Scratch & Scribble

Kalina Wong
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Professor Mitchel Resnick
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Introduction

A computer science professor of mine at UC Berkeley once commented that, though employers highly praised Cal graduates for their technical knowledge, there was one very loud compliant: Cal's computer science graduates couldn't write to save their lives.

The Problem
The ability to write well is a difficult skill to master. Yet, whether we are able to write well or not, writing is a task we all have repeatedly faced and will continue to face: for narrating our summer adventures in the 2nd grade; for explaining cloud formations in the 6th; for exploring the events leading up to the assassination of Archduke Ferdinand in the 10th; for expressing statements of purpose to college admissions committees in the 12th; for final design briefs in graduate school and so on. But how much attention is focused on gearing students towards Hemingway perfection (clear and concise)?

A hot topic is definitely something writing is not – at least when being compared to reading. There are shelves full of research on reading. There are shelves full of software and toys for developing reading skills. Reading is FUNdamental. There is no doubt that reading is an absolute essential to academic, professional, and even personal success. Reading, however, is only one pea in the pod of learning. Writing is also FUNdamental. To focus on both reading and writing, simultaneously, would be beneficial. One may reinforce the other.

But, alas! It is the duty of English teachers to teach us how to write. This is the general impression I gathered from interviewing a few students. But, for those lacking a literary bent, is the English classroom really conducive to motivating students towards writing well? Or towards writing at all? Can it be that good writing cannot be learned? Is it simply a gift of nature/God?

The Goal: Scratch a little, Scribble a little
At the Computer Clubhouse, children learn to express themselves through technology, through creative learning. Many seem to do so with great joy and enthusiasm. It would be great to see that joy and enthusiasm spread towards another tool of expression: writing. The goal of this project is to present a design for modifying the Scratch program, as presented in MAS 714, to include opportunities for writing. In doing so, the hope is to encourage users of Scratch to express themselves not only through animations, games, or interactive art, but also through writing – hoping that users discover the joy of creating a literary piece (or any form of print) and the significance of being able to convey one's thoughts clearly to others. Most importantly, by writing about their experiences and sharing what they've learned, children can transform from being learners to becoming teachers.

Existing Approaches

So what's already out there? Not much. A search through Amazon.com and various major educational software companies' websites (i.e. Leapfrog, The Learning Company, and Scholastic) yielded hundreds of titles for reading (especially phonics), spelling, elementary math, geometry, and exploratory programs (i.e. space, mummies) for children of all ages (with a heavy emphasis for children in the primary grades). Only two titles focused on writing:

The Amazing Writing Machine by Riverdeep
http://www.riverdeep.net/products/other/amazing_writing_machine.jhtml

Features

- 5 project types: Story, Journal, Essay, Poem and Letter
- Familiar "Kid Pix®" paint tools and Rubber Stamps
- Idea generators and thematic writing environments
- Text to speech
- Outline feature
- Spell Check, Thesaurus, and Rhyming Dictionary
- Assign and track projects with personalized instructions to students or classes (ATS Network Only)

Learning Opportunities

- Encourages various styles of composition, from poetry to password-protected journaling
- Reinforces essential spelling, language, and proof-reading skills
- Reaffirms the connection between the written word and listening skills
- Helps students organize thoughts when writing essays
- Enriched imagination through hundreds of concepts,quotes, fun facts
- Help meet specific academic standards through management of student writing activities

and Creative Writing Workshop: A Three-Part Series by the Thomas S. Klise Company
http://www.klise.com/learn/writing/creative.htm

This informative series provides a fine introduction to three important types of writing: letter writing, personalized reports, and research papers. *Dear John* stresses the importance of a friendly, personal style in writing informal letters. *My Vacation* shows how the use of specific details makes a personalized report come alive. And *Theme Paper* addresses the research paper and the necessity of having a good idea, sound facts, and an organized outline. The CD-ROM version features games and interactive writing opportunities. Users can print and save their work.

Unfortunately, I was unable to obtain a demo for either program online. From the descriptions, both programs seem to support aspects of early writing curriculum, covering more than simply storytelling. *The Amazing Writing Machine*, however,

appears to offer more features like a text-to-speech function. This is a great element, as the reading of sentences familiarizes young readers with the sounds of words. And, while not covering grammar directly, hearing sentences read may aid in helping children internalize syntax – much like the way children already indirectly learn from listening to adults speak. The *Amazing Writing Machine* also appears more encouraging of creative activities by including Kid Pix. This approach reminded me that writing could often do with a visual aid!

It might be of interest to note here that both programs seem to be offered specifically to teachers (although anyone is probably welcome to purchase them). *The Amazing Writing Machine* is listed under the products category in the educator section, while *Creative Writing Workshop* is listed in a catalog named *Learning Materials*. When requesting a catalog, a question on the form asks "Are you a teacher?"

I found one other piece of software, *Make-a-Story in Kenya,* which allows users to make a story by point-and-clicking on the options presented on the screen – an idea that leaves no room for creativity. The format of this software is consistent with and similar to some of the online activities on children's websites. More specifically, the format of *Make-a-Story in Kenya* consists of a "Mad-Lips" type fill-in the blanks approach:

> -The first screen displays different characters against a predefined setting. At the bottom this screen, the sentence "This is a story about _____." is printed.
> -A young child's voice (the computer) reads, "This is a story about."
> -By clicking on a character, the character's name appears in the blank.
> -The computer reads the completed sentence.
> -Clicking on an arrow at the bottom right, you are taken to the next page in the story. Here you are presented again with options. Upon choosing one, the corresponding word appears in the blank.
> -This continues for a few pages until the story is complete.

A free demo of this software is available at:
http://www.riverdeep.net/products/downloads/free_downloads.jhtml
A reason for *Make-a-Story in Kenya*'s simplicity is perhaps that it is a component of the program *Travel the World with Timmy!* targeted for young children. The main goal of *Timmy!* program is to promote cultural diversity, not writing.
http://www.riverdeep.net/products/early_learning/ttw_timmy_del.jhtml

A feature which makes *Make-a-Story in Kenya* particularly nice is the button (in the form of a Kenyan flag) in the lower right, which when clicked, translates the English sentence into Swahili. The computer reads the sentence in Swahili as well.

Of the three programs presented in this section, two do not seem to engage their users in creative activities. Although *The Amazing Writing Machine* does seem to have a more creative leaning than the others, all the programs do provide options for their users to save or print their work. <u>Sadly, none provide an option to share work on a website with other children – none provide a space for feedback and collaboration.</u>

While looking for a Web-based tool that supports creative design, however, I ventured upon the following website: http://nfbkids.ca/showcase/en_html/home_e.html . This website – Cliposcope – which helps its users create cartoons, promotes creative learning through design and allows users to save, send, and share their creations. Sound a little too good to be true? It is. While Cliposcope has an option for users to share their cartoons, their cartoons must be chosen as a "clip of the month." The format of the activity suffers, too, from a predefine set of options. Yet, it is more design oriented than the programs above as there are more choices and a vast variety of aspects to consider (i.e. camera angles, multiple scenes, and using a timeline to define when actions will happen).

Design Rationale

The Inspiration Behind The Design
Howard Gardner once remarked at a workshop for educators that for him "'the purpose of education is to enhance understanding'" (as cited in Harvey, 1998, p. 1). By that, he meant students' comprehension of subject matter, whether in primary or post-secondary education, needs to go beyond being able to read materials and answer questions, beyond being able to take in input and retell it. Gardner provided his own daughter as an example. An A+ student in advanced high school physics, she discovered, during her first year of college, that she did not understand the subject even though she was able to do the math and complete the assignments (Harvey, 1998). Excellent test scores, therefore, do not automatically indicate or guarantee understanding. How, then, can educators help children to understand what they learn?

In MAS 714, we have read and experienced hands-on several different types of programs which strive to help children gain such understanding about their interests through technological fluency.

> Technological fluency means much more than the ability to use technological tools; that would be equivalent to understanding a few common phrases in a language. To become truly fluent in a language (like English or French), you must be able to articulate a complex idea or tell an engaging story – that is, you must be able to 'make' things with language. Analogously, our concept of technological fluency involves not only knowing how to use technological tools,

but also knowing how to construct things of significance with those tools. (Resnick, Rusk, & Cooke, 1998)

In *The Computer Clubhouse: Technological Fluency in the Inner City* (Resnick et al., 1998), we witness the evolution of Mike Lee: from using computer software to express himself to realizing the implications of his art (removing guns from his art after seeing children mimicking his work), to realizing self-expression through different styles (his art evolves from cartoons to collages that combined photographs and graphics), and to the development of his own ideas about learning and teaching. Through his experiences at the Computer Clubhouse, Mike's understanding extends beyond technological fluency to include awareness of his own influence through his art and his mentoring. He not only makes contributions, but he also understands he is contributing and understands the impact of his contributions.

In *Beyond Black Boxes* (Resnick, Berg, & Eisenberg, 2000), we encounter fifth-grade girls, who armed with Crickets equipped with temperature sensors, explored the world through changes in temperature. They not only learned how to decipher the information they gathered through graphs, but they also discovered surprising behaviors about their family members and even refrigerators. The girls were able to go beyond the fact that temperatures change, that some things are warmer than other things, and learned that temperatures can be used in many different ways to explore the world around them.

Inspired by these accounts and many more presented throughout the semester (i.e. Ari & Fadhil with StarLogo in *Beyond the Centralized Mindset* (Resnick, 1996)), I hope to uphold the following principles in my design:

> ***Foster creative expression:** No templates, no predefined anything. Allow the user's passion to run wild. Ensure that the user has the capability to express what he or she wants to express the way he or she wants to express it and then some more.
> ***Engage users in thinking about different aspects of writing:** Get users to think about the different ways they can express one idea. Get users to think about what kind/style of writing is best for what they want to say (i.e. through a story, through explicit directions).
> ***Encourage collaboration:** No great artist or writer ever got anywhere without feedback. Help users to share their ideas in a safe environment where they can receive feedback about their work and work with others on making new pieces of work. Also, help users to discuss their interests, to develop new ideas.
> ***Develop new attitudes about writing:** Writing is fun. Writing is not a chore. Aid users in feeling comfortable with writing by maintaining a safe environment where users can practice, practice, practice!

Design

The Evolution
At the very beginning, my ideas were very broad and my plans were very big. But, I knew I wanted to focus on writing. I then decided to focus on third grade writing, because I am convinced that by reinforcing reading development with writing, one can alleviate (at least a little) the 4th grade slump, where primary schoolchildren struggle to make the transition between learning to read to reading to learn. I began researching third grade curriculum in an effort to make sure my design reflected somewhat of current research and practice. One day, looking over past readings for MAS 714, I slowly began to see how a writing component could be embedded in existing programs. Still unsure, I met with Professor Resnick and realized the large scope of my original design. In the end, the decision was made to keep everything very simple – to promote writing in a context that was already familiar: Scratch.

The Constraints
The design is limited by the need to conform to the structure and logic of Scratch.

Key Features
New Buttons (on menu bar) & A New Website!
-"Two Happy Faces" Button = Share Button: Uploads user's creation onto the *Scratch & Scribble Share Site!* On this site, users can

> -Browse the different animation creations
> -Search for animation creations of a particular artist
> -Check the most recently uploaded animation creation
> -Read a bio about the artist
> -E-mail the artist with comments, suggestions, or an offer of collaboration!
> -Send applause – a simple, quick way of saying "I like it!"
> -Post a thought on the message board for feedback or to start a discussion
> -Make/keep their animation creations private until they are ready to share
> -Join the website for full access, else the browser is restricted to only looking at animation creations and sending applause – for safety reasons, the operator of the site would like to know who you are before she lets you access information on the artists. She'll also boot off those who are disrespectful of others.

-Letter Button = E-mail Button: Sends the user's animation creation to whomever it is he or she wants to send it to.

New Commands
-Prologue (enter text):   Displays text at the very beginning of animation
-Epilogue (enter text):   Displays text at the very end of animation

-Intermission (enter text and NUMBER of times to be displayed): Displays text at random intervals throughout animation

-State (enter text):   Displays text enclosed in a box near the sprite

-Exclaim (enter text):   Displays text enclosed in a multi-sharp edged bubble

-Think (enter text):   Displays text enclosed in a thinking bubble

-Label (enter text):   Displays text across the sprite

-Point (enter text and NUMBER for length of arrow): Displays text with an arrow pointing to the sprite

*Say (enter text – already a command in Scratch): Displays text in a speech bubble

Accessories

-Scroll (enter UP or DOWN): Imagine the prologues at the beginning of Star Wars movies.

-Fade (enter IN or OUT)

-Change Font (enter font NAME and SIZE)

More "accessories" can be added by simply mirroring the animation features (for text) available on Microsoft Power Point.

The following are some of the commands that already exist and can also be used with the new writing commands – actually, most commands listed under the Looks category can be used with the new ones.

*Change Brightness

*Change Hue

*Change Whirl By

Key Features = Key Goals?

With no templates or predefined anything (commands don't count!) and an abundance of commands to choose from, Scratch & Scribble provides ample room to let the user's imagination run wild and provides ample tools with which to express any idea that sticks.   And as the user is inundated with an over abundance of tools (one can always add more) and a Share Site to sift through, Scratch & Scribble provides an environment which engages the user to think differently (i.e. what can I use these tools for?) not only about writing but other aspects as well.

The Scratch & Scribble Share Site provides a safe environment in which users can share their creations and experiments, receive feedback, begin discussions, and collaborate with one another. Through this safe, sharing environment, users are free to exchange and develop new ideas. With new ideas and a community to talk about them with, new attitudes about writing and art will emerge.

How the key features highlight the key concepts is better illustrated in the scenarios section belong!

Scenarios (Ideally)

Arnie
It's the day after Christmas, and Arnie is too stuffed to move. Reposed on the couch, he begins a long cartoon marathon. Before he knows it, vacation has slipped by, and it's time to return to school. Having absorbed countless hours of two-dimensional action, Arnie decides it would be neat to create his own superhero action scene. After school, he tells a mentor at the Computer Clubhouse of his idea. The mentor suggests that Arnie give a prototype version of Scratch & Scribble a try and explains to him the Scratch & Scribble website.

After spending several hours getting a feel for the good many commands he has to choose from, Arnie begins to design his action scene. First, he uploads the pictures of two superheroes he had drawn himself. Once they become sprites, Arnie sets out to choreograph his fight sequence. [We fast forward through the Scratch stuff! Sorry.] His scene is now complete…no wait! Something is missing. Arnie realizes that the scene doesn't quite capture the adrenaline he wanted his work to emanate. What should he do?

Ah-ha! Although Scratch doesn't have any POW! or BAM! sounds, he can insert them into his animation as text, just like comics books do. Arnie inserts the Exclaim command right after the part in his program where the computer checks to see if one sprite is touching another – if touching, display "POW!" Arnie also inserts a couple of "mmpf"s using the State command for a clear but subtle touch. He's now satisfied with his artwork, saves, and clicks the share button. Scratch & Scribble uploads his animation creation onto its website. Arnie feeling proud of his work goes home to rest.

The next day, Arnie is back and he immediately logs onto the Scratch & Scribble Share Site to check whether he has received any applauses. He has! Arnie is ecstatic. People like his action scene! He's also received an e-mail from a fellow artist:

> *"I like your action scene! Your superheroes are so cool.*
> *Did you draw them yourself? Do they have names? Looks*
> *like they really don't like each other. How come? What are*
> *they fighting about?"*

"What are they fighting about?" thought Arnie. And yes, he had given them names: Ketchupman and Mustardman. So, Arnie gets to work using the Label command to identify his heroes at the beginning of his action scene. Then, he spends the rest of the afternoon thinking about why his superheroes were fighting each other. After a few hours of typing and editing, Arnie inserts his story using the Prologue command and reposts his animation creation on the Scratch & Scribble Share Site. He writes back to the fellow artist: "Thanks! I put a new version up. Hope you like it!"

And the fellow artist did. In fact, the fellow artist liked it so much, he asked Arnie if he could continue the story (post-fight). Arnie agrees. In the end, Arnie and his new friend share their ideas about how the story should go and divvy-up the new scenes they taught up. In a couple of months, they should have a whole cartoon show!

Peep

It's Peep's mom's birthday next week, and Peep wants to make a card, a fun card. She uses Scratch & Scribble to create her own interactive birthday art. She uses the Fade-in command on the words HAPPY BIRTHDAY! and feels very happy with her card. There are still many days until she can show this card to her mom. Peep thinks may be she can add something else to the card. After looking at other artists' work on the Scratch & Scribble Share Site, Peep decides she should add a poem telling her mom how much she loves her. But how should she organize her card? Birthday greeting first, then poem? Or poem and then birthday greeting? Her final product:

Prologue command: Dear Mom,
[Interactive art]
Intermission command: (poem)
Epilogue command: HAPPY BIRTHDAY! Love, Peep

Future Directions

A crucial next step in this design process would be to create a working prototype of the design and put it to test in the field. I would need to evaluate its reception by users (i.e. what did they learn?) and gather suggestions for improvement. Points of observation that also may be useful to note:

-Of the users with prior exposure to Scratch, how many experimented with the new writing component? Of these users, how many used the feature because an introduction was given? How many used the feature without an explicit introduction?

-Of the users with **no** prior exposure to Scratch, how many experimented with the new writing component? Of these users, how many used the feature because an introduction was given? How many used the feature without an explicit introduction?

-How many users chose to share their work online? Of these users, how many used the writing feature? How many did not? Were those who utilized the writing feature more likely to share their work online?

What might prove helpful, too, is to present the prototype to writing experts – be they teachers, researchers, or writers – and see what their assessments of the design are. It

would be also interesting to notice the differences in critique between those learning to write and those with ample experience in writing.

Other Designs
Embedding a writing component into existing programs is not too complicated (design-wise, not programming-wise!). For example, another design project could focus on adding a writing feature to the ever popular Sim series. One could insert prompts urging the player, as mayor, to write a conciliatory speech lest the populace should riot. How the Sim program will rate the conciliatory nature of the speech is beyond this student – but it probably could be done! There is also the possibility that such a feature would detract players from the Sim games. How, then, can we make writing fun?

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