

It's Going to be Amazing: Exploring Children's Game Play and Making

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Abstract: This paper reports on the results of a game-based learning study that had a twofold purpose: first we sought to find out what our study participants (ages 10-13) could tell us about their video game play habits at home and second to explore students use of *Super Mario Maker 2* software on the Nintendo Switch Lite to design their own games. The study took place in two schools, one middle school and one elementary school, in the suburbs of a medium-sized city on Canada's West coast. Two grade 6 classes participated in the study (n=44), and played *Super Mario Maker 2* over 9 days, in pairs. Overall, the study found that all students had prior gameplay experience, meaning that no students struggled with the controls, nor did they need much assistance to build their own games, even though only a handful of participants reported having prior coding and/or game design experience. We also found that gameplay was a common leisure activity for most participants, with girls demonstrating significant skill and familiarity with games, challenging previous gender disparities in game play. This short intervention demonstrates how a commercial off the shelf game can be used to support students' design-based thinking and making, with all participants managing to design a playable level by the end of the study.

Keywords: Nintendo Switch, Super Mario Maker2, Game making, Game-Based learning, Game pedagogy

1. Introduction

Even though gameplay patterns have shifted demonstrably since the pandemic (Donati et al, 2021; Lager & Corso, 2025; Smirni et al, 2021), there is a paucity of current research which examines gameplay choices and patterns of play among children (Lager et al, 2025; Gottfried et al, 2024). Indeed, much of the research on children and video games has been on the impact of video games and screen time on children, observing positive and negative correlated behaviours with use (Alanko, 2023; Lobel et al, 2017; Mupalla et al, 2023; Sauce et al, 2022), regardless of what they are choosing to play, overlooking the ways children engage with games (e.g., their preferences, social interactions, and time spent). The ways in which children engage with games, influenced by factors such as gender, socioeconomic status (SES), and race, has been generally omitted. Additionally, there is limited research about what games children are consistently playing, and the role video game playing has in their daily lives.

This study's purpose was to find out what our participants (children ages 10-13) could tell us about their video-gameplay habits at home, paying attention to whether and how the global COVID-19 pandemic may have shifted patterns of children's at-home video game play. Because of the large scale of surveys, overviews of play practices of children are usually just self-reported snapshots. We do not necessarily have a clear view of what school-age children are playing when they do play games, how often, and if their play is seen by them as overseen by a parent or guardian. Our hope is that this deeper dive into the play practices of young people in a small city in British Columbia might contribute to a more nuanced understanding of which young people are playing and why they say they are playing digital games.

2. Related Literature

Current research shows that more children are playing more often and for more hours than ever before (Donati et al, 2021; Smirni et al, 2021). According to a recent Pew Research report, 85% of U.S. teens report playing video games, and 41% say they play them at least once a day (2024). What that means is that video games occupy, for many young people, a very large part of their mediated world, especially outside of schools. Games and learning literature has for decades, made a strong connection between games and learning. (Barab et al, 2012; Barr 2016; Carrisoli & Villani, 2019; Cassie, 2012; Foster et al, 2011). Used in classrooms to teach a variety of subjects (Tobias & Fletcher, 2012; Young, et al., 2012), games have become a tool that educators call on to introduce concepts or practice new skills (Barab et al, 2012; Cole et al, 2023; Dishon & Kafai, 2020). When used in classroom settings, some video games have been used to address different curricular expectations (Barr 2016; Hébert et al, 2018). When examined through the lens of the British Columbia Core Competencies (BC Government, 2015), which are quite wide-open curriculum expectations, many of these studies directly address

the key skills that educators are working on to bring to their classrooms in the province (Carmen et al, 2012, Cassie 2012; Cole et al, 2023; Foster et al, 2011). This more specifically includes the Applied Design, Skills, and Technologies curriculum, which emphasizes iterative learning processes, visual programming, design thinking, and strategies for identifying and troubleshooting problems with regards to technology (BC Government, 2015).

2.1 Gameplayers

As the aforementioned Pew study discussed, most teen boys and girls play video games, but more boys play every day (61% vs. 22%) (Gottfried et al, 2024). This gender discrepancy in everyday play practices is seen in smaller qualitative studies as well (Almusharraf et al, 2023; Girón-Gambero & Franco-Mariscal, 2023; Jenson & de Castell, 2023; Nguyen et al, 2022). There are few, if any, more recent qualitative studies which examine these game play differences with respect to gender since the COVID-19 pandemic. This study reexamines these gendered play differences post-pandemic and, in a school-based setting.

2.2 What is Being Played?

There have many studies who ask students to play video games within school contexts, and which examine the educational affordances of video games (c.f. Beavis, 2014; Nash & Brady, 2022; Zuicker & Anderson, 2021). However, there are limited studies of at-home play patterns of children generally breaking down the percentage of people who play (Donati et al, 2021), and they do not address who is playing what. This omission is potentially crucial in understanding play patterns within the class, as what they play at home is foundational to their game understanding within the classroom. None of the located studies include outside the classroom or previous video-game play experience as an examined variable when incorporating video games into the classroom.

3. Research Design

This qualitative study looked to understand young people's game play, in and outside of school. Two grade six classes (ages 12-13) participated in the study in the suburbs of a small city on Canada's West coast. The middle school where the study took place occupies a building that is over a century old and scheduled for demolition at the conclusion of the 2025 academic year. Currently, a new facility is under construction directly in front of the existing structure. The students in the middle school are from varied social-economic backgrounds. Two of the authors of this paper (Jenson and Perry) ran the study for 9 days, which took place an hour a day with supervision from the classroom teacher. Data collection included video and audio recording of all play sessions, teacher interviews, short 5-to-10-minute interviews with all students (usually in their game play pairs), scans of game design notebooks that students planned their games in, and a short questionnaire on at home and in school game play. Both authors also took field notes over the two weeks of game play, and two GoPro captured ongoing audio-visual data.

Participants included two classes of grade 6 students (n=44) and their two teachers. The classes were not especially diverse linguistically, as just two children were English language learners, which meant that they received additional English language support. There were 19 female-identifying, and 15 male-identifying student participants. All but two students who were in the classes during the study consented to participate.

During the 9-day study, participants were provided Nintendo Switch consoles on which to play and to create levels within the game *Super Mario Maker 2* in pairs. Researchers taught basic game design terms, and asked participants to then create their own "playable" levels within *Mario Maker 2*, which would be shared with the class on the last day of the study. The study concluded with the students playing each other's levels on a projector, so that each pair was given a chance to showcase their level to the whole class. These levels were first drawn by participants in sketchbooks that we provided, then constructed within the game and edited to create a level on the Switch. We continually emphasized during the two weeks that the participants' goal was to create a 'playable level' – that is one that they (and others) could complete. Participants were not trained on any of the technical skills or more complex blocks that users can utilize when building in *Super Mario Maker 2*. Instead, participants were introduced to the "Tutorials" section of the game, where different skills are broken into digestible steps and in-game logic is explained. All mechanics that they incorporated they taught themselves to use, including levels that made use of conditionals, creating levels that offer a depth of in-game knowledge that surprised us.

3.1 Data Analysis

With so much data from participants with respect to their gameplay and game making, a thematic analysis approach was selected to sort the interviews and provide inductive codes on at-home play. Following Braun et al's definition of themes as "reflecting a pattern of shared meaning, organized around a core concept or idea, a

central organizing concept,” (p. 3, 2019) themes were created from coding the interviews and checking those against the responses on the questionnaire with respect to at-home gameplay. Preliminary inductive codes were created from the interview data, the gameplay footage, and from the interview with the teacher. These inductive codes were based on expressed game-play time, devices, and preferences that participants shared. By examining the images of their play and sketchbooks with the inductive codes from the interviews and observing how students visually represented their play and design processes, details were revealed that may not have been fully articulated in interviews, such as which participants had constructed their own game levels before.

4. Prior Video Game Experience

4.1 At-Home Game Play Experiences

All participants had experience playing on a Nintendo Switch console prior to the study. This is in contrast to previous studies in libraries or classrooms that have noted that boys tended to report having more prior gameplay experiences than girls (Cunningham, 2018; Hébert, et al., 2018). That all students in this study reported prior experiences playing on a Nintendo Switch is noteworthy. For example, while studies have shown that most households have a game console (Donati et al., 2021), having a group of participants that all had prior play experiences on a Switch changed how we approached using the console and teaching with it. Additionally, when introducing the console to the class, we affirmed that students were comfortable with the location of the buttons on the Switch and their actions without needing guidance. That all students had prior gameplay experience meant that all students started from a somewhat level playing field, meaning that they all had familiarity with Nintendo Switch, and did not need to be taught how to use the controls.

When asked in the interviews, all participants said they had prior gameplay experience, and all students had played or regularly played at home. All students had access to at least two technologies with which to play, with 12 of the participants having regular access to three or more game play technology options. These options included traditional game consoles like Nintendo Switches and PlayStations, but also more general-purpose options like computers, phones, and tablets. The most common technology option for play was a phone (n=32), with Nintendo Switch as the second-most common (n=24) and any model of computer third (n=21). Participants also listed having access to PlayStation and Xbox consoles (respectively, n=19, n=11), and tablets (n=8) at home to a lesser extent. Interestingly, the teacher’s perception of participants’ SES did not seem to correlate to the number of devices they had access to at home. In other words, even lower income households had two or more devices on which participants reported playing games.

At home, 18 student participants reported playing every day, for at least an hour, ranging to four hours a day, five of those identifying as girls. The other 24 students ranged from playing every other day to two to three times a month. The average student in the class reported playing **five days a week, for two hours per play session** for those who offered an estimate for how long they played (n=29). When asked how they know their play session is done, the participants who answered (n=27) were split, either they stopped playing when bored, or they were told to stop or were limited by their parents.

In terms of what the participants reported playing, the most popular titles were *Fortnite* (n=19), *Minecraft* (n=25), and several titles from the *Mario* franchise (*MarioKart*, *Super Mario Galaxy*, *Super Mario Odyssey*) (n=23). Only five students reported that they did not play with others, either in person or online. While of the other 39, 34 reported playing both online and in person with friends or strangers in online lobbies. Not all participants mentioned playing in gaming lobbies directly, and many of those who did not mention lobbies still discussed playing games such as *Fortnite* or *Roblox*, which exist almost exclusively as online multiplayer games that utilize lobbies and play with randomly grouped strangers. Therefore, most of our participants (87%) are reporting playing with friends or strangers in lobbies, whether they recognize it or not. This is notable as it reflects the significant role video games have as a socializing tool for these young people.

4.2 Perceptions of Gaming Outside of School

Playing video games, we learned, was a way for some participants to connect with each other outside of school. As the interviews were conducted in pairs, several of the pairs named each other first when sharing who they connected with outside of school, whether it was through playing video games together, calling, or texting. Games were considered a common form of interaction between friends, with several of the participants (n=13) offering that they went home to immediately log on, playing with local friends from school or, as two participants mentioned explicitly, calling close friends who live far away and playing together. Digital games are often used for socializing, and participants mentioned that even when they were not in physical proximity, they would use two kinds of virtual connections to play together. For example, participants would put each other on FaceTime,

SnapChat, or a phone call while playing games like Roblox together regularly. For many of the participants, games are a primary medium for connecting with friends outside of school.

For some of these students, games were also their main source of activity and entertainment outside of school, describing how they play digital games with family, immediate and extended. Even before working with the participants directly, their teacher had named several participants who were vocal about their gameplay at home, with each other or around games. For example, one of the teachers mentioned a specific participant who often did not show enthusiasm for schoolwork but would share his game progress with her when talking about his at-home activities. This participant was one who was immediately excited to discuss video games with the researchers, naming many games he interacted with and how he enjoyed their difficulty.

4.3 Learning from Games

Due to the rudimentary coding mechanics that *Super Mario Maker 2* employs, participants were asked about previous educational coding and gameplay experiences. Twenty-one out of the 23 participants had played or made games using coding software/building games like *Scratch*, *Roblox*, or *Minecraft*. Many of these players had mentioned learning with *Scratch* (a rudimentary coding and game-maker, free online) in school (n=30); however, only one person chose to build in *Scratch* outside of these classroom based-experiences. Additionally, many students (n=24) mentioned playing *Roblox* at home, and only nine students said they chose to build their own game in the program. The ratio of students whose knowledge of building games came from school compared to those who sought out similar experiences on their own time was notable because of the expressed enthusiasm within the class for creating the levels. Many proponents of educational video games encourage the use of games like *Roblox* or *Minecraft* for the coding opportunities embedded in certain game functions (Han et al, 2023). Within this study, the classroom setting offered a structured environment where participants were excited to engage with the coding affordances of the game.

5. Findings: Play at Home Impacts Engagement in Game Play in Classroom

When planning the study, one of the most interesting and pressing questions was how at-home gameplay and experience may be impacting participants' in-school play. This was timely as well, because the teacher initially expressed concern that while some of her students were avid gamers, some may be unfamiliar and therefore disengaged. This perceived unfamiliarity was immediately addressed when all of her students reported playing video games at home in some capacity. To address any lingering imbalances in the participants' game play ability, the class was given a five-minute introduction to the game mechanics in *Super Mario Maker 2*. While participants were familiar with the gameplay and the mechanics with which they were interacting, they did treat this as an academic experience, focusing on the designated level-building tasks they were given.

As previously stated, participants played in pairs during the study, paired with someone whom their teacher thought that they could collaborate with while still staying focused. We were consistently impressed with the engagement of the class. In video and photo data, student pairs diligently constructed levels, both in their notebooks in the ideation phase, and in the *Super Mario Maker 2* game in building mode. Engagement for this group required very little teacher feedback, as the group were given directions on the order of building their level and then time to work, while observed by the research team. As their teachers commented multiple times in their exit interviews, every student participated actively and enthusiastically.



Figure 1: Players collaborating in their pairs, close body language

For example, Ms. R characterized student learning during the study as immersive, expressing her “shock” at how engaged some of her girl students were when they did not talk previously about their game play habits to her. Their obvious prior play experiences were seen through their comfort with the game, as well as the collaborative ways in which they constructed their own levels. How well the participants all engaged together was reiterated during the 9 days of the study, as well as the teacher interviews post-study.

That doesn’t mean we didn’t observe some frustration during level-building, particularly in the playtesting stage. After participants had constructed the levels they had designed in their sketchbooks, they played their own levels and each other’s to test out the feasibility of completing the level in its original design. The challenge was to offer kind but critical feedback to other pairs in their level, so that they could take the level and adjust it for the final showcase. This was an iterative process, a cycle of testing, offering feedback, reworking, and testing again. Frustration was also seen when building progress was lost, as some groups forgot to save their levels and therefore lost their work.



Image 2: Pairs playtesting each other’s levels, exchanging Nintendo Switches with each other

5.1 Social and Physical Proximity

Sociality between and among students was crucial to this project’s success. The two teachers had a strong understanding of their classes, providing the researchers insights into how different pairs would collaborate successfully. In previous iterations of this study, there have been classes where partnerships had been changed to support the focus of the pair or minimize their disruption to the class. These classes worked more in tandem, within groups that surprised the teachers, and collaborated without teacher input to show each other their levels, playtest, and offer ideas in each other’s notebooks. As seen in the above images, the students were physically close as well as sharing verbally with each other.



Image 3: Final class where the participants played each other’s levels

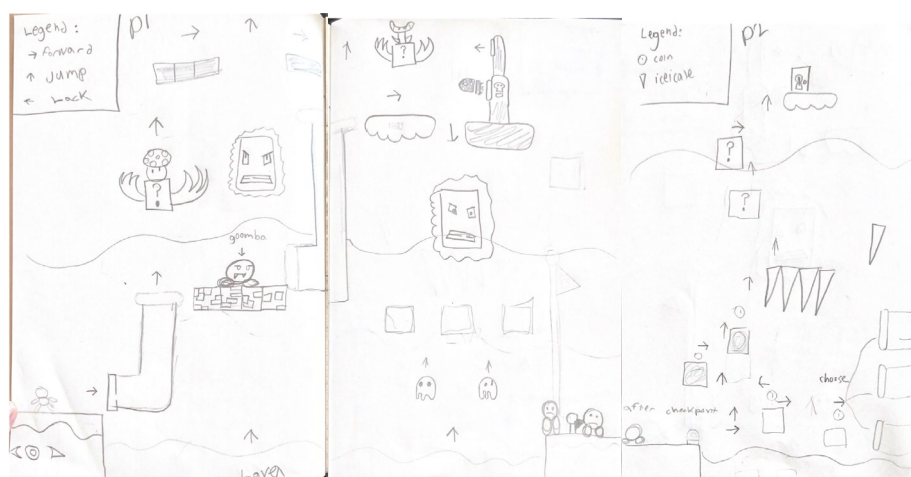
5.2 Design Thinking Through Game Making

As stated previously, participants were encouraged to plan their levels by sketching them in their notebooks after they had experimented with play to familiarize themselves with the usable game elements. Many of their initial drawings featured levels that were impossible to complete, featured too many enemies that the player had to fight, and sometimes missed including a floor for the player to walk on. These initial drawings showed a familiarity with the characters and concepts of the game but lacked the deeper knowledge of how to create a level that was playable. Often, there were several iterative drawings of these levels, changing how the blocks were arranged for players to run on, and altering the mechanics needed to win the game (e.g., adding a door where a key needs to be retrieved).



Images 4-6: Examples of a single participant's initial notebook sketches that are infeasible due to the number of enemies

Through iterations, whether altered by feedback or their building understanding of the game, most participants created playable levels. Their sketches showed their experimentation process, with the development of levels that show an understanding of the players' movement through their designed space, as well as the actions needed to progress. This is seen in the above images 4-6, in which the participant employed so many enemies that they could not play their own level to completion. Over time, they redesigned their level so that the final product was playable, yet looked similar in structure to the images above. Many of the students started including arrows in their drawn designs, tracking where the Mario avatar would need to traverse to get to the flagpole that signaled the end of the level.



Images 7-9: An exemplary created level, with the inclusion of legends to show what selected symbols meant

This theme of game-design thinking encompasses much of the planning, strategy, and iterative problem-solving seen in participants' work. Both their sketchbooks and the levels developed from the sketches show this movement from initial creative development to producing playable levels, with the audience in mind.

6. Study Limitations

This qualitative study is limited to the population that we examined, one middle school, in one small city in British Columbia, Canada. While it can't account for all children's play habits at home, nor how they might exhibit their game play skills in a classroom setting, we do think it gives some important insights into play habits and preferences for children who were significantly impacted by the global COVID-19 pandemic.

7. Conclusion

This study offers an examination of video game play in and out of the classroom. The variety and sheer amount of data, help to create an in-depth picture of what and how often children are playing video games. Indeed, the reported number of hours participants reported playing weekly (five hours on average) was startling to us as researchers, as many of these students are replacing in-person play or hanging out with playing video games together, especially while calling or FaceTiming. This change to an online existence is made more distinct by the use of video games to socialize.

For example, the self-reported gaming habits of participants revealed that all students in the class regularly engaged with video games at home. This was startling to one of their teachers but was seen in the easy engagement of all the participants during level creation and gameplay. As Ms. R had noted previously, she expected less engagement from some of the girls in her class, but across the class, we saw the girl participants playing collaboratively and engaging deeply in their game-development process. Their participation in game play was enthusiastic, and they were open to engage with a problem-solving process. The interviews offered insight into participant attitudes around video game play, whether they were excited to play or hesitant to show enthusiasm. The comfort and ability to socialize around games translated to what can best be described as an engaged, enthusiastic classroom for all participants, regardless of gender.

Finally, and to repeat, all students engaged collaboratively in their level construction and sharing their levels with the class. This formal-learning setting offered a space for personal interests in games to bridge into the class, fostering an enthusiasm that surprised their teachers. Student participants less invested in the more traditional lessons were offered a space to creatively engage and showcase a passion that they have at home. All participants reported spending a large proportion of their time outside of school on screens, and integrating more screen time into a school setting increases those hours. This study shows that while having the requisite skills to navigate playing video games in classrooms might have been a barrier for some students to participate fully in in class video game play, that skills gap has, at least in this study, been closed, in a large part due to the purchasing of game consoles by families to have indoor activities for young people to do during stay at home orders during the pandemic. Moving forward, we hope to conduct the study a second time within the same school to see what similarities and differences there might be within this age range.

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