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## **(RE)MAKING DIGITAL IMAGINARIES WITH VIDEOGAME DEVELOPMENT: DO-IT-YOURSELF (DIY) DISRUPTIONS TO SOCIAL INEQUITY**

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### **Introduction**

Digital media has altered not only the form through which we communicate, but also the type of both communication and learning that transpires across transmedia platforms. 'Do-it-yourself' (DIY) productions reflect changing forms of communication, education and civic engagement (Ratto & Boler, 2014; Stack & Kelly, 2006) and represent new possibilities for not only imagining social interactions and opportunities, but also constructing them. In this paper, we draw on Charles Taylor's (2005) definition of 'social imaginaries' to consider "the ways people imagine their social existence" (p. 23) in the context of digital industries and maker spaces.

Networked digital technologies in particular enhance the possibility of sharing and collaborating across geographical and conceptual social divides. In recent years there has been growing recognition that digital media like film and videogames can create opportunities to interrupt social norms – to 'show what you know' to, with, at and across boundaries. Importantly, multimedia production creates a process of reflective (re)making that incorporates knowledge and experience from varied aspects of an individual's life into a product that can be reviewed, remixed, and reflected upon later on (Pink, 2001, 2007). This process of working with and creating digital artifacts informs and transforms society, creating an opportunity – a new imaginary – for continual dialogue and altered networks and social norms, circulating around digital artifacts throughout production and after.

### **Background**

Over the past ten years, there has been growing recognition that digital media

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like movies, video games, and social networking technologies are changing the way we think about teaching, learning and education. Videogames and videogame development are an important component of this new media landscape, as one of the largest grossing industries in North America (ESA, 2014). Research related to education and videogames has examined the learning potential of playing digital games. This includes several educational possibilities. Scholars have explored how game mechanics have a rhetorical influence on players (Bogost, 2007) and how “serious” social and political content can be taught/learned through gameplay (Dahya, 2009; Frasca, 2001). Others have considered the important role of videogames for learning and literacy (Gee, 2003; Squire & Jenkins, 2003), and the rich social worlds of massively multiplayer online games (Dickey, 2011; Steinkuehler, 2004). These studies (among others) demonstrate the potential of digital videogames as a valuable component of formal and informal education and support the continued exploration of videogame design and play as an important part of 21<sup>st</sup> century education.

At the same time, it is well documented that there is a persistent gap regarding who makes games and who engages in novice game making (computer programming) from a young age. Currently, women constitute less than 25% enrollment in computer programming at both the secondary and post-secondary level (U.S. Department of Education, 2012), with even fewer continuing into programming (Hill, Corbett & Rose, 2010) and specifically videogame development post-secondary and careers (Haines, 2004). This disparity in participation has a multitude of intersecting causes, including access to tools and sociocultural contexts that make computer programs and videogaming spaces uninviting for girls and women (Jenson, de Castell & Bryson, 2003; Kafai, Peppler & Chapman, 2009).

The poor representation of ethno-racial minorities in videogames presents an additional layer to the barriers minority girls and women (literally) face with regard to participation in the world of videogames. Everett and Watkins (2008) discuss how African American women are the most likely demographic to be victimized by violence in videogames, while of the few female player-controlled characters (Joyce, 2014), only a small fraction are women of color. The intersection of social structures such as gender, race and class – and importantly the way these

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structures influence digital (and analogue) social divides – have been identified as intersecting barriers to computer access and participation with/in digital media generally (Ahn, 2012; boyd, 2011; Everett & Watkins, 2008; Jenson, de Castell & Bryson, 2003; Hargitta & Walejko, 2008; Margolis, Estrella, Jellison Holme & Nao, 2011). Shifting this landscape requires a reimagining of who works in videogame development and what factors influence the interest of underrepresented groups – such as women and ethnoracial minorities – to participate in the construction of more equitable and inclusive videogaming and videogame production communities.

This paper is based on a research study conducted with boys and girls in two schools making videogames. We argue that the production and construction of collaborative spaces for videogame development – both physical and digital – serve as powerful interventions to what continues to be presented as a homogenous and discriminatory videogame-making field.

### **Methodology**

In our study, we explored both the process of computational and algorithmic pedagogies through videogame production for racialized boys and girls in two schools, and observed the sociocultural environments of all-girl and all-boy game making spaces in an afterschool context. Data collection consisted of mixed qualitative and quantitative methods, including coding of student games, pre- and post- game development surveys, facilitator/embedded researcher surveys, exit interviews with students and facilitators, and field notes.

In this paper, we focus on the quantitative analysis of participant pre- and post-game development surveys, as well as the qualitative and quantitative coding of students games. Coding of game mechanics and design was deemed important by the research team to complement survey data with more concrete information that was developed into games. Coding was completed using a two-step process first involving the creation of qualitative codes by the research team and application of those codes to the games produced by participants. Researchers independently coded the same games using broad category codes that were agreed upon with a focus on game mechanics and the intended skills taught during the program. The team discussed any discrepancies in the coding scheme until consensus was reached and our codebook was finalized through this

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collaborative coding process (Smagorinsky, 2008). Final codes identified the presence of newly drawn sprites, sprites copied from internet images, multiple levels, inclusion of music, score boards, game-reset functions, and multiplayer functions.

The study was conducted with grades 6 and 9 boys and girls over one year in three locations. We worked with two schools in the Toronto area: one junior-middle school and one secondary school. In addition, we ran a summer camp in an under-served community in one of Toronto's larger suburbs. Participants in the two Toronto schools were predominantly from ethno-racial minority communities, documented as in the lowest school-achievement groups in the Toronto area. The summer camp community was comprised of predominantly white and Indigenous participants situated in a socioeconomic region that is also among the lowest achieving in Ontario. All three schools shared in their 'low academic achievement' status, and even with the white students from the summer camp, majority of participants were from non-dominant racial groups. Though we do not apply a critical race theory to this paper, we do point to the racialization of poverty in Ontario and later draw conclusions that also relate to socioeconomic status and access to technology. Our analysis addresses the comprehensive process of videogame production in these unique afterschool environments as part of the construction of new possibilities for creating videogames in this field.

### **Summary of Findings**

1. Girls in grades 6 and 9 tended to expect using GM to be less difficult than their male peers, as well as expressed less fear regarding the use of GM before engaging in the game development work. Disaggregated by gender and grade, grade 9 girls showed particularly high confidence. Boys showed more enthusiasm for the game making process than girls.
2. Grade 6's tended to report more self-confidence in using GM as well as fewer negative self-attitudes (e.g. believing that they were not good at GM, or not the type to do well at GM). This was true across male-female, not only girls.

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3. In the post-survey, there were no significant differences between gender regarding attitudes towards GM.
4. In the post-survey, there were no differences between gender in self-reported confidence regarding GM.
5. Grade 6 boys and girls did enjoy using GM more than grade 9 girls and boys.
6. Participants reported feeling less confident both that they could problem solve and that they could figure out what to do if they got stuck in GM after the intervention.
7. Girls reported significantly more agreement that they found GM to be enjoyable and stimulating, that they would have a hard time stopping once they started working.
8. There were no significant differences between boys and girls or across grades, except that coders showed a trend towards better quality sprites by girls than boys.
9. Grade 6s showed statistical significance regarding having better quality music in their games, and tended to create games with more levels than grade 9s.
10. There were no differences between the frequency each genre was created by male and female students with the exception of sports games. Sports games played a significantly greater role in boys' game designs.

In our discussion of these findings, we want to highlight the lack of significant differences between the engagement of boys and girls in this videogame development program under these interventionist conditions. Through this controlled intervention and research study, we have documented how changing the conditions of videogame production – of teaching and learning computer programming through the design of videogames in extra-curricular school

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programming – demonstrates girls equal interest and confidence in the development of videogames.

Rather than approach this problematic disparity related to who makes games as an essentialist debate about gender differences (of boys versus girls), we are arguing that the power structures that guide (or dictate) the meaning of “feminine” and “masculine” (ascribed to male and female bodies) requires interrogation and critique (Butler, 1990). In this paper, we consider what it means to think about social and political space before binary sex/gender distinctions related to how and why girls and boys (do or do not) make and play videogames. We bring the conversation back to poststructuralist feminist theory exploring non-essentialist perspectives about girls when social and political context does not dictate their role as outsiders by (sex/gender) design. We invite the reader to consider what it means to look at girls and videogames by interrupting their/our conventional expectations of gender within male-dominant, hetero-normative social and cultural space. Additionally, we highlight the commonalities between boys and girls that are evident when the social space (and consequently gendered politics of that space) is leveled. Finally, we consider the importance of access to resources and importantly thoughtful and feminist pedagogical practice to create equitable learning spaces where all young people, and especially those from non-dominant groups, can thrive in their production of videogames.

At the end of this project, students, parents, researchers and educators came together to play student made games at multiple celebratory events. In each case, “networking” these digital technologies and reconstructing digital imaginaries was very much engrained in face-to-face engagement with videogame producers (students) as well as within (and between) the digital artifacts they made. Considering Taylor’s (2005) argument that “the social imaginary is the common understanding that makes possible common practices and a widely shared sense of legitimacy” (p. 23), we argue that constructing ‘digital imaginaries’ through networked technologies is directly tied to the construction of physical space, as well as to sociocultural interventions that challenge existing inequities and highlight socially restrictive ideological frameworks influencing the videogame development field.

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