Urban Game Design as a Tool for Creativity, Collaboration, and Learning Among Youth

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Abstract

As part of a National Science Foundation grant entitled "Urban Game Design as a Tool for Creativity, Collaboration, and Learning Among Youth," we report on early findings from our first workshop with a group of young people, aged 9-14, at a branch of the New York Public Library. The focus of the workshop was to determine whether teaching kids the principles of game design had any impact on how they used mobile devices for creative ends. We report on early findings that suggest that game play does not necessarily prompt a desire to design games in youth, that the transition from two-dimensional to three-dimensional game spaces can be challenging, and that articulating game rules is one of the most difficult aspects of being a game designer.

Introduction

There is little contestation to the claim that living, learning, and working in the twenty-first century will require a combination of technological literacy, social acumen, and innovative problem solving. Recently, the Partnership for 21st Century Skills (P21), a coalition of the U.S. Department of Education and several corporate partners, has produced a framework to guide institutions in providing the necessary skills and training to up and coming youth populations (Partnership for 21st Century Skills, 2008). This skills framework does not privilege traditional content areas such as history or geography, but rather emphasizes the cultivation of abilities such as creative thinking, applying technology effectively to a task, and working collaboratively to incorporate knowledge into a realistic context of use. Moreover, the Partnership contends, skills should be developed within supportive learning environments that provide learners equitable access to "relevant, real world 21st century contexts" and via situations that "support expanded community and international involvement in learning, both face-to-face and online" (Partnership for 21st Century Skills, 2008, p.9).

P21 defines creativity as a learning and innovation skill. They suggest that creative thinking is constituted by the ability "to use a wide range of idea creation techniques (such as brainstorming); to create new and worthwhile ideas (both incremental and radical concepts); and to elaborate, refine, analyze, and evaluate one's own ideas in order to improve and maximize creative efforts" (2008, p. 9). Alongside of this, individuals should be able to work creatively with others and know how to implement their innovations.

It has not always been the case that creativity has been defined as a necessary skill or competency. In his treatise on creativity, Csikszentmihalyi (1996) documents the lives of notable creative people, ultimately detailing their common practices and highlighting their unique

attributes as a way of both celebrating yet demystifying what the author often refers to as a state of 'flow' (Csikszentmihalyi, 1990). In a paper on creativity and learning systems, Burleson (2005) acknowledges the various theories of creativity by such thinkers as Amabile, Faure, Kay and Papert, a few of whom speak of creative skills (e.g., Amabile, Kay). Yet on the whole, the approach Burleson takes as he considers building learning systems is one of motivating creative engagement for his potential users, not engineering it. Shneiderman (2007) echoes this approach is his work on creativity support tools, as does Resnick (2006) with his notion of the computer as paintbrush. Indeed, at the far end of the spectrum of creativity research, media scholars such as Ito and colleagues (Ito et al., 2008), Jenkins (2006, 2009), and Loveless (2002) suggest that IT-enabled creative engagement, beyond being a state that is motivated or supported, simply is the same as normal youth practice online. In this sense, participation and creative engagement are becoming blurred.

Thus we find ourselves at the apex of an important conversation regarding the relationship between creativity and technology. On the one hand, educators are embracing the need to teach creativity and hone creative skills to prepare their charges for the complexities to come. On the other hand, researchers of contemporary digital youth practices seem to have imploded the definition of creativity beyond its traditional associative anchors of 'newness' or 'innovation' to categorize the everyday as worthy of creative assessment. As researchers, we stand at this juncture equally influenced by the research streams of user-centered technology and youth-centered practices, but find appeasement by neither set of arguments. As such, we have designed a study to test the following research questions: (1) If creativity is a expandable skill, what is required to nurture it? (2) If creativity is a nascent quality of everyday youth practice, how is it expressed and identified? (3) What role does information and communication technology play in the development of creative skills, the expression of creative actions, or the engagement in creative practice? We interrogate these queries by placing them within the context of design.

Creativity in the Design Process

There are many types of design—iterative design, participatory design, collaborative design, etc. We focus our investigation of creativity within a set of collaborative design activities. Collaborative design, or co-design, is the area of design in which people come together with different ideas, perspectives, and skills and work towards one common goal of making the end-product better. Complex design problems require more knowledge than any single person possesses because the knowledge relevant to a problem is usually distributed among stakeholders. Bringing different and often controversial points of view together creates a shared understanding that can lead to new insights, new ideas, and new artifacts. According to design researcher, Don Norman, "Good learning requires that learners feel like active agents (producers), not just passive recipients (consumers). Co-design means ownership, buy in, and engaged participation. It is a key part of motivation. It also means learners must come to understand the design of the domain they are learning so that they can make good choices about how to affect that design" (1993).

Providing open systems is an essential part of supporting collaborative design. An open system provides opportunities for significant changes to the system at all levels of complexity. By creating opportunities to shape the system themselves, designers can be involved in the formulation and evolution of problems from multiple entry points. Games provide just such an open system for collaborative design.

Like design, there are different types of games. Our project makes use of the game type known as 'Big Games'—a new game genre that encourages players to step outside and explore physical reality as a three-dimensional game space. Big Games, often played in cities where they are known as 'Big Urban Games', are made possible because of mobile technology. Mobile devices like the iPhone allow *designers* to use things like QR codes (1) to tag aspects of the physical environment (e.g., walls, benches, etc.) as essential elements of the game. Mobile technology also allows for the possibility of using less discrete parts of the natural of historical environment, such as a city block or a building, in the design of a game. For example, a game set in lower Manhattan could avail itself of actual historical landmarks to build a historically accurate narrative in which players inhabited characters from history (2). Mobile devices give *players* the opportunity to move and explore an area in an entirely new way—hopefully a way that encourages new insight or experience because of being in a particular locale. Another way of stating this is to say that Big Games offer their players situated learning experiences. In addition to the learning affordances of videogames, which actively engage players' visual and auditory senses while fostering the imagination of virtual world, Big Games present a tactile and kinesthetic experience that allows players to piece together a larger meaning system within in a real, physical context.

Research Study

While the affordances of game design and mobile learning have been well documented regarding their various learning attributes (Gee, 2008; Salen, 2008; Soloway, et al., 2001), the relationship between game design and creative expression, as well as creativity and gameplay, have yet to be fully researched. In alignment with our research questions, we have begun to address this gap by creating a project that investigates how an urban mobile game might be used as a design tool to support and possibly enhance the creative output of youth. Our hypothesis, more precisely, is that by designing an urban mobile game, iteratively testing it, and playing it, youth will experience the game framework as a mechanism for both creative expression (game design) as well as creative engagement (interactive game play). We also believe that bringing the city to life via mobile game play will foster situated and social learning, geospatial understanding, and interest in community engagement.

The curriculum for this project was developed by LeAnne Wagner, a graphic artist and game designer, and Hillary Kolos, a media artist and educator. Together they created a staged set of experiences that take participants over the course of 32 hours (2 hours a day, twice a week, for 8 weeks) from game players to game designers. The logic of their activity plan was based in developing design and collaboration skills among the participants while familiarizing them with some of the more production and locative aspects of smartphones like QR codes and GPS functionality. The first sessions begin by having kids play board games like Chutes and Ladders to understand that games are systems. Things move on from there to modding games—sometimes in ways that included adding new elements (see Figure 1 for a modified game of Monopoly that includes origami cranes), and other times in ways that created new rules for existing game elements. After gaining the insight that games are malleable systems, we teach about the potential game functionality that could be employed when moving games from a two-dimensional board to a three dimensional space using an iPhone smartphone. We encourage this dimensional shift by having kids play games using QR codes. Where possible, we also utilize a locative authoring tool such as ARIS to support richer, locative gameplay. The workshop concludes when teams create their own mobile games, which they play-test with one another.

***Figure 1*. Modding Monopoly with added origami elements.**

The participants of the 'GameMaker' workshop at the public library were a group of young people who frequented the library on a daily basis to play videogames on the public computers. They were all from the immediate neighborhood, the Chinatown section of New York City, and ranged in age from 9 years old to 14 years old. Most self-identified as 'gamers', and were particularly interested in and adept at playing web-based videogames from Asia. Participation in the workshop was voluntary, but over the course of the 8-week workshop term a core group of 8-10 kids came regularly to the design sessions held on successive Monday and Wednesday afternoons.

Our metrics for success for the workshop were two-fold. First, did participants move in self-identification from being game players—and thus seeing technology as a platform primarily for consumption—to game designers—correspondingly identifying technology as a potential platform for production? Second, did participants use their nascent game design skills to create games that expressed personal or team creativity? During the workshop that we report on here, Hillary and her collaborator, Kyle Li, a member of the teaching team at Quest to Learn (3), served as workshop facilitators; Ingrid Erickson administered pre- and post-surveys and observed a series of workshop sessions as project researcher.

Emergent Findings

We have three early takeaways from the New York Public Library GameMaker workshop. First, kids' interest in games doesn't necessarily translate to an interest in creating games. While many of our participants knew quite a bit about the details and mechanics of games and game play from their time playing games in the library after school, when they were encouraged to move from player to creator, it took them a while to realize the wealth of their own knowledge. Kyle got kids to move into this creator frame of mind by getting them to complain about the games that they played regularly. These complaints evolved into reimagining idealized game features, which triggered a nascent self-awareness that instead of just being expert players, constrained by the systems they were playing on, they could instead be creators. Prior to this moment, the highest aspiration many of the young people sought to achieve was the role of 'game master' because they felt that this was the position that would garner them the most power.

The shift from two-dimensional to three-dimensional space was also challenging for our participants. Our project is intended to use New York City as a "game board," however in the case of the library we were restricted to using the library space itself (see Figure 2) as our three-dimensional canvas because of parental permission issues. The most successful usage of this space for game play was when youth mapped story elements from popular fiction onto different areas in the library. In this four-story space, the basement, for example, was often associated with a nefarious or illicit locale. The elevator was sometimes endowed with magical powers. Given that the usage of GPS was impossible within this setting, kids also had to make due with using QR codes as their sole link between physical and digital game space. The most successful genre of game that fit these constraints was the scavenger hunt, particularly with the added element of hiding codes where they would be difficult to find, such as under window shades, within books, or in hidden sections of bookshelves. We consider the three-dimensional games that our participants produced in the workshop a first step along the broad spectrum of three-dimensional game design—one that was particularly successful in disassociating mobile devices merely with their media consumption capabilities.

***Figure 2*. Thinking of the library as a three-dimensional game space.**

Finally, kids reported that creating and articulating the rules for their games was the hardest part of being a game designer. When they reached the section in the workshop dedicated to creating their own games, participants were typically not at a loss for generating thematic ideas. One group of older girls was particularly adept at this part of the design process once they became confident in their role as designers. They first explored the possibilities for translating stories from *The Percy Jackson and The Olympians* series; in another instance they figured out how to develop a game based on the birthdays of the members of a favorite Korean boy band.

What was particularly difficult for participant groups was translating their creative enthusiasm for themes and game genres into structured rules for game play. This portion of game design definitely tests the understanding of a game as a system. The group dedicated to creating

a game about their heartthrob boy band ended up devising a complicated system of grouping members by birth dates and years (see Figure 3) to define a challenge that had players order all fifteen members from oldest to youngest. Players were given clues to assist them via QR codes. In testing the game, it became obvious that the importance of rules is not only their logical, but also their social, function: a game is not a game if it cannot be played by other people. Much as the game made sense to its creators, it failed to coherently compel any other teams in the group.

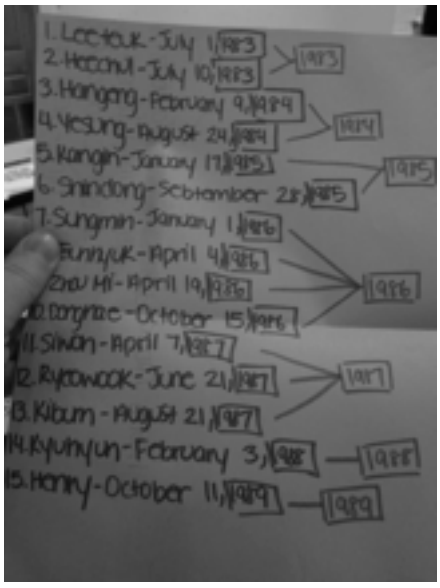

***Figure 3*. Rules for a game based on the birthdays of all the members of a Korean boy band.**

Conclusion

Our early findings regarding the relationship of game design, mobile technology, and creativity are just that—early. We attempt herein to share some of the moments during our workshop with a group of kids at a branch of the public library that provoked pause and begged for reflection. We were interested to note an initial reticence by kids to adopt the role of creator, but were also pleased when they imaginatively generated ideas for games based on their own interests and passions. Certain constraints on mobility in this case may have impacted the shift from 2D to 3D game design. We will see whether this perceptual is any more natural when the game space is a city street instead of a city building in future workshops. Finally, the dual nature of rules as both social as well as logical characteristics of a game suggest that creativity in game design is not merely a matter of content, but equally of structure.

The early days of this project yield one particular insight overall: the power to be a creator, even a modder, is not encouraged enough when it comes to kids and games. We should celebrate not merely learning through play, but learning through design. We will have more to say on this topic as our research progresses.

Endnotes

(1) QR codes are 2-dimensional bar codes that can be read by a smartphone to reveal an attached message, image or link to a webpage.

(2) For an example of this style of big urban game, see the project 'Settlers of Manhattan' developed by Colleen Macklin, David Carroll and their students at Parsons the New School for Design using the mobile authoring tool 7Scenes.

(3) Quest to Learn is a new public middle school in New York City whose curriculum is entirely organized around games.

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