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Homeschooling in a Digital Age: Children Fostering a Love for (Self-Directed) Lifelong Learning – with Constructive Use of Digital Technologies

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Abstract

Opting to homeschool children is a growing trend worldwide. However, surprisingly, there is a dearth of research on understanding how digital technologies are used by learners who opt for homeschooling. Thus, in the present study, semi-structured interviews with homeschoolers in the United States were conducted to examine (1) how are digital technologies being used? (2) why do homeschoolers use these technologies to support their learning process? And (3) what digital technologies are they using? Thematic analysis revealed that homeschooled children utilised a wide array of digital technologies to support their learning. Children's learning projects commonly stemmed from their interaction with the real-world: a good portion of homeschooler's learning was self-directed. Digital technologies afforded learners access to specific materials and enabled homeschoolers to collaborate with other learners. Perhaps most importantly, homeschoolers reported a love for (self-directed) lifelong learning: where they are habituated to learn in a self-directed and autonomous manner, and more likely to use digital technologies constructively and productively.

Keywords

School choice; homeschooling; information literacy; self-directed learning; digital competence; digital technologies

The COVID-19 pandemic affected more than 1.5 billion learners of all ages worldwide – and forced many learners into learning at home (Bonilla & Gerstl-Pepin, 2022; OECD, 2020). For those countries in lockdown during COVID-19, learning at home was the primary form of schooling available and caused many educational institutions to implement emergency online instruction (Bozkurt et al., 2020; Tate et al., 2022). Such lockdown learning inevitably gave students and parents a glance of what it might be like to be homeschooled. But *homeschooling* takes learning at home a step further – it involves a process in which a child’s parent or guardian serves as the main educator (Neuman, 2019).

As the popularity of homeschooling is growing rapidly and steadily in many countries worldwide, so are the ways in which it is carried out (Guterman, 2023; Tan, 2020). For example, virtual, co-op, and unschooling are all types of homeschooling (Mitchell, 2020). The present paper views homeschooling in terms of Cogan’s (2010) definition: education occurring in the home with a child’s parent or guardian serving as the main educator. This definition is used to delineate homeschooling from *education at home*, which typically employs an outside teacher or tutor (a public or private education) with students learning at home. Within this homeschooling definition, however, there is still great variety in the nature of homeschooling; but, homeschooling is known for its individualized education (Bell et al., 2016; Carpenter & Gann, 2016), independent learning (Gann & Carpenter, 2017; Jackson, 2016), catering to student interest (Bell et al., 2016; Carpenter & Gann, 2016), and using eclectic approaches in curriculum and instruction (Alamry & Karaali, 2016; Hanna, 2012).

Homeschooling represents an alternative to traditional schooling that is based on the ideals of meritocracy and the tyranny that may come with mainstream schooling (Brighthouse, 2022; Chen & Bland, 2022; Mils, 2022; Sandel, 2022). Nonetheless, perhaps a salient feature of homeschooling

which differentiates it from traditional forms of education is that it commonly resembles the ideals of self-directed learning (SDL; Alamry & Karaali, 2016).

Homeschooling has been around since colonial times (Parkay, 2013; Ray, 2017). The modern homeschool movement, nonetheless, began in the 1970s, and was primarily popularized by white, middle-class evangelicals (Kleist-Tesch, 1998; Kunzman, 2009). Today, however, homeschoolers are a diverse group (Kunzman & Gaither, 2020; Romanowski, 2006). With that diversity comes numbers; for example, Ray (2015) estimated that homeschooling in the USA is growing at 2-8% per annum and figures from the NCES (2018) puts the number of homeschoolers in the United States at close to 2 million – and this growth in homeschooling is reflected in many countries worldwide (cf. Guterman, 2023; Tan, 2020) – making homeschooling a very important educational context to study. There are multiple reasons for choosing homeschooling including family related reasons and personal safety, but repeatedly research points out that homeschooling becomes the preferred choice due to dissatisfaction of parents/guardians with the quality of education within the available formal schooling system (Neuman, 2019).

Homeschooled children perform as well academically when compared to their traditionally schooled peers, however studies on homeschooling highlight the point that the instructional strategy, thus the child's learning *process*, might be differential when compared to traditional schooling (Bennett et al., 2019). Specifically, in respect of learning process, Gann and Carpenter (2017) found that homeschooler's parents commonly used self-directed study as an instructional strategy. Likewise, in a study by Roth (2011) homeschool participants reported using a myriad of SDL opportunities. While homeschooling naturally lends itself to SDL, very few studies have explicitly looked at the role of SDL in homeschooling, and those that have looked at it have focused on specific components of homeschooling and SDL, such as STEM education (Gann & Carpenter,

2016), achievement motivation (Bell et al., 2016), or flipped instruction (Alamry & Karaali, 2016). As such, this study seeks to add to the knowledge base of SDL and investigate its role in homeschooling.

Self-Directed Learning

SDL provides the theoretical lens for the present study. SDL represents a process in which learners take primary responsibility to direct their learning means and objectives in order to meet their personal learning goals (Knowles, 1975; Kranzow & Hyland, 2016; Morris, 2019a, 2020).

SDL competence is particularly important in adulthood, including providing the person with the ability (1) to adapt proactively to changing contextual conditions, enabling a person to avoid knowledge and skill obsolescence (2) to effectively deal with changes in economic conditions, and (3) for persons to grow and adapt to change (e.g., Alonderiene & Suchotina, 2017; Brassil et al., 2017; Caruso, 2018). In a recent review on SDL, Morris and Rohs (2023) argued that SDL is a fundamental competence for living and working in our digital age because it enables learners to meet the demands of changing conditions.

However, more recent empirical studies have identified that many adult learners are indeed not competent self-directed learners, and therefore highlight the importance of fostering this competence in childhood schooling (e.g., Beckers et al., 2018; Kicken et al., 2009; Morris & Rohs, 2021). SDL competence being “the ability to pursue self-directed learning with success and efficiency: to proficiently direct one’s own learning means and objectives in order to meet definable personal goals” (Morris, 2019b, p. 302). In sum, SDL represents a process in which the learner takes primary responsibility with or without the help of others to direct their learning process; and childhood schooling is a primary opportunity to foster this competence (Knowles et al., 2015).

Indeed, it has been said that SDL has not caught on as a foremost goal of formal education in many traditional educational settings (e.g., Kranzow & Hyland, 2016). In this regard, Dunlap and Grabinger (2003) have highlighted the point that consequently traditional forms of formal education are not adequate for some people, especially for preparing those who have careers in complex fields, and this is a particularly palpable point in our digital age – in which conditions are changing rapidly.

Self-Directed Learning with Digital Technologies

In respect of digital technologies and their application for self-directed learning, a recent systematic review from Morris and Rohs (2023) examined the potential for digital technologies to support children in their self-directed learning efforts in “traditional” formal childhood educational settings. A key insight from this study was the conclusion that commonly children schooled in traditional educational settings may be competent in using digital technology (e.g., for gaming purposes), but lack the competence to use digital technologies for “educational” purposes.

In this respect, Gokcearslan (2017) conducted a mixed-method study in Turkey (N = 414 high school students), which concerned SDL with tablet computers. Students found tablets somewhat useful for researching information, were competent in using tablets for gaming, but for educational purposes the authors reported that tablets often represented a “distraction” to progression in learning.

Similar findings were reported in a mixed-method quasi-experimental study in North America with K-12 (N = 706) technology and engineering students (Bartholomew, 2017; Bartholomew et al., 2017). In this study, learners completed design portfolios and constructed prototypes (maker learning), with or without access to mobile devices, in small learner groups. The study concluded that mobile device access led to an improvement in portfolios but did not improve

the quality of the final product design. In this study, mobile devices supported some students by enabling access to a rich source of information, but they were a distraction for other learners who used the devices for playing rather than working.

Moreover, the empirical study from Hughes et al. (2019) trialed the use of iPads for critical making inquiry-based learning with Middle School Canadian students with behavioral, language, or learning challenges aimed to address bullying. The authors reported that the students felt overwhelmed due to a lack of digital literacy skills – which was a key barrier of using the digital technology for educational purposes. This finding was mirrored in the conclusions of the systematic review from Morris and Rohs (2021) on adults and their use of digital technologies for self-directed learning. This study concluded that *still* in adulthood many adult learners lack the necessary information literacy skills for successful self-directed learning with digital technologies, and therefore are often *lost* in a sea of information – the internet.

Application to the Homeschooling Context

To the knowledge of the present authors there are, somewhat surprisingly, very few studies that explore the process of SDL in homeschooling settings. For instance, Riley (2018) examined homeschooled learners' experiences (N = 28 adults, reflecting upon their childhood experience) of SDL in terms of learning how to read. In this study, the participants discussed that *choice* was a central factor that was essential to their enjoyment and progress in their learning process and reading competence. However, the study did not concern how digital media may support homeschooling. Moreover, Pannone (2017) conducted participant interviews, surveys, and document analysis with homeschoolers – concluding that SDL can foster homeschooled learners' desire to become an entrepreneur and increase their propensity of engaging in entrepreneurial activities.

The dearth of research on SDL in homeschooling settings is surprising given that the salient features of SDL process fit like a glove on a hand to homeschooling (cf. Bell et al., 2016; Gann & Carpenter, 2017; Jackson, 2016). In this respect, it has been proposed that the process of homeschooling is commonly built around the concept of SDL (Beese & Watson, 2016). This is because during the homeschooling process it may be commonplace that learners are stipulated to take responsibility for the planning, undertaking, and reviewing aspects of their learning (e.g., Alamry & Karaali, 2016; Gann & Carpenter, 2017; Roth, 2011).

That said, at present, little is known about how digital technologies can support a SDL process in a homeschooling context. However, the broader SDL literature provides some clues to this; for instance, Albedah and Lee (2017; as per McCarthy & James, 2017) theorize that digitization has transformed out-of-classroom learning, rather than in classroom learning. Lejeune et al. (2021) suggest that digital tools can assist goal setting. Moreover, Cook et al. (2017) describe how digital technologies, especially the internet, have influenced our learning habits. On the other hand, Cooper (2018), and other studies explored above (Bartholomew, 2017; Bartholomew et al., 2017; Gokcearslan, 2017; Hughes et al., 2019; Morris & Rohs, 2021, 2023) described some challenges of both children and adults using digital technologies for SDL.

Such empirical studies were however outside the context of homeschooling but suggest that the nature of SDL in informal and non-formal contexts has changed especially due to digitization. Additionally, findings from studies focusing on SDL in homeschooling contexts, such as that of Riley (2018), might be already outdated. As digital technologies have changed the nature of our SDL behavior, this is an important area to study – especially given the rise in popularity of homeschooling. Therefore, the purpose of the present study was to examine for homeschoolers:

- (1) how are digital technologies being used?

(2) why do homeschoolers use these technologies to support their learning process? And

(3) what digital technologies are they using?

Method

Prior to data collection, ethical approval was granted for this present study from Liberty University. After giving their informed consent, semi-structured interviews (cf. Table 1) were conducted with ten homeschoolers' parents/guardians (all female, M age = 38.88, SD = 5.38) in the United States to examine what, how, and why homeschoolers (N = 22) use digital technologies to support their learning process.

Table 1

Interview Questions

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1. What are the main reasons for your students being homeschooled?
 2. What types of digital media are being used in your homeschooling environment?
 3. What electronic devices are being used in your homeschooling environment?
 4. Why have you chosen these digital technologies in particular?
 5. If you had ultimate freedom, what digital technologies would you like to use in your homeschooling environment and why?
 6. What digital technologies would you recommend for homeschooling and why?
 7. How are you supervising or controlling the use of digital devices?
 8. How are your students cooperating with other students for the purpose of learning using digital technologies?
 9. Why are you using digital technologies instead of non-digital technologies?
 10. What do you think are the benefits that the students gain from using digital technologies?
 11. Is there anything else related to homeschooling and digital technologies that you would like to share that I have not covered in my questions?
-

Interview questions were original to the present study: they were specifically designed by the authors of this study to derive answers specific to the research questions. Each parent/guardian in this study homeschooled between one and three children (Mean age 9; range 3 to 12 years old). Participants were from the East, South, or Midwest of the United States and were recruited via social media posts and snowball sampling. All homeschoolers in this study had begun homeschooling pre-pandemic – and participants were thus long-term rather than short-term homeschoolers. Due to participants not being in the researchers’ locale, in-person interviews were not feasible. Interview lengths ranged from 11 minutes to 28 minutes, and participants were given the opportunity to add any details they felt might be pertinent to the study. Additionally, ten survey questions were answered online via SurveyMonkey™. Questions were a combination of demographic information, multiple choice responses, and open-ended responses.

The analysis followed six phases of thematic analysis (cf. Braun & Clarke, 2006), which involved (1) data familiarisation (2) generating codes (3) themes arrival (4) reviewing themes (5) defining and naming themes, and (6) writing the report. Applying this sequence of process, using hand coding, and beginning with inductive open coding, parts of sentences, whole sentences, and groups of sentences were assigned one or more code(s). In the second round of coding, new codes were defined, and the initial analysis revisited; data were re-coded if applicable. Themes were redefined a number of times.

Table 2 details the codes and initial themes used to arrive at the final themes. At times, the data organization was complicated by the overlapping of data into the themes and the researcher took a “best-fit” approach to data classification in this regard. Findings are presented with pseudonyms for the purpose of anonymity.

Table 2*Theme Arrival*

<i>Theme</i>	<i>Codes and initial themes used to arrive at the final themes</i>
1. Collaboration	Talk online; Social interaction; Teamwork; Cooperatively; Partners; Connect; With other kids; Teams; Works with others
2. Supervision	Independent; Trustworthy; Hands off; Let them pick; Close by; Watch with them; Direct oversight Check-in; Track; Aware; Parental controls; Regulate; Monitor
3. Interesting topics through enjoyable learning means	Interesting; Enjoyment; Love; Follow interest; Want to learn; More engaging; Able to choose; Autonomy; Personalization; Flexibility; Excited; Comes alive
4. Digital technologies as necessary	Experience; Part of our world; Necessary skills; Technological world; Comfortable with technology; Used to it; Everything digital; Familiar with computers; Prepares for future; Can't get away from it
5. Digital technologies as a means for accessing supplementary learning materials	Look at a lot; Look up; Finding everything; Do a lot; Get ideas; Find the material; Use a lot; Flexibility; Spontaneous; Go along with what we are learning; Easier; Never-ending supply of ideas; More to learn; Amount of access; So much information; Convenient

6. Learners directing (digital) means to meet their learning objectives Pick a subject; Interested in; Self-directed learner; Decided; Own pace; Freedom; Independence; Follow interest; Best for that individual

Findings

How are Digital Technologies Being Used?

Theme 1: Collaboration

Half of the parents reported that their children used collaboration with other children through their digital technology. Other parents highlighted the point that collaboration was important, but felt their students were either too young, or preferred in-person collaboration. Shanida shared “People say computers are so isolating, but my son has a whole group of homeschooled friends, and they all talk online via Discord. So even if they are playing like Roadblock or Minecraft, there is a lot of like team effort: they have to plan out strategies. I hear them say “Okay, you go in first and then I’ll do this.” I feel like there is a lot of social interaction, teamwork, and team building. Also, as homeschoolers, a lot of his friends don’t really live close by so I feel it’s very important that he use the technologies so he can socialize.” Tina also referenced video gaming: “Even in Minecraft where he builds historical places and things of that nature, there are times when he absolutely plays with other kids cooperatively in that manner.”

Several participants also referenced more traditional collaboration methods, like in online classes. For example, Katherine shared “My oldest has really, really loved doing the class online like in a classroom setting with other students – that has been really fun for him.” Stephanie had a similar experience: “When they used the online writing class it was in sort of a classroom chat

session.” Finally, Celina identified that her son used collaboration throughout his online class for building and programming robots: “When he did that Sphero [programmable robot] class they had partners that they worked with. The Sphero could do different things like a maze or a race and they would be racing the other kids.” In sum, it was apparent that collaboration was important for most parents and that some digital technologies enabled collaboration between learners.

Theme 2: Supervision

When asked how they supervised or controlled the use of digital technologies in the homeschool environment, participants were split: half reported monitoring the use, while the other half adopted a more hands-off approach. For those adopting a hands-off approach, participants felt that their students needed to be independent and could be trusted. For example, Tina related that she didn’t implement strict supervision because of the trust in her son to use digital technology appropriately: “I’m sure every parent thinks their kid is super trustworthy; I believe my child is super trustworthy” Stephanie also shared that she trusted her children to work independently: “My kids are now 10 and 12 so my husband and I decided to take that [software regulation] off and sort of let them independently regulate themselves in a way. We felt it was important. If we just leave them alone with it, they kind of get bored with it. We don't really monitor their time as much. We just trust our kids.” Erin also felt that technology utilisation was a time for her students to practice independence: “I don’t supervise that [digital technologies] very much. That’s their independent time; go take it and do it” Finally, Katherine shared “We are pretty hands off [in supervising or controlling digital technologies]. There are certain things I would not let them watch that are really geared towards an adult audience, but aside from that we pretty much let them pick.”

On the contrary, about half of the parents adopted a “monitoring style” of supervision. For instance, Celina related “Anything that they do digitally we are close by, like when we are watching

the videos on YouTube, I am watching them with them. So, most of it is just kind of direct oversight – I am with them while they are doing it.” While Shanida did not sit with her students while they utilised digital technologies, she shared that she liked to regularly check in: “I check on him regularly, just kind of pop in, just to check up and see what they are looking at. Their Dad is a CTO so I do tell them that everything they do, or delete, etc., we can track; everything they search on. If they Google something bad, we are going to see it.” Pamela had a similar style of monitoring. “YouTube videos aren’t always appropriate, so those ones I monitor more closely.”

There were some examples of heavy monitoring styles of supervision. For instance, Crissy said “On the computer, we do it only at the dining room table and he is only allowed to go to the website that I put him on.” Moreover, three participants also utilised parental control features in the digital devices in their supervision. For example, Pamela shared “They have the Amazon FreeTime, so they are only able to use certain apps that I have approved for them.” Similarly, Elena explained that she used parental controls to monitor what her kids were doing on the digital devices: “With the Kindle FreeTime, you choose what books and stuff they are allowed to use on the Kindle and the Echo.” Interestingly, two participants shared they had used but no longer utilise parental controls.

Why do Homeschoolers use these Technologies to Support Their Learning Process?

Theme 3: Interesting Topics Through Enjoyable Learning Means

Overwhelmingly, participants shared that the choice to use digital technologies in their learning process was because of the enjoyment their students had from its use and the promotion of interest-led education. For example, Katherine shared “My kids really love the way stories can be told in movie and show format – they love interacting with games. They love being able to learn things from a video, like actually seeing the graphics and things.” In a similar vein, Elena and

Celina both felt that digital technologies allowed for better learning in some areas: Elena stated, “It [technology] just makes it come more alive with the videos instead of just reading words on a page and looking at pictures” while Celina related “It is hard to grasp the concepts without seeing it, like the orbit around the sun or something like that – you cannot really observe that from our vantage point, but you can watch a video about it that really helps with their understanding.” Stephanie simply stated, “I think it holds their interest more” and Elena echoed her sentiments, stating “It catches their attention more”. Similarly, Crissy shared “Using technology really keeps their interest a lot more,” while Erin related “The novelty of it [schoolwork] being on the iPad helps them get it done.”

Tina, however, related that not only did her son enjoy using technology, utilising digital technology in their learning process allowed for her son to follow his interests: “There have been many times that my kid popped off with some history fact or geography fact and I know that we didn’t do that or talk about that. And it’s just because he can follow his own interest online so there’s a lot of value in kids having that screen time and freedom and I think that we don’t think about that when we are thinking about formal learning.” In the same vein, Pamela also related that digital technologies allowed for easier interest-led education than books alone: “I’m a huge advocate of ‘child love learning’ and we have tons of books and they are like, ‘I want to learn something,’ so let’s see if we have a book or go to the library and get a book, so that’s important. But online stuff does the same thing, and even more.” Pamela also related, “I am seeing how it [digital technology] actually piques their interest more.” Shanida perhaps stated it most clearly when she shared: “Overall, I feel like online is more engaging and you can really get to what you are interested in.”

In fact, not only was the decision to use digital technologies in the learning process a result of the emphasis on enjoyment and interest-led education, but the great majority of the participants also related that having the ability to focus on interest-led education was a deciding factor in the decision to homeschool. For example, Pamela shared “My kids just thrive in being able to choose what they are interested in versus kind of being stuck in a US school where they don’t really have a choice about what they can learn about.” Similarly, Katherine related “I would say that our number one reason [to choose homeschooling] is that we think kids should have autonomy on how they use their time and what their interests are and what they learn and how they learn it.” Likewise, in the survey, when asked what subjects were emphasized in the homeschool environment, Shani responded “Whatever they [the students] are interested in.” Stephanie also referenced child-led interest when she responded that her decision to homeschool was “to have more flexibility to learn different things; like childhood interest, I suppose.” Celina shared much of the same: “It is just the personalization aspect of education that I like.” Shanida, however, had tried traditional schooling with her son, but found that it did not work best for interest-led education: “He’s basically interested in computer programming, so he went to try middle school as they have a computer programming technical track. Unfortunately, that was very basic; kind of a waste [of time].”

Theme 4: Digital Technologies as Necessary

The majority of homeschool participants in this study also felt that using digital technologies in their homeschooling was necessary, given the widespread use of technology throughout the world. For instance, Erin stated “Getting comfortable with technology at this point is going to leave them not lost as they get older in jobs and things.” Elena felt much the same: “With everything today being digital, getting them used to it on a basic level with just playing Minecraft or something, then when they are older, they are familiar with it and it’s not as much of

a struggle to learn how to use Google Docs or something if they are already using it.” Similarly, Celina stated: “I think they kind of have to have that experience with technology – I don’t think they are growing up in a time where they cannot have any experience with technology and still be able to thrive in a more advanced setting.” Katherine echoed the other participants’ thoughts when she shared “It [technology] is such a part of our world, you just can’t get around it. [There are] skills that will be necessary in the digital world that we live in. Job skills are becoming increasingly technological, and the huge access to information – that can become overwhelming, but they need to learn how to navigate. Finally, Pamela summed it up when she said “Just knowing the way that the world is going, everything is so digital. I think it’s important now that they learn how to appropriately use these things, because they are going to have them their whole life and they can do whatever and access whatever and if they don’t know how to kind of limit it in an appropriate way then that won’t help them then. I think it is good for interest and just learning to interact with our growing technological world.”

What Digital Technologies are they Using?

Theme 5: Digital Technologies as a Means for Accessing Supplementary Learning Materials

Homeschooled children in this study utilised a wide array of digital technologies, including Laptop, Tablet, TV, Phone, Desktop, and/or Gaming Consoles to access both centralized curricular and, more commonly, learning materials that were outside of (i.e., supplementary to) the prescribed curricular. Laptops and tablets were the most commonly used devices. For example, Elena shared “We look at a lot of YouTube videos to go along with what we are learning. If we are learning about different insects, we will look up a video about those insects so that they can visualize it more than just a picture on a page.” Likewise, for Pamela, a wide variety of supplementary sources were accessed through digital technologies: “For media they do a lot of where they are watching

TV stuff, like Netflix. They both like documentaries. We also have Curiosity Stream; they love that. We do have some educational videos, but I am finding everything we want through YouTube or Netflix. Also, we got Disney+ and they have that National Geographic, which is really cool, so we have been using that lately.” Tina also highlighted the supplementary nature of their digital technology use: “We do a lot of current events, a lot of keeping up with politics, a lot of YouTube videos.” Of those using digital media for specific courses, math overwhelmingly was the most represented, with four of the ten participants utilising digital media for math instruction.

Most participants also reported that even if they had ultimate freedom (time and money were not an obstacle) to choose new digital technologies, they were happy with what they had or would just purchase more of what they already had. For those who did want additional digital technology items, they were primarily specialty items like a Smart Board or a digital microscope.

Theme 6: Learners Directing (Digital) Means to Meet their Learning Objectives

Some parents/guardians highlighted the point that choice of digital technology means was more of a collaborative effort, while others allowed their children full choice in this respect. For example, Shanida explained “He’s interested in Japan and wants to learn Japanese, so we’ve been using some Japanese apps and Japanese tutorials. And, basically, that’s the best way to find the material he is interested in”. For Shanida, not only did her son help choose the type of digital technology, but whether digital technology was used at all: “We did try using a lot of math programs – he did online math, like CTC Math for a couple of years, [and then] Beast Academy, but now he has just gone to a math textbook. He decided he doesn’t really like online math.” Tina shared “I very firmly think that every family and every child will have a different path in homeschooling if they are doing what is absolutely best for that individual. I think keeping your options open and being open minded [is important].” It was clear that for most parents the nature

of the learning objectives, and children's preference in learning means were important factors in terms of digital technology use.

Discussion

How are Digital Technologies Being Used?

Theme 1: Collaboration

In the present study, a number of the homeschoolers' learning process included collaboration with other learners via digital technologies. Collaboration took multiple forms, and it was noted in the study that digital technologies enabled connection with other learners even though they didn't live close by in geographical terms. Indeed, previous studies discussing SDL in childhood with digital technologies reinforce the notion that technologies can support a collaborative learning process.

For example, the study from Hsu (2017) examined 38 Taiwan third graders ($M = 9$ years old) who completed a task-based English vocabulary game with augmented reality using a tablet reported that it was conventional for learners to work together in collaboration. Likewise, the empirical study from Hennis (2017) discussed the effectiveness of a learning intervention (across multiple countries) to engage at-risk youth migrant students through SDL with the use of ICT Web 2.0 and interest-based collaborative learning activities.

The present study added to the literature in this regard and highlights the point that digital technologies can enable a collaborative homeschooling learning process through multiple means. Homeschoolers in the present study used digital technologies constructively and productively, and often this was a collaborative process, where collaboration was common with other homeschoolers, and digital technologies were employed successfully as a *tool* for collaboration.

Theme 2: Supervision

An interesting finding in the present study was that when homeschooling parents/guardians were asked how they supervised or controlled the use of digital technologies in the homeschool environment, participants were split: half reported monitoring the use, while the other half adopted a more hands-off approach. This finding highlights the point that there are different approaches to homeschooling (cf. Mitchell, 2020).

For those adopting a hands-off approach, participants noted the importance of promoting independent learning. The nature of this learning process closely reflects the theoretical framework of SDL. In this respect, Garrison's (1997) SDL framework model highlights that SDL concerns both self-monitoring (responsibility for process of learning) and self-management (control of what and how to learn). Similarly, the classic model of SDL from Brockett and Hiemstra (1991), named the personal responsibility orientation model, emphasizes the point that SDL starts with a learning orientation in which learners are offered responsibility to direct their learning process.

On the other hand, some of the parents in the present study adopted a monitoring style of supervision. The reasons for parents to choose a monitoring style of supervision was not possible to examine in the present study due to how this study was set out and undertaken. Potential reasons for this observation in the present study include the widespread phenomenon of educators to want to maintain control of learners' learning processes (Tough, 2002); educators approaching the learning process differentially due to differences in learners personality characteristics including learners' tendency and propensity toward SDL (cf. Alharbi, 2018; Kirwan et al., 2014; Slater et al., 2017), and/or; concerns about risks and dangers of online learning – which had been especially a concern during the COVID-19 pandemic, and remains a key concern (UNICEF, 2021).

Why do Homeschoolers use these Technologies to Support Their Learning Process?

Theme 3: Interesting Topics Through Enjoyable Learning Means

A key dimension of SDL is that learners choose their learning means and objectives (Knowles, 1975; Morris, 2019c). In the present study, the use of digital technologies was overwhelmingly used to enable learners to study topics of interest through enjoyable learning (i.e., digital) means. Indeed, in terms of SDL theory and in respect of previous studies on SDL, the majority of studies in childhood formal schooling rarely depict a learning process in which learners have primary responsibility to direct their learning means and objectives (refer to review from Morris & Rohs, 2023). Rather, in the present study, for a good portion of the homeschoolers, the learning process was one in which learners had, *habitually*, primary responsibility to direct their learning means and objectives: a personalized learning environment (cf. Bellarhmouch et al., 2023).

In this respect, it is important to point out that many interviewees in the present study highlighted that learner choice in terms of learning means and objectives is a salient feature and advantage of the homeschooling process. This included choice in use of digital technologies. Moreover, parents/guardians highlighted that such SDL – habitually undertaken with digital technologies – satisfies learners’ interest, catching their attention and enjoyment, where a love for learning can be fostered. Actually, the majority of the homeschoolers specifically stated that having the ability to focus on interest-led education was a deciding factor in the decision to homeschool.

Theme 4: Digital Technologies as Necessary

An important theme in the present study concerned digital competence and information literacy (cf. Rapchak et al., 2015 for further discussion). Specifically, homeschoolers highlighted the importance of fostering learner’s digital competence and digital literacy and that homeschooling with digital technologies was an opportunity to do so; this opportunity was taken

up by many of the homeschooler's learner environments depicted in the present study: a central part of a common means of SDL. Specifically, it was clear that it was felt that digital technologies were seen as necessary as a normal and central part of life and work.

The findings of the present study – that homeschoolers have the opportunity to foster digital competence and digital literacy on a regular basis due to the regular practice of SDL through digital technological means, contrasts with studies in childhood formal educational settings which often report a lack of learner competence to use digital technologies for learning purposes (Hughes et al., 2019; Morris & Rohs, 2023). Rather, in the present report, SDL with digital technologies could be considered second-nature for the homeschooled children, where they have the opportunity to foster their digital competence, information literacy skills, and use of a range of digital technologies on a regular basis over an extended period of time.

What Digital Technologies are they Using?

Theme 5: Digital Technologies as a Means for Accessing Supplementary Learning Materials

A strong theme in the present study was that participants utilised a wide array of digital technologies to access learning materials which were considered “supplementary” to a pre-planned or specified curriculum. Specifically, it was quite clear that many of the topics of learning rather seemed to flow as natural and organic learning projects that stemmed from children's interaction with the real-world, such as learning about current events, politics, other cultures, and nature. In other words, a good portion of homeschoolers' learning was SDL. This fits in with and supports previous literature on homeschooling in respect of that, indeed, the central presence of SDL in homeschooling is a salient feature that differentiates it from traditional forms of education (cf. Alamry & Karaali, 2016; Bell et al., 2016; Gann & Carpenter, 2017; Jackson, 2016).

It is interesting to note that to access these SDL materials, primarily, homeschoolers in this present study relied upon laptops and tablets as devices to access several internet-based learning resources, including website browsing, educational videos, and documentaries, etcetera. In this respect, most homeschoolers noted that they had ultimate freedom to choose new digital technologies that they were happy with in order to enable their individual SDL pursuits. Indeed, these findings support the speculations of scholars that advanced digital technologies available today present as an opportunity for, and to support the process of, SDL (e.g., Bonk & Lee, 2017; Rohs & Ganz, 2015).

That said, importantly, it appeared in the present study that choosing digital technology and using it for constructive and productive learning purposes was habitual to the homeschoolers. This is in contrast to studies in traditional formal schooling settings which have reported that children may be competent to use digital technologies for gaming, but may struggle (and even find technologies distracting) using digital technologies for educational purposes (e.g., Bartholomew, 2017; Bartholomew et al., 2017; Gokcearslan, 2017; Hughes et al., 2019; Morris & Rohs, 2023).

Theme 6: Learners Directing (Digital) Means to Meet their Learning Objectives

On this point, it is important to point out that studies have historically and consistently identified that many people go through childhood educational processes without having the chance to practice SDL and to become a competent self-directed learner (e.g., Bonk et al., 2018; Canty et al., 2019; Gatewood, 2019). Indeed, the classic scenario in traditional formal educational settings is that children are exposed to a teacher-directed learning process over many years, but then when they are suddenly tasked with SDL some learners find the process stressful and difficult (cf. Kasworm, 1983; Kicken et al., 2009; Knowles, 1975).

In this regard, Bonk and Lee (2017) note that it is somewhat surprising that facilitating SDL and fostering SDL competence is not, *yet*, considered a foremost goal of education, in the majority of formal education systems, given that the importance of SDL has been noted by scholars for decades (cf. Rogers, 1969). Morris and Rohs (2023) point out that consequently, it is particularly disconcerting therefore that, for these persons, self-directed learning will not be fully utilised throughout the course of their life. And then, the affordances enabled by self-directed learning competence – a fundamental meta-competence – might be lost across a person’s life course.

On the contrary, in the present study homeschoolers were habituated to learn in a self-directed and autonomous manner and reported choosing their digital technologies and using them constructively and productively to achieve their learning goal. It may be argued that – at least with the homeschoolers sampled in the present study – that calls by scholars – such as Kranzow and Hyland (2016) – for a holistic educational system that captures the ideals of the self-directed inquiry process are met by the homeschooling processes.

Conclusion

In the present study, we reported that homeschooled children utilised a wide array of digital technologies to access learning materials. Indeed, it was quite clear that many of the topics of learning rather seemed to flow as natural and organic learning projects that stemmed from children’s interaction with the real-world, such as learning about current events, politics, other cultures, and nature. Specifically, there was evidence in this study that, in the majority, homeschooling represented a process in which SDL is habitual, natural, and normal for homeschooled children. This evidence supports previous research by Gann and Carpenter (2017) who reported that homeschool parents and guardians utilized self-directed study as a common instructional strategy. The findings of this study, coupled with Gann and Carpenter’s study, imply

that homeschooling is not only well-suited to self-directed learning, but that it is regularly practiced.

When homeschooling parents/guardians were asked how they supervised or controlled the use of digital technologies in the homeschool environment, participants were split: half reported monitoring the use, while the other half adopted a more hands-off approach. This finding highlights the point that there are differential approaches to homeschooling, a common theme in homeschool literature. For those adopting a hands-off approach, homeschoolers highlighted the importance of promoting independent learning and felt that their students could be trusted to self-manage and regulate their process of learning. The nature of this learning process closely reflects theoretical frameworks that intend to capture the key dimensions of SDL. Given that the participants were split on their style of monitoring, however, the findings of this study imply that implementing technology in the classroom and home can have difficulties, particularly in regard to younger learners. Investigating the reasons behind the monitoring styles would be an interesting topic for future research.

Moreover, in the present study, a number of homeschoolers' learning process included collaboration with other learners via digital technologies. Collaboration took multiple forms, and it was noted that digital technologies enabled connection with other learners even though other learners and/or friends didn't live close by in geographical terms.

A key finding from the present study was that for a good portion of the homeschoolers, the learning process was one in which learners fully directed their learning means and objectives, which was supported and afforded through digital technologies. Parents/guardians highlighted that such SDL processes satisfied learner's interest, catching their attention and enjoyment, where a love for learning can be fostered. Actually, the majority of the homeschooling parents/guardians

specifically stated that having the ability to focus on interest-led education was a deciding factor in the decision to homeschool.

In summary, in this study homeschoolers were habituated to learn in a self-directed and autonomous manner and were more likely to use digital technologies constructively and productively. However, while the number of participants was in keeping with qualitative research standards (Creswell & Poth, 2018), the small sample size and female dominated participant pool was a limitation and does not provide for study generalizability. As a result, although this study provides some clues on how homeschoolers use digital technologies in a self-directed and autonomous manner, we do not claim external validity and further studies in a variety of contexts are required in this emerging research field.

Statements and Declarations

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

- Alamry, A. & Karaali, A. (2016). Flipped education: Transitioning to the homeschool environment. *Cogent Education*, 3(1), 1-9. <https://doi.org/10.1080/2331186X.2016.1224607>
- Albedah, F., & Lee, C. B. (2017). The use of mobile devices outside of the classroom for self-directed learning among female EFL students in Saudi Arabia. *International Association for Development of the Information Society*. <https://files.eric.ed.gov/fulltext/ED579302.pdf>
- Alharbi, H. A. (2018). Readiness for self-directed learning: How bridging and traditional nursing students differs? *Nurse Education Today*, 61, 231-234. <https://doi.org/10.1016/j.nedt.2017.12.002>
- Alonderienè, R., & Suchotina, N. (2017). The impact of self-directed learning on work performance of lawyers. *Organizations & Markets in Emerging Economies*, 8(2). 165-176. <https://doi.org/10.15388/omee.2017.8.2.14185>
- Bartholomew, S. R. (2017). Middle school student technology habits, perceptions, and self-directed learning. *International Journal of Self-Directed Learning*, 14(2), 27-44. <https://www.sdlglobal.com/journals>
- Bartholomew, S. R., Reeve, E., Veon, R., Goodridge, W., Lee, V. R., & Nadelson, L. (2017). Relationships between access to mobile devices, student self-directed learning, and achievement. *Journal of Technology Education*, 29, 2-24. <https://doi.org/10.21061/jte.v29i1.a.1>
- Beckers, J., Dolmans, D. H., Knapen, M. M., & van Merriënboer, J. J. (2018). Walking the tightrope with an e-portfolio: imbalance between support and autonomy hampers self-directed learning. *Journal of Vocational Education & Training*, 71, 260-288. <https://doi.org/10.1080/13636820.2018.1481448>

- Beese, E. B., & Watson, S. L. (2016). Development of learner self-direction over the course of a home education. *International Journal of Self-Directed Learning*, 13(2), 15-37. <https://www.sdlglobal.com/journals>
- Bell, D. A., Kaplan, A., & Thurman, K. (2016). Types of homeschool environments and need support for children's achievement motivation. *Journal of School Choice*, 10(3), 330-354. <https://doi.org/10.1080/15582159.2016.1202072>
- Bellarhmouch, Y., Jeghal, A., Tairi, H. et al. (2023). A proposed architectural learner model for a personalized learning environment. *Education and Information Technologies*, 8, 4243-4263 <https://doi.org/10.1007/s10639-022-11392-y>
- Bennett, D. L., Edwards, E., & Ngai, C. (2019). Homeschool background, time use and academic performance at a private religious college. *Educational Studies*, 45(3), 305-325. <https://doi.org/10.1080/03055698.2018.1446332>
- Bonilla, S., McDermott, K. A., & Gerstl-Pepin, C. (2022). The politics of COVID-19 and educational inequities. *Peabody Journal of Education*, 97(3), 251-256. <https://doi.org/10.1080/0161956X.2022.2090145>
- Bonk, C. J., & Lee, M. M. (2017). Motivations, achievements, and challenges of self-directed informal learners in open educational environments and MOOCs. *Journal of Learning for Development*, 4(1), 36-57. <https://doi.org/10.56059/jl4d.v4i1.195>
- Bonk, C.J., Zhu, M., Kim, M., Xu, S., Sabir, N., & Sari, A.R. (2018). Pushing toward a more personalized MOOC: Exploring instructor selected activities, resources, and technologies for MOOC design and implementation. *International Review of Research in Open and Distributed Learning*, 19(4), 92-115. <https://doi.org/10.19173/irrodl.v19i4.3439>
- Bozkurt, A., I. Jung, J. Xiao, V. Vladimirschi, R. Schuwer, G. Egorov, S. R. Lambert, et al. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating

- in a time of uncertainty and crisis. *Asian Journal of Distance Education*, 15(1), 1-126.
<https://doi.org/10.5281/zenodo.3878572>
- Brassil, E., Gunn, B., Shenoy, A. M., & Blanchard, R. (2017). Unanswered clinical questions: A survey of specialists and primary care providers. *Journal of the Medical Library Association*, 105(1). <https://doi.org/10.5195/JMLA.2017.101>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Brockett, R. G., & Hiemstra, R. (1991). *Self-direction in adult learning: Perspectives on theory, research, and practice*. Routledge.
- Brighouse, H. (2022). The tyranny of meritocracy and elite higher education. *Theory and Research in Education*, 20(2), 145-158. <https://doi.org/10.1177/14778785221113990>
- Canty, D., Barth, J., Yang, Y., Peters, N., Palmer, A., Royse, A., & Royse, C. (2019). Comparison of learning outcomes for teaching focused cardiac ultrasound to physicians: A supervised human model course versus an eLearning guided self-directed simulator course. *Journal of Critical Care*, 49, 38-44. <https://doi.org/10.1016/j.jcrc.2018.10.006>
- Carpenter, D. & Gann, C. (2016). Educational activities and the role of the parent in homeschool families with high school students. *Educational Review*, 68(3), 332-339.
<https://doi.org/10.1080/00131911.2015.1087971>
- Caruso, S. J. (2018). Toward understanding the role of Web 2.0 technology in self-directed learning and job performance. *Contemporary Issues in Education Research*, 11(3), 89-98.
<https://doi.org/10.19030/cier.v11i3.10180>
- Chen, V., & Bland, T. B. (2022). Power, populism, and a policy of grace: Moral perspectives in the tyranny of merit and cut loose. *Theory and Research in Education*, 20(2), 159-172. <https://doi.org/10.1177/14778785221109067>

- Cogan, M. F. (2010). Exploring academic outcomes of homeschooled students. *Journal of College Admission*, 208, 18-25. <https://files.eric.ed.gov/fulltext/EJ893891.pdf>
- Cook, D. A., Price, D. W., Wittich, C. M., West, C. P., & Blachman, M. J. (2017). Factors influencing physicians' selection of continuous professional development activities: A cross-specialty national survey. *Journal of Continuing Education in the Health Professions*, 37(3), 154-160. <https://doi.org/10.1097/CEH.0000000000000163>
- Cooper, J. (2018). Examining factors that influence a woman's search for information about menopause using the socio-ecological model of health promotion. *Maturitas*, 116, 73-78. <https://doi.org/10.1016/j.maturitas.2018.07.013>
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE Publications.
- Dunlap, J. C., & Grabinger, S. (2003). Preparing students for lifelong learning: A review of instructional features and teaching methodologies. *Performance Improvement Quarterly*, 16(2), 6-25. <https://doi.org/10.1111/j.1937-8327.2003.tb00276.x>
- Gann, C. & Carpenter, D. (2017). STEM teaching and learning strategies of high school parents with homeschool students. *Education and Urban Society*, 50(5), 461-482. <https://doi.org/10.1177/0013124517713250>
- Gatewood, E. (2019). Use of simulation to increase self-directed learning for nurse practitioner students. *Journal of Nursing Education*, 58(2), 102-106. <https://doi.org/10.3928/01484834-20190122-07>
- Garrison, D. R. (1997). Self-directed learning: Toward a comprehensive model. *Adult Education Quarterly*, 48, 18-33. <https://doi.org/10.1177/074171369704800103>
- Gokcearslan, S. (2017). Perspectives of students on acceptance of tablets and self-directed learning with technology. *Contemporary Educational Technology*, 8(1), 40-55.

- Guglielmino, L. M., Long, H. B., & Hiemstra, R. (2004). Self-direction in learning in the United States. *International Journal of Self-Directed Learning*, 1(1), 1-17. <https://www.sdlglobal.com/journals>
- Guterman, O. (2023). A comparison of parents and inspectors views regarding homeschooling. *Educational Studies*, 49(5), 767-782. <https://doi.org/10.1080/03055698.2021.1886056>
- Hanna, L. G. (2012). Homeschooling education: Longitudinal study of methods, materials, and curricula. *Education and Urban Society*, 44(5), 609-631. <https://doi.org/10.1177/0013124511404886>
- Hennis, T. (2017). Engaging at-risk youth through self-directed learning. *Italian Journal of Educational Technology*, 25(1), 18-30. <https://doi.org/10.17471/2499-4324/866>
- Hsu, T. C. (2017). Learning English with augmented reality: Do learning styles matter? *Computers & Education*, 106, 137-149. <https://doi.org/10.1016/j.compedu.2016.12.007>
- Hughes, J., Morrison, L., Mamolo, A., Laffier, J., & de Castell, S. (2019). Addressing bullying through critical making. *British Journal of Educational Technology*, 50(1), 309-325. <https://doi.org/10.1111/bjet.12714>
- Jackson, G.M. (2016). Australian home educated students on self-regulation opportunities at home and in school. *Cogent Education*, 3(1). <https://doi.org/10.1080/2331186X.2016.1203514>
- Kasworm, C. E. (1983). An examination of self-directed contract learning as an instructional strategy. *Innovative Higher Education*, 8, 45-54. <https://doi.org/10.1007/BF00889559>
- Kicken, W. S., Brand-Gruwel, S., van Merriënboer, J. J., & Slot, W. (2009). The effects of portfolio-based advice on the development of self-directed learning skills in secondary vocational education. *Educational Technology Research & Development*, 57, 439-460. <https://doi.org/10.1007/s11423-009-9111-3>

- Kirwan, J. R., Lounsbury, J. W., & Gibson, L. W. (2014). An examination of learner self-direction in relation to the big five and narrow personality traits. *SAGE Open*, 4(2), 1-14. <https://doi.org/10.1177/2158244014534857>
- Kleist-Tesch, J. M. (1998). Homeschoolers and the public library. *Journal of Youth Services in Libraries*, 11(3), 231-41.
- Knowles, M. S. (1975). *Self-directed learning: A guide for learners and teachers*. Follett.
- Knowles, M. S., Holton, E. F., & Swanson, R. A. (2015). *The adult learner: The definitive classic in adult education and human resource development* (Vol. 8). Routledge.
- Kranzow, J., & Hyland, N. (2016). Self-directed learning: Developing readiness in graduate students. *International Journal of Self-Directed Learning*, 13(2), 1-14. <https://www.sdlglobal.com/journals>
- Kunzman, R. (2009). Understanding homeschooling: A better approach to regularization. *Theory and Research in Education*, 7(3), 311-330. <https://doi.org/10.1177/1477878509343740>
- Kunzman, R. & Gaither, M. (2020). Homeschooling: An updated comprehensive survey of the research. *The Journal of Educational Alternatives*, 9(1), 253-336. <https://www.othereducation.org/index.php/OE/index>
- Lejeune, C., Beusaert, S., & Raemdonck, I. (2021). The impact on employees' job performance of exercising self-directed learning within personal development plan practice. *The International Journal of Human Resource Management*, 32(5), 1-27. <https://doi.org/10.1080/09585192.2018.1510848>
- McCarthy, K. E., & James, W. B. (2017). Are teachers self-directed? An examination of teachers' professional learning. *International Journal of Self-Directed Learning*, 14(1), 58-72. <https://www.sdlglobal.com/journals>

- Mijs, J. J. B. (2022). Merit and resentment: How to tackle the tyranny of merit. *Theory and Research in Education*, 20(2), 173-181. <https://doi.org/10.1177/14778785221106837>
- Mitchell, E. (2020). An exploratory study investigating why do English parents choose to home educate their children and what educative practices do they adopt. *Educational Studies*, 48(4), 490-507. <https://doi.org/10.1080/03055698.2020.1781598>
- Morris, T. H. (2019a). Adaptivity through self-directed learning to meet the challenges of our ever-changing world. *Adult Learning*, 30(2), 56-66. <https://doi.org/10.1177/1045159518814486>
- Morris, T. H. (2019b). An analysis of Rolf Arnold's systemic-constructivist perspective on self-directed learning. In M. Rohs, M. Schiefner-Rohs, I. Schüßler, & H.-J. Müller (Eds.), *Educational perspectives on transformations and change processes* (pp. 301-313). Bielefeld: WBV Verlag.
- Morris, T. H. (2019c). Self-directed learning: A fundamental competence in a rapidly changing world. *International Review of Education*, 4, 633-653. <https://doi.org/10.1007/s11159-019-09793-2>
- Morris, T. H. (2020). Creativity through self-directed learning: three distinct dimensions of teacher support. *International Journal of Lifelong Education*, 39(2), 168-178. <https://doi.org/10.1080/02601370.2020.1727577>
- Morris, T. H., & Rohs, M. (2021). Digitization bolstering self-directed learning for information literate adults—A systematic review. *Computers and Education Open*, 2, 100048. <https://doi.org/10.1016/j.caeo.2021.100048>
- Morris, T. H., & Rohs, M. (2023). The potential for digital technology to support self-directed learning in formal education of children: A scoping review. *Interactive Learning Environments*, 31(4), 1974-1987. <https://doi.org/10.1080/10494820.2020.1870501>

- Morrison, D., & Premkumar, K. (2014). Practical strategies to promote self-directed learning in the medical curriculum. *International Journal of Self-Directed Learning*, 11(1), 1-12. <https://www.sdlglobal.com/journals>
- National Center for Education Statistics (NCES). (2018). *Digest of Education Statistics*. https://nces.ed.gov/programs/digest/d17/tables/dt17_206.10.asp
- Neuman, A. (2020). The meaning of learning: Homeschooled compared with schooled children. *Educational Studies*, 46(6), 760-772. <https://doi.org/10.1080/03055698.2019.1668258>
- Neuman, A. (2019). Criticism and education: Dissatisfaction of parents who homeschool and those who send their children to school with the education system. *Educational Studies*, 45(6), 726-741. <https://doi.org/10.1080/03055698.2018.1509786>
- Organisation for Economic Co-operation and Development (OECD). (2020). A framework to guide an education response to the COVID-19 pandemic of 2020. https://www.oecd-ilibrary.org/education/a-framework-to-guide-an-education-response-to-the-covid-19-pandemic-of-2020_6ae21003-en
- Pannone, S. J. (2017). The influence of homeschooling on entrepreneurial activities: A collective case study. *Education + Training*, 59(7/8), 706-719. <https://doi.org/10.1108/ET-05-2016-0091>
- Parkay, F. W. (2013). *Becoming a teacher* (9th Ed.). Pearson.
- Rapchak, M. E., Lewis, L. A., Motyka, J. K., & Balmert, M. (2015). Information literacy and adult learners: Using authentic assessment to determine skill gaps. *Adult Learning*, 26(4), 135-142. <https://doi.org/10.1177/1045159515594155>
- Ray, B. (2017). A systematic review of the empirical research on selected aspects of homeschooling as a school choice. *Journal of School Choice*, 11(4). <https://doi.org/10.1080/15582159.2017.1395638>

- Riley, G. (2018). Exploring unschoolers' experiences in learning to read: how reading happens within the self-directed learning environment. *Journal of Unschooling and Alternative Learning*, 12(24), 1-33.
- Rogers, C. R. (1969). *Freedom to learn*. Charles Merrill.
- Rohs, M., & Ganz, M. (2015). MOOCs and the claim of education for all: A disillusion by empirical data. *International Review of Research in Open and Distributed Learning*, 16(6). <https://doi.org/10.19173/irrodl.v16i6.2033>
- Romanowski, M. H. (2006). Revisiting the common myths about homeschooling. *Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 79(3), 125-129. <https://doi.org/10.3200/TCHS.79.3.125-129>
- Sandel, M. J. (2022). Meritocracy, education, and the civic project: A reply to commentaries on The Tyranny of Merit. *Theory and Research in Education*, 20(2), 193-199. <https://doi.org/10.1177/14778785221113622>
- Slater, C. E., Cusick, A., & Louie, J. C. (2017). Explaining variance in self-directed learning readiness of first year students in health professional programs. *BMC Medical Education*, 17(1), 207. <https://doi.org/10.1186/s12909-017-1043-8>
- Tan, M. H. (2020). Homeschooling in Singaporean Chinese families: Beyond pedagogues and ideologues. *Educational Studies*, 46(2), 135-153. <https://doi.org/10.1080/03055698.2019.1584850>
- Tate, T., McPartlan, P., Baker, R., Aubele, J., & Warschauer, M. (2022). "I just didn't feel like a student anymore:" Student responses to emergency distance learning. *Peabody Journal of Education*, 97(3), 369-389. <https://doi.org/10.1080/0161956X.2022.2088176>
- Tough, A. M. (1971). *The adults' learning projects: A fresh approach to theory and practice in adult education*. <http://ietl.org/tough/books/alp.htm>

Tough, A. (2002). *The iceberg of informal adult learning. New Approaches to Lifelong Learning*
(NALL) working Paper, 49-2002. <https://nall.oise.utoronto.ca/res/49AllenTough.pdf>