

# Boys' gaming identities and opportunities for learning

Laura Scholes , Kathy A. Mills  and Elizabeth Wallace 

Institute for Learning Science and Teacher Education, Australian Catholic University, Brisbane, Australia

## ABSTRACT

This article addresses a gap in research about primary school boys' identification as 'gamers.' Drawing on a survey of 318 Year 3 (7–8 years old) students, the research identified boys' self-reported enjoyment for gaming, their frequency using digital devices, and their self-rated digital skills. Interviews with four boys from the survey also explored the lifeworlds of self-professed 'gamers.' Findings point to the salience of games for many boys' emerging identities and the inter-related nature of their experiences. We argue that teachers can capitalise on the strength of video games to create 'in-group' cultures and communities of practice in their classrooms to support learning.

## ARTICLE HISTORY

Received 6 October 2020  
Accepted 20 May 2021

## KEYWORDS

Boys; video gaming; identity; schooling; games and learning

## Introduction

There are a few popular video games, like, if you have a *certain game then you're a certain person*. One popular game in the school is ... well, mostly *Fortnite*, most people play that game. Doesn't really matter if you have it or not, but you at least have to know the game. (Jax,<sup>1</sup> 8 Years, 7 months old)

In the narrative above Jax is responding to questions about his enjoyment for gaming – prompting him to highlight the significance of *Fortnite*, one of the most-popular video games of the time. Jax's personal recount highlights the salience of games for his identity formation or recognition as a 'certain person' (Abrams 2011; Gee 2003; Marsh 2003), along with the social currency afforded by knowing the intricacies of the video game *Fortnite* (Carter et al. 2020; Dezuanni, Beavis, and O'Mara 2015). As digital practices reshape social, cultural and interpersonal interactions in the twenty-first century (Mills 2010), critical examination of the relationship between boys and technology is increasingly significant, particularly in terms of identity issues that arise from these relationships, and the implications for learning (Livingstone and Sefton-Green 2016).

Many boys who play video games identify as 'gamers' within a culture stereotypically considered a male affinity space (Garcia 2017). Such identity work, and relationships with associated social groups, has implications for boy's attitudes, beliefs, behaviours (Killen, Mulvey, and Hitti 2013), and digital skill development (Drabowicz 2014). How boys such as Jax, in the opening vignette, position themselves and identify as gamers, is an important part of their social recognition as members within groups and how they engage in digital spaces (Abrams and Hogg 1988; Nesdale and Flesser 2001). That is, 'gamers' adopt dynamic subjectivities with learning integral to this process (Gee 2003). Engagement in action gaming also promotes problem solving, creativity, critical thinking, and the ability to develop new cognitive learning templates (learning to learn), due to enhanced perception, attention, and cognition to become better players (Bejjanki et al. 2014). The role of gaming in the lives of self-proclaimed video gamers can provide situated insight for educators who seek

**CONTACT** Laura Scholes  [laura.scholes@acu.edu.au](mailto:laura.scholes@acu.edu.au)

to move beyond knowing how technology works to explore how technology can be used to enhance learning across the curriculum (McKnight et al. 2016). As Selwyn et al. (2020) recently noted, however, visions of the future require understanding digital education as part of complex and unpredictable systems, without a one-size-fits-all ‘solution’ or systematic ‘way forward.’

This article explores boys’ identification as ‘gamers’ in Australia, as student engagement with digital technologies needs to be understood from an international perspective, but also a local level (Selwyn et al. 2020). Examining current data on the nature and frequency of boys gaming is critical as the gaming and technology landscape is changing rapidly. Past research on video gaming has tended to focus on older cohorts (Johnson et al. 2013) and male gaming identities in countries beyond Australia, with the majority in the United States (e.g., Paaßen, Morgenroth, and Stratemeyer 2017) while the present study involved 7 to 8-year-old boys. We build on earlier Australian work by Beavis and Charles (2007) who explored ‘girl’ gamers, to focus here on ‘boy’ gamers. An in-depth focus on boys is warranted as research has found that a larger proportion of boys report spending more time gaming compared to girls (Desai et al. 2010; Gilje and Silseth 2019), and play within larger social groups, with game play an important part of their socialisation (Hygen et al. 2020).

In our Australian context, the first research question asked: Are there differences in Year 3 boys’ and girls’ enjoyment of video games, frequency of using digital games, and their self-reported digital skills? Our second research question asked: How do boy gamers describe their experiences of gaming? We were prompted to ask these questions because there are no contemporary large-scale mixed methods study in the Australian context that develop understandings about the salience of gaming cultures for younger boys, including how these cultures are embedded in their emerging local identities (Sefton-Green 2006), and what affordances are provided for promoting learning.

To explore these questions the article progresses through three stages. First, the article considers background research on the role of video games for learning, and relatedly, boys’ identity formation. Second, our mixed method study focusing on the voices of boys is presented. We report findings from our survey of 318 Year 3 (7–8 years old) students from diverse economic communities (regional, metropolitan, private, public), and their self-reported enjoyment for video gaming, their frequency using digital devices, and their self-rated digital skills. This approach addresses a gap in previous methodologies as the majority of studies of gaming, particularly from the socio-cultural approach, have been ethnographic, and small-scale (Mills 2010). We report broad patterns in boys’ responses, while referencing girls’ data as a counterpoint.

To enrich the findings, we present the interview narratives of four boys from the survey who reports a love of gaming, daily engagement with digital devices, and outstanding digital skills. In this way, we consider broad trends in boys’ gaming practices across a significant sample size, while the case studies permit an in-depth examination of emerging identities to advance discussions and provocations related to the role of cooperative gaming in schools (Hygen et al. 2020).

### ***Video games and learning***

Video games are fundamentally multimodal texts that involve two or more modes and are socially and culturally shaped resources for making meaning (Mills and Unsworth 2017). The growing popularity and accessibility of multiplayer games afford opportunities for social interaction that are reshaping the nature of multimodal communication (Stone, Mills, and Siggers 2019). In line with increased game play, scholarship has focused on game-based learning (Gee 2003), making links to educational imperatives, such as media and literacy learning (Beavis 2014; Dezuanni 2018; Gee 2003; Marsh 2003), and mathematics and scientific concepts (Lane and Sherry 2017), with ongoing research into the potentials of serious games (Jones et al. 2020; Scholes et al. 2014), and gaming for education (Dezuanni, Beavis, and O’Mara 2015; Livingstone and Sefton-Green 2016).

There is an increasing economic divide, however, that impacts on access to digital devices in homes in countries across the globe (Pick and Sarkar 2015), including Australia (Thomas et al. 2018) and the United States (Warschauer and Tate 2018). The idea that students today have unlimited access to online platforms and possess uniquely advanced digital skills is persistent in the field of education, yet we remain cautious, as the myth of the digital native has been dispelled (Bennett, Maton, and Kervin 2008; Kirschner and De Bruyckere 2017). Jenkins, Ito, and Boyd (2016) have drawn attention to the continuing reality that we do not yet live in a fully participatory culture, with ongoing issues of inequality and exclusion. Inequity in digital access at home has negative implications for learning in formal education contexts (Kirschner and De Bruyckere 2017).

The above complexities and situated shifts in digital worlds have implications for students' access to, and development of, digital skills, as well as the learning opportunities afforded by gaming (Van Deursen and Van Dijk 2014). However, when boys do have access to and engage with video games, there are implications for the digital skills they cultivate, along with their emerging identities.

### ***Video gaming and boys' identities***

In this article we are interested in boys who have access to, and engage with, video gaming. Our analysis of boys' relationship with gaming draws on social identity theory (Tajfel 1979), to understand how identifying as a gamer and belonging to associated cultural groups is an important source of pride and self-esteem. Along with gameplay, indulging with associated paratextual materials (e.g., fan-based gaming wikis, game play walk through videos, blogs, game play guides, *YouTube*, and so on), contributes to one's sense of belonging to a gaming community (Molyneux, Vasudevan, and de Zúñiga 2015), and to opportunities for learning (Carter et al. 2020). For instance, gaming can lead to engagement in related platforms such as Twitch.tv – where players live stream themselves playing digital games and subscribers receive perks, such as special emoticons for chat, access to 'sub-only streams,' newsletters, and the opportunity to play alongside the streamer (Consalvo 2017, 180). Social identity, then, evolves as a sense of self-concept, and is central to one's membership within an affinity group with its associated values and practices (Tajfel 1979).

Belonging to an affinity group defines members of the same social category (Abrams and Hogg 1988), while excluding those who do not belong. It also describes what it means to be a group member (e.g., what gamers are like), reflecting the norms (e.g., popular video games and related paratexts), and common attitudes (e.g., gamers often see themselves in opposition to others, such as 'sports' students at school). In this way, traits, stereotypes (e.g., gamers are nerdy), and behaviours (e.g., playing specific games relates to your identity) manifest. Through a social comparison process, young people who display group normative values and behaviours are categorised as 'in-group,' while young people who differ from the norms are categorised as the 'out-group' (Killen, Mulvey, and Hitti 2013; Nesdale and Flesser 2001).

Societal expectations about groups, status, and power begin in early childhood, and are reflected in school playgrounds and peer interactions (Killen, Mulvey, and Hitti 2013). Traditionally gaming cultures have supported the formation of affinity groups based on mainstream understandings of masculinity and social identity of gamers (Gilje and Silseth 2019). Reductive and normative gender differences in who plays games begin to emerge in the early years of school, and speculatively may contribute to the digital skills gap that manifests post-schooling (Wong and Kemp 2018).

### **Materials and methods**

The study draws on a broader mixed method program of work (Scholes 2019) that explored student beliefs and attitudes towards a range of activities. In this article we draw on original survey and interview data to investigate the following research questions proposed in the introduction:

- (1) Are there differences in Year 3 boys' and girls' (ages 7–8 years old) enjoyment of video games, frequency of using digital devices, and their self-reported digital skills? (Survey phase)
- (2) How do boy gamers describe their experiences gaming? (Interview phase)

The first question was asked because we were interested in boys' self-reported perceptions of their engagement and enjoyment for gaming with girls' responses providing a counterpoint. Based on survey analysis, the second question focused specifically on boy gamers, defined as those reporting a love of gaming, who use digital devices daily, and who believe that they have high level digital skills. We were interested in how they described their love of gaming, including how they positioned themselves within the gaming culture. Sex was self-assigned by the participants (indicated by male or female). An explanatory, sequential, mixed method research approach was implemented. It involves collecting and analyzing quantitative and then qualitative data in two consecutive phases within one study to allow a more robust analysis, taking advantage of the strengths of each (Tashakkori and Teddlie 1998). The approach highlights congruence of patterns in the data across surveys and interviews, strengthening the applicability of the findings (Blatter and Haverland 2012). This design included conducting and analysing interviews second in the sequence to help explain and elaborate the survey results (Tashakkori and Teddlie 1998).

## Materials

The following description of the materials is divided into two parts for this mixed method, two-phase research. The phase one survey sampling, survey design, and survey analysis are presented first, followed by phase two interview methods, including participant selection, interview description, and analysis.

### Survey sampling

Primary schools were randomly selected across South East Queensland, Australia to include a range of faith and non-faith institutions embedded in a range of geographic locations (inner city, metropolitan, regional), with diverse economic demographics (lower to higher socioeconomic communities). They included Anglican ( $n = 1$ ), Catholic ( $n = 2$ ), and government schools ( $n = 11$ ) schools. Participants who took part in the survey included 318 third grade students (ages 7–8 years old) from 14 schools across Australia, including 152 boys and 166 girls.

### Survey design

A 21-item pencil and paper questionnaire was developed and validated as part of a broader program of study to survey students about their enjoyment of a range of school related activities (Scholes 2019). This article specifically draws on Year 3 survey responses to three of the items. The first item was student self-reported enjoyment for video games on a 3-point Likert scale (like a lot, like a little, don't like). A three-point Likert scale was used with an understanding that younger children may not have the cognitive ability to make a five-point differentiation. Additionally, because the reliability and validity are independent of the number of scale points used for Likert-type items, the three-point scale is adequate (Jacoby and Matell 1971) (Table 1).

**Table 1.** Self-reported enjoyment for video games example item.

How much do you like the following activities? Colour in the face to show your answer.	Like a lot	Like a little	Don't like
Playing video games			

**Table 2.** Self-reported frequency using digital devices.

How often do you use a digital device?

(e.g., computer, laptop, ipad, gaming console etc.)



Colour-in the diamond to show your choice

Everyday	◇
A few times a week (3–4)	◇
Once a week	◇
A few times a fortnight	◇
Hardly ever	◇

The second item gauged student self-reported frequency of using digital devices (iPads, computers, gaming consoles, smart phones and so on) on a five-point scale that ranged from: (i) hardly ever, (ii) a few times a fortnight, (iii) once per week, (iv) a few times a week, or (v) every day (Table 2).

The third item recorded student's perceived level of digital skills on a five-point scale that ranged from: (i) poor; (ii) average; (iii) good; (iv) very good; or, (v) excellent.

### Survey analysis

Responses to student level of enjoyment for video gaming were coded 2 = like a lot, 1 = like a little, and 0 = don't like. Student self-reported frequency using digital devices were coded 5 = every day, 4 = a few times a week, 3 = once per week, 2 = once per two weeks, and 1 = hardly ever. Responses related to student self-reported digital skills were coded 5 = excellent, 4 = very good, 3 = good, 2 = average, and 1 = poor. Because we were interested in broad patterns in student responses to the three items, and any differences in responses between boy's and girl's answers, analysis included running frequencies and Pearson's chi-square tests for correlation. Analysis of the survey responses then informed the follow up interview phase. For instance, in the survey students were asked about their level of enjoyment for playing video games, and in the interview, we probed to understand participant justifications and elaborations.

### Interview sampling

Follow up interviews took place after the survey using convenient sampling of 45 students (9 boys and 16 girls) across six demographically diverse participating schools (Lavrakas 2008). The interviews purposely selected for this article represent four boys who met the criteria for participation, namely, that they self-reported a love of video games, used digital devices daily, and believed they had excellent digital skills.

### Interview design

Two researchers withdrew the selected participants individually from their classrooms and first reviewed their survey, asking if any of their responses had changed. Second, the students were asked to elaborate on their survey responses. The audio-recorded interviews took approximately 20 minutes and were transcribed at a later date.

### Interview analysis

The first deductive iteration or 'confirmatory' approach (Saldana 2009) of analysis involved identifying interview narratives that corresponded with responses identified during quantitative analysis. For instance, if a student had responded that they enjoyed video games 'a lot' in the survey, we identified interview narratives that elaborated on their response. The second iteration considered the qualitative data as a means of exploring more complicated and textured relationships and nuances associated with identity theory (Tajfel 1979) (Table 3).

**Table 3.** Interview coding example.

Student ID	Survey item	Survey response	Interview narrative
0101	Like gaming	Like a lot	Researcher: On the survey you said you like video games a lot. Can you tell me about the games that you like? 0101: Car racing games, hack and slash, definitely bike games and other stuff like Minecraft, I like to watch YouTube. Researcher: What do you watch on YouTube? 0101: Jacksepticeye. It's a YouTuber. Researcher: Oh. What's his name? 0101: Jacksepticeye but his real name is Jack. He plays videogames.
0202	Frequency gaming	Everyday	Researcher: You said on the survey that you like to play video games every day. Can you tell me why you like to play each day? 0202: Because you can meet new friends online. Researcher: How do you do that? 0202: You can join games and sometimes they can [unclear] and you might have a lot of things in common.

As part of this process, open ended coding of interviews was undertaken independently by the authors, with iterative intercoder discussions at multiple points to discuss analytic memos (Saldana 2009).

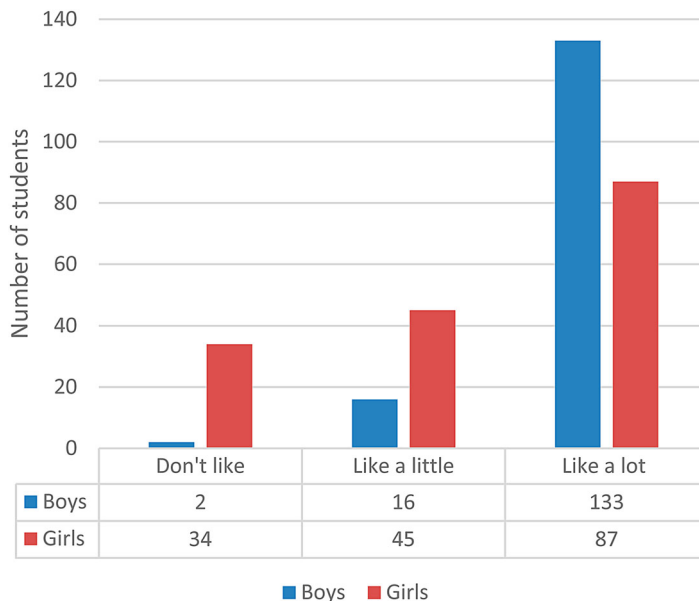
## Results

The findings are divided into two sections presenting the phase 1 survey findings, followed by the phase 2 interview findings. Each of these two sections is organised by the key areas of inquiry in the research questions – level of enjoyment of digital games, frequency of gaming using digital devices, and digital skills.

### Survey findings

#### Enjoyment for gaming

Responses in Figure 1 illustrate that video gaming was enjoyed ‘a lot’ by the majority of Year 3 students (220 out of 318 students or 69%) with more boys (133 or 87%) indicating they enjoyed gaming



**Figure 1.** Level of enjoyment for playing digital games.

‘a lot’ than girls (87 or 52%). This gender difference indicates a 35% variance in self-reported levels of enjoyment.

We can only speculate that this difference may reflect game play habits that begin to manifest in the early years (Marsh 2003).

### Frequency using digital devices

Approximately 50% of the 318 students reported using digital devices (including iPads, computers, gaming consoles, and so on) ‘every day’ (79 students) or a ‘few times a week’ (85 students). This number is lower than expected, particularly as there has been an increase in tablet and laptop use in classrooms (Selwyn et al. 2017). This trend however, may reflect the socioeconomic contour of some of the schools in the study, and subsequently issues of access as the digital divide between the rich and poor has been widening in Australia since 2014 (Thomas et al. 2018). However, as illustrated in Figure 2, a breakdown of gender indicates that more boys (52 or 34%) reported that they use devices every day, as opposed to girls (27 or 16%).

This variance may also reflect autonomy of children at this age or parental restrictions due to the age of the cohort (7-8 years old); even when children grow up in homes with a high-level presence of digital devices, this does not necessarily lead to high use (Chaudron et al. 2015).

### Perception of digital skill level

Student responses illustrated that while many young people reported excellent digital skills (124 students or 38%), more boys (51%) indicated this high level of skill than girls (27%). This gender variance in self-belief at this early age is noted in Figure 3, and may reflect differences in boys’ and girls’ enjoyment and engagement with digital devices, noted above.

Previous research proposes that girls’ perceptions may also contribute to the digital skills gap that manifests post-schooling, especially in computer science, which is often gendered as a male domain (Wong and Kemp 2018), and the decrease in number of girls pursuing STEM subjects and entering traditionally male-dominated STEM-related professions (Drabowicz 2014).

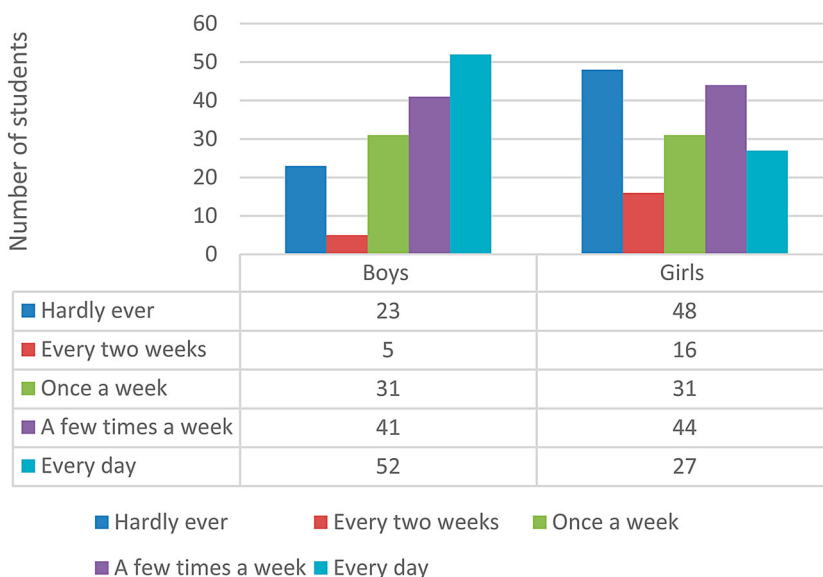
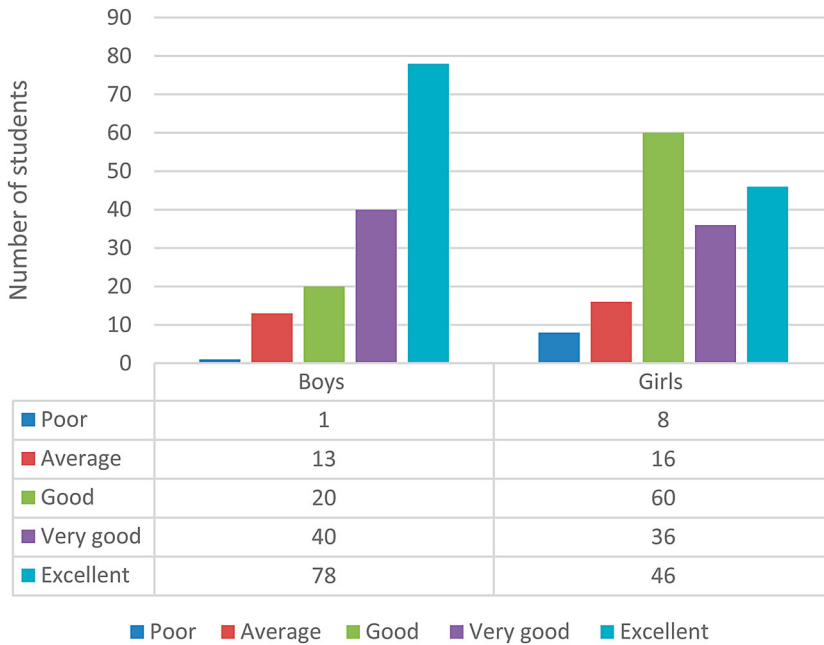


Figure 2. Frequency using digital devices.





**Figure 3.** Self-perception of digital skills.

### **Pearson's correlations**

Chi-square (crosstab) was run to see if responses by boys and girls to the three variables – enjoyment for digital games, frequency using digital devices, and digital skills – were by chance (Field 2015). A two-tailed analysis indicated there were significant differences in two variables – level of enjoyment for digital games and level of digital skills. Specifically, there was a relationship between sex and levels of enjoyment for digital games ( $n = -.386$ ,  $p = 000$ ) with a medium effect size ( $-0.3$  to  $-0.5$ ), indicating boys' higher levels of enjoyment. Correlations between sex and level of digital skills ( $n = -.274$ ,  $p = 000$ ) were indicated with a small effect size ( $-0.1$  to  $-0.3$ ). Although the relationship was not as strong as for enjoyment, boys indicated higher level digital skills. These findings support previous research that highlight gendered digital divides and speculations that boys' more frequent gaming may put them ahead in terms of digital skills (Drabowicz 2014; Wong and Kemp 2018).

### **Interview findings and discussion**

To probe into participants survey responses, the next section examines findings from follow up interviews with four boys from an identity perspective (Tajfel 1979). Interviews with Jax, Tobi, Zali and Mitch were selected because they met the criteria for participant selection; namely, all enjoyed playing video games 'a lot,' used their digital devices 'every day,' and believed they had 'excellent' digital skills. The four participants identified as Anglo-Australian and were meeting school academic requirements, although Mitch was achieving below the others in literacy according to teacher reporting.

### **Enjoyment for playing video games**

For Jax, Tobi, Zali and Mitch, gaming is an integral part of their everyday lives as they 'love' playing video games and identify as 'gamers.' As noted in the opening narrative, Jax talks about gaming in terms of identity, explaining that 'if you have a certain game then you're a certain person.' He



explained that to be popular you have to be funny, cool, and that ‘every single one of your moves has to be good, if you make one bad move, you go down a rank.’ Playing and enjoying the ‘right’ games is crucial. Attending a school in a leafy green suburb in a metropolitan city, for Jax, the game *Fortnite* is an important part of his daily gaming practice at home, and peer group interactions online contribute to the identity he presents at school. He explains that *Minecraft* is not that popular now with his peers:

Well, now that I have new friends, there’s new popular games. It’s kind of like one of those old games. There’s different games, different times of years, different years – there’s been different games.

Jax’s gaming persona becomes part of his playground conversations at lunch time when the ‘gaming kids’ hang around together and share insider information, such as game plays and game ‘cheats.’ As *Fortnite* is often played in duos, four-player ‘Playground Mode,’ or in teams, the casual, social nature of this specific game reinforces existing social relationships, such as those formed in schools, providing opportunities to learn teamwork, collaboration, strategic thinking, spatial understanding, and imagination (Carter et al. 2020).

While *Fortnite* is recommended for children 13 years and up (officially rated PEGI 12 in most of Europe – due to frequent mild violence), for Jax and his friends (8–9 years old during the interviews), an affinity with, and intimate knowledge about this popular game provides them with high social capital (Abrams 2011; Carter et al. 2020; Dezuanni, Beavis, and O’Mara 2015). While *Minecraft* has been touted as one of the most popular games for children between 3 and 12 years, it decreases in popularity, particular with boys, after the age of 11 (Mavoa, Carter, and Gibbs 2018). *Fortnite* fans such as Jax, can draw on their expertise with *Minecraft* (at scavenging and building) to scaffold a more interesting play experience. While the literacy benefits of *Minecraft* are well known, game play also promotes learning mathematical concepts (divide supplies evenly among players, estimate the area needed to build a city), historical concepts (import famous buildings and landmarks), and STEM learning through modding and hacking – altering the original programming code of the game to enhance the game (Dezuanni, Beavis, and O’Mara 2015; Lane and Sherry 2017).

The appeal of *Fortnite* appears contingent on the rich and rewarding social experience that it offers players such as Jax, intersections with *YouTube* and *Twitch*, along with the way the game acts as a vehicle for social capital and the performance of masculine identity (Carter et al. 2020). As *Fortnite* players improve their tier standing through skills development, they decipher new narratives for themselves by authoring authentic expressions of their personality, which ensures their participation in the community of practice along with their identity as rising experts in the game (Marlatt 2019), or identity development through textual interaction (Gee 2008).

Along with *Fortnite*, Jax also mentions playing *Minecraft*, *Terraria*, and *Trove* with his friends online. As part of the preamble to his interview he explained that he had been playing *Fortnite* with one of his school friends, Tex, online the previous night. He explains that ‘Most of the gaming kids, they spend hours and hours playing.’ His enjoyment goes beyond engagement in the game as he reads more broadly to learn short cuts and skills needed for new games, and as he writes game tutorials for game plays. He recalls, ‘sometimes I post my *YouTube* videos to my *YouTube* channel or watch others’ videos on there.’ These daily game-related practices are particularly salient for Jax, given his desire to work as a gaming *YouTube*er when he finishes his education. For Jax, his personal identity as a gaming *YouTube*er and his ‘in-group’ identity as a ‘gamer’ transcend his personal, school-based relationships through online platforms in his home (playing with his school friend Tex at night), his daily playground interactions with his affinity group (sharing cheats), and his embodied lifelong aspirations (to be a *YouTube*er).

Tobi who attends school at a metropolitan suburb in transition (higher income families moving into the area), is also an avid gamer who uses a *Play Station 4* (PS4) device at home that his Dad bought him using *Qantas* points, and enjoys fighting platforms, particularly ‘hack and slash games.’ He also spends time on *Crash Bandicoot N. Sane Trilogy*, *Call of Duty: Black Ops*, and

used to play *Minecraft: Story Mode – A Telltale Games Series*, but he is waiting on the next season to play it. He was quite excited, however, during the interview as he had found a *YouTube* video clip about the next update. ‘There’s this really cool thing that I’m sharing with all my friends because it’s really cool about *Minecraft*.’ In this way, Tobi has a broader range of practices related to gaming – that potentially contribute to his sense of belonging, identification, and positioning within his peer group (Molyneux, Vasudevan, and de Zúñiga 2015).

For Zali, who lives on the outskirts of a metropolitan city, enjoyment of play as a ‘gamer’ is specific and is explicitly related to his preference for sports. Aspiring to be an NBA basketball player, Zali plays this sport for a local club on the weekends. He also plays NBA 2K, a basketball simulation video game based on the National Basketball Association (NBA) that allows the player to compete in basketball games with the current season’s players and teams.

- Zali: I play NBA 2K [videogames], because that’s my favourite sport.  
 Researcher: NBA. Is that NBA the US or NBA Australia?  
 Zali: No, not Australian, U.S.A. because Australian is NBL.  
 Researcher: Ah okay, thank you for that correction. Do you follow the NBL as well as the NBA?  
 Zali: Not as much as I do, no actually. Sort of, but I follow NBA a lot.

As part of his involvement, Zali ‘secretly downloads games’ and goes on the internet to ‘watch awesome NBA stuff because I’ve got the NBA app.’ As he explained he has his ‘own phone and I watch everything through that.’

Mitch lives in a regional town that has a history of economic struggle. He talks of how having muscles and being strong are important in his school context, and describes the physicality he encounters in the playground as he has ‘been in a fight on the oval once or twice.’ Descriptions of his interests beyond gaming includes riding his motorbike and playing rugby league. Aspiring to be a policeman, because he would ‘get to Taser people and stuff’, his very specific gaming preferences reflect a hyper-masculine image (Scholes 2018).

- Mitch: I play a really violent game.  
 Researcher: Which one is that?  
 Mitch: *GTA – Grand Theft Auto*.  
 Researcher: *Grand Theft Auto*. What do you like about that?  
 Mitch: You can steal cars and stuff.

Sometimes Mitch also plays *Grand Theft Auto* with his dad illustrating an example of home-based social practice. Such a game described by Mitch himself as ‘violent,’ elicits a certain way of expressing masculine identity in the gaming community (Garcia 2017).

There are some dangers for the self-professed ‘gaming kids’ who reportedly spent ‘hours and hours gaming,’ as according to Tobi, ‘people normally pick on the gamers, because they’re not normally not as strong. So all the bullies normally pick on them.’ In Tobi’s recount there is an ‘us’ and ‘them’ dichotomy emerging – or stereotypes associated with the in-group related to the gaming community at his school (Abrams 2011; Nesdale and Flesser 2001). For instance, Tobi explained:

- I normally see the gaming kids getting picked on because the gaming kids normally stay together. They get picked on and they get called weaklings and stuff like that. Because most of the really good gaming kids, they’re normally not as strong as the kids that go out outside and do outdoor activities and sports.

According to the boys, sporting prowess and physical strength were important at their schools because ‘boys who are good at sport are popular,’ creating another in-group criterion around athleticism. Binary frictions between these competing male groups then, inform normative ways of being a particular kind of boy, or ‘a certain person,’ according to Jax. Social comparison processes were evident as group normative values and behaviours were categorised and labelled as in-group (gamer group or sports group), while young people who differ from the norms were categorised as the out-group (Nesdale and Flesser 2001).

### Frequency using digital devices

All four boys recounted how they played video games every day, sometimes with siblings, occasionally with their parents, but more often with friends online. Jax explained how he connects with his peers at home in the evening as they play favourite games online. There had been some complications the previous evening while playing with Tex.

- Jax: We play online games together. I told him my user name and he told me his one, and then we found each other, and joined each other ... We went to an app. Well, he went to his Xbox, but I had an app on my computer, so I could access my Xbox from there. Yeah, I found him from there. We played Fortnite.
- Researcher: Okay and how long did you play it for?
- Jax: About an hour or something, but my online pass thing expired, so then I couldn't play online. We're going to try again tonight.

*Fortnite* is a cross-platform game (through PC, PS4, Xbox One, Switch, Mac and mobile), which means that friends, such as Jax and Tex, have greater access to multiplayer games. According to Tobi, daily gaming online was also one way of making friends, and a benefit of being into gaming. In this way seeking out friends with common 'in-group' characteristics related to gaming becomes more accessible.

- Tobi: Because you can meet new friends online.
- Researcher: How do you do that?
- Tobi: You can join games and sometimes they can talk, and you might have a lot of things in common.

In this way the gaming community creates a dependency on others, rewarding players who learn to work together as a team (Hewett, Pletcher, and Zeng 2020). The salience of gaming in Tobi's life was palpable, and he did not perceive any limits on his gaming play time at home. Zali however, was having some problems with his daily access to gaming.

- Zali: My dad keeps banning me.
- Researcher: Why is that?
- Zali: Because my brother asked me to come outside with him and I was just finishing a race on Crash [Crash Bandicoot N. Sane Trilogy] in a level, and I just said hang on, I'm just going to finish this race then I'll come outside. Then he yelled at me, 'No, mum said so.' Then I said 'okay, okay,' in like, a yelling voice, and then my mum was upstairs on the toilet, and dad was calling, and he was on speaker (phone), and dad could hear me and mum. ... Yeah, I got banned again for some reason.

Everyday game play evidently flowed into other daily activities in Zali's home. In terms of associated paratexts, Tobi is an avid fan of Seán William McLoughlin, known as Jacksepticeye, an Irish YouTuber with currently over 26.8 million subscribers. For Tobi, daily immersion in video games permeates into broader media consumption (Apperley and Beavis 2011; Consalvo 2017) as he indulges in *YouTube* and *vlog*, and is part of a world-wide transmedia consumer assemblage (Garcia 2017). Associated paratexts provide opportunities for learning for Tobi through artefacts that surround a central text (video game), such as decoding of guides and walkthrough, but also production of texts associated with game wikis, reviews, cheats and player-created fan fiction.

### Self-perception of digital skills

All four boys claimed they had 'excellent' digital skills. Successful digital game play requires mastery of 'traditional' and 'new' literacy practices, with simultaneous attention required to process textual meanings, such as on-screen semiotic signalling and juxtaposing modal meanings (e.g., moving images, written text, audio), and contextual understandings related to plot structure, narrative, genre, and specifics of game organisation (Beavis and O'Mara 2010). Literate understanding is critical in gaming cultures, including older forms of narrative conventions, understanding character

and plot development, and experiences with multiple text types that players bring to the game, along with knowledge from associated paratexts (Consalvo 2017).

As noted earlier, Jax has his own *YouTube* channel and aspires to develop this passion into a career when he finishes school. He explains how broad literacy skills are important for ‘games, yeah, and tutorials, because you have to write the guides in the description sometimes as well. With games there’s usually popups, like cut scenes you have to read as well.’ His *YouTube* channel also requires a lot of time on the internet.

- Jax: Sometimes I post my *YouTube* videos to my *YouTube* channel or watch others’ videos on there [the internet].
- Researcher: You have your own *YouTube* channel? What kind of videos do you post there?
- Jax: Tutorials and game plays.
- Researcher: Fantastic. Do you have followers on your *YouTube* channel?
- Jax: Yeah. There’s more than – last time I checked which was two weeks ago, there was more than 60 something. But I just made a Twitter account, so I have followers on that.

Jax is also involved in related paratexts – reading game reviews, walkthroughs, and game cheats, while simultaneously honing his digital gaming skills. Texts can expand the world of gaming and the mechanics of play; as noted by Tobi, many boys in his class have a thirst for reading experiences that complement their game play (Hewett, Pletcher, and Zeng 2020). Along with understanding the storyline of games there can be the need to read details of a mission, quests, cutscenes, lore books, dialogue, scrolls, puzzles, and gaming websites.

Most of the kids in our class again as I said, they are not big on story books, because they’re not about gaming, because the libraries don’t have much about gaming, they just read about gaming.

Keeping up with news, media, and cultural dialogue that shapes the broader world within which gaming takes place is then pertinent to belonging for the boys (Garcia 2017).

In sum, the follow up interviews of the self-professed ‘gamers’ illustrated how they established an understanding about who they were as gamers. Everyday online multiplayer experiences and associated playground interactions were related to their gamer ‘in-groups,’ while distinguishing them from other groups. The associated digital skills transcended digital gaming literacies in play, and encompassed gaming related paratexts and other gaming ‘in-group’ social experiences and literacies.

## Conclusion

Our findings provide insights into young boys (7–8 years old) participatory cultures. In response to our first research question the survey data ( $n = 318$ ) across 14 schools showed that boys, more so than girls, ‘love’ video games, engage with digital devices daily, and believe they have ‘excellent’ digital skills. This finding contributes geographically and demographically broad data about boys’ beliefs in a field that has been predominantly based on ethnographic and small-scale studies (Mills 2010). A surprising finding was the low number of students (50%) who reported using digital devices daily or a few times a week (including phones, iPads, computers), particularly given the increase in schools that promote tablets and laptops in classrooms (Selwyn et al. 2017). This trend may reflect the widening digital divide (Kirschner and De Bruyckere 2017; Thomas et al. 2018) that has implications for students’ access to computer hardware/software, human resources to facilitate training in the use of digital technologies, and institutional and national infrastructure access (Warschauer and Tate 2018) that impacts on the development of digital skills (Van Deursen and Van Dijk 2014).

Interview findings responded to the second research question and illustrated that the salience of the gaming culture for self-professed gamers is palpable at an early age. It is integrated within their emerging sense of identity, that transposes, and is ingrained in their experiences at home, with peers in the playground, and potentially, the classroom. This finding addresses a gap in

understandings about the way young boys' gaming identities are embedded within broader experiences and local contexts. Mitch, for instance identified with a range of masculine expressions at home (motorbike riding, playing ruby league) in school (fighting in the playground), and through his aspirations (to become a policeman). His specific gaming preference (*Grand Theft Auto*) appeared entangled with his emerging identity, and with his portrayal of self in the gaming community (Garcia 2017).

Similarly, Jax's daily engagement in multiplayer action gaming, such as *Fortnite*, was embedded in his belief that playing the 'right' game was critical for his social standing and popularity, as well as his aspirations to be a YouTuber. His daily engagement potentially promotes critical thinking and meta-skills – learning to learn as his perception, attention and cognition is focused on learning the strategy of the game (Bejjanki et al. 2014). As Jax creates content for his *YouTube* channel he blends digital expertise with related paratexts (Beavis et al. 2009; Marlatt 2019) to encapsulate the new literacy practices we have come to associate with meaning-making in the twenty-first century (Mills 2010, 2013; Mills and Unsworth 2017). Together these findings provide new insights into links between gaming frequency, digital skills, and participatory cultures.

Teachers can capitalise on the strength of video games to create 'in-group' cultures within communities of practice to promote learning. In the Australian context Dezuanni, Beavis, and O'Mara (2015) illustrated how 8- and 9-year-old girls performatively bring themselves into being in and around *Minecraft* through the social processes of play, learning and identity construction within affinity groups. Learning in these spaces enhances problem-solving, creativity, self-direction, and collaboration, developing media literacy skills (Dezuanni 2018), and consolidating mathematical and scientific concepts (Lane and Sherry 2017).

However, issues arise with using games in the classroom. The advent of the global success of *Fortnite*, while increasingly linked to school curriculums through modes such as *Fortnite Creative* – where students build their own world within the game, encouraging computational thinking and problem-solving – raises issues of consent (13 years and older), privacy (voice-chat and text-chat capabilities), and appropriateness (violence). While these issues will be ongoing, discourse related to the value of games for learning is still critical.

Skills learned playing games are recognised in educational research (Apperley and Beavis 2011; Beavis 2014) and are increasingly used in real-life work situations that require leadership, organisation, the ability to assimilate information, react swiftly, and co-ordinate actions whilst remaining calm under pressure (Hewett, Pletcher, and Zeng 2020). Significantly, the study showed the complexity and advanced level of the boys' digital skills, with their gaming enjoyment and daily engagement potentially linked to their self-reported confidence in their digital expertise. How to ethically create gaming spaces in classrooms and promote participatory cultures, however, is an ongoing challenge (Jenkins, Ito, and Boyd 2016). There is a need to explore ways to provide safe spaces for students to exercise volition as gamers, and to engage in safe, multiplayer experiences with peers, providing access for children marginalised by the digital divide at home (Thomas et al. 2018). Providing educational access for children excluded or marginalised in such digital participatory cultures is a salient aspect of further research, as we move forward to broaden communities of practice, and to create opportunities to enhance games-based learning.

## Note

1. All names of students are pseudonyms.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

This work was supported by Australian Research Council [grant number DE170100990].

## ORCID

Laura Scholes  <http://orcid.org/0000-0002-8849-2825>

Kathy A. Mills  <http://orcid.org/0000-0003-1140-3545>

Elizabeth Wallace  <http://orcid.org/0000-0002-5544-3373>

## References

- Abrams, Sandra Schamroth. 2011. "Association Through Action: Identity Development in Real and Virtual Video Game Environments." *Yearbook of the National Society for the Study of Education* 110 (1): 220–243. <https://onlinelibrary.wiley.com/journal/17447984>.
- Abrams, Dominic, and Michael A. Hogg. 1988. *Social Identifications: A Social Psychology of Intergroup Relations and Group Processes*. New York: Routledge.
- Apperley, Thomas, and Catherine Beavis. 2011. "Literacy into Action: Digital Games as Action and Text in the English and Literacy Classroom." *Pedagogies: An International Journal* 5 (2): 130–143. doi:10.1080/1554480X.2011.554620.
- Beavis, Catherine. 2014. "Games as Text, Games as Action: Video Games in the English Classroom." *Journal of Adolescent & Adult Literacy* 57 (6): 433–439. doi:10.1002/jaal.275.
- Beavis, Catherine, Thomas Apperley, Clare Bradford, Joanne O'Mara, and Christopher Walsh. 2009. "Literacy in the Digital Age: Learning from Computer Games." *English in Education* 43 (2): 162–175.
- Beavis, Catherine, and Claire Charles. 2007. "Would the 'Real' Girl Gamer Please Stand Up? Gender, LAN Cafés and the Reformulation of the 'Girl' Gamer." *Gender and Education* 19 (6): 691–705. doi:10.1080/09540250701650615.
- Beavis, Catherine, and Joanne O'Mara. 2010. "Computer Games – Pushing at the Boundaries of Literacy." *Australian Journal of Language and Literacy* 33 (1): 65–76. <https://www.alea.edu.au/resources/australian-journal-of-language-and-literacy-ajll-2>.
- Bejjanki, Vikranth R., Ruyuan Zhang, Renjie Li, Alexandre Pouget, C. Shawn Green, Zhong-Lin Lu, and Daphne Bavelier. 2014. "Action Video Game Play Facilitates the Development of Better Perceptual Templates." *Proceedings of the National Academy of Sciences* 111 (47): 16961–16966.
- Bennett, Sue, Karl Maton, and Lisa Kervin. 2008. "The 'Digital Natives' Debate: A Critical Review of the Evidence." *British Journal of Educational Technology* 39 (5): 775–786. doi:10.1111/j.1467-8535.2007.00793.x.
- Blatter, Joachim, and Markus Haverland. 2012. *Designing Case Studies: Explanatory Approaches in Small-N Research*. Hampshire: Palgrave Macmillan.
- Carter, Marcus, Kyle Moore, Jane Mavoia, Heather Horst, and Luke Gaspard. 2020. "Situating the Appeal of Fortnite Within Children's Changing Play Cultures." *Games and Culture* 15 (4): 453–471. doi:10.1177/1555412020913771.
- Chaudron, Stéphane, Manfred E. Beutel, Veronica Donoso Navarrete, M. Dreier, Ben Fletcher-Watson, A. S. Heikkilä, and V. Zurkova. 2015. *Young Children (0–8) and Digital Technology: A Qualitative Exploratory Study Across Seven Countries*. Ispra: Joint Research Centre.
- Consalvo, Mia. 2017. "When Paratexts Become Texts: De-Centering the Game-as-Text." *Critical Studies in Media Communication* 34 (2): 177–183. doi:10.1080/15295036.2017.1304648.
- Desai, Rani, Suchitra Krishnan-Sarin, Dana Cavallo, and Marc Potenza. 2010. "Video-Gaming Among High School Students: Health Correlates, Gender Differences, and Problematic Gaming." *Pediatrics* 126 (6): 1414–1424.
- Dezuanni, Michael. 2018. "Minecraft and Children's Digital Making: Implications for Media Literacy Education." *Learning, Media and Technology* 43 (3): 236–249. doi:10.1080/17439884.2018.1472607.
- Dezuanni, Michael, Catherine Beavis, and Joanne O'Mara. 2015. "Redstone is Like Electricity: Children's Performative Representations in and Around Minecraft." *E-Learning and Digital Media* 12 (2): 147–163. doi:10.1177/2042753014568176.
- Drabowicz, Tomasz. 2014. "Gender and Digital Usage Inequality Among Adolescents: A Comparative Study of 39 Countries." *Computers & Education* 74: 98–111. doi:10.1016/j.compedu.2014.01.016.
- Field, Andy. 2015. *Discovering Statistics Using IBM SPSS Statistics*. 5th ed. Sussex: University of Sussex.
- Garcia, Antero. 2017. "Space, Time, and Production: Games and the New Frontier of Digital Literacies." In *Handbook of Writing, Literacies, and Education in Digital Cultures*, edited by Kathy A. Mills, Amy Stornaiuolo, Anna Smith, and Jessica Zacher Pandya, 198–210. New York: Routledge.
- Gee, James Paul. 2003. *What Video Games Have to Teach us About Learning and Literacy*. New York: Palgrave Macmillan.
- Gee, James Paul. 2008. "Video Games and Embodiment." *Games and Culture* 3 (3–4): 253–263. doi:10.1177/1555412008317309.



- Gilje, Øystein, and Kenneth Silseth. 2019. "Unpacking FIFA Play as Text and Action in Literacy Practices In and Out of School." *Learning, Media and Technology* 44 (2): 180–192. doi:10.1080/17439884.2018.1563105.
- Hewett, Katherine J. E., Bethanie C. Pletcher, and Guang Zeng. 2020. "The 21st-Century Classroom Gamer." *Games and Culture* 15 (2): 198–223. doi:10.1177/1555412018762168.
- Hygen, Beate W., Jay Belsky, Frode Stenseng, Vera Skalicka, Marianne N. Kvande, Tonje Zahl-Thaniem, and Lars Wichstrøm. 2020. "Time Spent Gaming and Social Competence in Children: Reciprocal Effects Across Childhood." *Child Development* 91 (3): 861–875. doi:10.1111/cdev.13243.
- Jacoby, Jacob, and Michael S. Matell. 1971. "Three Point Likert Scales are Good Enough." *Journal of Marketing Research* 8 (4): 495–500. doi:10.2307/3150242.
- Jenkins, Henry, Mizuko Ito, and Danah Boyd. 2016. *Participatory Culture in a Networked Era: A Conversation on Youth, Learning, Commerce, and Politics*. Cambridge: Polity Press.
- Johnson, Daniel, Christian Jones, Laura Scholes, and Michelle Carras. 2013. *Videogames and Wellbeing*. Melbourne: Young and Well Cooperative Research Centre.
- Jones, Christian, Laura Scholes, Ben Rolfe, and Colleen Stieler-Hunt. 2020. "A Serious-Game for Child Sexual Abuse Prevention: An Evaluation of Orbit." *Child Abuse & Neglect* 107. doi:10.1016/j.chiabu.2020.104569104569.
- Killen, Melanie, Kelly Lynn Mulvey, and Aline Hitti. 2013. "Social Exclusion in Childhood: A Developmental Intergroup Perspective." *Child Development* 84 (3): 772–790. doi:10.1111/cdev.12012.
- Kirschner, Paul A., and Pedro De Bruyckere. 2017. "The Myths of the Digital Native and the Multitasker." *Teaching and Teacher Education* 67: 135–142. doi:10.1016/j.tate.2017.06.001.
- Lane, H. Chad, and Yi Sherry. 2017. "Playing with Virtual Blocks: Minecraft as a Learning Environment for Practice and Research." In *Cognitive Development in Digital Contexts*, edited by Fran C. Blumberg, and Patricia J. Brooks, 145–166. Cambridge, MA: Academic Press.
- Lavrakas, Paul. 2008. "Convenience Sampling." In *Encyclopedia of Survey Research Methods*. doi:10.4135/9781412963947.n105.
- Livingstone, Sonia, and Julian Sefton-Green. 2016. *The Class: Living and Learning in the Digital Age*. New York: New York University Press.
- Marlatt, Rick. 2019. "Fortnite and the Next Level Discourse: Understanding How Gamers Cultivate Pedagogy in Teacher Education." In *Society for Information Technology & Teacher Education International Conference, 1974–1974*. Association for the Advancement of Computing in Education (AACE).
- Marsh, Jackie. 2003. "Superhero Stories: Literacy, Gender and Popular Culture." In *Boys and Girls in the Primary Classroom*, edited by Christine Skelton, and Becky Francis, 59–79. Berkshire: Open University Press.
- Mavoa, Jane, Marcus Carter, and Martin Gibbs. 2018. "Children and Minecraft: A Survey of Children's Digital Play." *New Media & Society* 20 (9): 3283–3303.
- McKnight, Katherine, Kimberly O'Malley, Roxanne Ruzic, Maria Kelly Horsley, John J. Franey, and Katherine Bassett. 2016. "Teaching in a Digital Age: How Educators Use Technology to Improve Student Learning." *Journal of Research on Technology in Education* 48 (3): 194–211. doi:10.1080/15391523.2016.1175856.
- Mills, Kathy A. 2010. "A Review of the 'Digital Turn' in the New Literacy Studies." *Review of Educational Research* 80 (2): 246–271. doi:10.3102/0034654310364401.
- Mills, Kathy A. 2013. "Cuol: See You Online: Teaching Strategies for Digital Literacy Practices in the English Curriculum." *Screen Education* 70: 52–57. [https://www.metromagazine.com.au/screen\\_ed/](https://www.metromagazine.com.au/screen_ed/).
- Mills, Kathy A., and Len Unsworth. 2017. "Multimodal Literacy." In *Oxford Research Encyclopedia of Education*. doi:10.1093/acrefore/9780190264093.013.232.
- Molyneux, Logan, Krishnan Vasudevan, and Homero Gil de Zúñiga. 2015. "Gaming Social Capital: Exploring Civic Value in Multiplayer Video Games." *Journal of Computer-Mediated Communication* 20 (4): 381–399. doi:10.1111/jcc4.12123.
- Nesdale, Drew, and Debbie Flesser. 2001. "Social Identity and the Development of Children's Group Attitudes." *Child Development* 72 (2): 506–517. doi:10.1111/1467-8624.00293.
- Paaßen, Benjamin, Thekla Morgenroth, and Michelle Stratemeyer. 2017. "What is a True Gamer? The Male Gamer Stereotype and the Marginalization of Women in Video Game Culture." *Sex Roles* 76 (7): 421–435.
- Pick, James B., and Avijit Sarkar. 2015. *The Global Digital Divides: Explaining Change*. New York: Springer.
- Saldana, John. 2009. *The Coding Manual for Qualitative Researchers*. Thousand Oaks, CA: Sage Publications.
- Scholes, Laura. 2018. "Working-Class Boys' Relationship with Reading: Contextual Systems that Support Working Boys' Engagement with, and Enjoyment of, Reading." *Gender & Education* 31 (3): 344–361.
- Scholes, Laura. 2019. "Differences in Attitudes Towards Reading and Other School-Related Activities Among Boys and Girls." *Journal of Research in Reading* 42 (3-4): 485–503.
- Scholes, Laura, Christian Jones, Colleen Stieler-Hunt, and Ben Rolfe. 2014. "Serious Games for Learning: Games-Based Child Sexual Abuse Prevention in Schools." *International Journal of Inclusive Education* 18 (9): 934–956.
- Sefton-Green, Julian. 2006. *New Spaces for Learning: Developing the Ecology of Out-of-School Education*. Magill, SA: Hawke Research Institute for Sustainable Societies.



- Selwyn, Neil, Selena Nemorin, Scott Bulfin, and Nicola F. Johnson. 2017. "Left to Their Own Devices: The Everyday Realities of One-to-One Classrooms." *Oxford Review of Education* 43 (3): 289–310. doi:10.1080/03054985.2017.1305047.
- Selwyn, Neil, Luci Pangrazio, Selena Nemorin, and Carlo Perrotta. 2020. "What Might the School of 2030 Be Like? An Exercise in Social Science Fiction." *Learning, Media and Technology* 45 (1): 90–106. doi:10.1080/17439884.2020.1694944.
- Stone, Bessie G., Kathy A. Mills, and Beth Sagers. 2019. "Online Multiplayer Games for the Social Interactions of Children with Autism Spectrum Disorder: A Resource for Inclusive Education." *International Journal of Inclusive Education* 23 (2): 209–228. doi:10.1080/13603116.2018.1426051.
- Tajfel, Henri. 1979. "Individuals and Groups in Social Psychology." *British Journal of Social and Clinical Psychology* 18 (2): 183–190. doi:10.1111/j.2044-8260.1979.tb00324.x.
- Tashakkori, Abbas, and Charles Teddlie. 1998. *Mixed Methodology: Combining Qualitative and Quantitative Approaches*. Thousand Oaks, CA: Sage Publications.
- Thomas, Julian, Jo Barraket, Chris K. Wilson, Ellie Rennie, Kay Cook, Yee Man Louie, Indigo Holcombe-James, S. Ewing, and T. MacDonald. 2018. *Measuring Australia's Digital Divide: The Australian Digital Inclusion Index 2018*. Melbourne: RMIT University for Telstra.
- Van Deursen, Alexander JAM, and Jan AGM Van Dijk. 2014. "The Digital Divide Shifts to Differences in Usage." *New Media & Society* 16 (3): 507–526. doi:10.1177/1461444813487959.
- Warschauer, Mark, and Tamara Tate. 2018. "Digital Divides and Social Inclusion." In *Handbook of Writing, Literacies, and Education in Digital Cultures*, edited by Kathy A. Mills, Amy Stornaiuolo, Anna Smith, and Jessica Zacher Pandya, 62–63. New York: Routledge.
- Wong, Billy, and Peter E. J. Kemp. 2018. "Technical Boys and Creative Girls: The Career Aspirations of Digitally Skilled Youths." *Cambridge Journal of Education* 48 (3): 301–316. doi:10.1080/0305764X.2017.1325443.