CHAPTER 7

Homeschooling and Gameschooling

Deborah Solomon, *Montgomery College, 51 Mannakee Street, Rockville, MD 20850, deborah.solomon@montgomerycollege.edu*

Key Summary Points

1. Homeschooling is one of the fastest-growing forms of education in the United States.
2. The homeschool population is becoming more diverse, and families differ widely in their reasons for homeschooling as well as in their learning methodology.
3. Homeschoolers increasingly are using entertainment and educational games as part of their informal and formal curricula. "Gameschooling," which means using games for education, can help children who have alternative learning styles or are resistant to formal schooling.
4. Homeschoolers represent a growth market for game developers, as do "afterschoolers" who use games to enhance learning after school.
5. Educational games can better address the needs of homeschoolers by improving reporting and assessment, making it easier to switch between sibling accounts, making gamified rewards more meaningful, improving privacy and security, and providing increased opportunities for cooperative learning.

Key Terms

Homeschooling
Home education
Unschooling
Gameschooling
Afterschooling
Virtual school
Gamification
Rewards
Intrinsic & extrinsic motivation
Social learning
Assessment, reporting & documentation
Stealth learning
Cooperative learning
Long form games
Short form games
Analog games

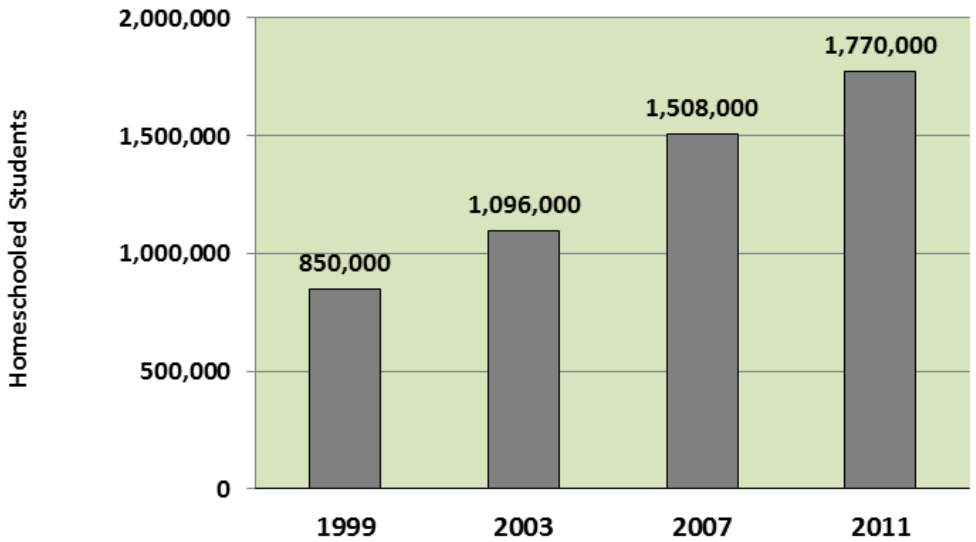
Introduction

What homeschoolers have in common is that they do not attend school *in person* and *full-time*. Other than that, there is very little that can universally be said to describe the diverse population of homeschoolers. They differ widely in school attendance, in methodology, and in motivation for homeschooling. Homeschoolers do not necessarily do all of their education "at home"—some attend school part time, some travel the world, some are professional athletes or actors who work with tutors on location, and some attend full time online virtual public school. What is clear is that homeschooling is on the rise, diversity within the homeschool population also is increasing, and homeschoolers represent a substantial market segment for educational games.

Fastest Growing Form of Education

Homeschooling has steadily grown in the United States, from less than 20,000 students in 1975 to almost two million in 2011. According to Education Week, "some experts argue that homeschooling is the fastest-growing form of education in the country" (Education Week, 2011). The U.S. Department of Education's National Center for Education Statistics (NCES) reports that, "The increase in the percentage of homeschooled students from 1999 to 2007 represents a 74 percent relative increase over the 8-year period and a 36 percent relative increase since 2003." (NCES 2009) The most recent NCES statistics put homeschoolers at 1.77 million in 2011, which is 3.4% of the school-age population (NCES 2013).

Table 1. U.S. Homeschool Enrollment from 1999-2011 (as reported by NCES)



Furthermore, state and federal homeschooling statistics omit large numbers of homeschoolers, because there is no agreed upon defininition of homeschooling. For example, some states (like California) consider homeschools to be small private schools. Some states count virtual school students as "public school students," especially when these online schools are funded by the state. A recent news article explains how some states fail to count homeschoolers:

> In California, the statistics are even fuzzier. That's because, technically, there is no such thing as home schooling in California. Here, it is done in several ways. Families that go it alone must establish what amounts to a miniature private school. They can hire a credentialed teacher to tutor their child. Or they can home-school through an independent study or online program sponsored by a public school…While the California Department of Education keeps a tally of private schools in the state, it omits from the count any private school with fewer than six students—and in so doing neglects to track the number of home-schoolers. (Kuznia, 2013, para. 17-18)

School districts can earn significant funds from increasing their enrollment by classifying homeschoolers as public or charter school students. This structural incentive reduces the official "counts" of homeschoolers. As one researcher notes, "School districts themselves are actively strategizing, employing such technological connections to enhance their revenue flow but maintaining existing enrollments or by actively recruiting home school parents to join a home school charter" (Apple, 2007, p. 117). Despite the lack of complete data, it is clear that the homeschooling population is substantial and growing.

Homeschooling also exists internationally but global statistics are difficult to find. According to the National Home Education Research Institute, homeschooling is growing in Australia, Canada, France, Hungary, Japan, Kenya, Mexico, South Korea, Thailand, and the United Kingdom (Ray, 2011). In other countries, such as Germany, homeschooling is illegal. An informal summary of international homeschool laws can be found on *Wikipedia* (http://en.wikipedia.org/wiki/Homeschooling).

How Does Homeschooling Work?

Some homeschoolers study at home, but others attend school for part of the day. In states like Idaho and Illinois, public schools allow part time attendance for academic classes and for after-school sports. NCES data shows that about 16% of homeschooled children attend school part-time (2009).

Other homeschoolers attend school full-time, but they do it online through virtual charter schools like Florida Virtual School, Calvert, Connections Academy or K12. (Many states accredit and pay for these virtual schools as part of their public school program and do not count these students as "homeschoolers"). A few travel the world while homeschooling—one family has taken their daughter to experience over 44 countries and five continents since 2006 (www.soultravelers3.com). Another family travelled by bicycle from Alaska to Argentina (www.familyonbikes.org). Some young actors and athletes use tutors on set or at training facilities. So, there is a huge variety in location, and not all homeschooling takes place at home.

Homeschoolers also differ widely in their methodology. Some do school-at-home—replicating a school like environment in the home with recess, bells, and desks. At the other end of the spectrum are unschoolers, who follow a child-led, interest-based lifestyle, generally without formal classes or academic structure (Thomas & Pattison, 2013). Some unschoolers do participate in classes and other structured activities, but only if requested by the student. There are as many different flavors of unschooling as of homeschooling itself. In between are a variety of other methods, such as reading original source literature instead of textbooks ("Charlotte Mason" method – see www.simplycharlottemason.com), or learning through the lens of a thematic unit—such as studying math, science, literature and history through Ancient Egypt (i.e., unit studies). Others methods might be based on a religious viewpoint or nature/environmental outlook, and some focus on special needs (e.g., a child's disability or giftedness), career needs (e.g., acting or athletics), or a family lifestyle (e.g., farming or world travel).

Games, Homeschooling, and "Gameschooling"

"I have always had a fancy, that learning might be made a play and recreation to children…" – John Locke, *Some Thoughts Concerning Education*

"Do not…keep children to their studies by compulsion but by play." – Plato, *The Republic*

A growing homeschooling methodology is called gameschooling, where students play games as an integral part of their learning (www.gameschooling.org). Most of the elementary curriculum can be taught through games, and much of middle and high school material can be learned through games or gamified learning applications. There are fewer educational games and apps, though, at the secondary school level. (Cooney Center, 2014). Games have always been used in education—whether board games, trivia quizzes, or learning skip counting through hopscotch—however, advances in technology have made digital games a key educational tool for many homeschoolers.

Some children learn best though games. This may be due to dyslexia, ADHD, emotional issues or simply due to the independence and immediate feedback that games can provide. Marino, Basham, & Beecher (2011) found that videogames particularly helped at-risk learners and students with disabilities. A growing group of homeschoolers initially attended school but left due to bullying, dyslexia, lack of academic rigor, too much academic pressure, food allergies, or a myriad of other issues. For some of these students, school was stressful or traumatic, or traditional learning methods did not work for them, so educational games may be a welcome alternative. Games can also give homeschool parents a way to keep one child productively engaged while focusing on a sibling. So games are becoming an increasingly important tool for homeschoolers.

Homeschoolers are a growing market for educational games, as are "afterschoolers" (families who use games to enhance learning after school). So how does the use of games at home differ from the use of games in the classroom? And do homeschoolers have specific needs that are different from afterschoolers?

For the most part, homeschoolers use games for learning and entertainment just as other families do. Yet homeschoolers have a few distinct needs that current games are not fully meeting. Volume One of this book series explored how to analyze specific games for a variety of subject areas. This chapter describes the size and diversity of the homeschool market in the United States, and explains how learning games in general can be adapted for the homeschool audience.

Case Study One: Social/Emotional Learning and Content Creation in *Minecraft*

As noted above, most homeschoolers have rich social networks (Murphy, 2012). Games provide additional social tools for homeschoolers. *Minecraft* is an open sandbox game where players can build elaborate Lego-like virtual structures and can play online with friends. A key element of this long form game is that the player is a "prosumer," i.e. not just a passive consumer of game content, but a producer who can actively create new content. The gameplay can be simple enough for a six-year-old, or complex enough for an adult—easy to play, but difficult to master. Since *Minecraft* online servers can be open to the public or restricted to friends only, parents can control who can interact with their children online.

Homeschool parent and author, Suki Wessling explains how *Minecraft* has helped her children with social interaction as well as social/emotional learning:

> One of the reasons I started homeschooling one of my children was that she had problems understanding social interactions. Forcing her to be in a classroom, which was stressful to her, just made the problem worse. Homeschooling allowed her to do her social/emotional learning in safer environments. *Minecraft* is one of those environments. In *Minecraft*, the children are somewhat separated from their physical selves, yet the same rules of social engagement apply. Kids with difficulties understanding social rules in the complicated physical world can act things out in the virtual world in a constructive and helpful way….
>
> Creative, visual games like *Minecraft* allow children with different abilities a place to be confident and skillful. In the oral culture of classrooms, highly visual kids are sometimes left out and made to feel slow or stupid. Inside a world that doesn't require words, they can develop their strengths along with self-assurance and confidence.
> (S. Wessling, personal communication, September 26, 2013)

Minecraft can thus be a learning tool for emotional growth, where children can safely practice social interactions. This application of game technology is useful for a wide range of children, from those who are simply lonely or shy to those with developmental delays and autism spectrum disorders. There is even a whitelisted *Minecraft* server for children with autism (www.autcraft.com).

Minecraft is popular with homeschoolers, and not just for social goals. *Minecraft* also can be used to teach topics from architecture to programming to quantum physics. *QCraft* is a free *Minecraft* mod used to teach quantum physics (www.qcraft.org). Wessling notes her son used programming skills to develop his own *Minecraft* mod, which won first place at a county science fair, and then honorable mention at the state fair. The *Minecraft* Homeschool website uses the game as an immersive environment for history classes, where students build structures related to their history lessons (www.minecrafthomeschool.com). Thus *Minecraft* is being used as a platform to support a variety of academic specializations.

Minecraft is also used as enrichment to supplement other structured classes for homeschoolers. *Athena's Advanced Academy,* is a website that provides online classes for gifted and talented homeschooled children. *Athena's* classes include philosophy, literature, mythology and other subjects. Students can talk (via chat) during class, and can also build connections in moderated online forums. *Athena's* also has a private *Minecraft* server where students can socialize and continue their studies with activities such as "creating virtual mathematic equations, scenes from literature readings, historical reenactments, geographical locations, famous sites, and more!" (www.athenasacademy.com/mod/page/view.php?id=25094, para 3). Thus *Minecraft* is being used to extend class learning and also to help a specific population (gifted students) connect with their peers. The open-ended, sandbox style gameplay gives unlimited hands-on experiences, making Minecraft an exciting platform for learning.

Key Frameworks

Numerous commentators have extolled the learning potential of games, both in educational and entertainment contexts (See e.g., Gee, Prensky, and many more). In his book, *Unschooling Rules*, game developer and unschooling father Clark Aldrich urges families to embrace technology for learning, especially high-quality video games. He notes, though, that not all video games are equally educational. In *Rethinking Education in the Age of Technology: The Digital Revolution and Schooling in America* by Collins and Halverson, the authors posit that public education in general may become "more like home schooling by emphasizing field trips, interacting with peers, playing computer games or even teaching others with technological tools" (Collins & Halverson, 2009, p. 129). Ian Bogost, a game designer, theorist, and also a homeschooling parent, argues that

> Videogames and education are at the cusp of commensurate revolutions. We have begun to recognize the need to create well-educated rather than well-schooled kids in broader numbers. We have begun to recognize the potential of videogames for educating; now we need to understand and embrace the ways they undermine schooling.
> (Bogost, 2008, p.170).

Thus games are not only useful in individual homeschooling and unschooling cases, but also have the potential to inspire broader educational reform.

Gamification, Leveling up, and Rewards

Gamification means applying game-like rules or rewards to non-game situations, i.e., making something more like a game to serve a non-entertainment purpose. Gamification has been used in education for years—even in a traditional classroom, teachers run word games or trivia contests for children to learn spelling words or history.

In the digital world, gamification often uses game-like rewards such as points, awards, or levels in an attempt to motivate player behaviors. These rewards are considered "extrinsic" or external versus "intrinsic" or internal rewards like the satisfaction of learning itself. Gamified learning may be motivating, but not always in the ways that parents intend. Extrinsic rewards can cause a student to de-value learning in favor of rewards (Kohn, 1993).

Another danger of gamified learning is that students may game the system itself, for instance by choosing easy lessons to quickly earn points, thus defeating the learning objectives. Educational game designers can learn from entertainment game designers regarding leveling up and quest design. In *World of Warcraft*, new players can complete easy quests to start leveling up their avatar. Advanced players must do harder quests to level up quickly because it would take too long for a higher level avatar to level up using these easy quests. Similarly, in a learning game, a typical high school student should not be able to earn rewards for kindergarten level work.

Furthermore, if the reward has little value to the student, it will not motivate learning. Just as small children love stickers but teens may find them worthless, sooner or later, kids will become bored by digital images like "badges" and "awards" that are really just virtual stickers. Game designers have the challenge of creating more meaningful rewards—or "badges worth bragging about" as *Khan Academy* claims (www.Khanacademy.org). Effective "bragging" requires meaningful social interaction:

> In order for status and reputation (levels, badges, leaderboards) to work, it is important to connect the user to a meaningful community with the same interests. An achievement is made to show it your friends with the same interests. If there is nobody whom you can show it to, your achievement will be nothing special.
> (Groh, 2012, p. 42)

Making educational games more social would increase the perceived value of gamified rewards. Methods to increase the social nature of games could include, posting achievements to Facebook, Xbox Live or other social media (for older students), enabling students to ask for assistance from peers or parents, and turn-based gameplay within the learning application (in the manner of the games *Word with Friends* and *Draw Some*). (See also "cooperative learning" below.) Social gaming can be made safer for children if parents are able to limit interaction with strangers and keep personal information private.

Alternatively, getting rid of artificial rewards and instead providing meaningful game outcomes that are focused on gameplay can make learning more internalized. In other words, "The dependence upon external rewards for motivation should be replaced by connections between the non-game activity and needs or goals in the user's life based upon information, which will allow users to have a positive internalized experience" (Nicholson, 2012, p. 242). Nicholson (2012) cites the example of the Toyota Prius' game-like dashboard that gives drivers meaningful interactive feedback on their fuel efficiency, instead of just a score or reward.

The game *Minecraft*, described in the case study, is a good example of the use of virtual rewards that are meaningful in that they provide actual gameplay value to the player as well as social status within a community of peers. *Minecraft* players have the option to play online on public servers, and many form communities and online friendships with others who play regularly on the same servers. On some servers, player actions can be incentivized with rewards like earning the ability to fly in the game or access new game worlds. In-game flying is a real benefit to players who want to escape hostile mobs (creatures that attack the player) or to build tall structures. Community status is increased for players with flying abilities, and their avatar names may also be listed on a leaderboard on the server's webpage. Meaningful social rewards such as these can be used to try to motivate game players to complete entertainment or educational goals.

Family/Cooperative Learning

Joint media engagement (JME) is a term used to describe parents and children using media together. JME is an "important way to enhance the impact of educational media" (Rideout, 2014, p. 5). Features that would enhance group learning or allow parents and children, or older and younger siblings to play together (each at their own level) can help games be more effective learning tools. Homeschooling website *Time4Learning* reports that two-player games are "one of the most popular parts of the entire *Time4Learning* service." (www.Time4Learning.com/playground.htm, *Time4Learning* is described in the case studies below). JME can be asynchronous (e.g., adding a button that would send an email to a friend or family member asking for help or sharing tips), or synchronous (e.g., a multiplayer co-op mode as in *Super Mario Galaxy*, where one player can perform easier tasks in the game alongside the more experienced player). Cooperative learning helps students stay engaged in learning because it is more social and players can get help quickly when stuck.

Furthermore, games and learning systems could better market to homeschoolers by permitting parents to save account information for multiple students (e.g., siblings or members of a small group co-op class). It is often cumbersome to switch between accounts, and games can streamline this functionality, minimize the number of steps involved, or put a visible "switch user" button at the top of the screen. Also, account switching at the operating system level could be made more user-friendly. Some devices, notoriously iOS devices, only allow one user profile, making it difficult for a family with three children to let each have an account with their own age-appropriate games and apps. It is unreasonable to expect a family to buy an iPad for each child.

Time Limits, Privacy, Content, and Internet Safety

Time limits and time tracking also help families who want to limit screen time or have the computer enforce taking turns among siblings or friends. Time limits could be managed within individual games or through the operating system, which could track multiple student accounts for different games and applications.

Parental controls and privacy settings can be tricky, especially across platforms. Many operating systems have limited protection for children, and some parents end up purchasing additional services. *Net Nanny* provides a suite of parental controls; however, parents must purchase separate accounts for each PC, iPad and other device, and the settings for each operating system and each device are also managed separately. This can become expensive, as well as cumbersome to maintain.

The full scope of Internet safety and privacy is too broad for in depth discussion in this chapter but is an important and troubling issue for families trying to protect their children online. Development of user-friendly, cross-platform parental controls is important but so is raising parental awareness about existing tools. Apple has greatly improved iOS website filtering, but few parents know how to use Apple's new tools (FOSI, 2011). Furthermore, multiple user account profiles still are not allowed, so parents with a four-year-old and a 14-year-old must block the same content for both children. Adding multiple profiles and time limit options would further improve iOS products for families. Windows also comes with family safety tools, and Mac has a set of parental controls, but parents often do not know these options exist (see more in the Resources section).

Many homeschooling families use mobile and web games for learning. Unlike console games, mobile and web games are not rated by the ESRB. Without age and content ratings to consult, parents have little guidance about potentially inappropriate game content. ⁋ Mark DeLoura, Senior Advisor for Digital Media at the White House Office of Science and Technology Policy thinks this should be changed: "Another key priority for DeLoura is to develop a consistent rating system for mobile games. It's not always clear whether mobile games and apps are safe for kids, even if they are marketed to this demographic" (Farr, 2013, para. 22).

Even within a single game, server settings and player behavior may determine whether the experience is safe and age-appropriate. *Minecraft* public servers can be restricted to a "white list" of approved players. Server extensions can be installed to prevent offensive language. Chat functionality can be allowed or turned off or set to public only (to prevent secretive or private communication between individual players). And players can be permanently banned for griefing, bullying and other rule-breaking. Alternatively, a server without any administrative control can be a free-for-all where extreme behavior and language is allowed.

Luckily, review sites exist to help parents decide which games are most suitable for their children. These sites, such as Common Sense Media (www.commonsensemedia.org) not only rate games based on appropriateness of the content for different ages, but also rate the quality of the content taught in the game. While dependent on user-submitted reviews and scores, in the aggregate these ratings give a good picture of many of the more popular games on the market. Other sites such as Educade (www.educade.org) provide game reviews with lesson plans created by teachers.

Increasing online safety would also help schools, libraries, and museums, not just families. Some libraries that provide games for pre-school and elementary school children have resorted to purchasing special

child-safe computers that completely lock out outside content (e.g., www.awelearning.com). While these services are great, they can be expensive and force libraries to pay for games that can be played online for free. It seems a shame that libraries must use their limited budgets to buy these expensive software/hardware packages, when better operating system controls—or better use of existing controls—could give libraries much greater freedom in their technology purchases.

State Homeschooling Requirements

Why are testing and reporting tools important for many homeschool families? Homeschool regulations differ widely from state to state. Some states require extensive documentation of time spent homeschooling, broken down by subject, day and hour. Some require standardized tests or proof that the child is making academic progress. So, depending on state laws, homeschool parents may have to keep records of their child's academic activities for review. (A survey of state laws can be found on www.hslda.org). Adding printable reports to learning games would help homeschooling parents document their child's academic progress.

State and county regulations are not the only reason why homeschoolers may be concerned with record-keeping. Some children are homeschooled through elementary or middle school, but then they enter a public or private high school, and many go on to college. When applying to selective colleges (or to private or magnet schools), homeschoolers need to assemble a persuasive transcript for admission and thus need documentation of the student's work.

Finally, even when there is no official need for documentation, it is helpful to parents to keep records of subjects mastered and diagnosis of potential trouble areas where a student may need additional help, or to ensure that children are being honest about completing assigned work, or even to determine how long they are spending on the computer. It is also useful for students to see which lessons they have completed and topics they have mastered or need to practice more. These systems do not necessarily need to add gamified badges and achievements, but seeing a record of progress is motivating in itself.

A contrary—and equally valid—view would be that many families homeschool to escape the rigidity and test-focused culture of the public school system. Thus it is ironic to advocate for increased testing and reporting in games, particularly when games may act as a break from formal studies or reward for completion of a non-game learning module. Some homeschoolers do not need to report to state agencies (or they may choose not to report game-based learning). For these and other reasons, reporting and assessment should be *optional* tools in games.

In conclusion, key frameworks for examining the use of games in a homeschooling context consider the needs of homeschooling families, such as making learning personal and meaningful, providing an alternative to traditional schooling, enabling Joint Media Engagment and use of devices by multiple siblings while protecting children online, and providing resources for documentation that may be required by state legislation. Analysts also have suggested that the growth of homeschooling and of educational gaming has the potential to inspire broader educational reform.

Case Study Two: "Gamified Learning" with Khan Academy and Duolingo

Gamification means applying game-like rules or rewards to non-game situations, and has become a popular term for its application to digital environments and learning programs that are used by homeschoolers.

Online learning programs Khan Academy and Duolingo provide game-like rewards and badges to encourage students to progress through online tutorials and tests. Both Khan and Duolingo are widely used by homeschoolers due to their high quality of instruction and the fact that they are free. On Duolingo, students can learn Spanish, French, and other languages. Khan Academy started with math tutorials and has expanded to cover a variety of STEM and humanities topics.

Gamification works well for some homeschoolers but can be a source of frustration for others who may find the virtual rewards irrelevant or phony. (For a more in depth look, please see the chapter in this book on gamification). Wessling comments on how her children feel about gamified learning in Khan Academy:

> [O]ur highly techy kid positively hates it while our non-techy kid loves it. So I would say from our experience, gamification is hardly the all-around solution that some say it is. Our techy kid doesn't care about empty praise. He thinks it's just sort of dumb that *Khan Academy* gives him awards—other apps that are more blatant about it annoy him and he won't use them. Our other child, however, really likes seeing constant, incremental progress. She loves it when learning environments have some sort of score-keeping aspect, and will even print out the medals she receives. So I am hoping that the world of education doesn't blindly go into gamification without thinking about the fact that it's not the best thing for every kid.
> (S. Wessling, personal communication, September 26, 2013)

It is important to keep in mind that gamified rewards and badges are not uniformly motivating or uniformly worthless. Their relevance depends on the preferences and personality traits of the user such as competitiveness, diligence or need for feedback and reassurance. Likewise, when playing entertainment games, some gamers intently focus on their scores, achievements, leaderboard placement, or Xbox Live points, while others could not care less.

Key Findings

Key findings in the area of homeschooling and games show that homeschooling is now a mainstream choice that is no longer considered radical and that the homeschool population is becoming more diverse. Extensive research shows that homeschooling can be a successful educational option; however, there is still very little research on the homeschool use of technology, and of games in particular.

Homeschooling Becomes Mainstream

With the rapid growth in homeschooling, it is shifting in public perception from being a radical choice to being an accepted mainstream alternative to public or private schooling:

> Home schooling, once dismissed as a fringe activity practiced by head-in-the-sand reactionaries and off-the-grid hippies, is now widely considered an integral part of the mainstream education system. Growing more common every year, the practice has gained attention due to home-schooled students sweeping up scholastic and athletic honors at national competitions and high-profile politicians opting to teach their own children at home.
> (Education Week, 2011, para 1, citing Lyman, 2007)

Similarly, the tone of news coverage of homeschooling has changed over the years from minimal coverage and general lack of awareness to overall more positive reviews.

Studies of formerly-homeschooled adults are rare; however those that exist indicate that homeschooled students usually are well-prepared for college and adult life (Ray, 2014). As Joseph Murphy, author of *Homeschooling in America*, notes, "Homeschool students are successful and they don't perform worse than other students or seem to be disadvantaged in any way… If you have one teacher dedicated to one or two children, it's a success equation, and so it doesn't surprise me [homeschooling] works" (Wetzel, 2012, quoting Murphy, para 8). Thus homeschooling is becoming accepted by the media, researchers and the general public as a viable educational choice.

Diversity and Motivation in Homeschooling Populations

Homeschoolers differ widely in their reasons for homeschooling as well as in their methodology. Stereotyped caricatures of "head-in-the-sand reactionaries" or "off-the-grid hippies" perhaps describes some homeschooling families at the extremes, but in reality homeschoolers are much more varied and complex in their motivations, which include concerns about the school environment (such as safety, drugs, or negative peer pressure), to provide religious or moral instruction, to provide a nontraditional approach to education, dissatisfaction with academic instruction, health problems or special needs, and "other reasons" such as family time, finances, travel, and distance (NCES, 2013). What works best for one child might not be the best for a sibling, so it is common for homeschooling parents to have another child in a conventional school setting (Kunzman & Gaither, 2013, p. 8, citing Isenberg, 2006).

Notably, in NCES's most recent survey of data from 2011, only 21% listed religious or moral instruction as their primary reason for homeschooling—this is a steep decline from 36% in the 2007 survey (NCES, 2013). As one commentator notes, "[A] newer breed of home schooler is emerging that [is] not motivated by religious belief or countercultural philosophy. Uppermost for these parents are concerns about violence, peer pressure and poor academic quality in their schools" (Education Week, 2011, para 4).

Homeschooling is also becoming more diverse. The National Home Education Research Institute explains that "Homeschooling is quickly growing in popularity among minorities" and "A demographically wide group of people homeschool—these are atheists, Christians, and Mormons; conservatives, libertarians, and liberals; low-, middle-, and high-income families; black, Hispanic, and white; parents with Ph.D's, GEDs, and no high-school diplomas" (Ray, 2014, para 5). The 2011 NCES survey showed a particularly dramatic increase from 2007 in the number of Hispanic and African American homeschoolers (NCES, 2013).

Homeschoolers Have Rich Social Networks

Critics of homeschooling sometimes assert that homeschoolers are "unsocialized." In fact, this critique is so common, it has become somewhat of a joke among homeschoolers, as evidenced by a popular car bumper sticker that reads "Caution: Unsocialized Homeschoolers Aboard!" (www.homeschoolmania.com).

It is often unclear what the term "unsocialized" is intended to mean, specifically whether it refers to socializ*ing* (interacting with other people and making friends) or socializ*ation* (absorbing cultural norms and societal values) (Kunzman and Gaither, 2013, p. 19-23). Nevertheless, most homeschoolers spend plenty of time with other children and with adults, via co-ops, park play dates, boy and girl scouts, religious, and secular activities, and science and karate classes. Studies have found that most homeschoolers have strong social networks (Murphy, 2012). (See also Gathercole, 2007. However, CRHE, 2014 notes that not all homeschoolers have sufficient social interaction.)

A minority of homeschoolers are more isolated due to geography, disability, or other factors. Games and virtual worlds can help meet their social needs by providing opportunities to maintain existing friendships or make new friends online (Graham, 2012).

Limited Research on Use of Games by Homeschoolers

Back in 2002, researcher Kariane Mari Nemer explained in her report *Understudied Education: Toward Building a Homeschooling Research Agenda* that the explosive growth in homeschooling necessitated more research:

> In pursuit of a comprehensive knowledge of national education, therefore, we need to direct more attention to understanding the education of homeschooled children. Moreover, such studies will generate a wealth of information applicable to broader educational settings. Scholars interested in cognitive development may gain important insights from unschooling families, who tenaciously pursue child-led learning (see Holt, 1981). Scholars concerned with curriculum may gain important insights from the many homeschoolers who devote themselves to tailoring lessons to meet the individual needs of each of their children. And scholars focused on policy may gain important insights about market-based reforms. Homeschooling, after all, is the ultimate in school choice: not simply between schools, but whether schools.
> (Nemer, 2002, p.1).

Still, twelve years later, there are not many studies to be found, particularly on the use of learning games and technology by homeschoolers. Research on current homeschooling methods not only would illuminate the work of homeschoolers, but also might contribute to national discussions on public education hot topics, such as individualized and differentiated learning, flipped classrooms, and MOOCs, and provide "a context highly conducive to the discussion of how the American education system can fulfill the needs of our pluralistic society" (Nemer, 2002, p. 16). (Also see Bogost, 2008, Collins & Halverson, 2010, and Glanzer, 2013). As the most recent NMC Horizon Report notes,

> Movements such as "unschooling" are taking the idea of K-12 education in a completely different direction. Unschooling rejects conventional methods of learning and instead emphasizes education through natural means, such as gameplay, work experience, and household responsibilities, while encouraging the freedom for learners to pursue their personal interests…. Whether or not this model gains traction over the next five years, it is stimulating important conversations about the need to move to more progressive education paradigms that better engage all kinds of learners, even in traditional settings.
> (Johnson et al., 2014, p. 28).

Reliable research on how homeschoolers use games (or other technology) is very limited, so this area is ripe for academic study. A 2014 report explains, "Home school populations have been studied for socialization and academic preparedness, but there are few studies on the use of technology among home schooled families" (Neil et al., 2014, p.1). Research on homeschoolers generally falls into five themes: reasons for homeschooling, student achievement, social development, special needs, and legal and policy issues (Alias et al., 2013, p. 10. See also Kunzman & Gaither, 2013).

Existing game research usually focuses on data from schools and teachers, not homeschoolers. Some learning game research specifically omits homeschoolers. The Cooney Center's 2013 *Games for a Digital Age: K-12 Market Map and Investment Analysis* is a blueprint for developers "hoping to succeed in the K-12 institutional school space" and not the consumer market or "the less traditional adjacent markets, e.g. after school, independent distance learning courses, game design contests, or homeschooling" (Richards et al., 2013, p. 7). Given the report's explicit focus on selling games to schools, the exclusion of homeschoolers is not surprising.

One might then expect to see inclusion of homeschoolers in the Cooney Center's 2014 *Learning at Home*—a report on learning games outside of the school context. *Learning at Home*, however, does not include any references to homeschooling. It was based on a survey of 1577 randomly selected parents of children ages two to ten years old, and was "representative of the entire U.S. population." (Rideout, 2014, p.9) So, at least 3.4% (about 54) respondents likely were homeschoolers. Yet, the survey excluded use of learning games as homework or school assignment, making it unclear how a homeschool parent might classify the use of games in their households. When asked the following question about education, parents did not have the option to answer that they were homeschooling:

> During the 2012-2013 school year, was [CHILD] enrolled in:
> a. Day care outside the home 10%
> b. Preschool 13%
> c. Head Start preschool 4%
> d. School 53%
> e. None of the above 22%
> (Rideout, 2014, p.48)

Homeschooling was not listed as an option, so the 22% (approximately 347 parents) who answered "none of the above" likely included both homeschoolers and toddlers/preschoolers not in day care or preschool. It would be interesting to go back to this data to see which of the 22% were of school-age, and thus were likely to be homeschooling. This commentary is not intended to critique the Cooney Center's very useful reports; it is merely to show how homeschoolers are often invisible in the field of games research and not included in leading reports on either K-12 education or home learning. (For a discussion of why educational research overlooks homeschoolers, see Howell, 2013).

Recent research on homeschoolers and technology provide a good, but limited, starting point. A study of technology adoption by homeschoolers asked if they used the following technologies: internet, email, videos/DVD, educational software, productivity software, streaming, message boards, cell phones, TV, blogs, wikis, imaging software, and MP3's (Neil, Bonner & Bonner, 2014). It is surprising that games were not on this list, but perhaps they were included under the general category of "educational software," which was used by 68% of homeschoolers, or "internet," which was used by 96%. Likewise, an analysis of homeschoolers in Malaysia found that many used games, but did not explain further how the games were being used (Alias et al., 2013). (See the Future Needs section for suggestions for further research).

Long form vs. short form games

The Cooney Center report on K-12 education compared short and long form games. Short form games are brief, focused games that fit a 40 minute class. Long form games take longer, do not fit in a class session or school day, have "a stronger research base" and are "focused on higher order thinking skills." (Richards et al., 2013, p. 4). The report concluded that long form games "lend themselves to the development of 21st century skills such as critical thinking, problem solving, collaboration, creativity, and communication," but long form games are not practical for sale to schools. This is an ongoing source of frustration for developers of long form games (Richards et al., 2013).

In contrast, developing games for the homeschool market can be rewarding for developers because homeschool education is not limited by 45-minute classroom blocks or by the bureaucracy of curriculum development and complex contracting requirements. Homeschoolers are rapidly adopting digital games and other technology for education. While they do not have the budget of big school districts, homeschoolers have the advantage of flexibility and speed in making purchasing decisions. So while schools require quick games and make slow decisions, homeschoolers can enjoy long games and make quick purchasing decisions.

Some developers have been successfully targeting the homeschool and virtual school audience to increase their revenue. Filament Games describes its "Path to Commercialization":

> Filament Games is taking a two-pronged approach to commercialization. First, the games are sold via channel partners such as BrainPop, Edmodo, Learning.com, Florida Virtual School, and Carolina Biological, all of which have substantial user bases. Second, the games are sold directly on the Filament Games webstore, and marketed via social media, webinars, and presentations at industry trade shows.
> (SBIR Success Stories, 2013, para 4).

Florida Virtual School is a Florida public school that enrolls public, private and homeschooled students, who complete their coursework online. (These are mostly students who complete their work from home using a computer, but they may be classified differently depending on the state they are in, and whether or not the virtual program is funded by their state). Filament Games recognizes that these new virtual learning models (which are used by many homeschooled students) are a significant path to commercialization of their game products.

Online schools and homeschoolers do not have the same time limitations found in traditional brick and mortar schools with short class periods. For example, the 2013 Cooney Center report suggests that the success of long form games would require significant educational reform:

> Investors looking for long-form games to support will succeed to the extent that they can simultaneously be involved in education reform movements that will re-imagine the school day to promote in-depth study, provide longer class periods, involve open ended projects, and engage critical thinking skills.
> (Richards et al., 2013, p.9).

Improving schools is an important goal, and, as James Paul Gee explained in a recent interview, "if we want deep games and deep game-based learning we would have to change the policies in our schools" (Gee, 2014, p. 10). School reform is not the only way that long form games can succeed, though. By broadening their audience to market to homeschoolers and afterschoolers, game developers can increase their market and revenue. Conversely, by being an example of 21st century learning, homeschoolers can provide an example of success to motivate school reform. The NMC Horizon report on technology in K-12 education notes that institutional education must adapt to maintain enrollment, especially since

homeschooling provides an enticing alternative: "Learners have increasing opportunities to take their education into their own hands, and options like informal education, online education, and home-based learning are attracting students away from traditional educational settings. If the system is to remain relevant it must adapt" (Johnson et al., 2012, p.10).

Case Study Three: Learning Systems with Games: K12, Time4Learning, BrainPOP, WiloStar3D

Many homeschoolers rely heavily on online learning systems, particularly when students need to be able to work independently from parents. Independent learning is especially important in large families with many children, single parent families, or families where the parent(s) work while homeschooling. Online learning in homeschooling can vary from occasionally using a few web resources to full-time virtual schooling, and mobile technology enables students to complete academic work while traveling away from home (Bullock, 2011). Some online learning systems include games as a part of their product. This case study compares three learning systems widely used by homeschoolers, Time4Learning, K12, and BrainPOP, and examines how their use of games could be improved for the homeschool audience.

Time4Learning (www.time4learning.com) is a website with online lessons and tests for preschool through 12th grade. Most lessons are in the form of interactive, game-like simulations. Time4Learning keeps track of the student's progress, and students have access to three years of material at once. Since a 3rd grade student can choose 2nd, 3rd, or 4th grade material, they are not locked into a single grade. This flexibility makes Time4Learning useful both for gifted and for struggling students, since they can work above or below grade level.

Time4Learning also uses games as a reward. Students who finish their lessons are allowed to spend time in the game "playground":

> The Time4Learning Playground relies on a suite of licensed games as well as a white list of great online sites and activities like PBS Kids, BBC Interactive, Sesame Street, Pauly's Playhouse, VeggieTales, and Starfall. The games and sites are carefully chosen and the navigation between them is a fun simple and safe interface. …The children quickly accept the structure that they have to do their studies to get to the playground. Just like eating their meal before dessert. Or homework before TV. Time4Learning relies on and reinforces this basic principle. Children find this structure both comforting and motivating. (www.Time4Learning.com/playground.htm, para 5-6)

Similarly, K12 provides online lessons, quizzes and a curated list of games. K12 is a certified program; in some cases it is state-funded for homeschoolers as a virtual public school. It can be used as a complete kindergarten through twelfth grade curriculum, or individual subjects can be purchased separately. Depending on the options purchased, K12 classes may be entirely virtual or they can be taught and

graded by a live (online) teacher. K12 students are enrolled in one grade at a time, but there is some flexibility in how the grade level is assigned. K12 keeps track of a student's time spent on lessons, quiz results, and subject mastery. It does not keep track of time spent playing games, specifically, but games are interspersed with other learning content that is tracked cumulatively.

BrainPOP is another learning system with online, animated lessons, quizzes, and games. BrainPOP is structured more informally than Time4Learning and K12 in that there are no grade level restrictions, visitors may view any of the material on the site at any time, and there are no restrictions on time spent playing games. There is also no reporting or saving of student progress for homeschoolers, so it is difficult to keep track of what their children have completed. Quiz results can be printed out, but the results are not stored online. Game outcomes also are not measured or recorded. (BrainPOP recently launched "MyBrainPOP" for school districts, with increased reporting, but this is not yet available for families.)

WiloStar3D states that their accredited homeschool program is a "revolutionary new way to homeschool" (www.wilostar3d.com). Students create avatars and are immersed in an online 3D virtual campus. In this virtual world, students attend class, create 3D objects, role play historical characters, build virtual environments based on biology, history and social studies topics, and interact with the avatars of teachers and classmates. The educational content is similar to other learning systems – the difference is the interactive 3D worlds in which the content is taught. For example, WiloStar has an ocean virtual environment called "Sealab" that students use to research marine biology, oceanography and underwater archaeology.

WiloStar3D also has a special needs homeschooling program for students with physical or mental disabilities that may have prevented those students from achieving success in a physical school environment. Public schools are also exploring the use of 3D virtual worlds (which can be contracted from software providers like Protonmedia.com) to tutor students at home and to "keep school open" during snow days. Corporations are similarly using virtual worlds to run online meetings and trainings. Since the days of Second Life (an older online virtual world), there has been debate about whether or not a 3D world without explicit goals, quests or narrative is truly a game or merely a sandbox toy. However, the success of games like *Minecraft* shows that sandbox mechanics appeal to many game players and have potential for homeschool, school and corporate learning methodologies.

The above learning systems provide many advantages for homeschoolers: games as learning tools, environments, and rewards, and the ability to pick and choose individual topics and grade levels and to work independently. Some could be improved by providing greater integration with games (i.e., using games for teaching, not just for rewards, including more game mechanics in sandbox virtual worlds, and including game scores in overall reporting of subject mastery). Others, like BrainPOP, could be improved by adding optional documentation and reporting for homeschoolers.

Assessment Considerations

Since there is a dearth of research on games in the homeschooling context, specific assessment considerations for this population have yet to be developed. Furthermore, since homeschoolers are a highly diverse group, research and assessment may be difficult to generalize:

> Further research may continue to prove challenging because homeschool families often do not like to participate in research if the research organization is not one they trust. Also, many homeschool practices are so unlike public school practices that they are difficult to quantify and qualify. A particular philosophy of homeschooling (referred to as 'unschooling') does not involve objectives or promote the use of ordered curriculum for any subjects. These homeschool families reject organized attempts to formalize real-life learning. Another challenge to researchers, especially in states like Michigan, is the lack of documentation of homeschoolers. Where no registration is required, few databanks exist from which researchers can draw. True representative sampling might be impossible. Very small sample sizes can also prove a difficulty for researchers.
> (Hautamaki, 2011, p. 26).

The varied perspectives and diversity of homeschoolers makes them an interesting but challenging research pool. One solution is to narrow the research field to specific subgroups of homeschoolers, such as those in a local geographic area, special need groups, or users of a particular homeschooling methodology or virtual school program (see e.g. Ogburn, 2013).

The limited research that does exist on homeschooling and technology rarely addresses game technology. These studies often use methodologies such as anecdotal or case study reports, the Cultural Historical Activity Theory (CHAT) analysis, the Interpretive Structural Modeling (ISM) process, Social Network Analysis (SNA) or the Technology Acceptance Model (TAM). Without going into detail about these methodologies, what they have in common is an understanding of the diversity of social contexts in which homeschooling takes place. Many incorporate qualitative tools (e.g. interviews, focus groups, and opinion surveys) over quantitative methods (e.g. analyzing hard data) (see Kunzman & Gaither, 2013, p. 5 for an explanation of how homeschooling scholarship in general is "almost entirely qualitative"). Those studies that do use quantitative methods often rely on self-reported data from parental surveys rather than objective data or direct observation. More objective results could be found by observing interactions on a homeschool Minecraft server, or analyzing data from a virtual school program.

Finally, at minimum, research surveys, like the Cooney Center's 2014 report, that ask about a child's education should include "homeschooling" as a possible answer option (not just "other" or "none of the above").

Future Needs

Homeschoolers are a substantial and growing market for educational games. As noted above, more research is needed to analyze how games are being used in home education. Such research could look

at the importance to homeschoolers of features like documenting/recording progress, cooperative learning, parental controls, profile and account management, meaningful social sharing of badges in gamified applications, and building community among subgroups of homeschoolers (e.g., gifted/talented, disabled, ethnic/racial/cultural groups, secular or non-secular, virtual schoolers, or unschoolers).

We have very little information about how use of learning games differs in a variety of formal and informal educational contexts like schools, libraries, museums, day cares, homeschooling, and afterschooling. In other words, does learning improve when students can choose their own games or spend longer than a typical school period on a single game? How are homeschoolers using games to meet educational or social needs? Do games promote independent learning in the homeschool setting? Information about the size and shape of the homeschooling market would be useful for game developers, researchers, and parents.

A recent study on homeschoolers and technology (Neil, Bonner, & Bonner, 2014) provides a good starting point but could be expanded to include games as a separate category and to investigate more detailed questions about the types of games used. Additionally, the authors suggest two promising avenues for further inquiry: analyzing the differences between parents and students in perceptions and use of technology, and investigating whether interventions can change perceived usefulness and ease of use of technology.

Likewise, reports by the Cooney Center, NMC and MacArthur Foundation are extremely helpful for looking at how schools or families use learning games but do not discuss homeschooling. Useful follow-ups might compare school use, family use by non-homeschoolers, and family use by homeschoolers. The achievement gap, in particular, is a hot topic in education policy. The growth of homeschooling by African American and Hispanic families provides an opportunity to study the achievement gap through a new lens. Specifically, is there a similar achievement gap among homeschoolers? (See http://www.hslda.org/docs/study/ray1997/08.asp, and Lundy & Mazama, 2014).

A newer concept—the curiosity gap—could also be a fruitful research area. The rise of free online information means that today's students are only limited by Internet access and their own curiosity. Game developer and professor Jesse Schell explains, "There is a huge advantage for curious people now…You can learn what you want, when you want to, so curious students will leave everyone else behind. The curious will win." (Schell, 2014). Schell notes that, in contrast to traditional schooling, games stimulate a cycle of curiosity, insight, and wonder that drives learning. Research that looks at how curiosity is supported in the use of games in school vs. in homeschool would help clarify the role of new media in 21st century education.

Finally, there are more learning-focused games for elementary students than for middle and highschoolers. More high-quality games are needed for older students both in school and at home (Rideout, 2014).

Case Study Four: Stealth Learning with *DragonBox*, *Ko's Journey*, board games

"Stealth learning" in games is where a game secretly provides an educational benefit. One might argue that stealth learning is simply good game design because learning should be seamless and secondary to the game's educational value. Certainly many children prefer games that are not overtly "educational," and to some extent all games include learning, whether stealth or obvious. In some homeschooling situations, stealth learning may be the only type of learning that a child can tolerate. Stealth learning is particularly useful for children who have had traumatic or stressful prior school experiences—perhaps they were bullied or had a learning disability that made them feel inferior. Stealth learning can be a way to gently ease a reluctant child back into learning.

DragonBox is an award-winning example of stealth learning, where players complete puzzles that involve moving around cute monsters. Only later in the game, when the monsters turn into numbers, letters and functions, does the student realize that they have been learning how to solve algebraic equations. *DragonBox's* home page (www.dragonboxapp.com) explains that the game "secretly teaches algebra to your children!" and claims that "83% of children learn the basics of algebra in an hour" and "Children as young as 4 have solved equations meant for a 12 year old!" *DragonBox* has won many awards and national recognition for its ingenious design, and was "voted world's best serious game at the International Mobile Gaming Awards (IMGA)" (www.dragonboxapp.com). The company has recently released a follow-up game, *Elements*, that "secretly teaches geometry" (www.wewanttoknow.com/elements).

Ko's Journey is another math game that is somewhat stealthy in its approach as a "creative tool aimed at addressing emotional resistance to math" (www.kosjourney.com/faq, para 1). *Ko's Journey* is a long-form game that teaches middle school math. The game is purposely slow paced to inspire imagination and mathematical thinking. It is about Ko, a young girl from an ancient culture, who was separated from her family during an attack on her home village. She uses math to navigate the wilderness, save an injured wolf pup, and search for her family. Girls in particular identify with the main character and storyline, according to the game's developers, who explain that, "Ko's Journey was specifically designed to consider both boys and girls. In our test groups, girls in particular have responded positively to story-line and character development that helps build a thematic relationship to the content material." (www.kosjourney.com/faq).

Many non-digital ("analog") games also are stealth learning opportunities. Analog games can include tabletop games, board games, card games, games with miniatures, and games without any accessories (like *Charades or Werewolf*). Homeschool parent Monera Mason explains that her family plays games such as *Once Upon a Time* (for storytelling), *Settlers of Catan* (trading and economics), *Pandemic* (working cooperatively to defeat a global pandemic), *Munchkin* (resource management), and *Principato* (empire building in the Renaissance). Board games can teach strategy, logic, cooperative teamwork, how to manage resources, as well as just about any content area like math, science, history. Mason explains,

> They are complicated games that require the players to plan ahead and make decisions. Most games also require you to stick out a game even when losing. The kids want a *Warhammer* set which requires painting, rule negotiations, budgets, angles and geometry, community building, story telling, interpersonal skills, and again resource management. (M. Mason, personal communication, September 25, 2013)

Extensive lists of educational board games used in homeschooling can be found on the popular analog game site Board Game Geek (www.boardgamegeek.com) as well as on homeschooling blogs. Analog games can provide incredible learning opportunities as well as family time and a break from computer screens. Analog games range from quick battles like *Math War* (a variant on the card game *War*) and *Bananagrams* to complex, lengthy strategy sessions of *Risk or Agricola*. Homeschoolers have the advantage of being able to spend hours on a long game as they are not tied to 45-minute class sessions (see discussion of long form vs. short form games above).

Best Practices

The following are best practices for including games in homeschooling:

1. **Research:** When studying learning games, include homeschoolers. If your multiple choice survey asks about student enrollment, list "homeschooling" as a possible answer. Include homeschool experts on advisory boards for research organizations.
2. **Gamification:** Be aware that extrinsic rewards may devalue learning. Rewards should be tied to appropriate level challenge (i.e., do not reward a high schooler for kindergarten work) and meaningful (i.e., valuable and shared within a community of peers, not just virtual stickers).
3. **Content:** Make more games for middle and high school audiences. Develop more long form games, not just games that can be played during a 45-minute school class period.
4. **Cooperative learning:** Enable cooperative in-game learning between friends, parents and siblings.
5. **Parental Controls:** Help parents keep kids safe online with effective parental controls, and educate parents about how to use them! Also allow multiple profiles with their own settings on the same device, so safety settings can be different for younger and older siblings.
6. **Documentation:** Allow families the option of documenting game activities (time spent, progress, mastery) because some homeschool parents are required to keep records of their child's academic activities.

7. **Marketing:** Market your game to homeschoolers and families directly, not just schools. Put a "homeschool" page on your website that directly addresses homeschoolers, and get included in online compilations of games that are used by homeschoolers such as Time4Learning, BrainPOP, K12, and Florida Virtual School. Post reviews on Common Sense Media and Educade to help educate families about your game.
8. **Pricing:** Most homeschoolers do not have the resources of a school district. To reach this price-sensitive market, game developers can develop pricing structures that include multiple siblings, allow demos/trial periods, or arrange bulk pricing through co-operative buying sites, such as the Homeschool Buyers Co-op (www.homeschoolbuyersco-op.org) and CurrClick (www.currclick.com).

Resources

Books & Research

Aldrich, C. (2011) *Unschooling Rules: 55 Ways to Unlearn What We Know About Schools and Rediscover Education*

Collins, A. & Halverson, R. (2009) *Rethinking Education in the Age of Technology: The Digital Revolution and Schooling in America*

Gee, J.P., (2003) *What Video Games Have to Teach Us about Learning and Literacy*

Gathercole, R. (2007) *The Well-Adjusted Child: The Social Benefits of Homeschooling*

Kunzman, R. & Gaither, M. (2013) *Homeschooling: A Comprehensive Survey of the Research, (The Journal of Educational Alternatives)*

Murphy, J. (2012) *Homeschooling in America: Capturing and Assessing the Movement*

Prensky, M. (2001) *Digital Game Based Learning*

Rivero, L. (2014) *Creative Home Schooling: A Guide for Smart Families*

Wessling, S. (2012) *From School to Homeschool: Should You Homeschool Your Gifted Child?*

Research Websites

Coalition for Responsible Home Education (www.responsiblehomeschooling.org)

Family Online Safety Institute (www.fosi.org)

Gameschooling (www.gameschooling.org)

Home School Legal Defense Association (www.hslda.org)

International Center for Home Education Research (www.icher.org)

Joan Ganz Cooney Center (www.joanganzcooneycenter.org & www.gamesandlearning.org)

Journal of Unschooling and Alternative Learning (jual.nipissingu.ca)

Macarthur Foundation (www.macfound.org/programs/digital-media-learning-research)

National Home Education Research Institute (www.nheri.org)

National Center for Education Statistics (nces.ed.gov)

New Media Consortium's Horizon Project (www.nmc.org/horizon-project)

Virtual Schools and Online Learning

Always Icecream (www.always-icecream.com)

Athena's Advanced Academy (www.athenasacademy.com)

BrainPOP (www.BrainPOP.com)
Calvert School (www.calvertschoolmd.org)
Clever Dragons (www.clever-dragons.com)
Connections Academy (www.connectionsacademy.com)
Dreambox (www.dreambox.com)
Duolingo (www.duolingo.com)
Easy Peasy (www.allinonehomeschool.com)
Florida Virtual School (www.flvs.net)
K12 (www.k12.com)
Khan Academy (www.khanacademy.org)
ProtoSphere (www.protonmedia.com)
Time4Learning (www.Time4Learning.com)
WiloStar3D (www.wilostar3d.com)

Online Safety & Parental Control Tools

Android Parental Controls (www.android.com)
Mac Parental Controls (www.apple.com)
Microsoft Family Safety (familysafety.microsoft.com)
iOS Parental Controls ("Restrictions") (support.apple.com/kb/HT4213)
Net Nanny (www.netnanny.com)
Nintendo DS/DSi (www.nintendo.com/consumer/systems/dsi/en_na/settingsParentalControls.jsp)
Nintendo Wii (en-americas-support.nintendo.com/app/answers/landing/p/604/c/628)
Online safety contract (www.fosi.org/images/stories/resources/family-online-safety-contract.pdf)
Playstation (support.us.playstation.com/app/answers/detail/a_id/5097/~/ps4-parental-controls)
Xbox (http://support.xbox.com/en-US/my-account/security/xbox-one-manage-privacy-and-online-safety)

Games

Board games: *Agricola, Bananagrams, Chess, Compounded, Elementeo, Equate, Math War, Settlers of Catan, 7 Days in Africa, Munchkin, Once Upon a Time, Pandemic, Principato, Timeline, Resistance, Risk, Warhammer.*
Cell Craft (www.kongregate.com/games/cellcraft/cellcraft)
DragonBox and Element (www.wewanttoknow.com – algebra and geometry)
Gamestar Mechanic (www.gamestarmechanic.com)
iCivics (www.icivics.org)
Kerbal Space Program (www.kerbalspaceprogram.com)
Ko's Journey (www.kosjourney.com)
Mathtoons (www.mathtoons.com – upper level math)
Minecraft (www.minecraft.net)
Minecraft related sites (www.minecraft.edu, www.minecrafthomeschool.com, www.autcraft.com, www.qcraft.com)
Mission US (www.mission-us.org - history)
Prodigy (www.prodigygame.com – elementary math)
Reach for the Sun & You Make Me Sick (www.filamentgames.com)
Timez Attack (www.bigbrainz.com)

Games (reviews collections)

Board Game Geek (www.boardgamegeek.com)
Common sense media (www.commonsensemedia.org)
Educade (www.educade.com)
Educational App Store (www.educationalappstore.com)
Hoagies Gifted (www.hoagiesgifted.org/gifted_apps.htm & www.hoagiesgifted.org/software.htm)

Homeschooling Sites

www.a2zhomeschooling.com
www.currclick.com
www.gameschooling.org (the author's website)
www.giftedhomeschoolers.org
www.homeschool.com
www.homeschoolbuyersco-op.org
www.howtoworkandhomeschool.com
www.sukiwessling.com
www.welltrainedmind.com
(Local facebook groups and email lists are additional sources of information for homeschooling families)

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