

Stealth teaching educational technology in an after-school setting.

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Abstract

Stealth teaching educational technology is premised on teaching high-level technological skills in a project-based and game-based environment. The teaching method aspires to provide extra, unexpected, chances for the “learned helpless” student by: (a) creating high-level learning tasks that appeal to the individual and situational interests of children eight to eighteen in an at-risk community; (b) writing detailed lesson plans with screen shots that anticipate common errors and that are accessible to poor readers; (c) making educational games accessible, particularly open source games, with which a troubled learner can advance at his own pace; (d) creating a supportive environment during the class itself that encourages the at-risk learner and reiterates the high level of the skills learned and the relevance of the learning tasks to the future of the student .

I teach in an exotic foreign land, where the local language is flecked with thought-provoking colloquialisms and where customs are often incomprehensible to me. I teach at-risk youth in computer labs at local libraries. I stealth teach.

Stealth teaching can be defined as making technology projects so enjoyable that children don’t notice how much they’re learning.

In the early days of developing a curriculum, I put together a “Roaring Dinosaur” class in Swish, a multimedia program somewhat akin to Flash. I thought it was fun to make the dinosaurs crash into each other and roar.

I taught the class both to children at the libraries and, as a guest speaker, to graduate students. I observed that kids learned the software effortlessly; graduate students also learned the software, but with brow-furrowed effort. It was only after watching the graduate students that I realized how difficult the class was. Kids wanted to know how to get the dinosaurs to crash into each other and roar; learning frames-and-layers programming was incidental to the important matter of dinosaur war. The graduate students applied all their intelligence to the process and took more than twice as long to learn not quite as much.

Epiphany: children will learn high-level technology with truly astonishing ease if the project is sufficiently intriguing. And formal studies back this up: “Although focusing attention and continuing cognitive engagement normally requires increased effort, when interest is high, these activities feel relatively effortless” (Hidi, 2000, p. 311).

The second major realization concerning the program, and the primary shaping factor of the stealth teaching method, was that I did not have a captive audience. From preschool to senior

year, schoolteachers in the traditional classroom are rarely confronted by a student who says – no thanks, I'll just pop out to the 7-Eleven till it's over.

But at the Wired for Youth centers at the Austin Public Libraries, all my classes are entirely optional. Luckily for my program, computers have a built-in coolness factor; unluckily, I'm a middle-aged woman wearing an Austin Children's Museum apron. If I wanted an effective program, I was going to have to answer two questions: who are these kids, and what will motivate them to stay for class.

Who Are These Kids?

Young people represent at least half of all public library users who turn to libraries not only for the books but also because they prove safe havens in troubled neighborhoods and a rich array of new technologies, including computer and CD-ROMS. (Quinn, 1999, p. 100).

The students at the Wired for Youth centers are, to a large extent, seeking a safe after-school haven; school is over for the day, and they want to finish homework and play games on the computers.

These are normal kids, and they represent the two kinds of learners – those who inhale knowledge, and those who run away like the sissy knights of Monty Python's Holy Grail. Educational psychologists term these two types, "mastery-oriented" and "helpless response oriented" (Dweck & Leggett, 1988, p. 256). The mastery oriented pattern "involves the seeking of challenging tasks and the maintenance of effective striving under failure." The helpless pattern "... is characterized by an avoidance of challenge and a deterioration of performance in the face of obstacles" (Dweck & Leggett, 1988, p. 256).

The first group loves being graded and critiqued; the second group falls apart at the least prospect of failure. I see both types of learners in this program, but as these computer centers are purposely located in "at-risk/at-promise" areas of the city, where the high schools have high dropout rates, I began to see that this program could provide a second chance for troubled, "helpless response" learners.

Research ... suggests that children who lack confidence in their ability are especially at risk for exhibiting a learned helpless response pattern when performance goals are salient. When these low-confident children expect normative evaluations of their performance, they respond with ineffective problem-solving strategies and negative self-attributions of ability (Ames, 1992, p. 265).

A variety of factors in the after-school setting ease the stress of learning for these learning-averse kids – the activities are un-graded and designed to provide a fun result for even the lowest level of skill; the setting is far away from the traditional classroom; children can arrange their own groups for activities; and, again, the child is free to leave at any time.

What Will Motivate Them To Stay?

“The pupil labeled hopeless may react in a quick and lively fashion when the thing-in-hand seems to him worth while, as some out-of-school sport or social affair” (Dewey, 1910, p. 35).

These classes are designed to appeal to the interest of the children likely to be hanging out at the library, in the hope that a positive learning experience -- an unexpected, positive learning experience -- will increase the self-respect of a learner and influence the student to continue learning. In point of fact, I trick them.

PROJECT-BASED AND GAME-BASED CURRICULUM

Building on the two co-equal founding factors, that the class must be complex and the class must be fun, we move to the next level – classes are either project-based or games-based.

Project-Based

The projects created for teaching in this after-school setting come within the most basic definition of project-based, “a model that organizes learning around projects” (Ibáñez, 2006, citing Thomas, 2001, p. 310). More detailed project-based definitions generally anticipate a traditional school setting, with a larger scope in both invested time and resulting project (Helle, 2006, p. 288).

Here’s the Stealth Teaching Scale – how much the kid learns on one axis and how little he realizes he’s been tricked into learning something.

1	Kid learns high-level	Kid has a great time, asks if I’m coming every day from now on.
2	Kid learns mid-level	Kid has a great time, asks if I’m coming every day from now on.
3	Kid learns low-level	Kid has a great time, asks if I’m coming every day from now on.
4	Kid learns high-level	Kid works through class and is satisfied with the outcome.
5	Kid learns mid-level	Kid works through class and is satisfied with the outcome.
6	Kid learns low-level	Kid works through class and is satisfied with the outcome.
7	Kid learns high-level	Kid is restless and repeatedly asks when class will be over.
8	Kid learns mid-level	Kid is restless and repeatedly asks when class will be over.
9	Kid learns low-level	Kid is restless and repeatedly asks when class will be over.
10	Learning-avoidance	Kid doesn’t stay for class.

Specific Recommendations and Sample Classes:

GROSS AND DISGUISTING IS GOOD STUFF. I love October, because Halloween-based (read: gross-out-based) classes are so easy to sell. I teach a Haunted House Soundtracks class (#1 on the Stealth Scale) in the shareware Music Masterworks, where kids create solemn organ chords (easy to do with this software) and then insert .wav sound clips of screams and creaky doors and werewolves howling. Kids have no idea they’ve learned a substantial amount of

music theory, along with a little math. Halloween is also a good excuse to use Photoshop to create virtual costumes – we learn to turn pictures of ourselves green or purple, and to give ourselves three eyes and two heads, again, learning fairly complex features of Photoshop in the process. And I can't tell you how many kids have been lured to learn Fireworks digital drawing tools with the question, "Would you like to write your name in blood?"

POP STAR MEDIA. My very first educational technology class was a Swish class, with the opening line, "Would you like to make a Lil Romeo music video?" Fortified with fan pics of Lil Romeo and a .wav file of "My Baby," I was able to trick dozens of pre-teen girls into learning frames and layers programming. I will never follow the complexities of Yugioh and DragonBallZ plots, but I duped tween boys into learning fairly complex features of Microsoft Publisher by using pictures and screen shots of characters to create faux trading cards. Our Hallowed 2006 Rose Bowl victory gave me an excuse to teach inserting and arranging pictures (of Vince Young and Bevo) in Microsoft Word – we printed them out on tattoo paper. We learned about setting margins, searching through the Windows folder structure, saving, and printing, portrait and landscape. Hook 'em.

VANITY -- DIGITAL CAMERAS AND PROPS. Kids love pictures of themselves – the tag line, "You'll get pictures of yourself that you can upload to your MySpace page" almost always gets the attention of a teen. One favorite that kids and staff always love is the "Photoshop-ping Yourself In" composite class, where we learn to create a transparent background and put our picture into an existing picture – into a still from a movie, or a book jacket, or onstage singing with Lil Bow Wow. Adaptable to school units: inside a molecule, alongside the defenders of the Alamo, etc. I found room in my budget for a portable photographer's blue screen, which makes this class much easier, but paper or a sheet tacked up on a wall will work almost as well.

THE WORD "MUSIC". Music is an almost-certain attention-getter for the tween and teen – using it in projects, composing it, editing it, and the phrase, "digital audio" will often stop a teen in his tracks. Your best one-stop shop for this is the open-source Audacity multi-track audio editing software. You can use it to edit out fair-use short clips of popular songs to use in projects, and kids can use it to create their own hip-hop compositions of loops and clips – add a microphone to this mix, and you've got kids being creative, learning music theory and math and the science of waveforms and actually thanking you for it.

THE WORD "MOVIE". At the Wired for Youth centers, the computers have Fireworks 3 installed – we are able to use this software to create animated .gif "movies" using all sorts of stop-motion animation – claymation, pixellation animation (stop-motion with people), construction paper animation (think South Park and Monty Python), as well as stop-motion with our Museum bendable dinosaurs. The word "movie" will often capture the attention of a too cool for school teen, and the opportunity to work in groups is not only appealing to them but good for them: "research has shown that children working in cooperative groups demonstrate superior problem-solving" (Lepper & Henderlong, 2000, p. 293).

The advantage of the movie concept is that it can be adapted to a wide variety of teaching units – construction-paper George Washington crossing the Delaware; claymation planets orbiting; stop-motion objects demonstrating mathematical concepts. If class computers have Windows XP,

you have access to the free Windows Movie Maker, which can be used for these projects. Let kids operate the cameras and do the “post-production”, and you’ve got a whole lot of learning going on – at a #1 on the Stealth Scale.

General Guidelines for Project-Based Classes

We’ve looked at some features of stealth-learning projects designed to catch both situational interest and individual interest.

Situational interest is generated by particular conditions and/or objects in the environment that focus attention, and it represents an affective reaction that may or may not last. (Hidi, 1990; Hidi & Anderson, 1992; Krapp, et al 1992; Murphy & Alexander, 2000) For example, a student who is not interested in science may watch an engaging television show one day that demonstrates how black holes can “suck up” things (Hidi, 2000, p. 312).

Individual interest has been defined as “an identified class of objects (subject content) to which a student predictably will attend” (Renninger, 2000, p. 375).

Individual interest enables a person to persist in the face of frustration and feelings of failure, to answer questions, and to resolve difficulty (Csikszentmihalyi et. al., 1993; Prenzel, 1992; Renninger & Leckrone, 1991). It sets him or her up to take risks and be resourceful as a problem solver (Renninger & Shumar, 2001) (Renninger, 2000, p. 377).

In other words, a group of teenage girls might not be interested in game programming, but if they can make a game with pictures and sound featuring Beyonce, they are more willing to stay and more willing to work through the difficulties of the class.

Following are tips in the design of the project to hold interest and to make the educational experience a quality one for at-risk learners, particularly those who are free to exit the class at will. Stealth teaching classes will provide:

- **initial instant gratification** - In developing classes, it’s important if at all possible to insert a “wow” moment early on – for example, in the Halloween Soundtracks class, kids find that 20 seconds of random clicking will result in a pretty impressive musical score. An early success reinforces their confidence and sustains interest.
- **a base level project that all can achieve, plus a higher level of complexity for older or more technically proficient students** - In the movie classes, all students will be able to import and play the movie they shot, and with some help, will be able to export and save the final project. Some students will complete the advanced portions of the class, learning to vary the frame rate, apply special effects, and add titles.
- **instruction in both subject matter and generalized information** - each class provides instruction in particular software and also in techniques common to most software, such as menu structures, saving and printing.
- **for individual creativity** – specific instruction is given in software procedures, but considerable latitude is encouraged in the realization – for example, students learn how to

use Fireworks strokes to create what appears to be pizza crust, sauce, and toppings, but the size, color, and amount are totally up to the student (with some surprising results).

Designing a project to encourage choice may be the most important component of encouraging the at-risk learner:

...permitting grade-school children to make even a small set of seemingly trivial and instructionally irrelevant choices in using an educational computer program substantially increased their learning from that program and the subsequent intrinsic interest in the material taught (Lepper & Henderlong, 2000, p. 289).

Lesson Plans in Project-Based Classes

Successful educational technology project-based classes depend upon carefully developed written lesson plans, particularly when the classes are designed to provide positive experiences for at-risk learners. When preparing the lesson plan, it's important to write out each step and to provide a screen shot of what the learner should be seeing, for several reasons:

- Ensures that no steps are glossed over or left out;
- Helps the teacher to anticipate possible mistakes that students are likely to make "...helpless children viewed their difficulties as failure, as indicators of low ability, and as insurmountable" (Dweck & Leggett, 1988, p. 258);
- Screen shots are helpful to students who have difficulty reading or who have difficulty reading English;
- A carefully documented lesson plan can provide a second chance to the child who decided not to stay for the class and returns, sees the fun the children are having who stayed and now wants to complete the project (this happens quite a bit in this program).

GAMES-BASED

If there had been computer math games when I was a kid, I might have turned out a genius. Software is endlessly patient; a kid can work at his own pace until it clicks; software is nonjudgmental, or at any rate less judgmental than a teacher and a class full of kids looking at you waiting for you to get the answer wrong (yes, those nightmares still recur); "...for children who have fallen behind their classmates, computerized instruction can allow them to work at their own pace and gain small-scale mastery experiences rather than be consumed by worries about being behind the rest of the class" (Lepper & Henderlong, 2000, p. 292).

Ease Rote Learning

Games make rote learning more accessible, even fun, and, in the hands of capable programmers, games can instruct beyond a mere rote level. The Math Games Stealth Teaching Event: propelled by a fusion of societal responsibility and personal angst, I spent months collecting and testing free math software, chose the best and built an interface, put it all together on a CD and steeled myself to wheedle and bribe (indeed I brought chocolate bribes) kids into playing with the math games.

Lo and behold, the class *killed* – kids signed up, played for the duration of the class and longer, were thrilled that they were able to keep the CD and play the games at home. I mean, the class killed every single time, and I've taught it dozens of times or more, leading to the inescapable conclusion: computer math games teach, and they teach stealthily.

All Levels of Games

I included very basic, silly preschool math games along the lines of learning to count with Dora the Explorer – kids were told that they could play only the easy silly games if they liked, (giving kids an “out” if they really did need to work on basic skills) and many did start there, gaining sufficient confidence to move up to more appropriate levels.

Game Programming

If I had my way, every school in America would require introduction to game making. Game programming classes bust the ceiling off the Stealth Scale – kids beg to gain admittance to the class; those who can't get in gather around to watch those who do – and the content of what the kids are learning is very, very high level. On top of that, programming teaches logic and consequences – time and again I see kids getting that concept right in front of my eyes – you see, you can't complain about what happens in the game that you program, because it's only doing EXACTLY WHAT YOU TOLD IT TO DO. Sometimes I even see a smile as the kid realizes the irony of what he was whining about only a minute before.

Open Source and Free Software

There are a lot of geeks out there - a lot of geeks writing software that they need and like, and they are making it available free for us, the lowly, under-funded masses. In my particular, unusual, situation, I have more time than money and take an odd geek delight in searching for and testing free software; however, those in the majority with neither time nor money can benefit from my efforts by checking in at my website – I post curriculum and software as much and as often as I can: www.auntlee.com.

THE STEALTH TEACHING CLASS EVENT

The stealth teaching concept does rely heavily on preparation; however, the class itself is the apotheosis. Remember, the class is designed to provide a positive learning experience for the at-risk learner:

- During class, provide positive reinforcement of talents and skills observed, including: design ability, musical ability, spatial skills, creativity, as well as basic geek skills.
- During class, relate skills learned to future career possibilities – Virtual Halloween costumes/Hollywood special effects; game programming, very cool job prospects there, artistic and design skills –

More over, students are more likely to approach and engage in learning in a manner consistent with a mastery goal when they perceive meaningful reasons for engaging in an activity, that is, when they are focused on developing an understanding of the content of the activity, improving their skills, or gaining new skills and when task presentation emphasizes personal relevance and meaningfulness of the content (Ames, 1992, p. 263).

- Note that the software they are learning is professional-level, is taught in colleges and isn't a special dumbed-down kid program.
- Point out features that are common to all software and encourage students to watch for those features in future projects, particularly the common "Edit/Undo" feature that saves mountains of frustration.
- During class, maintain a casual attitude toward technical, mechanical academic aspects of the project, such as spelling and grammar. You might say, "That's not the standard spelling; I can help you with that if you like..."
- During class, look for chances to positively improve a student's social confidence. It's perhaps not that surprising that in a class where creativity and artistic abilities are key, closely followed by geek abilities, the pariah child will often outshine the entire class. Calling the class's attention to the achievements of the outcast can often make the group see the outcast child in a totally new light.

CONCLUSION

Stealth teaching technology applications in a project-based and games-based environment can advance extra, unexpected chances to low-confident learners, teaching them, in some ways, tricking them, into learning skills they need to succeed in today's economy. Taking the time to develop classes that catch interest and that support the learner at each step will build on the intrinsic allure of computers to today's youth and prepare them for a productive adulthood.

It's important to me to exert substantial effort to develop Stealth Teaching-based classes because I don't want to see the light go out.

I see kids at a wide range of ages – I get happy, enthusiastic, bright-eyed nine and ten year olds who are up for learning anything as long as it's on the computer and they get some personal attention. Then gradually these same kids get older and go over to the dark side of cool-yearning.

There's a moment, where a tween pauses and deliberately changes his reaction from "ooh – claymation!" to this nonchalant vacant hip cool expression where the light has gone out, and I think, what can I do to change the balance of the struggle; what will it take to keep that light from going out.

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