"Let the Players Play!" & Other Earnest Remarks about Videogame Authorship

Abstract: This exploratory case study describes how middle school youth authored videogames at an urban summer camp using Kodu, a visual programming language and game creation tool. The study details how the youth took on authorship and gave and withdrew agency to their intended game players through a process of continuous revision. Connections to traditional literacy are made and future research on the transfer of literacy practices between informal and formal learning environments are suggested.

Introduction—Youth as Producers

Youth production of videogames and other media has been largely ignored by researchers (Peppler & Kafai, 2007a), and despite calls by educational scholars for further research in this area (e.g., Alvermann, 2008), very little is known about how multimodal production overlaps with traditional literacy practices. Our exploratory case study begins to fill the gap in the literature by looking at how middle school youth used Kodu (2008), a free tile-based, animation and videogame-making tool, during an inner city summer program. It also attempts to link the worlds of traditional academic literacy with the unique world of videogame authorship through a constructionist environment.

There is over 25 years of research on constructionist tools (Papert, 1969; DiSessa & Abelson, 1986; Sykes, 2007; Resnick, Kafai & Maeda, 2003) and youth videogame making (Kafai, 1993; Habgood, Ainsworth, & Benford, 2005; Perciles, 2007; Kelleher & Pausch, 2006; Howland, Good & Robertson, 2006; Robertson & Howells, 2008; Burn, 2008). The videogame studies have illustrated how production has a motivational effect, boosts self-esteem, engages participants in storytelling, and provides a gateway into early programming. Additionally, the research on constructionist tools has focused on learning and teaching practices, e.g., youth collaborative and creative processes (Peppler & Kafai, 2007a, 2007c), technology literacy and fluency (Cooper, Dann & Pausch, 2003; Resnick, Kafai & Maeda 2003), media literacy (Peppler & Kafai, 2007b), and instructional approaches (Moskal, Lurie & Cooper, 2000; Rusk, Resnick, Berg & Pezalla-Granland, 2008). Resnick and Silverman (2005) have also suggested that interactions with programming languages through constructionist tools "provides [users] with experience in using and manipulating formal systems" which may be transferred to "many other domains (from mathematics to grammar to law)." Other researchers have echoed such sentiments (see Gee, 2003; Ito, Horst, boyd, Her-Stephenson, Lang, Pascoe & Robinson, 2008). The shape of this transfer between subject area domains, however, has remained unexplored and unformulated.

Tackling the issue of transfer between domains, this exploratory case study devised simple research questions for an open and fruitful investigation of Kodu, a tile-based programming environment based on When/Do statements. These questions were: How did the youth engage with Kodu? And how did this engagement intersect with traditional generative literacy practices?

Methods

An inner city community center in the Pacific Northwest was chosen for the study based on its geographic accessibility, computer lab availability, compatibility of the computers with Kodu specifications, and willingness of staff to support the program. Camp Kodu met three days a week over three weeks for 2.5 hours each session for a total of 22.5 hours of Kodu exposure. The youth, who attended Camp Kodu, might best be described as "geeking out" according to Ito's (2008) "genres of participation" since they wanted to be in Camp Kodu to build a project as they learned technology by interacting with adults and receiving feedback from peers. They were self-selected and learned about the program through signs around the community and word of mouth at the community center and at other institutions serving low income, urban and minority youth. In all, eleven youth between 6th and 8th grade signed up for the class. Six of the eleven had regular attendance and were able to complete a final project for the program. These youth emerged as the focus of the study (Patton, 2002). Of the six core attendees, three were African American (Ky, Zeb, and Thomas), one was white (Eli), one was second generation Chinese (Dale) and one was second generation Ethiopian (Ahmed). (All names are pseudonyms.) We acted as participant observer as researchers and instructional support for the youth. Since the unit of analysis for the study focused on the youths' game making and literacy practices and activities rather than on the interactions between the instructor/ researcher and the youth, we felt that we could interact with students freely as we followed their actions, but making sure not to direct their end products.

Data Gathering and Coding

Observations were recorded and tagged for four areas: acts of collaboration, problem-solving, programming focus and storyline generation. Often tagging categories overlapped, e.g., collaboration and problem solving might both be tagged for an observational unit. Informal interviews during observation were also common.

These exchanges were recorded, parsed by thought unit, and coded by the same system as above. Ten to twenty minute think aloud protocols were also used as students were encouraged to talk while they composed with Kodu. The traditional think aloud format proved difficult for the youth given their task. Consequently, cognitive interviewing (Willis, 1999) was used to probe students in situ about why they made choices during programming. These sessions were parsed and coded by the same system as described previously. To round out our qualitative analysis, we analyzed the youths' games for code sophistication, clarity and simplicity. After the first round of coding was completed and reviewed, the theme of audience emerged prominently in the data, and subsequently, we added a theory driven coding structure based on Hammer's (2008) concepts of authority and agency, as it became clear these were of growing importance to the youth. We recognized that student uptake and use of the concepts would vary, perhaps because of the type of game they wanted to design or because of their comfort with Kodu or programming.

Results and Analysis

The concepts of authorship proved fruitful for contextualizing our findings and illuminating the degree to which the youth crafted games with an eye toward audience. Traditional writing research has shown that revision and audience awareness are key components to an expert writer's compositional repertoire of skills (Bereiter & Scardamalia, 1987; Fitzgerald, 1987; Flower, Hayes, Carey, Shriver & Stratman, 1986; McCuthen, 1994, 1997). In this respect, authorship in videogame making is similar to traditional modes of writing; however, videogame authoring is murkier in its structure and more layered, as other New Literacies research has illustrated (see Hammer, 2008; Knobel & Lankshear, 2008; Miller, 2005). Consequently, our frame for analysis was most applicable theory to Hammer's concept of first, second, and third authorship in multiplayer role-playing gaming (2008). She theorized that "The primary text is that which outlines the rules and settings of the game in general. The secondary text uses material to create a specific situation, and the tertiary text is created as the characters encounter the situation in play" (p. 70). From an authorial standpoint, the first author develops the world, sets the rules, systems, and settings. They are considered the world builder who creates the sets and costumes. The second author, according to Hammer, constructs specific fictional situations (the scripts) within a pre-established imaginary world. The third author is the player who brings the story to life.

1st to 2nd Author

According to the above framework, the youth in Kodu occupied a space between the first and second author, suggesting that in constructionist environments authorship is more aptly described as degrees on a spectrum, which are influenced by the toolset established by the first author (in this case, the Kodu developers). Although Kodu has preset characters that are controlled through a series of preset tiles, the settings produce a myriad of environments, game genres, and character attributes. Such affordances fall more on the side of first authorship than second, but the degree to which these affordances are utilized is influenced by the user, as well as the genre the user is evoking. While the dynamics between what the first authors (Kodu makers) allow and what the second author (the youth) utilize is not the focus here, it should be noted that the youth were able to still be creative given the confines of the program by adjusting the settings of the world (gravitational pull, environmental colors/brightness, firing speed, etc.) and the settings of the characters (movement speed, level of springiness, etc.).

Additionally, the youth were also creative in their use of tiles (thus pressing on their abilities to evoke the first author through a problem scenario, not just via the tools that allowed setting changes). To demonstrate this, I challenged the youth to create a storm within a Kodu environment. There are no storm tiles within Kodu, but a number of tiles in combination can make a storm-like effect. This was an exercise in bricolage. For instance, one could clone a number of clouds that were colored gray or black and then add a yellow or orange glow to some, along with downward aimed wisps to illustrate the act of lightening. After this request, two students asked where to find the storm or rain tile while several others simply looked for the tile. I informed them that such tiles did not exist, and they had to figure out how to use the tool to create the effect. One student was overheard saying, "Oh, a storm. First I take a cloud and color it black to make it a storm," and Thomas went further and programmed the cloud to rain rocks when precipitation tiles were not found. These instances might be considered as the youth finding the bounds of their secondary authorship in connection to the first which constrained them to a degree.

As Hammer (2008) defined it, authorship is partially an issue of agency. Each author has agency, but the degree to which it is available is determined by the author above it. Unlike traditional texts which remain fixed in form but malleable in interpretation, secondary authors have the complicated task of formulating a fluid game-story. However, according to Hammer (2008), in order to compose they need to have various types of agency in certain amounts. Types of agency include: textual (freedom text code), narrative (ability to create one's own storyline), psychological (the feeling of authorial control) and cultural (others recognizing one's authorial control).

While in role-playing games, all these areas need to be activated in order for the secondary author to do her job, this may not be the case in Kodu, where it is likely that these areas of agency again run along a spectrum (as in authorship). For instance, cultural agency may not play as large a role in individual game-making as it does in the socially bound arena of role-playing. These points aside, however, it is important to point out that "Agency is not simply 'free-will' or 'being able to do anything,'" as Wardrip-Fruin argued (2009). "It is interacting with a system that suggests possibilities through the representation of a fictional world and the presentation of a set of materials for action." The notion of agency acting in a bounded system is sourced in the work of Mateas (2001) and reverberates in the work of Gee (2007), who positioned it as a key component of educating and one reason why videogames hold so much promise for learning.

2nd to 3rd Author

So this begs the question of how the youth acted as secondary authors in relation to their tertiary authors (their audience). What affordances of agency did they allow their game players and what were their contours of agency design?

In the bounded domain of game genre, some of the most potent examples of second-to-third author agency came to the foreground. The youth continually called upon a game genre on which to hang their hats—mostly racing and action. Although a variety of seed story games were available to the youth, they gravitated to the genres they played at home according to the surveys. Similar findings surfaced in Burn's research (2008) in which authorship emerged within the "proto-critical discourse" of gaming in general, Eli created a game called Left 3 Dead, a play off the zombie game genre in general, Left 4 Dead (2008) specifically. Interestingly, the original game served as a stencil of sorts by which to formulate a story, and Eli crafted a hybridized, remixed game (Knobel & Lankshear, 2008) using the DNA of Kodu with the game story of Left 4 Dead. Consequently, the genre and storyline not only deeply affected what he created, but also how the game was perceived and played by others. The general dynamics of this game were clear-cut for the player, and references to the original were deep.

In the original game, players controlled the four survivors of a zombie apocalypse, but Eli's game was transformed to three players, hence the name change. Zoey, Bill, and Francis were all taken from the original and used as characters in his version—though with a Kodu skin. Besides character names, however, Eli incorporated similar features and narrative plot lines to his game that were noticeable to his peers who were familiar with the game. Consider Eli's brief description of one part of the game he is creating, "They think everybody turned into zombies. And their friend is in this house and they have to rescue em. And then, that is how you win the game without dying because those zombies are trying to kill you by hitting you." Reflexively, these connections to the original game (which acted as another first author) bound the agency for the second and third author through replication of storyline and rules of game.

Dale used a similar strategy, designing a game around the Tower Defense genre, but he ran up against the player and genre expectation while creating his game, demonstrating how third author agency was violated. Dale had created a wonderful landscape—a maze made of steep canyons filled with water in which white and black Kodus started on opposite sides and tried to destroy each other's home base—a castle and factory respectively. We interviewed him about his game during the think aloud. After he showed in detail how his game worked, we probed for the role of the user.

Researcher:	So what is the user controlling in this game?
Dale:	Ah, he is just watching.
Researcher:	Oh, he is just watching it so far?
Dale:	Yeah.
Researcher:	Is he going to be playing anything?
Dale:	No.
Researcher:	No? [long pause] Will he be playing anything?
Dale:	I don't think so.

The exchange with the student surprised us a bit given the narrative foundation on which the student was building his game; Tower Defense definitely had an active user. We closely observed the student as he continued to develop the game and share it with others. At one point during the session, we had the campers play each other's games and give feedback. Zeb was particularly blunt in his assessment of Dale's game. He simply wrote, "Let the players play!" Clearly, he was feeling as if he had no agency and that his colleague (the second author) was impinging on his ability to actually be an active participant in the game. The player expectations rubbed too roughly against the player affordances, and Dale began to realize he was violating user expectation. He sat in his seat before making revisions, and stared blankly, "My game sucks." His game design was more attuned to an animated story, but in subsequent drafts, he created an environment that better aligned with player expectations—including player control. It is perhaps interesting to note that Dale scored well on

standardized writing measures and did not define himself as a game player. These two factors suggest perhaps that during the initial stages of game development, he was connecting with more traditional, closed lines of authorship to express himself virtually and forgetting to leave a space for the third author to move.

These examples demonstrate how genre, knowledge of narrative history, and canonical pull impact the agency of the second and third author. These limits are not necessarily bad things, as stated earlier, since they serve as a function of coherency. As Nickerson suggested (1999) participants within an environment need structure in order to support their actions. However, it is when a second author limits the agency of the third in an unexpected way we see conflict. Participant agency is a balance between being bound and having freedom, which is not necessarily located in the powers of characters, but through them. This allows the third author to feel as if they have freedom without a sense of anomie. This idea is also reflected in game authoring literature. Wardrip-Fruin (2009) posited that "players come to games with assumption about the domain of play. To play successfully they must transition from their initial assumptions about this domain…to understand, often largely implicit, of how it is supported by the software model." If the transition is too sharp, novel or illogical according to the users past experience—for instance, not even allowing game play—the user will react.

Despite Dale's foibles with giving agency to the third author, there was a growing concern and attention given to the user by all the youth as they progressed through the camp. As with programming in general, they constantly pedaled between the Kodu program interface and the experience they were trying to create for the user. At first this act was the perpetual testing of the code without much thought about the player—perhaps acting as testers versus players. During the second of half of camp, however, and with more time devoted to sharing work, the youth became more interested in how and to what success their game was being played. For example, Ky was particularly attuned to audience and at first took pride in the fact that no one could win his game. With time and player feedback, however, he adjusted code to make the experience player friendly. He did this so much so that he would adjust the code and settings of his game depending on which camp peer was playing his game. When Ahmed won Ky's game on the first try, Ky increased the difficulty whenever Ahmed played his game—even if the first try was a fluke as they seemed to all agree. Such intense preoccupation with revising became a common practice for Ky and Eli. These two also spent the most time polishing their games in accordance with audience and what they considered to be challenging play.

Part of this revision included enhancement to the player's controller. Most of the youth began with long lines of code that allowed the user to control their characters in certain ways. However, Ahmed, Ky and Eli supplied the user with more than just movement and shooting ability. Ky for instance, gave the player the ability to glow blue, which was supposed to "blind" the enemies that were after him. Such a defensive tactic was not only clever, but also was in response to others suggesting that his game may be too difficult, hence also allowing the user greater agency to move within an environment without being destroyed.

As another example, Eli supplied the user with an array of options to act with agency. Although longer programming strands do not necessarily make for better programming, just as longer sentences don't make for better writing (consider the works of Hemmingway or Vonnegut), Eli's code set was telling, reflecting the type of creativity that was elicited from the storm-prompt. As an example, he used a programming feature (reloading) in a way that it was not explicitly intended. Additionally, his code offered a myriad of actions for the user through the game controller (some might think overuse), signaling his reaching out to the third author. First, he gave the player the ability to communicate status information (reloading) to the other two players in the game, as well as express emotions through text (DIE!!!). Interestingly, he also automated the calling of another character within the game (e.g., "Bill!!!") perhaps launching the story into narrative action. This may be considered an attribute assigned to user experience (the affect of the game) over third author agency (the ability to move within the game) since the player was not in control of this feature.

Additionally, Ahmed used text to communicate within his game, too. In contrast, however, he programmed text to appear when the lead character was moving on certain land types. "Careful! Oh Yeah! Keep Going! Stay on target! Heating Up!" The message acted both as a warning and as an encouragement, perhaps educating the third author of the constraints Ahmed had put within the game to make the play more challenging. This text might be considered an informative note to the third author suggesting the parameters of their agency.

The creation and adjustment of landscape was another way that the youth balanced agency for the third author. While considerably different from the broad scope of Hammer's (2008) definition of "framework agency" as it relates to role playing games, the crafting of landscape proved to afford players with degrees of agency in relation to the virtual physical world. The youth's continuous revision of the landscape signaled its importance as a game-play element. Thomas, for instance, spent several class sessions developing a racing game in which the landscape consisted of jagged mountains with steep valleys, but the landscape the path rested on was too extreme for his players to navigate without falling off and getting stuck. This was a real drag on agency for both characters, one of which was controlled by the player and other of which was automated. During one 20-minute think aloud (which was part of a much longer observation), we watched Thomas continually revise the path, rather than adjusting the characters' settings (such as speed). The session consisted of widening the path, changing the steepness of the path somewhat, adjusting the angle of the turn, raising the turns, and

swapping path types. Between each change he ran the program to see if the characters would fall off, and they fell repeatedly. At one point, he said, "Poor little cycle." This episode illustrated how the youth tried to give agency by tempering the effects of steep terrain, as he measured the game's challenge level.

While Thomas attempted to tame the force of landscape as he retained its aesthetic, Ahmed totally revised his landscape to tame it for character and participant movement, "making it a little more even for both the enemy and the player," and Ky used the landscape as part of strategic play. While discussing his landscape, Ky had a mind toward the player continuously.

Ky:	It makes it look like it's more intense because of all these rock spaces and stuff. It is going to make the player feel like he is in an enclosed area so when he runs this, [directs the players character] so like when he goes this way, he is going to be trapped when he turns around there is going to be a dead end with all the zombie Kodu.
Researcher:	So the landscape is influencing the story you are telling?
Ky:	Oh yeah, and I forgot there is a safe space.
Researcher:	Oh really?
Ky:	Right here, this is going to be a little safe spot and they won't know where I [meaning player] hide and so you [the player] can plan out what you are going to do next. And so when you are through, and you come out, they won't be able to see you because there is a wall right here. So you can sneak around and stuff, but once you get here you have to go really fast because when they see you they are going to go after you.

The above dialogue captured Ky's intense interest on the user experience and the degree of agency he gave the third author. Most interesting perhaps is his inclusion of a safe space for the player to collect his or her thoughts. The creation of this element took forethought about potential users and how they may be feeling during game play. Ky established a dramatic stage on which the game-narrative played out, giving the third author the agency to rest and decide actions.

Additionally, Ky's shifting of pronouns was perhaps interesting as well, reflecting the continual volley between second and third authorship he performed during coding third author agency into the game. While the lexical mistake might be considered random, the confusion might also be sourced in the dual roles the youth had to embody as they shifted back and forth from player to programmer. The player turns from "he" to "I" to "you" within the above dialogue. Such role acrobatics are not trivial and signal the complexity of authoring.

Connecting to the ever shifting nature of composing from multiple perspectives, all the youth had to also balance a "them" in the development of character and participant agency. *Them* refers to the degree to which allies and enemies were programmed to confine or assist the player's action. Interestingly, some of the youth moved from being particularly unforgiving in the virility of their antagonists to developing allies to assist the player in the world. Zeb, for instance, went from making a game in which the player was blown away within the first few seconds of play to distributing the antagonists along a linear path that supplied the player with a more refined experience and actual agency to survive within the world for an extended period of time. Ky also introduced a character, the last surviving flying fish, to assist the user during play by attacking the flying fish that had turned into zombies. And finally, Ahmed created a deep structure of alliances and enemies that afforded help and constraint on play. He strategically positioned them on the terrain and in the air to make the play "fair for both side." He spoke of the characters as if they were not attached to a player, though he considered how the player might be alerted to behaviors of alliance characters.

Ahmed:	I am going to add more characters to this side of the field and program this blimp thing
Researcher:	What are you going to program it to do? [Ahmed starts programming the balloon]
Ahmed:	When see cycles they glow to like warn the Kodus and the jet that they [the cycles] are coming to protect them.

Although these illustrations are partly attributed to building an interesting story for the third author, they are also related to giving the characters and objects in the field of play agency either by adjusting behaviors or establishing relationships in opposition or in alliance. As Wardrip-Fruin (2009) suggested, "Designing experiences toward the satisfactions of agency involves balancing the dramatic probabilities of the world with the action it supports. In other words, the design task is to entice players to desires the game can satisfy" (p. 13). In this case, Ahmed was anticipating his players' needs within the drama of the game. Satisfying the desire of an unknown player is a complex task in game making, where the interactions between the characters, the characters and landscape, and characters and user all need to be taken into account. The shifting of perspectives the youth underwent in the development of their games was complex. Considering character and participant agency was a

key component in the making of a plot that was driven by character behaviors and landscape constraints and affordances, and not traditional plot lines. Since this compositional task was so complex, one is left to wonder how these strategies related (or not) with traditional academic domains, particularly writing. How is authorship with an Xbox controller and Kodu different from a pencil and paper or keyboard and screen? Despite obvious differences, there may be conceptual, complementary compositional underpinnings.

Discussion and Educational Implications

Many educational researchers have presented descriptions on youth who are disengaged with learning traditional language arts curriculum but motivated by informal new literacy practices like videogames (Goodman, 2003; McGinnis, 2007; Ranker, 2008; Sarroub, Pernicek & Sweeney, 2007). Outside these depictions of the motivating and identity forming effects of New Literacies, however, there is little data on how engagement with various media domains intersects with what is defined as academic literacy.

Often times, traditional and New Literacies are considered "dueling discourses" (Alvermann, 2008), but in truth, while digital compositional spaces are unique, they also intersect with the goals of traditional writing instruction. Consider how the findings of Camp Kodu are connected to traditional literacy. Students crafted game-worlds in which they scripted character and player behaviors, motivations, weaknesses and strengths. They also produced settings that positively and negatively influenced character and player actions, and plot arcs were highly influenced by how the characters, players and settings were coded and designed. Additionally, the youth engaged and seemingly learned from the expectations associated with a genre and narrative plots, sometimes transforming both in interesting ways, much in the same vein as literary canons are built over time. They were also cognizant of audience expectations and afforded their users with agency through various controls of movement and expression. The students also demonstrated the importance of setting not just for mood and tone, but also as a space for user constraint and assistance. They developed characters that were interconnected and influenced each other's behaviors, and they continually inhabited the roles of author, users, and characters in order to create game-worlds that were appealing to an audience. Finally, the students constantly revised game text according to perceived audience wants and skill levels.

Centrality of audience, the roll of revision, and positioning one's authorship were essential to the students' creations and were motivated by the very academic goal of gaining and sustaining the attention of readers and viewers over time. During this authorship, the complex ways youth process information was largely implicit in the activity of game making. This processing overlaps with various literacy domains perhaps signaling a conceptual move away from learning as an explicit collection of knowledge to be acquired for mastery and a movement toward a framework based on the connections between knowledge, skills, and practices across authored spaced. Such a shift operates, according to Knobel and Lankshear (2008), on the vast and broad plane of encoding, not "letteracy," as literacy is often played out in schools, and it presses on idea of transliteracy (Thomas, Joseph, Laccetti, Mason, Mills & Perril, 2007).

Interestingly, learning transfer, as outlined by Schwartz, Bransford, & Sears (2005) suggested that multiple contexts and exposures to tasks underlie these implicit learning concepts. Extending their theories and findings to New Literacies and to programs like Kodu, it might be argued that compositional practices and skills are enriched by authoring in multiple modes of communication—generating an adaptive, compositional expertise that operates to some degree successfully across domains. For instance, by learning how composition operates across modes of communication, youth may build upon, learn new, and leave behind composing strategies as they discern what compositionally works from what does not across domains.

Consequently, future research in videogame making with Kodu might further unpack the relationship between authoring videogames and student reading and writing in traditional areas, looking at what transfers in and out of the practices associated these generative/creative activities across various modes and genres. Cross domain studies are needed in literacy education, and they suggest that videogame making through constructionist tools have merit outside of just teaching youth early programming concepts. As this small study itself demonstrated, students enlisted compositional strategies that were unique to game making, but also broadly related to authoring across compositional areas. Of course, dynamics of agency with Kodu seem uniquely situated in game making, though perhaps not without import to other compositional practices.

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