What Videogame Making Can Teach Us About Access and Ethics in Participatory Culture

Yasmin B. Kafai, William Q. Burke, & Deborah A. Fields*

University of Pennsylvania
3700 Walnut Street
Philadelphia, PA 19104
kafai@gse.upenn.edu, burkew@dolphin.upenn.edu

*University of California, Los Angeles
2331 Moore Hall 951521
Los Angeles, CA 90095-1521
stareyes@gmail.com

ABSTRACT

In "Confronting the Challenges of a Participatory Culture", Jenkins and colleagues (2006) outlined three challenges in their participatory competencies framework that need to be addressed to prepare youth for full involvement in a digital culture – participation, transparency, and ethics. Expanding upon the framework of our earlier work, in this paper we examine more closely two aspects of Jenkins and colleagues' challenges – the participation gap and the ethics challenge – as they apply to game-making activities in schools. We report on a four-month ethnographic study documenting youth's production of video games in both an after school club and classroom setting. The growing use of videogame-making for learning in schools offers youth the opportunity to no longer simply be consumers but also producers of technology. But as kids learned to contribute as such producers, both participatory and ethical issues arose in the ways they were willing or reluctant to share their own ideas and projects with their peers. Schools' long-standing focus on individual achievement and traditional notions of plagiarism drew these issues of participation and ethics to the foreground, making them especially relevant considerations given on-going efforts to bring more game playing and making activities into schools.

Author Keywords

Game modding, cheating, gaming literacies, access

BACKGROUND

In 2007, our paper "What videogame making can teach us about literacy and learning" articulated a missing perspective in the current discussion about playing games and learning [13]. Game making or modding, the authors argued, could be an equally promising context for addressing what Jenkins and colleagues' [8] called the challenges of participation, ethics and transparency in participatory culture. Our goal was to revisit the findings of a study conducted in the early 90s that had students in one class design games to teach younger students in their school about fractions [9] with the goal to enhance their learning of software design and mathematics. At the time, it was the only study that examined how to successfully integrate game design into the school curriculum and classroom activities. More than a decade later, we turned to a Computer Clubhouse in a community technology center to illustrate how youth from disadvantaged neighborhoods created and shared hundreds of games [10, 14]. We found that these young game designers were not only becoming more fluent in technology [12], but also learned how to participate in an increasingly more mediated society. By playing and making games, their knowledge of games and gaming increased – in what we now call gaming "fluencies" [14] or "literacies" [1, 21].

What exactly gaming fluencies –or literacies – are, has become a considerable point of debate within the research community [6]. In recent years, two approaches to game making have emerged using either game-design only environments like GameStar Mechanic [1, 21] or general programming languages like Logo or Scratch as design tools [3, 4, 7, 9, 13]. Researchers Buckingham and Burn suggested the term gaming "literacy" because they saw games as another example of multimodal texts that integrated sound, music, graphics, writing, and more. For them, game production combined cultural and communal experiences that vary by age, gender, and cross media knowledge.

In our proposal of gaming "fluencies" we too emphasize the importance of promoting a developmental relationship between the individual and the community that will enable youth to express their cultural heritage, have a broad communicative value, and allow for an information and resource exchange [11, 14, 17]. The game-making activities involve computational, creative and critical literacies as we have argued elsewhere [14]. In this context, the remixing and reworking of existing digital content is not only an essential component of creative literacy but also employs key technical and critical skills

to create vast online communities in which like-minded users network with each other. It is at this intersection of social networking and gaming sites that we see two particular issues – access and ethics – emerging in the context of game making activities.

The participation challenge is steeped in the question of access – an issue that jumps easily into mind with the massive growth of youth networking sites. One such site is MySpace, which has over 100 million unique accounts and roughly 230,000 new accounts being added daily [23]. One could argue that MySpace's high level of participation is directly related to the utter lack of technical competency the site requires to use its technology. MySpace users can generate pages simply through the basic competency of copying and pasting text and images. Such simplicity has allowed MySpace members to create extensive and media-laden web pages quickly, easily, and without knowing the first thing about coding languages such as HTML, XHTML, and Cascading Style Sheets (CSS). This ease has undoubtedly contributed to MySpace's rapid growth and the wide variety of user pages. Knowing how to copy and paste represents the site's only required literacy, but it is a potent one at that.

Yet the ease with which a MySpace user can access and appropriate content from others' pages can also be problematic and brings up Jenkins' ethics challenge. In "No, I Don't Feel Complimented: A Young Artist's Take on Copyright", Perkel [16] describes his encounter with Sharon, a fifteen-year old aspiring photographer who placed a number of her photographs online only to discover they had been subsequently copied and spread over multiple websites – MySpace pages included. When asked if she considered such copy and paste appropriation to be some form of a compliment, Sharon replied that she actually saw it as an intrusion of her privacy. "No, I don't feel complimented," she remarks incredulously. Sharon subsequently removed the remainder of her pictures from online, unwilling to allow them to also become future fodder for remixing. "This kind of activity," writes Perkel in his blog, "deeply upset Sharon's sense of right and wrong." The ease with which her pictures could be accessed and appropriated directly led to wider ethical considerations.

These two issues – access and ethics – then deserve further examination, in particular in the context of game-making in which individuals are re-appropriating others' work for their own purposes. The fact that such activity is occurring in schools further complicates the issue. Schools, in general, have a precise notion of cheating, but this rather rigid conception of what constitutes cheating does not necessarily serve kids well when it comes to the ethics of creating video games and online content where the cut and paste feature is commonplace in sites like MySpace. While research [2, 20] recognizes the practice of cheating in video games to be complex and occurring for a whole assortment of reasons, schools too often treat cheating as a "black and white" issue that happens simply due to some ethical failure on the part of students.

CONTEXT, PARTICIPANTS, TOOLS AND METHODS

For about four months, we were engaged in ethnographic research at a metropolitan laboratory school in Southern California. From February to March we started with an after-school Scratch Club, an optional extracurricular program that met 2-3 times a week for an hour. We then continued from April to May 2008 with a Scratch Class, where kids worked in groups of 2 or 3 during select math classes. A total of 47 middle-school youth, ages 10-12, participated in the study and were representative of the schools' diverse population of African-American, Caucasian, Asian, Latino, and Middle Eastern students.

Game Design Tool

Scratch allows designers to create games, animations, art and aesthetics, sound design, and stories [18] by manipulating media through a process of dragging-and-dropping command blocks of code and then stacking these blocks together to form coding scripts (see Figure 1). On the far left side of the screen is the series of programming commands blocks, allowing the user to manipulate sound, images, motion, and other input. In the lower right side of the screen, there is a cache of Sprites, which can be any imported or hand drawn characters or objects in the video game. The middle panel represents the particular command blocks that the user has selected and stacked. Once they are double-clicked with the mouse, these stacked scripts activate various selected images and sounds on the Scratch Stage (in this case an octopus swimming in an underwater scene) creating basic games, animations, and types of geometric art that can grow increasingly complex and nuanced depending upon a user's ability to stack and coordinate a range of command blocks [12]. The name of the software itself, "Scratch", refers to the remix practice of DJs who would appropriate various songs into a single track by way of "scratching" multiple records. Likewise Scratch designers are encouraged to share their projects with each other and build off of each other's ideas and creations. Since its public launch in May of 2007, the Scratch website (http://scratch.mit.edu) has become a vibrant online community, in which over 320,000 projects have been shared to date. With over 1,000 new projects being uploaded every day, Scratch has been described as the "YouTube of interactive media," allowing designers to not only to upload their creations but also download others' projects, as well as post comments, "friend" other designers, and start discussion threads [19].

Very much like the literacy practices of MySpace, Scratch designers often employ the basic technical skill of copying and pasting to create its programmable media. Not only do Scratch designers click on and drag coding bricks with the mouse to create media, but they also can

copy and paste whole stacks of coding bricks that have already been created by other users. Scratch very much sees its technological literacy in terms of participation and remix and, as with the creation of a MySpace page, simply knowing how to copy and paste with the mouse is enough to get an individual started.

Figure 1: Screenshot of the Scratch interface with Lucetta's first creation, "Mr. Wiggles".

Data Collection and Analysis
Ethnographic field notes were recorded daily in the after-school setting to capture the overall activity of interactions using the Scratch software. In addition, two video cameras were used to record student interactions in real time in both the Club and Class. These were set up to focus on particular groups and individual students over the course of the study, and their results were subsequently transcribed and analyzed. Third, both in the middle of March and at the end of May, a total of 21 students were selected by the research team to be briefly interviewed about their individual experiences using the Scratch software. In March, this group of interviewees was small in size and consisted of 6 regular attendees of the Scratch Club. In May, the number was larger – 15 students altogether, each of whom had worked with a partner (or partners, in one case) within the classroom setting. In each 10-15 minute interview – both in March and in May – students were asked what worked, what proved to be a struggle, if they received help from others, whether they would use Scratch again, and how they saw themselves as new programmers.

FINDINGS
In the first section, we will address the participatory challenge as Scratch Club and Class game designers shared content both online and in-person. In the second section we will deal with the different stances of designers towards the ethics challenge.

Participatory Challenges in Making Games
Access in Scratch Club
Scratch initially was introduced to the school through the afterschool Scratch Club. Meeting three days a week, the Club had a slow start with only two kids showing up for that first meeting in early February. Neither had used – much less heard of – Scratch before, but were excited by the prospect of making their own video games. At the first Club meeting both youth began experimenting with the various Sprites, stacking scripts at random before double-clicking upon them to test their effects. While both "newbies" were encouraged to visit the Scratch website and explore other projects to facilitate their own creations, neither seemed at all interested. One participant, Lucetta, seemed particularly determined to figure Scratch out entirely on her own. Working on a project she named "Mr. Wiggles", Lucetta created an underwater scene in which the central Sprite was an octopus. However, she was having a hard time coordinating multiple images of the creature to create the semblance of movement (see also Figure 1). As the first Club came to a close, both "newbies" were again encouraged to upload their work to the Scratch website, but as before, neither child opted to share and go to the site – as hesitant to let others view their early software designs as they were to explore the work of others.

This hesitancy to visit the Scratch website continued over the entire first week. While membership to the afterschool Club had grown to seven participants by the end of week, new members seemed to follow Lucetta's lead, occasionally sharing what they were working on with each but never joining the online community. "Yay, I got it to work!" Lucetta exclaimed of her "Mr. Wiggles" project mid-way through the second session, perhaps inherently demonstrating to others that this individual persistence of "guess and check" tinkering would eventually produce results. At the end of the first week, another participant in the club, Kaia, adapted this trial-and-error approach to game design by copying individual scripts from a Sprite that already had coding scripts pre-attached to it (the gravity cat). Kaia's project was

decidedly more complex than Lucetta's fledgling effort, and members "oohed" and "aahed" over the creation (though Kaia herself had a hard time explaining how she created it).

This was the beginning of an interest in copying and pasting Sprites that already had coding scripts written into them. At the beginning of the second week a new member named Taylor entered the Club and was introduced to Scratch by Lucetta. The two girls painstakingly took a screenshot of the scripts of "Mr. Wiggles" and Taylor created matching scripts in her first project of a winged hippo flying back and forth. It was not a complete copy – Taylor had to create two new costumes for the hippo Sprite, adding wings that were up and down to create the impression of flapping wings. She also used a different background and different music, and on her second day made a different ending to her project – having the hippo land on a large daisy in the background.

Interest in the Scratch website began on the first day of the third week when Craig came in reporting that he had made a project like "Mr. Wiggles" and uploaded it to the Scratch website. He had created the project by himself at home, but it was an obvious copy – using the same Sprite, having it go back and forth, and having an ocean background. The scripts were not all identical (as in Taylor's project) because he had not had anything to look at to copy, but the concept was a blatant and purposeful imitation. However the other Club members called Craig out on his slight. "You're making me feel *guilt*y!" Craig protested, but he subsequently credited Lucetta under the project notes section. Lucetta, for her part, did not appear upset. 'It's really a compliment that you copied my project,' she informed Craig from across the room. At this, Craig protested that it was not meant as a compliment, but Lucetta had made her point and the rest of the Club was there to witness it. Interestingly, despite the momentary friction it caused, this incident led three other members to create Scratch website accounts that day, and by the start of the fourth week, three more club members had made website accounts. Furthermore, members began calling each other out if they thought someone was copying them without citing their work, using the term "flagging" to threaten to report each other to Scratch website authorities. Craig was often the primary suspect – "I'm going to flag you," Taylor threatened him in early March, when he copied another person's project and uploaded it. Craig fell into an uproar, and said that he would give credit on the website, this time to Kaia whose project he had imitated.

By the Club's fifth week, all nine members had created their own accounts on the Scratch website. At first they only used the site to socialize and to browse: uploading their projects, "friending" each other, working on their website images, commenting on each others' projects, and browsing projects listed on the main homepage. Then members began to do more focused browsing based on their personal interests – looking for different games, anime movies, or solutions to challenges they faced in their own projects. It was during the fifth week that this later shift from socializing to downloading and remixing occurred. For instance, Ben wanted to create a laser effect on a gun in the game he had been working on for a couple weeks. He went to the Scratch website and found a game that had a similar effect, downloaded it, took a screenshot of the commands pertaining to the laser and used those in his project. Other members browsed projects, downloaded ones they liked, and made changes to them they thought would be interesting. By the sixth and final week of the Club, there had been an utter reversal of what we had seen in week one: numerous students were spending all their time online and almost no one was working solely offline using the old "guess and check" method.

Access in Scratch Class
While Scratch Club came to a close in mid-March, we continued Scratch in a classroom just over a month later in late April. This was the first time Scratch had been formally introduced during the school day, and the format was decidedly more structured. Scratch was used by sixth graders – four of whom had been previous Club members – though this time there was a total of 47 students over two classes as opposed to the dozen or so kids that were regulars at the after-school Club. In the Class setting, students worked in groups of two or three and students were expected to work on a single project over the three weeks – a total of six hour-long classes – set aside for Scratch. While students were encouraged to get up from their seats to roam the room, most groups relied on their immediate partners to generate ideas. At the end of the fourth class, the online site was formally introduced, and students uploaded their works-in-progress to share with others. Unlike in the Club setting where students used the online site to sample directly from others' projects, participants in the Scratch Class used the online site largely as a means to receive comments on their own creations.

The primary reason why the online site did not take on a life of its own in the classroom setting as it did in the Club was because the Class setting was a great deal more structured. Students were expected to focus on creating their project and web access was limited to uploading one's project and checking comments or commenting on other students' projects in the class. Participation largely meant being in Class and working with your group amiably enough to produce a final project for presentation at the end of week 3.

During the fourth and fifth classes however, the Scratch website played a more integral role in the classroom. Students were told that the projects they uploaded during the fourth class would be viewed online by expert media artists and programmers who had posted feedback. In fact, we acted as the "experts", though this was hidden from

the students who were excited that their work would receive outside attention. Our comments had a two-fold purpose. First, we wanted to make students aware of the wider network of Scratch users readily available to users through the website. Second, we wanted students to use our comments to develop their own Scratch skills. Some of our comments targeted particular elements of a group's creation, while other comments simply acted as encouragement. Most groups were given a minimum of two comments and typically a mix of constructive criticism and outright praise. The majority of groups responded accordingly and made changes based on the feedback. In post-interviews multiple Class members remember the comments as a particular element of the Class that they enjoyed. "So we get feedback," summarized one student Billy of the comments feature, "and then we can use feedback." This feedback also strongly impacted their project designs – the groups had one and half days to revise their projects, and the comments dramatically influenced the changes. Where students had generally felt like their projects were complete before they uploaded them during the fourth class, they were instigated into intensive revisions during the next two classes.
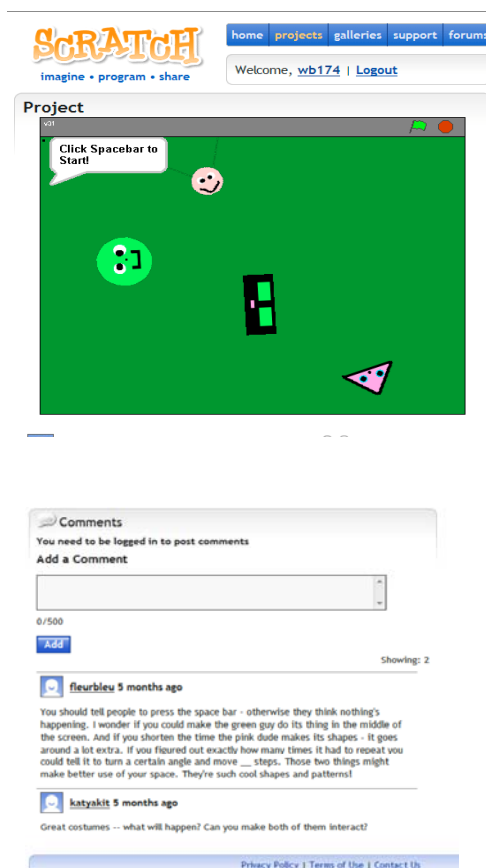

Figure 2: Screenshots of Emily & Taylor's project from the Scratch website

Ethics Challenges in Participatory Culture: Three Different Perspectives

While we described in previous sections how access was gained to Scratch web site and how different participants used the online network, here we turn to game designers' reactions of sampling, remixing, and sharing their work online. We showcase three cases who each presented a different stance to the "cut-and-paste" activities in relation to their own work. While all Scratch users – both from the Scratch Club and the Class – reported to have enjoyed the participatory features of the website, reactions were far more varied when it came to appropriating others' work for one's own creations. While some students saw nothing unethical in downloading others' work online and tweaking it for their own use, others were Scratch "purists" and, like Lucetta, preferred developing their projects entirely on their own from the "ground up".

Emily & Taylor: "I Feel Complimented" – A Positive Stance
Emily and Taylor created a digital game consisting of seven geometrically-shaped sprites which would become activated and make a series of patterns on the background scene when a user hit the "spacebar" button. While Emily and Taylor's video game held no distinct narrative or set of characters, it did grow more interactive as they continued to work on it. Picking up on feedback posted on the Scratch website, Emily and Taylor included a feature in which one of their Sprites told users to "Click Spacebar to Start!" which resulted in the game becoming decidedly more user-friendly.

Sitting down to be interviewed at the close of the Scratch Class, Emily and Taylor clearly identified how incorporating this online feedback helped develop their own creation.

> **INTERVIEWER:** There was a big change like between the second and third week of your project. Although I thought it was really amazing just to start with. How did you get it to go--I was so impressed that you made it like do these stars, and it completed this little "Achoo"! How did you do that?
>
> **TAYLOR:** (laughing) We actually did everything at random.
>
> **EMILY:** It helped alot when you showed us a bunch of projects and then we got to see the scripts. Like seeing how they did their "repeat" and then "forever"--that helped alot, so hit the "repeat" and then do "ten steps". That makes alot more cool shapes.
>
> **INTERVIEWER:** And of course I got that from someone else, so I looked at other people's projects online. How did working as a team help you?

EMILY: Well, I had never use Scratch before, so I think it would've been really hard if I didn't have somebody helping me that hadn't already used Scratch, so that helped alot.

TAYLOR: Yeah, I think it helped because I got a second opinion on everything.

Concluding the interview, Taylor points out, "I think seeing all the new ideas and just things like that, they really helped. And I thought it helped alot to see different people's ideas and then put them all together in our project." The network of the classroom in conjunction with the feedback posted on Scratch clearly worked to the benefit of their own project. Emily and Taylor's experience with Scratch was very much commonplace – especially among new users as Emily was. As evident with Lucetta and the first week of the after-school Club, first-time Scratch programmers often begin using the game in a "guess-and-check" manner. Only as some users grow more refined in their coding abilities, will they – like Emily and Taylor – begin to look beyond their own Scratch screen to sample whole blocks of code from others' work. It is here that they may begin to copy both code and Sprites from other video games and paste these features into their own work.

Mark & Nora: Debating the Pros and Cons
Mark and Nora were another pair who learned from others, but they did this in different ways. Mark liked to download projects from the Scratch website for his own play and to copy their ideas. Discovering in the post-Class interview that one could remix others' projects from the Scratch website, he remarked excitedly, "[t]hat's another great way if you have competition…you can mess them up," underscoring the competitive edge that often can accompany the reworking of others' creations. On the other hand, Nora preferred to simply view others' projects in the class and adapt the general ideas she saw. For instance, when she saw one group's project change background images, she got the idea to draw different background images and use them in their project (see Figure 3).
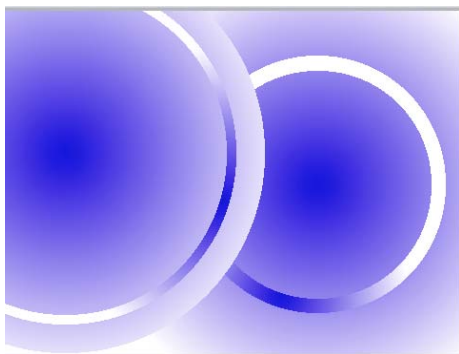

Figure 3: Screenshots of Nora's backgrounds

She referred to her work as "creative" during the interview:

INTERVIEWER: What about you Nora? How do you feel about yourself – as a Scratch programmer?

NORA: Um, kind of like, very—*creative*.

INTERVIEWER: Oh, good!

NORA: Because I don't like importing the stuff, I like making it because I like to draw.

MARK: (interjecting) I like downloading stuff!

NORA: So, it's fun because you get to make stuff. So, I think I'm creative as a Scratch programmer…(laughs).

Interestingly, while Mark said he likes downloading others' work in Scratch for his own play, Nora indicates that she much prefers to create (draw) her own art without relying on importing the scripts, images, and sounds of other users. While Emily and Taylor each incorporated a dual approach to programming, Mark and Nora are split – he considerably more "top-down" in his approach while she prefers to construct from the "bottom-up".

Matthew: Hijacking & Hijacked? – A Negative Reaction
While most participants from the Club appeared to enjoy remixing others' work, when their own work was remixed, such enthusiasm could wane. One Class member, Matthew, grew visibly excited upon learning his group's Scratch project had been downloaded online and remixed to operate slightly differently. The "appropriator" in this case was actually Debborah Fields, the graduate assistant who was responsible for running the Scratch classroom workshops; she had downloaded and tweaked the project to help the group refine their creation, an animation involving an exploding car. While Matthew was initially flattered to see his project had been remixed ("Oh, that's so awesome!"), he then grew wary as to whether he would receive credit.

The following excerpt is based on a video-log kept during one of the hour-long classroom sessions held in early May of 2008. In it, Debbie suggested that the team utilize the remix of the project in order to better understand how the

car should explode based on the input of the "space-bar" key.

> **MATTHEW:** (looking at the screen intently) No, it didn't jump--we need to press "space"; we need to press the "space"....
>
> **DEBBIE:** Okay, so, check the remix and see if they were able to help you at all.
>
> **MATTHEW:** (resentfully): If they don't give us credit, I'm gonna' beat them....
>
> **DEBBIE:** (turning around to face MATTHEW):If it's a remix, then of course they'll give you credit— *it's listed as a remix.*
>
> **MATTHEW:** (standing back up): But still...

Even though Matthew was originally excited that their project had been remixed and explained to his group that remixing was a compliment to their project, the excerpt above suggests some mistrust that the group may not have been given due credit. Incredulous that Debbie could do such a thing ("You made that other project?!" he asks), Matthew does not seem to be appeased. Telling Debbie her action was not "fair", Matthew mutters, "shame on you" before Debbie departs to assist another group. Is Matthew being entirely unreasonable in this situation? Are his feelings unwarranted? There is no small amount of irony to his reaction. As a regular member of the after-school Club, Matthew clearly relished the opportunity to download others' Scratch video games for his own appropriation. The following excerpt comes from the mid-March interviews with kids who had used Scratch in the after-school Club – nearly two months before Matthew discovered his own project had been remixed.

> **DEBBIE:** What do you do on Scratch and how do you do it? … what tools in Scratch did you use or outside of Scratch did you use.
>
> **MATTHEW:** Well, I like take sprites from other people's project and put them in mine or their's.
>
> **DEBBIE:** So you take sprites from one project and put into another, to improve it?
>
> **MATTHEW:** Yeah.
>
> **DEBBIE:** That's cool….

Debbie then asked Matthew to discuss a particular video game he downloaded and appropriated and asks how he particularly changed it.

> **MATTHEW:** I, uh…. I saw it, I was like I was just looking on Scratch randomly, the Scratch website. Then I saw this Ninja Showdown 2, and I said - like I think want to look at this - and then I saw it and they should have another scene that I think should be in there. So I got it on my flash drive and I started

working on it. Kind of complicated, kind of a little… Well, personally what I like to do is hijacking other people's Sprites.

> **DEBBIE:** Okay! (laughs)
>
> **MATTHEW:** Like downloading their projects and jacking their Sprites, it's fun.
>
> **DEBBIE:** Nice, so you've downloaded several projects.
>
> **MATTHEW:** Yeah.
>
> **DEBBIE:** And have you uploaded anything?
>
> **MATTHEW:** No.
>
> **DEBBIE:** Ok.
>
> **MATTHEW:** I'm working on it.

Matthew's use of the word "hijacking" here is particularly interesting as he clearly thought he was not simply building upon another's work but getting the better of that individual. This sentiment echoes Mark's own sense of "messing up" others' creations. Perhaps this was exactly what Matthew was thinking upon his discovery that his exploding car video game had been downloaded and improved upon. Clearly, in his mind, there was a competition of sorts taking place.

DISCUSSION

Now that game making is gaining popularity as a learning activity directly employed by schools [22], we need to be prepared to consider set curricula and deliberate pedagogies to address both the participatory and ethical nature of these ventures. At the close of "Copy and Paste Literacy", Perkel [15] charges schools with the responsibility of providing guidelines to help youth gain a better handle on the literacy associated with the remixing process. As long as educators and policymakers only consider literacy in terms of the traditional dichotomy of reading and writing, schools may very well fail to address the many literacies that children are adopting and using on mass levels outside of the classroom. Schools would benefit from also understanding the practice of literacy in terms of the socially-oriented terms of "participation" and "remix".

Our 1995 study [9] explored the use of game making as an exemplary teaching and learning tool for youth in the subject of mathematics, while our 2007 paper [13] expanded upon this initial research, investigating how videogame making, in general, offers an excellent forum for schools to acquaint youth with the 21st century skills of participation and remix. This paper builds upon these previous 2 pieces, adding an ethical dimension to the participatory culture of game making. Too often the popular media paints a picture of all youth actively participating in a wealth of virtual communities with abandon. However, our study suggests otherwise. During our own foray into an elementary school – both

within the Club and Class settings – while we regularly encountered young game makers remixing others' work via the Scratch program, others were much more cautious about the remixing process and remained on the sideline while their classmates actively surfed the Scratch website to download others' creations. Such hesitancy to plunge into online communities is clearly a topic that needs further investigation. Simply surfing through the discussion forums of a number of the social and gaming websites with targeted youth audiences, it quickly becomes evident that only a small minority of users actually run and regularly populate these communities. Meanwhile a significant majority simply looks on and doesn't contribute.

This lack of participation may very well be tied to the ethical issues associated with the remixing process so commonly used to create content on these gaming sites. As evident with Perkel's case study of Sharon as well as the experiences of Scratch users Lucetta and Matthew, designers who upload their projects online may feel conflicting feelings of being complimented yet blindsided or even cheated by others who appropriate their creations for their own purposes. Certainly, individual reactions to such an occurrence vary, but clearly schools could be instrumental in helping youth help navigate this often thorny pathway between sharing and stealing in the production of their own video games. Scratch automatically lists projects that have been downloaded, edited, and uploaded under the same name as "remixes," and participants can also flag a Scratch user who doesn't give others their due credit. This practice is useful – especially to youth who have not been exposed to the importance of citing one's sources. It introduces learners to the pivotal role of citation at an early age and, perhaps even more importantly, helps remove unnecessary taboos surrounding the copying of another's work. When a student has been deliberately instructed on how to appropriately cite her sources, the specter of plagiarism dissipates, and youth become that much freer to collaborate meaningfully within the classroom.

Certainly, our study was limited by the amount of time we had and the number of participating kids. But based on our results, we see a need for future studies investigating the use of video game making technologies in both the classroom and in after-school programs. As more and more schools introduce such software as learning tools, researchers need to explore what learning environments are best suited for student collaboration on the creation of video games.

ACKNOWLEDGMENTS

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