How to Talk in Tags:
Creating a Successful Computer Learning Environment for Adolescent Girls of Color

Cassidy Puckett
Urban Promise Academy
2825 E. International Blvd.
Oakland, CA 94601
Cassidy_Puckett@hotmail.com

(Key words: Learning ecology, persistence, gender, urban girls of color, technology, project-based learning)

Reference: C. Puckett (2005). *How to Talk in Tags: Creating a Successful Computer Learning Environment for Adolescent Girls of Color*. Paper presented at the National Educational Computing Conference, Philadelphia, 2005.

Introduction

Web Design Class

At Urban Promise Academy Middle School, a small school in East Oakland where 55% of students are English Language Learners—mostly Hispanic—and 87% qualify for free or reduced lunch, I teach an open-enrollment Web Design course in the Urban Arts after-school program.[1] Web Design is project-based, designed around the work of a professional web designer to build three types of skills: 1) technology (hand-coding HTML and using software programs) 2) design process and technique and 3) leadership/collaboration. Students complete three major projects during the course in roughly the following order: 1) individual personal websites (including blogs), 2) individually designed pages connected together to form a group Web site, 3) a Web site designed completely collaboratively. This way, students' skills in all three areas increase as projects become more complex.

In the 2003-2004 school year, 11 students enrolled in Web Design: 9 Hispanic, 1 Asian and 1 Multi-ethnic[2]—all girls.

Using computers: Race/ethnicity, socio-economic status and gender

According to a 2003 report by the National Center for Educational Statistics, my students appeared to be those less likely to use computers.[3] Hispanic students, particularly those from urban, monolingual homes, whose parents have low educational levels, from low-socio-economic backgrounds were among those in the study least likely to use computers.

While the gender gap for children and adolescents in terms of general use of computers has all but disappeared (NCES, 2003), according to the Higher Education Research Institute at UCLA (2005), females are less likely to pursue Computer Science as an undergraduate major.[4] Sherry Turkle states "girls are critical of the computer culture, not computer phobic. Instead of trying to make girls fit into the existing computer culture, the computer culture must become more inviting for girls."[5] The question is how exactly to do that—particularly for low-income, urban girls of color.

Conceptual Framework

Learning Ecology and Persistence

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[1] I started teaching the course in September 2002.
[2] The one multi-ethnic student was Hispanic, African-American and Japanese.
[3] NCES (2003). *Computer and Internet Use by Children and Adolescents in 2001.*
[4] As described in Vegso (May, 2005) in the *Computing Research News* article, *"Interest in CS as a Major Drops Among Incoming Freshman"*, available at http://www.cra.org/CRN/articles/may05/vegso
[5] Terkle is quoted in an Executive Summary of the Report accessible at http://www.aauw.org/research/girls_education/techsavvy.cfm

In order to understand the factors influencing my students' persistence in learning how to use technology in the ways a web designer would use them, I looked at the students holistically through the lens of their *learning ecologies*[6]—the multiple and overlapping communities of practice of which they are a part. (Sfard 1999; Lave and Wenger 1991; Rogoff 2001).

In this study, I look at the different supports present in students' communities (home, school, in the after-school program and in virtual communities) and strategies for supporting students, including:

- *Relational Access*: Relationship with individuals and groups of various roles
- *Attitudinal support*: Perception of others' attitude toward technology, perception of others' attitude toward student capacity with technology.
- *Material access:* computer and peripherals.
- *Structural support*: Content and pedagogy

[See Appendix A]

The presence of supports in a *learning ecology* encourages student persistence. A persistent student learns in personally meaningful ways, even in the face of challenges. Indicators of persistence in the context of Web Design include attendance (regular attendance, as well as meetings outside of regular classes), evidence of engagement (effort to complete course activities, teaching other students) and evidence of learning outside of the structure of the course.

Research Questions

This teacher-inquiry research project investigates the individual and group learning ecologies that affect adolescent girls of color persistence in a technology course. My major question was: What supported or failed to support students' persistence in learning how to use technology, especially when faced with challenges?

A trio of best friends—one who leaves the course, and two who remain—emerge as case studies to look deeper at how supports influence persistence.

Methodology

The study lasted from September 2003 to June 2004, during which time I kept observational notes on 1) the activities I designed for the class and how they were received, 2) the nature of self-chosen activities, 3) how students interacted as a group. I also prompted and took notes on informal whole-class discussions about gender, use and perceptions of technology. All students took a survey on interest, access and experience with technology that included scaled close-ended questions as well as open-ended responses, which I analyzed for differences within the group. I also conducted an in-person interview with Sandy, a high level student who was highly

[6] As described by Vissner (UNESCO, 1999).

engaged in using computers and with other students in the class. I conducted Instant Message interviews with Wei Ling, another high-level student who was much less interactive with computers and other students during class, but much more so outside of the class. Other artifacts of the study included emails with students, student blogs, and member tracking information on web communities to which students subscribed.

Results

Access, Interest and Experience Survey

To find out if there were differences in access, interest and experience, students took a survey in the middle of the school year.[7] Most had positive attitudes towards computers learning. They indicated that computer learning is interesting, fun, and they feel relatively comfortable with computers. Most responded that they were confident in their ability and were not nervous when using computers.

The great majority believed that teachers and parents think it is important to know about computers. For almost all of my students knowing about computers was very important. This is not surprising since they chose to spend time after school learning Web Design, above other after-school activities such as Intramural Sports, Graffiti, and Break-dancing. Most believe knowing about computers will help them get a better job, but not necessarily have a better life.

Access is widespread but not universal. Students indicated a range of access to computers and peripherals, with 55% of the class having Internet access at home.

Access Indicator	**Class Percentage *(n=11)***
Email Accounts	82% (9)
Computers at Home	82% (9)
One computer at Home	55% (6)
Two computers at Home	27% (3)
Internet Access at Home	55% (6)
Printers at Home	55% (6)
Scanner at Home	27% (3)
Gaming consoles at Home	72% (8)
Handheld gaming device (including Game Boys)	27% (3)
Cell phones that play computer games	82% (9)
Handheld device (PDA)	9% (1)
Digital camera	18% (2)
Movie camera	0%

[7] The survey was a modified version of a survey created by Professor Brigid Barron and her research team at Stanford University.

Overall, students indicated spending more time using technology for entertainment and communication than for learning and educational activities.

When my students were asked in an open-ended response question to draw and/or describe someone who knows a lot about computers, 8 of 11 students drew pictures of females. The explanation for my students' drawings was not reflected by their mother's use of the computer. Most students reported that their mothers did not use computers for work, and Sandy, who had the most technology at home, said her mother "wasn't really into computers."

While the support of a female role model at home was not part of their persistence with technology, students at UPA believed Web Design was a "girl thing."

Talking Gender, Collaboration and Technology

I explicitly asked students if class would be any different if there were boys enrolled. In our discussion, I first asked the girls: "Would the class be any different with boys? If yes, how would it be different?" Students responded:

> *It's different because boys wouldn't work, they'd just fool around.*
>
> *We're open with each other.*
>
> *Boys would just mess around.*

According to my students, it was the ability to work together (citing both *relational access* and the *structural support* of collaborative work) that made the class a good place to be. Most of the students said that it should be a girls' only class in the coming year, with a few adding the comment that "boys aren't interested, anyway," meaning that even if I made it co-ed enrollment, boys wouldn't sign up, and if they were in the class they would "just mess around."

This is reflective of Davidson and Schofield's (2002) study that found that the social aspects of instruction had a large impact on student learning. They identify other research that has indicated that "female behavior traits" are largely context specific and that "girls appear to benefit from collaborative approaches to programming and computer-supported work" (37). Although *relational access* described above is a key support for girls' persistence in using technology, other supports also influence *relational access* as well as have influence on students' continued learning.

School and Class Learning Ecology

Part of my students' persistence in learning how to use computers was in *relational access* to same-gender peers, but there was also *attitudinal support* through mutual dedication to project-based work and *structural support* of the design of a course to involve reciprocal teaching

through peer collaboration.[8] Talking was always allowed (except when I was giving direct instruction or another student was talking in our discussion circles) and students decided on the content of their individual and group projects.

Another important *structural support* provided by UPA, which extended into the after-school class, was the schools' dedication to TRIBES[9]-based learning environment. Students were coached in how to behave toward one another (which could also be considered an *attitudinal support* provided by the school) and thus were prepared for learning collaborative design.[10]

Case studies: Trio of Friends

A trio of best friends—Sandy, Wei Ling and Marisela—attended my Web Design class for two years in a row. In the second year, Marisela left the class about three-quarters of the way through the year, although Sandy and Wei Ling remained. Although Marisela's departure could have influenced Sandy and Wei Ling to leave the class as well, supports present in their learning ecology encouraged them to persist in learning how to use technology. Sandy persisted not only by attending the regular class, but by also by facilitating the class, meeting outside of regular class time, and doing additional computer activities (mostly design related) at home. Wei Ling persisted also by attending regular class, meeting outside of regular class time, and doing additional computer activities (mostly related to coding HTML and CSS for online blogs) at home.

Sandy: All About Personality

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[8] A part of this structure was class-established criteria for quality work (Appendix B) and persuasion goals for their final collaborative project: an 8th grade graduation website (Appendix C). See http://captology.stanford.edu/ for further information on persuasive technologies.

[9] Particularly important to the learning goal of collaboration, students were well prepared for this aspect of the course due to explicit instruction on how to co-create a community of learners. See http://www.tribes.com/

[10] Beyond being a girls-only class situated in a small school and in a small class, the Web Design class carries with it the legacy of the program of which it is a part: Urban Arts Academy After-school program. The program is based on the idea that students needed an alternative to the draw of the streets, a reason to stay in the safety of school. The program includes Youth Facilitators, students who are paid to help instructors run the class and lead discussion circles. The purpose of this structure is to invite close relationships between students and teachers and among students in the class, who are often from different social groups in the school. This structure keeps Web Design running smoothly, as the students know what to expect from the Instructor, Youth Facilitator, and other students in the class. The class involved: 1) single-sex instruction in which students could rely on one another, 2) standards of behavior and personalized knowledge of students facilitated by a small school and small class size, 3) legacy of past classes and knowledge of class structure so that students knew what to expect.

For two years Sandy had been my student and in the last year became Youth Facilitator in Web Design, organizing the administrative details and facilitating discussion circles. Sandy is highly computer literate, coming from a home in which there is high *material access*: computers, scanner, digital camera, handhelds, a game consol, cell phones, and a printer.

Sandy said her family had recently developed an interest in technology as a consequence of her and her sister's growing abilities to teach her father about it. Sandy remarked that became hard to get her dad off the Internet. Sandy's uncle worked with computers, so she called him if she had a question no one around her can answer. Sandy's home supported her persistence with technology through *relational access* with other family members interested and/or expert in technology*, attitudinal support* in her parent's expectation that their children not only learn about but also teach others how to use computers*,* and high levels of *material access*.

Sandy's friends thought of her as very technologically savvy, so much so that when they were asked to imagine a person who knows a lot about computers, they drew a picture of her. In class I watched Sandy easily navigate graphic design in Word, PowerPoint and Photo Deluxe.

In the class, Sandy thrived because she could be a leader—as Youth Facilitator and as the most technologically savvy in the class. I believe that she was successfully engaged in the class because it offered her opportunities she valued: to be a leader, hang out with her friends, and engage in a practice that was highly rewarded in her home.

All About Personality: Patience and Persistence

Sandy believed that being good at computers is related to a person's ability to be patient when engaged in challenges, a character trait she saw as part of her identity.

Cassidy: Do you think there's a computer type of person?
Sandy: I think so.
Cassidy: You think so? What type of person is that?
Sandy: I think it's a type of person that's really into them. That enjoys, like, you might get frustrated in a while, when you try to do something. But you won't give up on what you're doing. You continue to try to understand it. You won't give up on what you're doing.

Cassidy: Do you see yourself as a computer type person?
Sandy: Yeah, I think so.

[Later]

Cassidy: What does it take to be good with computers?
Sandy: Just not giving up. I know some people…let's say you want to change something in PowerPoint. They can't decide what to do and they just give up on it. They say, "I'm frustrated with it. I don't want to do this no more." I think you really need to be patient with yourself and not give up.

Here Sandy described persistence as a personality trait, but I believe that supports present in Sandy's learning ecology—at home/in the community, in school, and in the Web Design class—provided Sandy with opportunities and encouragement necessary to persist.

In the community of which Sandy was a part—from a Web Design class of all girls, to a younger sister teaching her father how to use technology—she constructed a unique version of what "computer-type" means. Sandy's learning ecology presented no barriers for women or young girls, or by race and—due to lowering prices of computers and peripherals—by socio-economic status.

Instead, it's all about persistence.

Sandy came into the web design class with high supports over time at home, school and in the class. Throughout elementary school she used computers in classes. Before taking Web Design she took Media Arts as a 6th grader. Her father's excitement and her sister's increasing expertise further encouraged her classroom participation. She led classes and hung out with her friends, dedicated to the class for two years. Sandy not only had multiple supports in various learning communities but had also worked to facilitate a social group among like-minded girls to encourage her (and their) continued persistence in learning how to use technology.

Wei Ling: Private Participation

Wei Ling arrived in the U.S. from China when she was 9 years old, just one year before starting the 6th grade at UPA. She took Media Arts in her first year at the school, and joined Web Design class in her second year. In the first year, she seemed primarily interested in email and finding pictures of Japanese anime art to save and print out, but not much interest in coding HTML or interacting with the class as a whole.

In the second year, her participation changed, not inside of class, but in the privacy of her home. Wei Ling's email correspondence increased sharply in comparison with other students in the class to solicit help in coding her (multiple) blogs. Over the course of the year, Wei gradually became the student most involved in coding web pages.

Guestbook: Playing with Identity and Coding

Wei Ling first approached me about how to do more intricate coding so that she could modify a guestbook she made. She wanted to align her text in the center of the screen and make it blue. I wrote down the code and asked her to send me a link to her guestbook. She wrote me the following message about it:

> hey cassidy
> look i go this website is 4 making
> ur own web so i sign up 4 it
> and now i'm having differcult with coding

and the only thin i got in my website is guestbook
here is my web:

www.blueangelx3.bravehost.com <http://www.blueangelx3.bravehost.com>

p.s. please sign my guestbook!!
hehe.....i have spent hours just to upgrade the guestbook
and it's really hard to edit ths web
and i can't figure it out myself
so pleas help me. >.<

I helped her with the code and sent the link to the supportive and highly involved principal to share what my students were doing. Looking at the site, he was impressed with how she was coding the site, but expressed concern about how she was representing herself, with gang colors and numbers. He thought it might be better that I say something about it, that she would expect him to be upset about it and it might be more powerful coming from someone who is not a school administrator.

The following class, students critiqued various web sites and made guidelines about what good and bad websites look like (see Appendix B). During the exercise, Wei shared her guestbook which she rated as a "bad website." Her peers were honest but supportive, giving her feedback about how to make the site better.

After class, Wei and I had a conversation about the guestbook. I expressed concern about representing herself the way she had in her guestbook. I said that I while realized it was much safer on the Internet than in person, I told her that I heard from other teachers that she had (at least once) experimented with coming to school wearing Surenos' gang color (blue).

I was worried that after the whole class critique and my confrontation about the site, she wouldn't return to the class, but she did. I checked her website later and it was gone, which I emailed her about. Wei responded by confirming her willingness to persist with her projects:

hey cassidy,
i didn't gave on my website. it'z just dat
i was changing it on sunday night,
then i think i messed up something.
and the whole thing was gone.
then todai i try to fix it something went wrong again.
just want to tell u dat i'm not those kind of person give up so easy.
maybe i'll give up later,
when i'm tired of it, i mean when i can't do it no more.
then i'll give up on that website.
any wayz have a nice spring break.
~*wei ling*~ :D

A couple weeks later, Wei witnessed a conflict between Marisela and another student without telling a teacher, so was suspended from Web Design for two weeks. Again, I thought she might

not return to class, but did. Not only did she return, she also started emailing and IMing frequently, inviting me to see an online community she joined and later her blog. Wei, like Cindy, had *relational access*, *material access,* and *structural support* at home, at school, in class and, in addition, in virtual communities to support persistence in learning about technology even in the face of challenges.

Blogging: Peripheral to Developing Participation

Wei Ling became involved in an online community called AsiaFinest.com, in which she participated in discussion about Chinese and Japanese culture.

Wei:	i'm on one right now
	iz an asian forum
	want it?
Cassidy:	yes
Wei:	k wait
	http://www.asiafinest.com/forum/index.php?act=SC&c=3
Cassidy:	which chat room do u go 2?
Wei:	i often go 2 chinese chat or korean[11]
	some time japanese too
Cassidy:	what do u chat about?
Wei:	any thin u wan

In the anime forum of AsiaFinest.com, users can post URLs images—thus, only those who have access to web space in which they can store their images can participate. I helped Wei to upload her images in our class web space. She then posted the URL of one of her images and had a discussion about her sketch with other users:

> "Posted by: ~*AzN pride*~ May 14 2004, 12:25 AM
> thiz iz da pic i drew 4om *[from]* a pic dat i print.
> think it'z from a manga book.

[11] Notice Wei's formal sentence, "I *often* go 2 chinese chat or Korean" [emphasis added]. In communicating with IM shorthand, typing and talking with others at a distance on the web, Wei played with new language and vocabulary and developed new literacy skills. While I don't go into a full analysis here, it would be interesting to study students learning IM shorthand. See also Chandler-Olcott and Maharr's (2003) article, *"'Tech-saviness' Meets Multiliteracies: Exploring Adolescent Girls' Technology-Mediated Literacy Practices."*

After posting her image, Wei Ling received replies indicating approval from other users:

> Dachink: hmm, looks familiar
>
> ~*AzN pride*~ [Wei Ling]: yeah u might.
> cuz i think it'z from a manga book'z
> i print the origianal pic
> then i drew it from it.
> i think dat manga book iz
> called somthin somthing angel.
>
> Dachink: looks like Setsuna from Angel Sanctuary *[anime character reference]*

Wei was supported by *material access* of class web space and by *relational access* to online peers who encouraged her to learn how to participate in online discussion forums and post images on the forum. This encouraged her continued exploration into other online communities and practices. Not long after showing me the online discussion board, Wei Ling emailed that she made an online journal. I subscribed to her online journal, called ".::^1cE again mY LiFe^^::." (Once Again My Life) and I received an update whenever she wrote a new posting.

Wei started finding other online journals that she liked, and wanting to emulate their features. One thing we worked on was changing the cursor from an arrow to crosshair. We talked about what she wanted to do over IM and in class, and then I emailed her the code:

> Hi Wei,
> Here's the code for the crosshair. This uses cascading style sheets—I'll explain that if you want or you could look it up online.

Copy it and paste in between <head> and </head>:

```
<style type="text/css">
body
   {
   cursor:crosshair;
   }
</style>
```

Got it? Hope it works!
-Cassidy

The next day I got an email alert that she had written the following in her journal:

> Ooooh yeah.....
> i jst change sum colorz 4 thiz blog.
> it lookz ok.
> Oh yeah, Cassidy if u read thiz, i wan 2 thank u 4 teachin me how
> 2 html da crosshair thingy.
> and it work! ^.^

Online, Wei learned to notice what she likes in the blogs, ask for help in how to code changes into her journal and is becoming more and more successful with coding. She also picked up technical language ("crosshair") as she did this work because she needed to learn specific terminology in order to code well.

Wei was also supported at home by her older sister, Ma Ling, who frequently used the computer (sometimes to Wei's frustration), who Wei observed using the Internet in different ways:

> then Ma Ling waz usin da compu til rite now. n i don kno how she got thiz thin, and she
> DL [downloads]
> da software 2 typ in Chynese it'z kool…
> oooh yeah i could typ chynese here 2. but i'm suck at typin chynese it tak me a long tym.
> tat'z it 4 2dai.
> §Ú«Ü_n¡C
> ok tat'z all i could typ rite now.
> it mean i'm aight.
> hehehe.....

What is particularly interesting about Wei's private interactions online is that she was able to talk about and participate in shared cultural experience with other female Asian youth. At UPA, Wei was one of a handful of Asian students, and the only one in Web Design. With her online audience, Wei had the opportunity to "hang out" with other Asian youth with similar interests. Wei's online writing was allowing for both testing new identities (as the case with gang related

colors and numbers) as well as developing cultural identity. She could do so in the safety of the online world, separate from her friends in school (Turkle, 1995).

Wei was cultivating relationships in a comfortable private online space and learning code to position herself as a more expert user in this environment. Lave and Wenger (1991) call this a move from "legitimate peripheral participation" to "full participation" within the context of her online blog community. For Wei, this move from peripheral to full participation was not a complete one; she will adjust her position of learning and teaching according to users' skills with whom she interacts.

However, Wei had definitely taken on the identity of someone who is *capable* of full participation in web design. In the last session of Web Design class, I asked students to share one thing they were most proud of in the discussion circle. Wei, smiling, said she was most proud of how much she learned about coding.

It seems that what supported Wei's persistence in learning was heavily *social access* at school, in the class, at home and online.

Marisela: I just don't feel the same.

Marisela joined Web Design halfway through the previous year with Wei Ling and Sandy. Marisela worked closely with Wei Ling in the class. When adopting online nicknames, Marisela chose "KandySimpson" similar to Wei Ling's "KandyLover." A good student and a quiet presence in the class, she seemed to enjoy spending time with Wei Ling, but wasn't as interested in computers. A fan of Eminem and Nike shoes, she spent much of her time in class on the Internet researching these two interests. She also exhibited engagement in a fieldtrip to the Exploratorium in San Francisco, playing with exhibit spaces with her friends.

In her second year, Marisela continued to come to class. I suspected her reasons for coming were largely to hang out with her friends and go on fieldtrips outside of school (which are perfectly good reasons!). During a visit to the Tech Museum in San Jose, she again showed interest in the exhibits, playing for a lengthy amount of time with a computer program for designing low-rider bikes.

Conflict and Identity Shift

Marisela publicly began to show an interest in gang-related material. Marisela drew gang symbols and colors in her sketch notebook and looked at gang-related web sites. This was not limited to the Web Design class, but also occurred during school, with Marisela sneaking gang colors into her clothing (in spite of the school dress code).

One day in the last quarter of the school year, Marisela got into a conflict with another girl about gang colors. While the exact details of the conflict are unclear, Marisela was in a fight claiming blue over red. Wei Ling stood next to her and did nothing during the fight. While common at other middle schools in the area, fighting is a rare occurrence at UPA. As consequence, Marisela

was suspended for a week from school and after-school programs. Wei Ling was also suspended for two weeks from after-school programs. I found out about their suspensions from Sandy who said, "It's crazy! Marisela, she's like the Valedictorian of our class, she has straight A's, and she's suspended!"

I was very afraid that both would not return to class. A few weeks later, Wei Ling returned, but Marisela did not. Sandy told me she quit all after-school classes. Two weeks after that, Marisela was in the classroom just before Web Design started but told me she wasn't staying. I stopped her in the hall to talk about it, asking her why she wasn't coming, if it was something about the class, school in general or something else.

Marisela didn't share much about how things had changed for her. What she said was, "I just don't feel the same." It's hard to say exactly what was going on with Marisela, but clearly supports were not present to motivate her to continue investing her time in the class. Despite the fact that her two best friends remained, something outside of school lured her out and something inside of school compelled her to go.

When Marisela filled out the survey months prior to her departure, she reported very low confidence and interest in learning about computers. Neither of her parents uses computers in their jobs and she indicated that she felt that her parents, teachers, friends and even she did not feel it important that she be knowledgeable about computers. For Marisela, there were very few supports in her learning ecology and the final support that kept persistent in learning to use technology was the *relational access* afforded by the class. Marisela indicated she had a computer and printer at home and used it often to email, instant message and listen to CDs, but *material access* was not enough to persist in the face of challenges.

When Marisela did not come back I was perplexed and still remain so. Although she stopped coming to all after-school classes, it seemed that Web Design would have the biggest draw for her with her two best friends in the class. Her suspension may have changed how she perceived herself and how she fit in at UPA. Having been denied the peer-to-peer support of the class and pushed out of her role as a good student and honored leader, her disillusionment changed her full participation in school in general.

Discussion

For Sandy and Wei Ling, computer learning was all around them, highly supported in their multiple learning communities. More than one person at home participated in using the computer for more than just communication and entertainment services. Wei in particular was encouraged by supports present in her learning ecology to persist through challenges.

Marisela's learning ecology did not provide her with enough supports to encourage persistence through challenges. The large shift in her learning ecology at school prompted her departure from the Web Design class. Marisela's break in *relational access*, *material access* and *structural*

support at school and in class changed her commitment to further learning in this particular context.

Many studies have not been able to measure the long-term impact of special programs designed to improve girls' participation in computer science classes. This one-year study also cannot measure the impact on the girls' future use of computers. However, in the coming years I intend to stay in contact with my students, support their continued web design work, and do follow-up interviews on the computer courses they take in high school and beyond. It is my supposition and hope that students' participation in the Web Design course will reflect Shapka and Keating's (2003) findings that successfully supportive learning experiences prepare students for future learning, that Sandy, Wei Ling, Marisela and other girls in the class will be provided enough supports to encourage persistence in learning how to use technology.

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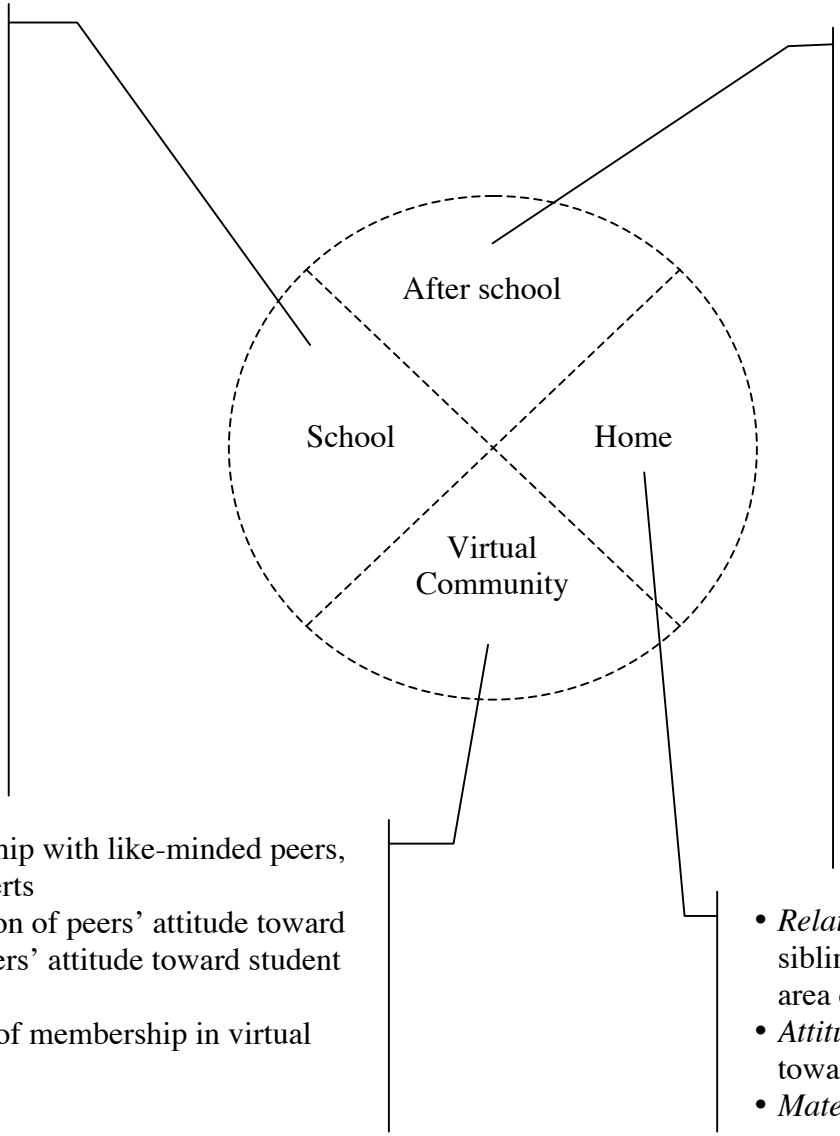
Appendix A
Conceptual Framework of Supports of Learning Ecologies

- *Relational Access:* Relationship with school teachers, administration
- *Attitudinal support*: Perception of school attitude towards the course, perception of school history/legacy of expectations for course/student involvement
- *Material access:* computer, peripherals, funding support for field trips
- *Structural support*: Administrative support for the course, community norms of interaction (community agreements)



- *Relational Access*: Relationship with instructor, relationship with peers in the course
- *Attitudinal support*: Perception of instructor and peer attitude toward technology, perception of instructor and peer attitude toward student capacity with technology.
- *Material access:* computer, peripherals
- *Structural support*: lesson is designed to address core content of subject area and asks students to produce/reflect on genre-specific language, includes high scaffolding and high expectations (e.g., culturally relevant projects, multiple entry points for participation, explicit instruction in how to engage in peer collaboration and discussion of what constitutes quality work, contextualization of class in the real work of subject-area experts, and reflective teaching practice that guides the contingent reshaping of class structures to meet students' needs) and reciprocal teacher to student and peer to peer teaching (including self-created rubrics/standards of quality).

- *Relational Access:* Relationship with like-minded peers, community subject-area experts
- *Attitudinal support:* Perception of peers' attitude toward technology, perception of peers' attitude toward student capacity with technology
- *Material access:* constraints of membership in virtual communities

- *Relational Access:* Relationship with parents, siblings, extended family, community subject-area experts
- *Attitudinal support:* Perception of family attitude toward technology
- *Material access:* computer, peripherals

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Appendix B

Web Design Guidelines for a Good Website:

Goods sites have:

- Lots of options, stuff
- Easy to use
- Games
- Right audience
- Things we already know about/it connects to things in real life
- You can tell which things are links
- Sound
- Music
- Bright/attractive colors
- It highlights what's important with colors
- Lots of things to do
- You can find what you're looking for
- You can interact with other people
- Good pictures
- Letters are nice
- Language of the site is right for its audience

Examples of good sites: mtv.com, univision.com, looney toons website, yahoo.com

Bad sites have:

- Sounds that repeat over and over
- You can't tell where you are
- There's only a few links
- Colors are too bright
- It's hard to read the letters
- Nothing there
- No pictures
- No colors
- No information
- Too much reading
- Too structured
- Language of the site is not right for its audience
- Too much stuff

Examples of bad sites: zombo.com, webpagesthatsuck.com

Appendix C

Web Design Influence Guidelines
for the 8th Grade Graduation Website

We want people to:

Know about this school
Know the teachers
Know what programs we have/what we do
Contact us
Know who we are
Know what we do
Learn about each 8th grader
Learn about promotion
Learn about the things 8th graders have accomplished
Learn how 8th graders influence others
Know how everybody gets along
Know about the 8th graders' favorite things
Learn about what makes us different from other middle schools
Know every person is unique
Give us $ for the promotion
Learn about different 8th graders
Feel like each *Urban Promise Academy* student is a star
Come to 8th grade promotion
Teach at *Urban Promise Academy*
Accept students into High School