-developed argumentative essays written by seventh-grade students in a public school in Newark, New Jersey, who I had taught this same lesson to. These two essays were examples of the arguments that had been written by all of the students in that class on propositions surrounding corporal punishment. One essay argued for and the other against the use of corporal punishment. I discussed how both essays reflected ways that the individual students had taken ownership of a number of ideas that had been generated through use of the different texts and through the various discussions about the expanding considerations of the theme of discipline and punishment. I illustrated how their essays incorporated some of these ideas into their arguments whether the arguments were for or against the proposition. In essence, these students had been able to take advantage of the collective intelligence of their class and draw on a wide range of ideas that had been generated in a variety of textual mediums. In the process of the lesson, the emerging ideas were recorded in a number of ways that could be easily accessed and reviewed. I also discussed how working with students to build a repertoire of ideas could reveal the development of their processes of individual and collective meaning making from initially generating, to sorting, to evaluating ideas in the development of more highly integrated knowledge about topics.

Because they had actually experienced them, the V-Tech teachers could clearly see the viability of the multitextual and multimodal strategies for making text-to-self, text-to-text, and text-to-world connections and how the strategies facilitated higher levels of student talk and learning from other students’ ideas through planned, goal-directed dialogues. They talked about how the tools could help students more clearly see complex aspects of an academic text, like the way our mapping of the events of the poem also forced a discussion about the narrator and the

narrator's role in the poem in contrast to that of the author. Ms. Church noted on this point, "I haven't been able to see students bring in the role of the narrator in defining the overall meaning of a poem, and I think this approach would help them with that." We also discussed how this process allowed for learning to take place even when some ideas that were generated were obviously incorrect. As the principal chimed in, "The bad ideas might be as good for learning as the good ideas." The participants also could see the critical but transformed role of the teacher as the designer and guide for challenging and engaging activities to stimulate complex thinking and motivate more sophisticated writing. They also discussed the utility of these approaches for other academic disciplines beyond language arts and how elements of approaches like this were already going on in some classes. For example, Ms. Church drew our attention to a graphic organizer posted on the wall in the classroom we were then using that Ms. Kim had created to help students organize and generate ideas for writing.

In subsequent PD meetings, other teachers volunteered to present their emerging designs for lessons to inform the group and to get our responses and insights. Mr. Roy's first presentation of a lesson idea was interesting because it also revealed limits to the usefulness of our responses when the focus went beyond the collective disciplinary knowledge of the group. He had written topics and ideas on the board for three of his upcoming science units. He began by giving us a handout and talking about how he had been thinking about teaching the units: "Before we start with anything, I always have warm-ups that have something to do with science. For example, this sheet I gave you has health facts on precursors to diabetes." The third unit was on cells and genetics, and Mr. Roy told us, "That's the one that I was going to ask for some help with because I felt like I could put some culture into it, because I got some ideas from our session last time. There's not a lot of culture in the textbook." He showed us a copy of a thick, new science textbook. Then he added, "I've been working on it. I'm just having a real struggle with many of my students to have them really get into it with science." He talked a bit more about specific activities he was considering and about how he eventually hoped to use some kind of technology in the class. He also talked about problems he was having getting adequate lab supplies. He closed by saying, "So now I'm just going to sit down and listen to all of your ideas about how you can help me."

There was silence for a while as we all tried to think of ways to help

Mr. Roy develop his lesson. Finally, Ms. Kim, who has been thumbing through the science textbook, said, “Yeah, this book is a little intimidating. I think because I haven’t had to look at a book like this in so many years, and I’m saying, like, wow, there is so much information on each page.” Mr. Roy responded, “And that’s intimidating for a lot of our students. They see this book and say, ‘What?’ and they just shut down. They look at all of these words and say, ‘Man, I got to outline all of this.’ And that’s why I’m trying to rethink how to approach things.” One of the graduate students offered a suggestion. “You could set up your activity center stuff and have the students use the book as a reference. If you talked about how some prisoners are being exonerated through DNA evidence, maybe some of these men would come to class, you could link that to genetics, and this might be able to hook kids on the science of it.” This seemed to be an interesting suggestion, and other teachers offered additional suggestions. Yet it was clear that Mr. Roy did not feel that much of what was being offered could really help him with the overall challenges that he faced in his classes. He was the only science teacher in the school, and our lack of knowledge of his discipline mitigated our collective abilities to offer strategies to significantly help him transform his teaching during the first semester of the school year.

ACTIVITY CENTERS

Despite not being able to support every teacher to the extent that was needed, the structure of having teachers respond to the work of other teachers was an important part of our PD approach. It allowed us to keep the focus for teacher learning on actual work that they were doing in their classrooms. This approach worked well during the first semester, when the focus was on developing teaching perspectives and practices that would also be central to the teachers’ more direct learning of digital mediation strategies in the second semester. The final component that we felt was critical to teaching with technology was the use of activity centers. Organizing classrooms into activity centers (or learning stations) transforms the fundamental structure of teaching and learning by making it possible for teachers to responsively instruct and assist small groups of students. The CREDE approach advocates the use of activity centers as the most effective way to incorporate and realize its standards

for effective pedagogy in the actual practices of teaching and learning (Hilberg, Chang, and Epaloose 2003).

Ms. Foster, as noted earlier, was not only an effective teacher; she was also a teacher leader in the school. When we focused on activity centers in the PD sessions during the first semester, she took the lead in planning and eventually modeling their use in her Spanish classes. In the last PD session in October, she volunteered to present a lesson plan for a unit that would utilize activity centers in order to get suggestions from the group before implementing it. Like Mr. Roy, she began by putting a number of her ideas for the unit on the board while also talking about some of the background considerations surrounding the unit. “There are all these different versions of how death is dealt with,” she said. “There is the Hollywood version; there are different cultural ways. I still haven’t started this yet, so are there any ideas how I can do this? I’m still trying to finish up the last lesson.” The teachers offered suggestions, and as they did, she wrote their ideas on the board.

The unit would have students researching and creating projects in Spanish on how different cultures deal with death. Some of the goals for the unit were to have students understand differences in how people look at and experience death; to document healthy ways of expressing death and other things associated with it orally, in writing, and in other textual mediums; and finally to explore ways to help stop community violence. As with most of the PD sessions, the principal was present, and he responded to Ms. Foster’s ideas by saying, “The centers are just supposed to be a part of this. If we can hone in with you, Ms. Foster, on the three or four things that you want them to have as products at the end of the curriculum cycle, it would clarify the nature of the centers and what kinds of activities should go on at them.” “I saw this as a two-week experience,” Ms. Foster responded. “The writing assignments are a poem, a composition. I see a poetry center, a history center, and a Silence the Violence one, and also some sort of altar. I’m thinking about something where students take pictures. I’m not exactly sure what to do with this, but it might be the culminating activity for a center.” “You could put a whole bunch of pictures on the floor, and everyone walks around and then picks up a picture and then just talks about it in Spanish,” said Ms. Church. “Do we break out and look at each center, or do we do it in a whole group?” Mr. Roy asked. “We can throw out a bunch of ideas, and then you keep what sticks,” said the principal. “I have an idea for the poetry center,” said Ms. Kim. “It could be a place where they go to read

poetry and then translate it into writing. The reading can be translated by writing it in Spanish.”

The principal then noted, “Ms. Foster brought her plan to the group, and it just hit me that elements of her plan were already organizers for the various learning stations.” He stated further, “The idea is that once you set these centers up, students should not have to come back to you and say what should I be doing at this center. I was also going to suggest a technology center.” “Everyone knows by now that the ten laptops on our mobile computer lab have been stolen,” Ms. Foster said, choking back emotion. “That’s why it’s hard to end the current unit because my students’ had PowerPoint presentations on those laptops. My ideal was to have a laptop at each learning station so that there may be times when students go to a computer just to do research for their project.” [After the theft, as noted in chapter 2, the principal decided to dedicate one classroom as a secure computer lab and to place new iMac computers he had purchased there rather than on mobile carts.] Ms. Foster continued to talk about things she had recently done to partially address the impact of the theft of the laptops on her students. “I had all of my students get Gmail accounts,” she said. “You can create documents within Gmail, so you can access all of your PowerPoints online. That way we don’t have to worry about our work being lost again. I also created a blog for each of my classes, so all of my assignments are online. All this has been really helpful, and it couldn’t have come at a better time.” By the end of this PD session, Ms. Foster had decided on creating four activity centers: one for building an altar; a poetry and translations center; one for writing and vocabulary; and one for viewing, talking about, and making photographs, pictures, and other visual texts.

LEARNING TO USE DIGITAL TOOLS

Although Ms. Foster had already been using technology in the Hip Hop Journalism class and to a lesser extent in her Spanish classes during the fall semester, she was an anomaly among the V-Tech teachers in this regard. The TEACH Project’s goal was to facilitate all of the teachers becoming competent in incorporating more technology in teaching. The work of the first semester on building relationships and developing teacher knowledge and perspectives regarding effective teaching practices through a process of joint activities was important to creating the

framework within which the teachers actually learned to use and eventually would teach by using a variety of digital tools. As we moved toward the end of the fall and into the second semester, we focused the PD sessions directly on guiding and supporting teachers in learning how to use a range of digital media in their teaching.

In making this transition, the TEACH Project hired a technology specialist, Mr. Cameron, to work with the core team to plan the second semester of professional development and to lead the sessions. The title for his position was Director of Instructional Technology. The principal had the expertise to lead these sessions himself; he has been the director of technology and instruction for schools on the East Coast. But he contributed his vision and support for the effort through his role as a member of the core team that was providing the primary structure during this school year for teachers to transition from novice to more expert users of technology in their classrooms. We were particularly excited about Mr. Cameron working with us because he had done similar work in Chicago in a technology project that worked both in the public schools and in nonprofit community and youth organizations. We had looked to that project to learn about some of the innovative things being done that could help us think both imaginatively and pragmatically about our work in California. He was also a graduate student in the School of Information Sciences at the University of California, Berkeley, and I had been influenced in the development of the TEACH Project by Peter Lyman, a professor in that school, as well as the work of the Digital Youth Project that he guided.

In the first PD session of January 2008, the principal formally introduced Mr. Cameron to V-Tech teachers and staff. The principal invited the support staff to this session because he wanted them to also be attuned to new ways that students in the school may be engaging in learning. For example, there might be times when students were in the school's computer lab after class working on assigned projects, and he wanted staff members to see these activities as legitimate work even if it might initially look like the students were just listening to music on the computers. In the following statement, the principal drew on the design of a new elective class that was going to be offered to talk about how he saw professional development working for the rest of the year.

One of the things I'm excited about with this new class is that the instructor didn't just talk about an individual computer program or application

in isolation, but about creating a product that encompasses several or many applications at one time to achieve a desired effect. This is the way that designers think. It's not like I just have this one application, so I'm restricted to that. It's like what's the end thing I want to create and what's available to me to do those things. That's also what we have in mind with these workshops. Mr. Cameron doesn't see these as individual workshops where you learn about isolated applications like a podcast or a blog. It's really about imagining the kinds of things you want students to create and thinking about the design and intersection of the kinds of applications that will allow them to do these things.

After these introductory remarks, the principal turned the session over to Mr. Cameron. "I'm really glad you brought that up," he began, "because that's exactly what I was going to bring up. He then talked about how he saw his role in his position.

I'm a bit apprehensive with the title you all gave me—particularly with the word *technology*, because the technology is just one part of it. . . . The focus for me is not to bring in more [technical] complexity, but for us to really think about what learning consists of. How do we approach teaching in terms of what's not a waste of time for us and not a waste of time for our students. . . . So it's more about us rethinking and reframing our work as teachers. That's how I see my work here. . . . We will introduce some themes and ideas. We will learn about some tools to help us explore, or expand, or present those ideas. Then you all can experiment with actually doing things in your classrooms and come back to the next session, and hopefully some of you will volunteer to talk about what you did and how it went, or even talk about how you just thought about doing it in your classroom. . . . And I will be available during the week to come to your classrooms to help out with projects that you all may be doing.

Mr. Cameron was clearly attempting to put the teachers at ease about what was going to happen in the coming PD sessions. Essentially, he presented the framework that had been developed in conjunction with the core team to integrate the learning of a number of digital tools with actual work going on in the teachers' classrooms but to keep it mainly at a low-stakes, voluntary level in terms of expectations of the teachers doing specific things in their classrooms. We wanted the learning activities not to be intimidating or stressful for the teachers, yet the final design for the second semester was quite comprehensive covering podcasting, blogging, various Google applications, digital photography and video, story-

boarding with *Comic Life*, and explorations of *Second Life*, in that order. Mr. Cameron's work on the development and implementation of the design was critical, and eventually he mainly met with the principal and me before or after a session to review or revise things. I will give a brief overview to show the coherence of the sequence of activities and then provide additional descriptions of ways the teachers were engaged in learning about these media.

The second semester of professional development began with the teachers learning how to create podcasts using *GarageBand*. A podcast is an audio recording that can be manipulated (remixed) using an application like *GarageBand* to create a variety of verbal, musical, and other sound as well as visual effects. The reason for starting with podcasting was to give the teachers an initial experience with a relatively simple form of digital media that they could immediately use to bring their students' voices and perspectives into the curriculum through audio recordings, by having them interview each other or family and community members, by tying this to class projects, and by posting the podcasts to websites online.

The next phase of the sessions was focused on having the teachers post to blogs and eventually create their own blogs during subsequent sessions. As a personal publishing platform, the blog offered additional tools for the teachers to use to manage, manipulate, and publish information of their own and from their students. The teachers learned how to do simple text postings as well as how to utilize more sophisticated features like adding pictures, creating thematic categories for hosting different conversations, or even uploading podcasts that they or their students had recorded. Mr. Cameron created a V-Tech blog for the PD sessions and encouraged the teachers to continually use it for comments about things they were trying out in their classes as well as for periodic reflections on their experiences with other aspects of the professional development. Another thing he initiated early on was to have the teachers draw designs or floor plans of how they would physically arrange their classrooms to most effectively accommodate digital learning. This connected to and extended the work of the first semester on the design and use of activity centers. Later in the second semester, some of the PD sessions themselves were structured around activity centers that had different foci for the work at each one, like a center for working on blogs, or one for working on podcasts, or one for working on digital graphics and photography.

As the work with podcasts and blogs continued to thread through and become more elaborated in subsequent PD sessions, the functions of Google Maps, Google Documents, and Google Images were introduced. The teachers learned how to connect the visual imaging capabilities of the media with its mapping capabilities to create a range of effects and possible learning activities. Work with these Google applications was soon connected to work with digital photography and, to a lesser extent, video. By this time in the semester, the teachers and students were just returning from spring break. Mr. Cameron had taken pictures in Ms. Glide's class, and he used them to demonstrate more visual editing tools and how to make digital collages. He also introduced the teachers to additional photo resource sites like Flickr and reviewed with them on how to combine audio and visual texts and how to embed them in podcasts, blogs, and PowerPoint presentations.

Based on where things were at this point in the semester, it was decided to not go too deeply into working with video. Before the break, the focus had been to give the teachers significant hands-on exposure with a variety of digital tools, but by this time it seemed necessary to "reset" the focus to give greater attention in the remaining sessions to solidifying links between what the teachers had learned and their actual use of what they had learned in their instructional practices. Yet there were two additional media that were introduced. One was Comic Life, a downloadable application that allowed users to create simple storyboards (somewhat similar to a comic strip) by combining pictures or drawings and written texts. Voice could also be added. The other digital media that was introduced was Second Life. Second Life is a multi-user virtual environment that both mimics and extends activities and interaction possibilities of the real world through the actions of avatars that "residents" of the Second Life world can create and digitally animate. These last two applications allowed Mr. Cameron to further teach and reinforce the ease and viability of integrating different digital media into other digital platforms.

This summary of the design and sequence of activities during the second semester provides context for a closer look at the teachers' actual experiences of learning about and working with podcasts, blogs, Google applications, digital photography, Comic Life, and Second Life. Rather than initially giving this overview and plan to the teachers, however, Mr. Cameron began his first session by asking them what they were already doing in their classes and what else they hoped to learn in the PD ses-

sions. “I pretty much want to know what uses you are making of technology in your classrooms,” he told them. “For example, the pen is a form of technology. I’d like to have as much sync as possible. Can someone start regarding what you are doing in your class?” “In the Hip Hop Journalism class,” Ms. Foster responded, “we would like to learn how to do podcasting. I think that would help. I also want to use more PowerPoint and word processing. We have been using a lot of the Gmail functions, and I would like to do more work with Photoshop also.” “There has been some work with video for shooting and telling stories,” a graduate student chimed in. “Is there anyone in science?” Mr. Cameron asked. “I use the DVD to lecture,” Mr. Roy said. “What about online resources?” Mr. Cameron asked. Ms. Church responded, “I think that it makes a big difference in doing research. My classes are starting to do research online. We started last year with Citation Creators. You know that company. But not many kids have done that. I would also like to learn how to use blogs.” “Anybody doing robotics? Anyone doing gardening? Are there any alternatives to paper, paper and essays?” Mr. Cameron asked. “Now we have the Ya/Ya program for making furniture art, and there is also airbrushing,” said Ms. Foster. At this point, the principal talked about his desire to have students learn how to design video games.

Next, everyone was asked to talk about any problems they saw in teaching with technology. The principal noted, “The robustness of the applications exceeds our students’ ability, one. And two, their innovation and excitement exceed the robustness of the applications. So it is the marriage of those two things that I think is sometimes problematic.” Mr. Guy noted that a key problem was “consistently functioning technology. . . . If the printer doesn’t work, or the computer doesn’t work, or not all of the computers are working, its frustrating.” Ms. Kim added, “We need a lot of one-on-one attention for the kids to teach technology.” “I don’t have the greatest and the highest tech skills myself,” said Mr. Roy. “Sometimes the challenge is that the teacher doesn’t know as much as the kids know, that the kids are ahead of the teacher,” a graduate student noted. “But when we are doing projects, the students’ attendance gets in the way,” added Ms. Church. In response, the principal said, “With some of these applications, if you don’t get that very first part, it becomes difficult to do the end product. There is no question that this is going to be a tough challenge.” I added, “If everything is working perfectly and these products come out, we don’t have from our own training the ability to

assess their quality. What is an ‘A’ youth commentary versus a ‘B’ commentary, or an ‘F’ commentary?” Mr. Cameron closed this discussion by showing several interesting examples of young people’s work with digital media in Chicago on the iRemix.org website. For the remainder of this session, he guided the participants in creating their first podcasts.

Podcasting

“You know what a ‘drop’ is in terms of radio?” Mr. Cameron asked. “It is basically when the host says, ‘You’re listening to WKWE radio; my name is Cameron,’ and something like ‘I’m going to be your company tonight.’” He told the teachers that for their first podcast, their drop would be their name, the subject they teach, and what they hope to get out of the PD sessions on technology. Everyone’s drop was to be no more than 30 seconds, and when they were completed he combined them into a “collective” podcast that was less than four minutes. They also took pictures of themselves using the Mac’s Photo Booth application to add to the podcast. Mr. Cameron gave a narration about himself to demonstrate the first drop, then each teacher took a turn. In this way, the teachers were able to quickly see how the application worked.

This initial podcast was played again at the beginning of the next session as a way of reminding the teachers of what they had said as well as how easy it was to create a podcast. At this point, none of the teachers were ready to present anything regarding experimenting with podcasting, and in this session they learned how to do additional things like mixing different kinds of texts in the podcasts and eventually posting them. Mr. Cameron passed out a sheet that listed three steps for producing the podcasts that would be completed during the session: record an interview in GarageBand, mix and edit music with the interview, and publish it. The sheet also had space for the teachers to write out a brief plan for how they might use a podcast with their students. Then he announced,

When you are starting a podcasting session with your students, I think it is a good idea in the beginning to let them know where it is going to end up. So starting with the end in mind is a good idea because it frames and conceptualizes the activity and what the end product will be. The end product might be in a PowerPoint presentation; the audio might end up on a blog, or it might be burned onto a CD. . . . Do you record on Monday, mix on

Wednesday, and publish it on the web on Friday, so you have a weekly cycle? . . . Knowing your process is the core that you wanna build on.

After the teachers worked on their individual plans, they were asked to work in pairs and use GarageBand to interview each other for one minute, in part to get a sense of how their students might go through the same process. As the teachers worked, they helped each other figure out what they needed to do while Mr. Cameron walked around and answered technical questions like how to add music tracks, how to set the timing for the podcasts, or how to control the sound. The teachers clearly enjoyed “playing” with mixing and posting their podcasts. “This is too much,” said Mr. Roy. He was paired with Ms. Kim, who was smiling and obviously pleased as she showed him what she had done. “I really like this,” said Mr. Elder from the other side of the computer lab. Ms. Church and Ms. Glide had brought their own laptops so that they could continue to work on the projects at home.

Toward the end of this session, two additional applications that could be used for podcasting were introduced—Audacity and Audio Jack—and their unique features were discussed. The teachers were shown how to download and use both programs. Audacity worked as an audio editing tool in much the same way as GarageBand, while Audio Jack was more powerful in that it could be used to capture any audio signal from any sound source on a computer. Toward the end of this session, Mr. Cameron told the group, “We are not going to have time to go into blogging today, so all we can do is mix down [compress into another digital format] the podcast you worked on and either burn it [on a CD or flash-drive] or send it as an e-mail. Good job ya’ll!” Everyone clapped.

Blogging

Learning how to technically use blogs was easy, but developing conceptual frameworks to exploit their affordances was more complex. Mr. Cameron created a PD blog site for collaborative use by the teachers and also helped each teacher create her or his own blog. Over time, the PD blog became a valuable resource in a number of ways. It allowed for a dialogue space for the teachers that ran collaterally to the face-to-face dialogues that were occurring in the sessions and thereby extended dialogue between the teachers in a number of productive ways. The teachers began posting and reading the blog to both inform others

and to keep up with what was going on in different classrooms through the continual record that was created. So things were not being posted arbitrarily.

Mr. Guy, for example, had posted a description of his math lesson that used Google Earth to give his students engaging experiences while learning trigonometric functions. He had volunteered to talk about what he had done with this application to the other teachers in line with our PD tradition, and he gave a brief verbal presentation. Teachers had a lot of questions, and he was comprehensive in his answers. Interestingly, a couple of teachers said they did not quite understand what he had done with his class until they read how he had described it on the blog. Ironically, one limitation for Mr. Guy was that he was not able to use math symbols on the blog: “I’d like to find a way to do my notes on the blog, but I can’t find a way to do the math script like subscripts, superscripts, and things like that.”

Mr. Cameron offered a number of suggestions in the PD sessions for creative ways that teachers could utilize blogs like using them as a platform to publish podcasting projects that were completed in classes, having blogs as a place where they post findings from research projects, or providing topics for students to write about more informally on the blog to offer reluctant writers opportunities for a different form of written expression. He described ways to organize blogs to achieve different goals, noting, “It only gets better with time, because as new students come in, they have the record of everything that you’ve done and all the perspectives of everybody who came to your class in addition to your knowledge.”

More than the actual tool, however, teachers came to see that use of blogs (as well as other digital media) reflected a shift in paradigm that required a concurrent shift in the structures of teaching and learning in classrooms. Blogging was a particularly useful tool for beginning these shifts because it enabled multiple voices, dialogic conversations, and distributed authorship. The PD blog was a key tool that was used to facilitate the development and reflect the contributions of the teachers to the processes of learning in the PD sessions. They posted descriptions of things they were working on and their ideas about what they wanted the sessions to focus on, and they documented some of their plans and goals for what they would do in their classes with the digital tools they were learning to use. These considerations are further discussed later in this chapter in the section “Teaching with Technology.”

Google Applications

After working with blogs, the next session was focused on the use of three Google applications: Google Maps, Google Images, and Google Documents. The teachers were guided through using these media to search for pictures, download them, edit them, arrange them in a particular order of compositional design, and finally create a specific Google map and blend the images to make a visual essay or pictorial itinerary that could be used in conjunction with other class activities or assignments. With Google Documents, teachers were shown how they (or their students) could all share the same document, collaboratively edit it, and see the changes taking place in real time.

In the following session, Ms. Glide presented aspects of what she had done with Google Earth in her class. She had her students download, edit, and sequence images that corresponded to the geography of a story that was being read in class and put them into PowerPoint presentations to present the images in sequence. Mr. Cameron had gone to the class to support her work with her students, and he had also taken pictures of the process that, as mentioned earlier, were eventually used to teach about digital photography in a subsequent session. In presenting to the group on this work, Ms. Glide talked about additional things she had learned while working with the application in her classes.

I did some work with Google Earth this week with the kids, and as usual they were teaching me functions that I did not know existed. Apparently, there is some way to put in place marks like we did with Google Maps, and I am not sure who can do that or how because it's kind of like the same little bubble is gonna pop up. It's something having to do with different layers that you can eliminate or add to that, and I think that would be really interesting. So we are going to work on that some more.

The idea that the presentations could be about work in progress or could present problems that Mr. Cameron, the group, or the principal could help with was an important feature of the professional development, so that teachers could feel comfortable sharing their work with the other teachers and participants in the sessions. Also during this session, I talked about a website that had lesson plans that utilized Google applications for every subject area in high school. Teachers asked to have it posted on the PD website.

Digital Photography

As a part of working with digital photography, Mr. Roy shared things he had been doing in his science class with a gardening project in back of the school. He had his students take pictures of the plants at different stages of growth. He was considering posting the pictures in a blog, but he also sought additional ideas from the group. Mr. Cameron responded, “I think that in the context of the blogs, that’s a natural way of maybe documenting it—what’s going on with the garden project—just taking pictures from the garden and starting a page and extending that with the information about nutrition awareness, et cetera.”

After other teachers made suggestions about additional possibilities for Mr. Roy’s project, Mr. Cameron laid out a structure for further working with digital photography in this session. The approach was to have teachers think of a thematic focus related to their discipline and then go online to find at least five pictures that related to that theme or focus. Next, the teachers were to download the pictures, edit them for size and image quality, add some special effects using iPhoto, and then save the pictures in a folder. Mr. Cameron demonstrated the process for the teachers by walking them through the steps on one photo. The last step was to use the photos to create a visual map or essay about the theme. The teachers worked for the rest of the session on this project, which gave them experience in going through several stages and using or developing a number of key skills for doing a range of things with digital photographs.

Comic Life

One entire PD session was spent working with Comic Life. Mr. Cameron felt it was important for the teachers to learn about this tool not only because it was easy to use and fun to play with but also because it could be a powerful way to storyboard plans for a video, documentary, podcast, essay, or any other project that required sequencing ideas. Additionally, he used Comic Life to review and reinforce for teachers the fluid integration possibilities of the different media. “It starts simple,” he told everyone in a session toward the end of spring. “I can easily crop these pictures [from Comic Life] and dump them into a podcast, then pair with Ms. Rivers to read all the captions and bounce that to iTunes

and into the same podcast. . . . So going from just one storyboard into a podcast, you have two projects with one effort. That's what I mean by the multiple connections of these projects." For the rest of this session, the teachers worked in pairs to experiment with making multiple textual connections while creating an audio/visual or visual/written text story using the digital affordances of Comic Life.

Again, what the teachers experienced, in part, was how fun learning could be both in the process of creating and in the process of sharing. Toward the end of this session, there was discussion about why everyone had enjoyed this process so much and how we could plan for our students to have this kind of feeling about the work they did in classes. This embodying of the actual experiences of learning with digital tools seemed to be one of the most important outcomes of these PD sessions.

Second Life

As noted earlier, Second Life is a virtual world in which "residents" can have social and creative experiences through their control of an avatar that they create. Ms. Glide had agreed to do a unit in two of her English classes using Teen Second Life, and the discussion of her work with students in this unit is the focus of chapter 4. We also wanted the other teachers to have some knowledge of and experience with Second Life, so in May, as the school year moved toward an end, we used a PD session to work with the teachers in Second Life. Mr. Cameron guided the teachers on downloading the program, building individual avatars, and practicing the basic movements and communicative capabilities of the platform. I joined Mr. Cameron in leading this session and also supported Ms. Glide when she did the unit in her class. After exploring a bit "in world" as it is called, we had a lively discussion about possible pedagogical uses and potential problems of this digital media in relation to other media we had worked with during this semester.

Mr. Cameron saw Second Life as another multimodal digital environment that shared some characteristics with media we had already worked with, but he also talked about how it contained key differences. He opened the discussion by saying, "I just wanted to see how people think about this. What are your exposures to this? How do you feel about it? Do you think it's a good thing, a bad thing? What do you think it can help do in a classroom setting?" Ms. Foster raised considerations about

privacy, and this led to an extended discussion also about issues of identity, since a person can choose how they want to represent themselves in Second Life through how they create their avatar. We talked about how these issues of identity might affect students both positively and negatively. Mr. Cameron compared Second Life identities to one of the projects in Ms. Foster's class where her students had to create and represent a historical persona or a famous contemporary person; he suggested that creating an avatar just takes this to another plane of the imagination: "That can be in itself an enriching conversation to figure out . . . to really become consciously aware of why people define themselves in a particular way when the options become limitless," he noted.

Clearly, there was not enough time in one session to address all of the considerations for our "first lives" that were raised by a brief experience of Second Life. This will be addressed more fully in chapter 4. But one of the things we were beginning to see in terms of our work in the PD sessions was that we as educators needed to understand how to take better advantage of the kind of learning being enabled by an increasingly widening array of digital media—each with unique capabilities and affordances. We could see that the ways we were learning to teach with technology were only the beginning of what was possible. Such learning was also only the beginning of what was critically needed to effectively transform schools to meet new, complex, and global challenges of life and learning in the twenty-first century.

TEACHING WITH TECHNOLOGY

There were a number of things that all of the V-Tech teachers did over the course of the school year to utilize some aspect of technology in their teaching. One was how each teacher worked to rethink and redesign the physical space and environment of their classrooms. As with the interior design of rooms in a home, what things are present and where things are placed reveals a great deal about the intentions for use and the kinds of activities that will occur in a space. Each of the teachers experimented with developing various kinds of activity centers in their classrooms, and in the second semester, this was augmented by actual designs and implementations of floor plans to more effectively accommodate digital learning, even when there was not extensive use of digital media in a par-

ticular classroom. The teachers themselves had experienced working in activity centers at various times in the PD sessions with designated areas for work with different digital tools, and they ultimately saw that the design of the space of the classroom itself was fundamental to enabling other changes in their teaching practices.

Another thing that all of the teachers implemented in their classes and engaged in with each other (although at widely varying levels) was the use of blogs. As earlier noted, the PD blog became a central tool for communication among teachers and other project participants in terms of sharing plans, ideas, and the progress of activities going on in different classrooms. Each teacher also created their own blog as one of the activities in professional development. Once the individual blogs actually existed, all of the teachers found ways to use them in conjunction with instruction at some level. The use of blogs by the teachers was also facilitated by the excitement that some of the students showed in their use of them. This was tied, in part, to the fact that the teachers had some of the same students in their different classes, and they often talked to each other about the work and progress of these shared students.

For example, before one PD session began, Ms. Glide talked with Ms. Foster about the student they each had in their class who did a blog in tribute to his friend that he called his “world wide wall.” Ms. Glide told Ms. Foster, “He was so excited about the possibilities and being able to share this with his friends in my class. So whatever you are doing helped him.” Ms. Foster then said, “What he is doing in his blog is he created a whole slideshow of a friend of his who was killed. It has 18 pictures in it. So this has been expressed in a way that he is using technology and he is so excited about it.” Overhearing this conversation, Mr. Cameron added, “Actually, this morning he was asking me how to add a song to his blog, and I said you have to go to customize, but make sure the song has no profanity. . . . So he goes through the site and pulls up in the blogger feature section a form that gives you the option of putting a warning on the content that you’re uploading.” Ms. Glide’s following response in this conversation was insightful regarding ways the teachers motivated each other (and were motivated by their students) to expand their teaching practices.

Sometimes he wants to stay later. . . . He is so excited. . . . So I thought about blogs, and then I thought, “Well, I have to teach myself more about

them.” So I found out that all the kids who were in your class were like “Oh yeah, we already have blogs.” So now, how to do it well makes my life so much easier because not only do they know how to do it, they know more features than I do. And they can also help a couple of other people who don’t know how to do it. So thank you, Ms. Foster.

A few weeks later, Mr. Cameron had observed how Ms. Glide was using blogs in her classes, and commented about it in one of the PD sessions. “As an observer, I have already seen some changes with her students. Just the fact of keeping a blog, and coming here and immediately going towards that, and adding more things or adding portions from assignments, pictures to share with friends. . . . It’s having an impact on her students.”

These cross-class engagements with students and among teachers also contributed to Ms. Rivers’s more extensive use of blogs in her teaching. At first, her use of blogs was more tentative and constricted. She reported to Mr. Cameron that she finally did begin to use her individual blog but that she initially used it “so I don’t have to take papers home.” By having her students submit assignments on the blog, her work in responding to them had become more portable. Soon she began to notice that a significant change was taking place in the dynamics of her classes as she mediated more work with the blog: “I’m finding that I speak less, and the students do more in class,” she noted.

Ms. Rivers also benefited by the fact that other teachers in the school were using blogs in conjunction with the work in their classes, such that a critical mass of student expertise in the use of this digital media was emerging. Since she shared a lot of students with Ms. Foster, Ms. Rivers began letting them extend the use of blogs they had created for Ms. Foster’s class to the work that she was assigning in her class. This, of course, required the students to increase the sophistication of their personal blogs by adding partitions for the work of multiple classes and incorporating more digital tools as necessitated by the different assignments. Eventually, Ms. Rivers and Ms. Foster began to collaborate on the assignments they were giving to their shared group of students. They began working together to connect and expand things that were going on in Ms. Foster’s journalism class, on the one hand, and Ms. River’s social studies classes, on the other, by making assignments that were more comprehensive in the blend of foci and content from both classes.

Ultimately, the work of these two teachers helped us understand that each student needed to have only one academic blog to use for appropriate work and assignments for all of her or his classes at the school.

The role and significance of technology transfers among teachers and students were partially envisioned as an outcome of the professional development, but we did not anticipate the fluidity, serendipity, and, in some cases, sophistication of these transfers. Specifically, we did not fully anticipate the significance of the roles that the students themselves would play in pushing themselves and their teachers to exploit the capabilities of the various media. Another example of this was an episode in which Ms. Church was working with Malik, a student mentioned in chapter 2, as he was trying to add a slideshow to his blog. First, they tried to do it through the iMovie application, but they discovered with the help of Mr. Cameron that a QuickTime file cannot be uploaded into blogger. Malik found another way to do it by using his Gmail account, and was able to make a seamless upload of his pictures. His probing of different media in order to achieve his purpose impressed Mr. Cameron, who noted, “Thinking like designers is where the magic in learning happens, because they bring their own ideas to it.”

The teachers as a whole did not make as much use of podcasting as they made of blogging. One exception to this was the work that Ms. Foster did with her students in creating podcasts, discussed in chapter 2. However, most of the teachers experimented with using various Google applications. Earlier in this chapter, I described how Mr. Guy had used Google Earth to help his students learn and practice math functions and, later, how he shared this with other teachers in a PD session. Ms. Glide and Ms. Foster also used Google Maps and other Google Images and had their students incorporate them into PowerPoint presentations. Again, in these activities, it was the students who often pushed the possibilities for what could be done with these media.

Work in Ms. Church’s classes also provided interesting examples of ways that teachers were taking what they learned in professional development into their classes. Ms. Church had done a unit that focused on homelessness as a significant issue that warranted more attention in society. She found that the students were more motivated to write essays about these issues when they could add images to their writing or do visual essays. They did Google Image searches for relevant pictures, which added more substance to their work. When the issue in focus switched to HIV/AIDS, the students extended their online work

from the incorporation of images to actually doing more research on the Internet at a variety of websites, and they added links to key websites to their final papers. Ms. Church became comfortable with this approach of having the students blending multiple modes of expression into their research projects, and she made plans to continue this approach with them in the next unit that she would be starting, on child soldiers.

Most of the teachers made considerable progress in using more technology in their classes. A couple of the teachers did not do quite as much, but even so, the TEACH Project changed their perspectives on utilizing additional approaches and additional tools, specifically digital tools, to further challenge and engage their students. In some cases, these changes were revealed in things like greater use of the schools' computer labs, even for traditional purposes like writing or typing essays. In other cases, the intense challenges of teaching at a continuation school mitigated things that teachers desired to do in their classes. I was particularly concerned that our project was not able to provide better support to Mr. Roy in his teaching of science classes. Yet, in the final PD session of the school year, he reported that he had joined the Teacher Institute at the Exploratorium, a science museum that has exemplary programs to support the teaching of science. "If you go to this two-year [after-school and summer] teacher program," he told us, "then you have access to their resources forever. . . . So if I know I'm gonna have access to computers and if I'm gonna have other science resources in my classroom, I'll let them know, and they'll help me integrate technology."