

Maker culture and Minecraft: implications for the future of learning

Dodie J. Niemeyer & Hannah R. Gerber

To cite this article: Dodie J. Niemeyer & Hannah R. Gerber (2015) Maker culture and Minecraft: implications for the future of learning, Educational Media International, 52:3, 216-226, DOI: [10.1080/09523987.2015.1075103](https://doi.org/10.1080/09523987.2015.1075103)

To link to this article: <https://doi.org/10.1080/09523987.2015.1075103>



Published online: 30 Oct 2015.



Submit your article to this journal [↗](#)



Article views: 806



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 3 View citing articles [↗](#)

Maker culture and *Minecraft*: implications for the future of learning

Dodie J. Niemeyer*  and Hannah R. Gerber

Department of Language, Literacy and Special Populations, Sam Houston State University, Huntsville, TX, USA

Collaborative learning environments found with gaming communities can provide excellent structures to study the way that learners act within informal learning environments. For example, many of these gaming communities encourage gamers to create videogames and virtual world walkthroughs and commentaries. Walkthroughs and commentaries provide gamers information that helps them in game play. We refer to this process of walkthrough creation as digital maker culture. This study explored the phenomena of digital maker culture through a multiple case study design by examining five *Minecraft* walkthrough creators who created walkthrough repositories on YouTube. Findings suggest multiple levels of experience are needed when players are involved in digital maker communities. These multiple levels of experience are (a) to engage in creating designs for immediate prototypes, (b) to belong to cultural environments that foster collaboration and sharing, and (c) use common design standards. This has implications that could inform innovative instructional practices with digital tools in school environments, in order to foster a more collaborative, participatory classroom experience.

Keywords: videogames; collaboration; *Minecraft*; YouTube; maker culture

Introduction

The YouTube video played softly, while a young boy about seven year old creatively and carefully described the attributes of what he felt made *Minecraft* (an increasingly popular style of videogame play: the sandbox-style videogame) such an enticing platform. Topics that threaded through his YouTube video discussion were related to creating modifications in the game, working collaboratively with other players to acquire materials and solve problems, and personally challenging himself to refine his craft while working collaboratively with others. He stated, “I like to hunt and be the woodsman and my friend, he likes to be the miner and builder”. His passion was evident throughout the four-minute clip, as he supported every topic listed above, with key elements and examples of game play that he deemed were crucial to achieving success in the *Minecraft* game.

Seven-year-old Roger is not unlike many young *Minecraft* players. Through his mother’s permission, he developed his own YouTube channel dedicated to helping other gamers navigate the space of *Minecraft*. He developed this channel because he wanted to provide resources and ideas for other gamers, like him, and he recognised

*Corresponding author. Email: stddjs15@shsu.edu

the importance of user created materials in the space of online gaming. He explained,

Some people just want to watch the videos because they can be really funny, but sometimes people want to know how to do something new. It is really funny when they mess up on purpose just to show you what not to do.

Minecraft and sandbox games: creating to play

Minecraft is known as a *sandbox game* because, like playing in sand, players create the game themselves by manipulating the world within it (Oakley, n.d.). Players create as many worlds as they want and they make, or craft, nearly anything they want within those worlds. There are several modes that a player can choose to play in within *Minecraft*. These modes are called *creative mode* and *survival mode*. In creative mode, players are given unlimited resources which provides them unlimited possibilities to craft a variety of structures and items without ever having to face obstacles or battle any creatures in the game world. In *survival mode*, the sole purpose is to create structures, objects, and items that will help them survive in the game when they are confronted with obstacles and creatures that they must battle. Survival mode is accomplished by mining for the appropriate resources and surviving attacks by hostile creatures.

Minecraft allows players to choose how they want to play: independently or in cooperative and collaborative groups. In *Minecraft*, cooperative groups can be as large as 8, can be played online or offline, and can be played in easy mode all the way to hard mode. With *Minecraft*, the possibilities are endless. The catch is that the game does not come with a manual, so players immediately must navigate the Internet and other resources to find information about the game and how to play (Thompson, 2014).

Metagaming and paratexts: literate connections across media platforms

Minecraft is not alone in promoting this type of engagement with youth in navigating multiple game-related resources and creating walkthroughs and online resources. Youth often engage in the creation and adaptation of multimodal literacy practices through videogames; this is known as metagaming. Through metagaming, adolescents create paratexts (texts and resources that are related to a publisher-created text) and engage in complex literacy practices; however, all too often many educators are unaware of the multimodal literacy practices in which youth are engaging (Abrams, Gerber, & Burgess, 2012; Apperley & Beavis, 2013; Gerber & Price, 2011; Steinkuehler, 2010; Steinkuehler, Compton-Lilly, & King, 2009). Digital game paratexts offer students and teachers a complex literacy outlet. Consalvo (2007) described paratexts as “the peripheral industries surrounding games” (p. 9) and included texts such as gaming magazines and strategy guides. Paratext “refers to both the texts and the surrounding material that frame text consumption, which in turn can shape the readers’ experiences with the text, as well as give meaning to the act of reading” (Apperley & Beavis, 2011, p. 133). One such paratext, machinima, which is a portmanteau of machine and cinema, allows gamers to use screen captured footage of game play within the game engine in order to produce videos that may serve as a parody or could further extend the storyline of a videogame (Gerber, 2013).

Maker culture: digitally designing learning

Maker culture focuses on using and learning practical skills and then applying them creatively to different situations. Maker culture draws upon a more participatory approach than traditional learning, encouraging learners to collaboratively engage with others as they learn through the creation of new items (Sharples et al., 2013). Maker culture draws upon a social constructivist perspective which emphasises the social, cultural, and historical factors of experiences (Vygotsky, 1979) as well as a constructionist view on learning (Papert, 1993), which examines the tangible items that are created through learners working within their environments.

Kelly (2013) referred to the maker movement era as a *third industrial revolution* and asserted that the digital is embodied by the physical in this new matrix for civilisation. People of the maker era are a diverse group including those using 3D printers to create toys, instruments, and weapons; those who experiment with the modification of household items such as retrofitting these items with sensors and Internet connectivity; and those who craft one-of-a-kind designs, such as clothing or furniture, for production on demand (Morozov, 2014). Morozov (2014) cited the numerous magazines, maker spaces, and Maker Faires (formal social gatherings that are centered as shows and exhibitions on the tangible items and crafts) as proof of the popularity of the movement. Anderson (2012) also referred to the maker movement as *the new Industrial Revolution* and explained that the Maker Movement consists of three transformative characteristics:

- (1) people who use digital tools to create new designs for immediate prototype;
- (2) people who are in a cultural environment that fosters collaboration and sharing; and
- (3) people who use common design standards.

Additionally, Anderson (2012) credited community-based websites such as *Kickstarter* as fodder for the maker movement. *Kickstarter* is a crowd-funded website that allows inventors to put their ideas into an online public domain and to set a minimum amount of money that they need to be able to get their invention/project off the ground. If the minimum amount of funding is met by the crowds' funds, then the inventor has a certain amount of time to deliver the product/invention to the public. Other similar related crowd-funded websites that harness the spirit of the maker-movement are

- (1) *Quirky* – a combination of crowd-sourcing and marketing that allows a product to become mass-produced.
- (2) *Etsy* – a website that handles the sale of interesting, hand-crafted, and small volume products.

Even President Obama alluded to the Maker Movement in a speech at the National Sciences Academy's Annual meeting in 2009 when he remarked:

I want us all to think about new and creative ways to engage young people in science and engineering, whether it's science festivals, robotics competitions, fairs that encourage young people to create and build and invent – to be makers of things, not just consumers of things.

In the opening lines of his book, *The Maker Movement Manifesto*, Hatch (2013), C.E.O. of TechShop (a chain of makerspaces across the country) proclaimed that readers of his book should take *The Maker Movement Manifesto* and make it their own by modifying it to suit their needs because that is the essence of making.

Maker spaces and classroom learning

Essentially, that is what youth are doing in and around videogames: taking new knowledge, making it their own, and collaborating with others who are doing the same. These principles can have a powerful impact on student learning in the classroom. Martinez and Stager (2013) posited that the phenomenon of making represents an excellent combination of new technological materials, learning through firsthand experience, and the basic human desire to create. Inherent in this movement is a child-centred classroom grounded on the desire that we all have to exert agency over our lives, to solve our own problems (Martinez & Stager, 2013).

But why study maker movements and videogames?

By more fully exploring the maker movement phenomenon within the paratexts of the *Minecraft* community, researchers and pedagogues will be provided insight into how this movement might serve as a model for instruction in the classroom.

The present study sought to understand:

- (1) How do select youth participate in the Maker Movement related to their *Minecraft* gaming practices?
- (2) What collaborative learning experiences are youth engaging in by participating in the activity of making within their related gaming practices?

Theoretical perspectives and conceptual framework

The theoretical perspectives and conceptual framework that undergird our study are constructionism (Papert, 1993) and connected learning (Ito et al., 2013). Both constructionism and connected learning allow us to honour and value the concept of creative and socially imbued ideation in young people's learning; this type of learning informally pervades their digital play spaces making us more aware of the value that youth hold for their own creations and how the development of these creations can be valuable to understand pedagogical revolution in new classroom spaces.

Constructionism as a theoretical perspective

Constructionism (Papert, 1993) is a learning theory that stems from constructivist (Vygotsky, 1979) viewpoints, whereby learners socially construct meaning through the creation of tangible objects. While constructionism is a theory that has existed for over 30 years, with the influx of new digital technologies and media, people are returning to a grassroots maker culture, where they create objects through 3D printing as well as traditional arts and crafts (Kelly, 2013). However, we posit that youths' creation in digital spaces shows that constructionism is a relevant frame with which to study how they are engaged in learning within digital spaces, and helps frame a movement we refer to as *digitally mediated maker culture*.

Connected learning as a conceptual framework

Additionally, we refer to connected learning (Ito et al., 2013) as a relevant frame and model for exploring how constructionism fits in this frame of learning. Through connected learning, we value the importance of learning through socially imbued creating that is enhanced by exploring the connections inherent in participatory learning. Connected learning is built on the foundation of three core values: equity, full participation, and social connection. Educational opportunities that are available and accessible to all young people elevate the world in which we all live. Full participation entails community learning environments which thrive best when all members are actively engaged and participate. The social connection is essential because learning is more meaningful when it is part of a person's valued social relationships and shared practices, culture, and identity. The learning principles that drive the core values are based on interactive and networked media which make learning and digital product ideation interest-powered, peer-supported, and academically oriented.

Through the power of technology available today, connected learning environments are populated with people who have shared interests, are focused on production where learners not only produce their own media but also comment on others', and are openly networked to include multiple institutions and groups from popular culture to educational institutions and beyond. Openly networked web-based communities provide opportunities for learners of all ages who share a common interest to come together to:

Produce, circulate, curate, and comment on media. Learning comes from actively creating, making, producing, experimenting, remixing, decoding, and designing, fostering skills and dispositions for lifelong learning and productive contributions to today's rapidly changing work and political conditions. (Ito et al., 2013, n.p.)

Connected learning seeks to bridge the gap between the skills needed to be competitive in the workforce and the way schools are teaching that is leading to disengaged and alienated students who see little purpose in their education. It is a new vision of learning that is social, hands-on, active, networked, and personal.

Research methodology

An exploratory case study design was employed for this study. According to Yin (2014), a case study design should be considered in order to focus on questions answering "how" and "why" about a phenomenon, when you cannot manipulate the behaviour of those involved in the study, when you want to uncover contextual conditions because you believe they are pertinent to the phenomenon under study, or when the boundaries are not clear between the phenomenon and the context. Exploratory case studies seek to explore situations in which the intervention being evaluated has no clear, single set of outcomes (Yin, 2014).

As the researchers are the primary instruments of data analysis, it is important to note our own experiences in gaming and education, as that is the lens through which we analysed data. One researcher is a classroom teacher and a parent of a *Minecraft* gamer who participates in this maker movement as both a viewer and a creator. It is important to note that although this researcher does not play *Minecraft* or create videos, she often engages in conversations about both with her own child and her students. The other researcher is an avid gamer who has, for the past decade, conducted multiple empirical studies of youth and videogaming, in-school and

out-of-school, as well as in developed and developing nations, in order to better understand the relationship between videogames and socially imbued literacy practices.

A modified referral sampling scheme was employed, whereby we interviewed an avid player of *Minecraft* and asked him which channels would be best to subscribe to for gathering information on *Minecraft* maker culture. From there, we subscribed to five of the channels recommended. We will call the individuals in the sample, of whom created the *Minecraft* videos that we are studying “creators” due to the culture of the *Minecraft* video creation YouTube community. We will use the term “viewers” to represent those individuals who view and/or leave comments on the videos, although we fully recognise that a creator can be a viewer, and a viewer can be a creator. Based on voices of the creators in the videos, all in the sample are male and at least two of the creators are adults, although their exact ages are not known due to lack of information provided in their profiles.

At the time of data collection, *Creator A* used a personal computer (PC) as his platform for gaming, and he had over 10.5 million subscribers, and more than 2.3 billion views on all of the 1015 videos posted on his *Minecraft* YouTube Channel. *Creator B* used an Xbox 360 as his gaming platform, had over 3.9 million subscribers, and had over 2 billion views on his 1197 videos. *Creator C* used a PC for his gaming platform and had over 85,000 subscribers with over 7.5 million views on his 309 videos. *Creator D* used a PC as his gaming platform and had over 71,000 subscribers with over 7.6 million views on his 395 videos. Finally, *Creator E* used his cell phone (playing the pocket edition of the game) as his gaming platform and had almost 7000 subscribers with 1.8 million views on his 282 videos (Table 1 lists our creators and their channel’s statistics). We watched an average of 10 of the most recently posted videos per channel.

The video creation and complication of video creation varied from creator to creator. Many videos included enhancements like titles, credits, and music. All videos had comments/discussions following the videos; these comments were analysed within the data-set.

Findings

We used a priori coding and pattern matching (Yin, 2014) as our method of analysis. The a priori codes that we analysed were based on Anderson’s (2012) three characteristics of maker movement revolution:

- (a) digital tools used to create new designs for immediate prototypes;
- (b) cultural environments that foster collaboration and sharing; and
- (c) common design standards (see Table 2).

Table 1. Creator information.

Creator	Number of subscribers	Number of videos	Number of views	Platform
A	10,500,00	1015	2,300,000,000	Computer
B	3,900,000	1197	2,000,000,000	Xbox 360
C	85,000	309	7,500,000	Computer
D	71,000	395	1,800,000	Computer
E	7000	282	7,600,000	Cellular phone

New designs for immediate prototypes

The digital tools used by the creators allowed them to create readily available prototypes for other viewers and players to engage in *Minecraft* paratext creation. Out of all the videos viewed, 100% provided prototypes that were used to instruct or demonstrate something to viewers. This included things such as

- (1) how to create a server (where other players could join a mission and play together or against one another);
- (2) how to complete a task (whether working cooperatively with a team or individually); or
- (3) how to create/build something in the game.

In these instructional videos, creators explained processes in their own commentary, while carrying out a variety of tasks on screen. This is akin to “walkthroughs”, which are often written on blogs or wikis (Gerber, 2013). Additionally, the creators in our study often acknowledged that their way was not the only way or even the most popular way to do something but that it was their preference. Commentary was matter-of-fact, and when other consequences were possible, these were explained as well. Phrases like “if you want this ... you will do this ... ” or “you can do that unless you are looking for this ... ” so that viewers understood other possibilities existed beyond what the creator was demonstrating. The creators all used situated language – language that is closely tied to the Discourse (Gee, 2011) and specialised terminology of a community – specific to *Minecraft* within their video creations, suggesting that the creators assumed the viewers had background knowledge of the *Minecraft* game. No time was spent explaining language that might be unfamiliar to a viewer.

Collaborative environments

Additionally, cultural environments of the *Minecraft* YouTube community fostered collaboration and sharing. Within each YouTube video discussion board, viewers and the creator of the video engaged in lengthy dialogue and debate about the content and creation of the video. Viewers asked questions that the creators and other viewers answered, provided information about their own experiences in a similar task, and left feedback regarding the videos themselves. Creators and other viewers commented back and forth to one another answering questions, offering alternate

Table 2. A priori code/characteristics of maker culture in *Minecraft* virtual communities and examples in use from our population of creators.

Digital tools used to create new designs for immediate prototypes	Cultural environments that foster collaboration and sharing	Common set of design standards
How to create a server	Viewers ask questions	High-quality video production
How to complete a task	Creators and other viewers answer questions	Creator commentary explaining ‘why’
How to create something in the game	Shared knowledge	Showing possible outcomes/consequences

ways of completing tasks and building structures in the game, and generally sharing ideas. Finally, many of the comments provided feedback and asked questions about the video's production from sound to music to commentary, leading to the common design standards.

Common design standards

Lastly, in line with maker culture, we see that in the digital realm creators are also engaged in following a set of common design standards. These included high-quality video production, creator commentary, and demonstrations and discussions of possible outcomes or consequences (Figure 1). The most popular creators had videos that included titles and captions as well as other special enhancements created with the use of computer software and/or the latest generation game console. All creators included commentary for their viewers, which was both informative and entertaining. The commentary was geared toward decisions and possible actions in the game, and related subsequently to what the results of those actions were or could be. As evidenced through the comments in the discussion boards, viewers were seeking to learn more about the game or to learn new ways of doing things.

Discussion

These findings indicate that both youth and adults are participating in the maker movement in digital realms as related to videogames. While traditionally maker culture has referred to tangible outcomes and designs, we posit that digital creations are equally compelling to study and provide an arena for studying digital maker cultures. The video creations represented in this study range from amateur to professional quality, indicating that creators are indeed “producing a hybrid of intense virtuality embedded in high-tech physicality” (Kelly, 2013). These creators are

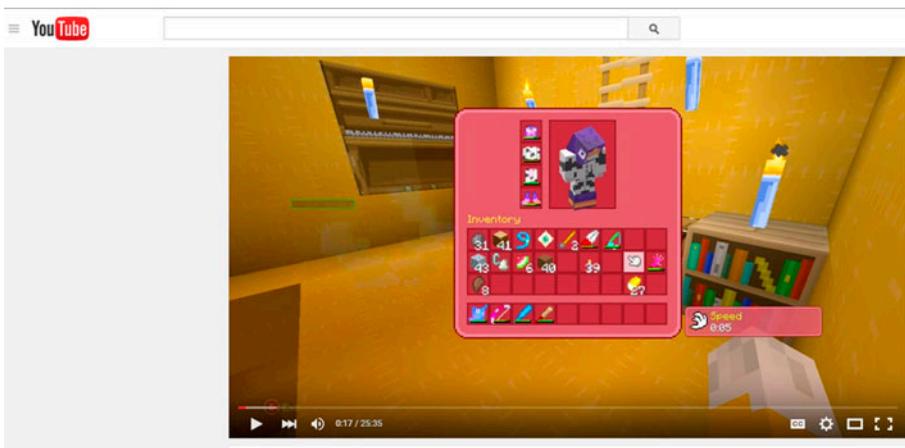


Figure 1. YouTube video demonstration.
Source: Dodie J. Niemeyer.

taking walkthroughs a step further and actually showing the process to viewers in a more creative, participatory approach. Martinez and Stager (2013) explained that an important part of “making” was documentation whether a lab report, inventor’s notebook, video, podcast, design portfolio, or other form which should be used to make private thinking public or invisible thinking visible in order to record evidence of learning in ways that are not possible with pencil and paper. Additionally, with an increase in access to digital tools, information sharing has drastically increased and allows students’ work to reach large audiences which is a key motivator in writing (Martinez & Stager, 2013).

Implications

By their own volition, the *Minecraft* video creators in our study crafted videos that focused on multiple aspects of game play, and they subsequently engaged in thought-provoking discussions about the *Minecraft* videogame and their video creations. From the commentary and discussions left by viewers, in response to the videos crafted by the creators, a constructionist model of education becomes evident. Martinez and Stager (2013) explained that there is no benefit to collaboration if it is burdensome to the process, but rather “when the collaboration is authentic, students will gain a greater appreciation for the benefits of collaborating and the result of the experience will be richer” (p. 163). *Minecraft* video creators are an excellent example of a collaborative learning community that works closely to support each other in the learning process.

The constructionist view of learning is inherent in maker culture and in the videogame and virtual world of *Minecraft*. Not only are players creating within the game, but they are also creating paratexts outside of the game.

Through this example of collaboration, critical thinking, and self-motivation to gain knowledge and spread the knowledge to others, connected learning as a conceptual frame is evident. Such qualities found in the connected learning examples that occurred in the *Minecraft* maker culture communities, Martinez and Stager (2013) argued, are desirable for teachers and students (see Table 3). By following the examples laid out in Table 3, educators can begin to similarly model their own classroom instruction. Martinez and Stager (2013) posited that “quality work takes time, disobeys bell schedules, doesn’t result in neat projects that work with canned

Table 3. Classroom implications.

From <i>Minecraft</i> to the classroom	Constructionism (Papert, 1993)	Connected learning (Ito et al., 2013)
Students show their knowledge through creation of tangible artefacts and/or digital media	Learning occurs through (re)construction rather than knowledge transmission	Interest powered and academically oriented
Students participate in collaborative environments, both in the classroom and online	Knowledge is socially constructed	Interest powered and Peer supported
Students share knowledge with other students, in their classroom and online	Knowledge is socially constructed	Academically oriented & peer supported

rubrics, and might not have any impact on test scores” (p. 81) and that “creative uses of new technology are well within the reach of almost any school” (p. 85). Future research may delve deeper into the creators’ and viewers’ perceptions of maker culture within videogames and virtual worlds, and subsequently allow us to see their perceptions on how these activities might transfer to school and/or work environments.

Conclusion

The community of *Minecraft* Makers on YouTube exhibit a collaborative, participatory learning environment whereby they work with digital tools to create new designs for immediate prototypes, engage in cultural environments that foster collaboration and sharing, and use a set of common design standards. In collaborative environments where all participants are highly engaged, they work together to teach and learn from each other and to reach common goals. By harnessing this type of learning, and replicating the ideas posed through maker culture communities, we can see dynamic ways to restructure classroom environments that foster learning in new ways in the twenty-first century.

ORCID

Dodie J. Niemeyer  <http://orcid.org/0000-0001-6287-8925>

References

- Abrams, S. S., Gerber, H., & Burgess, M. (2012). Digital worlds and shifting borders: Popular culture, perception, and pedagogy. In B. Williams & A. Zenger (Eds.), *Participatory popular culture and literacy across borders* (pp. 90–105). New York, NY: Routledge.
- Anderson, C. (2012). *Makers: The new industrial revolution*. New York, NY: Grown Business.
- Apperley, T., & Beavis, C. (2011). Literacy into action: Digital games as action and text in the english and literacy classroom. *Pedagogies: An International Journal*, 6, 130–143.
- Apperley, T., & Beavis, C. (2013). A model for critical games literacy. *E Learning and Digital Media*, 10(1), 1–12.
- Consalvo, M. (2007). *Cheating: Gaining advantage in videogames*. Cambridge, MA: MIT press.
- Gee, J. P. (2011). *An introduction to discourse analysis: Theory and method* (3rd ed.). New York, NY: Routledge.
- Gerber, H. R. (2013). Fostering collaboration, cooperation, and independent reading and writing through sports videogames. *Voice of Youth Advocates*, 36, 42–43.
- Gerber, H. R., & Price, D. (2011). Twenty-first century adolescents, writing, and new media: Meeting the challenge with game controllers and laptops. *English Journal*, 101, 68–73.
- Hatch, M. (2013). *The maker movement manifesto: Rules for innovation in the newworld of crafters, hackers, and tinkerers*. New York, NY: McGraw Hill Education.
- Ito, M., Gutiérrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., ... Schor, J. (2013). *Connected learning: An agenda for research and design*. Irvine, CA: Digital Media and Learning Research Hub.
- Kelly, K. (2013). *Cool tools: A catalogue of possibilities*. Hong Kong: Cool Tools Lab.
- Martinez, S. L., & Stager, G. (2013). *Invent to learn: Making, tinkering, and engineering in the classroom*. Torrance, CA: Constructing modern knowledge press.
- Morozov, E. (2014, January 13). Making it: Pick up a spot welder and join the revolution. *The New Yorker*. Retrieved from <http://www.newyorker.com/magazine/2014/01/13/making-it-2>

- Oakley, B. (n.d.). What is Minecraft all about? [Web log post]. Retrieved from <http://mum.com/what-is-minecraft>
- Obama, B. (2009). *Remarks by the president*. National academy of sciences annual meeting Washington, DC.
- Papert, S. (1993). *Mindstorms: Children, computers, and powerful ideas*. New York, NY: Basic Books.
- Sharples, M., McAndrew, P., Weller, M., Ferguson, R., FitzGerald, E., Hirst, T., & Gaved, M. (2013). *Innovating Pedagogy 2013* (Open University Innovation Report 2). Milton Keynes: The Open University.
- Steinkuehler, C. (2010). Video games and digital literacies. *Journal of Adolescent and Adult Literacy*, 54, 61–63.
- Steinkuehler, C., Compton-Lilly, C., & King, E. (2009). *Reading in the context of online games*. ICLS'10 Proceedings of the 9th International Conference of the Learning Sciences: Vol. 1, Chicago, IL, 222–229.
- Thompson, C. (2014). How videogames like Minecraft actually help kids learn to read. *Wired*, 22. Retrieved from <http://www.wired.com/2014/10/video-game-literacy/>
- Vygotsky, L. S. (1979). Consciousness as a problem in the psychology of behaviour. *Soviet Psychology*, 17, 3–35.
- Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). Thousand Oaks, CA: Sage.