# Seesawing (Dis)connections: Digital Parental Involvement in a Culturally Diverse School Community

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**Abstract**
As digitization of home-school connectivity continues apace, nuanced understandings of the digital capabilities of parents are essential. However, there has been considerable homogeneity in the representations of parents, and deficit understandings of digital parental involvement with schools, especially in schools serving diverse and disadvantaged communities. This study addresses the limitations of the extant research by examining how families in a case study school are oriented to digital technology, how cultural and linguistic resources impact home-school connections, and how a learning management system impacts digital inclusion in a diverse school community. Parent interviews were facilitated by interpreters, enabling participation of a culturally and linguistically diverse parent cohort. Parents' and teachers' diverse perspectives were also analyzed. Informed by Actor Network Theory, connections between humans and humans, and between humans and non-human actors (digital and material) were mapped onto a network diagram. Findings show considerable digital engagement and aspiration on the part of parents, which was frustrated by English-only communications from teachers despite Seesaw's multilingual affordances. We report teachers' disappointment with low parental uptake of the digital learning management system, and the deficit thinking that led them to assume a lack of digital skills or knowledge. We suggest that such deficit thinking should be challenged by a critical approach that might involve teacher-parent dialogue. Although a learning management system is a technological actor, that actor must be understood within the full context of school-home connectivity, in which schools serve communities and have a responsibility for cultural and linguistic inclusion.

**Keywords:** parent involvement, digital technology, cultural diversity, linguistic diversity, home-school connection, digital inclusion, digital equity

## Introduction

Enlisting parents' support for children's learning has long been an avowed aim of many education systems, particularly in the early and elementary years. However, the range of connection strategies available to schools may be limited and the complexities of families' circumstances can pose challenges in achieving the desired outcomes (Harry, 2008; Luet, 2017). Digital technology had already begun to shift the terms of engagement between families and schools prior to the COVID-

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19 pandemic that ushered in the widespread implementation of home-based online learning and the intensification of digital home-school connections. While research undertaken during that time often treated parents as a homogenous category, sufficient evidence emerged that families' social, economic, and cultural circumstances considerably impacted the implementation of online learning and how parents were digitally involved in schools. There is a need to develop a much greater degree of understanding of the impacts of diversity – in all its dimensions – on the uptake and use of educational technologies and associated home-school connections.

Deficit thinking has long been identified as a problematic and limiting perspective on communities whose members are economically, socially, and/or culturally other than the so-called mainstream (Tett, 2001; Schutz, 2006; Bertrand et al.; 2018; Fricker et al., 2023). In relation to parental involvement, deficit thinking manifests as the belief that "parents who are not from the dominant culture are … lacking the necessary skills and knowledge to help their children succeed in school" (Luet, 2017, p. 677).

When the "necessary skills and knowledge" encompass educational technology, the potential exists for deficit thinking to be extended to the domain of digital literacy. Indeed, Ellison and Solomon (2019) identified the existence of "incorrect, discriminatory, and deficit-view perspectives of what African Americans are capable of digitally producing" (p. 229). Reinforcing this concern, Pavlakis et al. (2019) have reported that teachers have expressed doubts about the technological capability of parents, particularly in diverse communities (Pavlakis et al., 2019).
The perception that certain groups of people are less capable of using digital technologies than others is often based on biases and can lead to unequal access to digital opportunities and resources. It is also necessary to consider digital exclusion and inclusion as elements impacting the experiences of families in different circumstances.

The *Australian Digital Inclusion Index* (Thomas et al., 2023) comprises three dimensions of digital inclusion: *Access* to digital networks (e.g., telecommunications infrastructure); *Affordability* of high quality and reliable connectivity (e.g., data, Internet-connected devices); and *Digital Ability* (digital skills and literacies). Measurement of digital inclusion using the index has consistently found an inverse relationship between measures of social disadvantage (e.g., education, poverty, and employment) and digital inclusion on all dimensions. That is, the more socially disadvantaged the group, the less likely they are to be digitally included. Addressing barriers to digital inclusion is crucial for reducing the digital divide.

## Educational technology and the promise of parental involvement

Among the promises that providers make about their educational technology is that such products support parent involvement. Multiple tools, applications, and platforms have been developed which have aimed to "increase parental engagement," for instance, by "providing parents with access to information about their child's homework, progress, attendance, and behavior" (Lewin & Luckin, 2009, p. 751). Marketing materials draw contrasts between the old-fashioned crumpled note in a child's school bag and the digital app at the ready on a parent's mobile device. Features such as the integration of translation functions are also claimed to support the involvement of parents for whom English is not a first language. An example, pertinent to this study, is Seesaw.
When launched in 2016, Seesaw was described as an app that would "allow teachers to capture, collect, and review student work with incredible ease." In terms of home involvement, the promotional material promises immediate connections between parents and their children:

> Seesaw's immediate, visual updates **actually** get seen by parents, provide encouragement for students, and cross language barriers …
> (https://www.educationworld.com/a_news/digital-portfolio-tool-seesaw-announces-premium-version-after-successful-first-year-784852097; original emphasis)

Note the claim to 'cross language barriers'; this is a reference to the integration of a translation tool into the platform functions. Furthermore, teachers are assured that parents' digital involvement is positive for children: "parents … can view their children on their learning journeys at school and leave words of encouragement to continue to inspire them (https://oceanviewresources.com/blogs/news/going-paperless-with-seesaw-app).

To understand how digital connectivity between parents and schools works in practice, we undertook interviews with parents, teachers, and children in three school communities. This paper focuses on one school, Hakea, which serves a community that is highly diverse culturally and linguistically, with a substantial population of newly arrived immigrant and refugee families.

Aligning with critiques of digital deficit thinking, our work explores the proactive, resourceful, and strategic ways that parents in a culturally diverse community engage with digital tools to manage everyday life and support their children. Interviews with members of the school community helped us to understand parents' actual uses of digital technology in their everyday lives, how parents engaged with the school on and offline, and the impact of a specific digital learning management system (LMS)—Seesaw—on home-school connectivity.

## Literature Review

Much of the literature on parent involvement in the context of digital technology treats parents as a homogenous category. When this is the case, it is hard to gain information about the impact of sociocultural context on involvement. For the larger project of which this study is a part, we conducted an extensive literature review (citation removed). For this paper, we have specifically focused our attention on studies in which parents' or families' sociocultural contexts are centered. Some of these studies were conducted in school communities or districts that are characterized by cultural diversity, and others involved comparative analysis across multiple contexts that casts light on sociocultural aspects of parents' digital involvement.

Overall, the studies indicate that schools serving communities characterized by cultural and linguistic diversity, particularly in combination with immigrant/refugee status and low income, face multiple challenges when attempting to integrate digital technology into their operations. Mac Iver et al. (2021) investigated the implementation of a parent portal in a school district in which more than half of the students were from "diverse racial backgrounds" and 20% spoke a language other than English at home (p. 15). Data analytics showed that while 82% of White students' parents logged in to the portal in its first year, this was much less for Asian (39%), Hispanic (31%), and Black (25%) students' parents (Mac Iver et al., 2021, p. 16). The first step to access the portal required the parents to register their email address, and overall this step had only been completed by 38% of the students' parents. School leaders noted that many parents did not use email but preferred to text, and some families did not have Internet access.

Vigo-Arrazola and Dieste-Gracia (2019) examined "virtual participation" of parents in three different types of schools: suburban, urban, and rural. The first of these was located in a "stigmatized" neighborhood and served racial minority families. The researchers found that while some families in the urban and rural schools engaged in virtual participation, in the suburban school such engagement "did not seem to work at all" (Vigo-Arrazola & Dieste-Gracia, 2019, p. 217). In turn, the suburban school abandoned the attempt to integrate virtual participation with parents and instead focused on increasing opportunities for face-to-face interaction. However, integration of digital technology into children's learning continued; therefore, the parents who were not digitally connected were less able to support their children academically.

Digital access and inclusion are made more difficult when families are "multiply marginalized," for instance on grounds of minority and economic status (Livingstone & Blum-Ross, 2020, p. 67). An example of intersectional disadvantage is explored by Kim and Padilla (2020) who interviewed parents in a majority Latinx community living in a mobile park to discover how

technologies were used at home for educational purposes. Internet access amongst mobile park residents was much less than in the rest of the city (76% compared to 92%). Furthermore, 36% of homes with Internet access were limited to small screen mobile devices (primarily smart phones), and although a district policy provided laptops on request, this opportunity was not taken up by all families. The researchers note that completing homework on a small screen device was virtually impossible," therefore, children in such circumstances had to do their homework at school or a public library (Kim & Padilla, 2020, p. 503).

Moreover, Heath et al.'s (2015) study of a "low-wealth urban school" shows the complexity of integrating digital technologies in conditions of sociocultural diversity and economic disadvantage. The principal of this school was committed to supporting parents' participation across a range of digital and traditional channels. The additional labor for leaders and teachers in accomplishing this aim included sending communications in three community languages, assisting parents to access refurbished computers at a low cost, and providing staff with time to tutor parents in the use of technology—not only for supporting children's education, but also for their daily lives. Given these demands on teachers, it is perhaps not surprising that examples like this are rarely reported in the literature.

A common assumption is that parents in low-income and immigrant communities have lower levels of digital literacy. However, studies of immigrant families point to the importance of digital tools in sustaining transnational family networks and describe the efforts of parents to access digital devices and learn applications (Compton-Lilly et al., 2019; Chen et al., 2019; Gonzalez & Katz, 2016; Machado-Casas et al., 2014). Positive views towards digital technology are reported in these studies. For instance, immigrant parents in one ethnographic study identified many advantages of mobile devices, describing them as "affordable, portable, lifelike, instant, highly efficient, and resource rich" (Chen et al., 2019, p. 4). The desire to support their children at school has been a motivating influence on immigrant parents' self-directed technology learning (Al-Salmi, 2015). Fostering children's learning and retention of the home language has also been a driver of parents' quest to access digital resources (Al-Salmi, 2015; Compton-Lilly et al., 2019; Tour, 2019).

These forms of competence do not appear to be visible to educators (Ellison & Solomon, 2019). Pavlakis et al.'s (2019) in-depth ethnography of parent involvement in a technologically advanced school serving a majority Latinx community sheds light on this issue. Interviews with parents revealed their use of a range of digital resources to access educational information, including translation tools when necessary. However, teachers viewed parents as "digitally limited" and underestimated their interest in digital technology, despite focus group data showing that 100% of participant parents "expressed interest in training around different technology applications" (Pavlakis et al., 2019, p. 21). The teachers in the study, nearly all of whom were monolingual English speakers, also conflated linguistic barriers with technological challenges.

Several studies have pointed to the issue of monolingualism as jeopardizing digital inclusion of parents. Piller et al. (2023) found that English was the "exclusive medium" on school websites, which they examined from the perspective of prospective parents looking for enrolment information (p. 333). While most school websites had the Google Translate plug-in located on the home page, this option was not available on the versions accessed through mobile devices. The direction to "select language" was in English and linked the user to a list of 108 languages printed in small font. Testing of the machine translation also revealed its inaccuracy in relation to some languages. Similarly, in a study of school websites in Sweden, Gu (2017) found that only 25% provided information in languages other than Swedish. Furthermore, Shin and Seger (2016) found that English-only parents participated more than their multilingual peers in a classroom blog. This study and others also note that multilingual children often experience the additional effort of mediating home-school communication for caretakers whose English is less proficient (Rideout & Katz, 2016).

Much of the research on parents' digital involvement—whether concerned with cultural diversity or not—provides minimal details of the contextualized practices of parents and educational personnel connecting with digital tools. Indeed, the tendency to treat digital technology as a toolbox, in which the contents are neutral objects waiting for humans to pick them up and use them, has contributed to a degree of opacity regarding the nuances of operations and activities. Actor Network Theory offers a fine-grained approach to critically analysis of technological innovations, and this theory is applied to examine the impact of educational technology on school-home connectivity in the case of Hakea.

**Actor Network Theory and Studies of Educational Technology**

Actor Network Theory (ANT) offers a way to study parents' digital involvement by treating technological entities as actors, rather than as simple tools for humans to use (Latour, 1990; Law, 2009; Walz, 2006). Actor Network Theory conceptualizes networks as 'comprised of diverse materials' (Murdoch 1998) including the human and the nonhuman. This approach is interested in tracing movements and connections between all elements that make up networks (Law 1999). ANT has from the outset been interested in technology and, specifically, in opening the "black box" on technological innovation (Latour, 1990, p. 109). Analysis of innovations has traced how they are assembled and able to operate through associations between multiple social and technological/material actors. This kind of analysis has challenged the "hero" narrative which attributes innovation to "an individual human -usually male" (Latour, 1999, p. 5). While ANT has been critiqued for elevating non-humans to the status of network members, this stance is becoming less unthinkable with the increasing integration of artificial intelligence (AI) into multiple systems used by humans (Arantes, 2023).

Educational researchers are accustomed to paying close attention to people—their learning and teaching behaviors, interactions, and beliefs. ANT asks us to look at the nonhuman elements in each situation and to think about what is being achieved by and through them (citation withheld). An early example is Clark's analysis of the adult education program Skills for Life in the UK (Clark, 2002). Clark utilizes the ANT concept of "enrolment" which is concerned with how network builders, such as the UK Department of Education in this case, attempt to recruit actors to the network, including individuals, organizations, and non-humans. Enrolment requires all these actors to be "transformed into manageable entities …," a process which can be fraught with complications that threaten both the smooth operation and the optimistic narrative regarding the innovation (Clark, 2002, p. 117).

Educational policy formation and implementation has been analyzed using ANT by Fenwick (Fenwick, 2011; Fenwick & Edwards, 2014). Such research has revealed that processes of network building and recruitment "'act to exclude, invite, and regulate particular forms of participation" (Fenwick. 2011b, p 721). While terms such as "invite" are often considered linked to social processes between humans, increasingly humans receive invitations mediated through, and even directly from, technological actors. A critical perspective attuned to power relations is also necessary to considering socio-technical actor-networks, as to human social relationships.

Since its emergence, ANT has been interested in deconstructing claims of scientific and technological innovation, to show the often-downplayed complexities involved when humans and non-humans form associations and negotiate with each other to get things done (Latour, 2005). In this respect, the distinction between *diffusion* and *translation* is particularly relevant (Latour, 1986). In the former model, the program, innovation, or tool "does not have to be explained"; instead, the goal is to implement it, as is (Latour, 1986, p. 266). When complications arise, explanations focus on the "slowing down or the acceleration … which results from the action or reactions of other people" (Latour, 1986, op. cit.). This kind of argument is echoed when teachers are accused of resisting change. The translation model, however, assumes that "the spread in time and space of anything—claims, orders, artefacts, goods—is in the hands of people" and, in this chain or network, "everyone shapes it according to their different projects" (Op. cit, pp 267 & 268). While

Latour (1986) here refers to human actors, he later made clear that non-human (e.g. digital) entities can also shape a process or program.

Importantly, the actor network in ANT is not the same as a computer network, or a technical network which is "strategically organized"; rather "it may be local, it may have no compulsory paths, no strategically positioned nodes" (Latour, p. 1996, p. 369). This inclusion of the local and contingent means that ANT can potentially assist researchers to better understand both the community and the system level of activities, such as school-home interactions.

## The Project

This case study investigates the views and experiences of parents in a culturally and linguistically diverse school community regarding their and their children's interactions with digital technology. It is part of a larger study of digitally mediated ecologies of schools, students, and families (citations withheld for review). This project employed a multiple case study methodology, in which schools and their communities were constituted as cases through which to explore the impacts of digitalization of home-school interaction. Phase 1 of the project involved interviews with Year 5 children in which a network mapping activity was used, but this aspect is not discussed in this paper (Neumann et al, 2022; Soong et al 2024).

The case of Hakea, which is featured in this paper, is one in which a specific digital LMS—Seesaw—has been implemented in a school serving a highly culturally and linguistically diverse community. The makers of this LMS have made specific claims about improving parent involvement and inclusion in linguistically diverse school communities. This case study examines such potential from the perspectives of parents and teachers, and the findings contribute to the field of sociocultural studies of digital involvement and further the cause of digital equity. This case study analysis is guided by the following three research questions:

- How do families in a culturally and linguistically diverse community orient themselves to digital technology in general and specifically in relation to children's education?
- How do families' cultural and linguistic resources impact on their interactions with digital technology in general and specifically in relation to children's education?
- How does a digital learning management system impact on teachers' enactments of, and families experiences of, digital inclusion and exclusion in a school serving a highly culturally and linguistically diverse community?

### The Focus School

Located in the northern side of Adelaide, Hakea Primary caters to a diverse linguistically and culturally diverse local community, and 53% of its children come from English as an additional language or dialect (EAL/D) backgrounds. Over 27 languages and/or dialects are spoken by students and their families, including Bhutanese Nepali, Khmer, Arabic, Hazaraghi, Dari, Russian, and Italian (school's website). This diversity reflects the attraction of the neighborhood for immigrant and refugee families.

Hakea Primary school has a strong sense of community and values the diversities of cultures, languages, and experiences of their students and families as a source of strength and knowledge. One of the key challenges the school faces is the rising effects of compounding economic disadvantage due to long-term unemployment, and as a result, many students have experienced complex vulnerabilities and additional needs. The Northern Plains (pseudonym) council district, in which Hakea is located, is considered socially disadvantaged, based on statistical comparison with the rest of the state and country. The district has more citizens in working-class jobs, fewer with tertiary education, fewer homeowners, and fewer families where both parents are working (Australian Bureau of Statistics, 2021). Nonetheless, the Hakea school community remains resilient and committed to ensuring the students are provided with opportunities to achieve their full potential.

While Hakea has integrated digital technology into its teaching and learning, this integration was less evident during the COVID-19 pandemic compared to schools serving more advantaged communities. Since Hakea school leaders could not assume families' ability to provide sufficient digital devices, Internet access, or parental supervision, they implemented a hard copy homework pack. This option was how many of the children in our study continued their education during the period of school lockdown.

**Recruitment**

All parents whose children had been involved in Phase 1 were invited to participate, as presented in Table 1. All those agreeing to participate were invited to be interviewed. Since this group was a small number, no willing participant was excluded from the case study phase. From Hakea Primary, six parents were recruited, and four of them were fathers and all were from immigrant families. Parent information was provided in two community languages in addition to English, and recruitment was supported by bilingual school services officers (BSSOs) who assist parents to navigate school information. All parent interviews were undertaken with an interpreter to enable parents to express themselves more fully in their stronger language. Six educators were also interviewed: five teachers of two Year 5 classes, and the digital learning coordinator.

**Table 1**

*Hakea Parent and Teacher Participants*

| **Parent** | **Background** | **Language** | **Child's teacher** |
|---|---|---|---|
| Shoaib | Syrian | Arabic | David |
| Leki | Bhutanese | Nepali | Lisa |
| Haleema | Syrian | Arabic | Amber and Jay |
| Ibrahim | Syrian | Arabic | |
| Penjor | Bhutanese | Nepali | |
| Mariana | Iranian | Farsi | Bradley |
| | | | Digital Learning Coordinator: Damien |

**Interviews**

The parent interview was designed to address a range of topics that have emerged as significant in the literature, but which are rarely covered in a single study. Interviewers asked the parent whether their child was "into" digital technology and about the parents' own digital technology practices. The interviews explored the parents' views about digital technology in children's education, as well as experiences of digitally mediated home-school communication. The parents were also asked about their experiences linked to home-based learning during the COVID-19 school lockdowns.

The interview questions were carefully worded to avoid communicating any sense of a preferred or "right" approach to the use of digital technologies. We deliberately avoided taking a risk-based focus, as this is often associated with parent-blaming (Jackson & Mannix, 2004). Communicating perceived judgement, particularly when participants are members of a marginalized group, can create discomfort and hesitation to share experiences. The interviews were semi-structured, so if parents' responses appeared to be at a tangent from the original question, the researchers assumed this was due to a valid reason and did not deflect. Educational personnel were asked about their use of digital technology in their work, whether and how their interactions with parents were mediated by digital technology, and whether they had ever offered or been asked to assist parents with school-related technology.

### Analysis

Three rounds of analysis were undertaken on the interview data. First, data from all three schools was coded according to categories incorporated into the questions, and this coding system was then elaborated to identify sub-themes related to initial *a priori* categories. For instance, under the theme "views about digital technology in schools," the sub-themes "resignation" and "lack of awareness" were identified, amongst others. Second, cross-site analysis was undertaken from which emerged commonalities in parents' views and experiences across all three school communities, as well as aspects which were distinctive to a particular site. Hakea was distinctive in several respects related to the cultural and linguistic character of its community.

The third round of analysis, specific to Hakea, was a network mapping exercise focused on the use of Seesaw from the perspective of teachers and parents. This analysis took up Actor Network Theory in incorporating both human and non-human actors, and examining connections, disconnections, diversions, and the passage of resources around the network (Fenwick, 2011; Gourlay, 2015; Latour, 1999). Based on his analysis of the practices involved in scientific innovation, Latour argued, "[… ] transformations undergone by actors are of crucial importance to us when we follow innovations, because they reveal that the unified actor ... is itself an association made up of elements which can be redistributed" (1990, p. 109).

To "open the black box" (ibid.) of Seesaw's operation at Hakea, we examined what teachers and parents had to say about their attempts (successful or unsuccessful) to use the application, what they did when they were unable to do so, and circumstances in which they decided to instead utilize a different method for communicating or interacting with others in the network. We also noted all the non-human entities involved in these processes, including digital devices (e.g., phones, laptops), applications (e.g., email), and other materials (e.g., hard copies).

As experiences were documented from transcripts, connections were mapped onto an evolving "Seesaw system" diagram. Once all relevant material was exhausted and the diagram was finalized, pathways, switch points, and disconnections became visible. At a "switch point," one pathway becomes impassable and another route is taken. First, the findings about parents' use and views of technology and teachers' perspectives on parents' digital involvement are reported. Then, the place of Seesaw in home-school communications at Hakea is discussed.

## Findings

### Parents' Uses of and Views on Technology

The six parent participants from Hakea were actively engaged in digitized ecologies and networks of everyday life. Mobile phones were the main device for digital connectivity; all reported that they had a mobile phone. One parent stated that they had access to a computer and two mentioned having a television.

The interviews provided insights into the multiplicity of digital tools (devices and apps) employed by the parents and the uses to which they were put. Haleema spoke through an interpreter about the activities she undertook using digital technology:

> Interpreter: She mostly uses the phone for calls and to pay bills and to see shopping offers… she's paying, for example, electricity bills. And to see what is available in shopping centers. And mostly to contact family.
> Interviewer: Overseas?
> Interpreter: Yeah.
> Interviewer: So just she makes phone calls or through WhatsApp, like, uh?
> Interpreter: Uh, it depends on the, on each person and which place he is in, but sometimes WhatsApp, Messenger, Facebook

Haleema was a particularly active digital user. Other participants named fewer and sometimes different apps. However, the sense that digital technology is integral to the participant's personal life, which is true for Haleema, is found across the Hakea data sub-set. This link to digital technology is illustrated by Haleema's response to a question about whether she uses technology for daily tasks, and the interpreter noted, "She cannot stay without her phone".

Other uses of digital technology mentioned by the parents included watching videos for entertainment either in their home language or in English—sometimes alongside their children as well as connecting with family and friends locally, for example to know their children's whereabouts.

Every one of the parents was active on social media—specifically Facebook— with some making use of Instagram and Messenger. Four of the parents said they viewed media digitally, naming YouTube and TikTok as their tools. Three of the parents spoke of making "calls" and also about being on WhatsApp. Google Text, Viber, Facetime and Imo were mentioned, as was online shopping. In short, digital tools, accessed primarily on mobile phones, were integral to the personal lives of the Hakea parents.

**Parents' Observations of Children as Technology Users**

The Hakea parents observed that the technological basis of childhood had changed. When asked whether his daughter was "into technology," Shoaib replied, "They are the generation of technology." The interpreter conveyed his response as follows based on a request for elaboration:

> Fatima using laptop almost seven hours a day. And, uh, television almost from one to two hours. And, uh, mobile, but not that much. And, uh, he's mentioning about laptop at school from two to three hours.

This sentiment resonated across the Hakea data sub-set. Ibrahim spoke of his son "being raised with technology" unlike himself, who acquired his first phone at age 30. By Ibrahim's estimation, his son spent at least a quarter of the day using technology, "the least amount of time to play with his technological tools, almost six hours." Haleema likewise contrasted her own experience with that of her child. The interpreter conveyed that "here, the technology is more embedded in children's lives and she's comparing that with her own life where she's saying that she got married and she was not having a phone". Drawing a contrast with herself, Mariana spoke of her daughter being "in the environment" of technology.

In describing the difference between their own experience with technology and that of their children, the parents signaled more than generational difference. There was a strong sense of social difference. Penjor was explicit about this. Asked if he had anything more to say, he drew attention to the differences in the material conditions in which he and his son had been raised: "I was brought up in the refugee camp so we—we don't have anything there… I don't have all the background of technology."

The Hakea parents described what they considered to be the limitations of their digital competences. Mariana said that people like her who had not grown up with technology "don't know how to use it" while her daughter "knows how to use a computer" and was able to help "find me something in my phone." Ibrahim spoke similarly of his son assisting him with Google searches for shopping, paying water and electricity bills online, checking the television guide, and using online banking. This assistance was not just technological but linguistic, because many of the sites and resources were in English. Haleema appreciated her children's competence and assistance: "it is a very good, especially that children are teaching adults… she's giving examples about buying things online. That is something that she learns from her children." Children were an important family resource, supporting parents' technological learning and progress.

### Parents Mediating Children's Technology Use

Although learning about digital technology from their children, the Hakea parents still acted to shape and mediate their children's everyday digital experience. The interpreter conveyed Haleema's approach as follows:

> She is presenting that she is knowledgeable about it… She knows that her children are [more] knowledgeable than her in using technology, but also, she's presenting herself as knowledgeable, and the children need to have boundaries.

For example, Haleema discourages her children from watching violence, instead encouraging them to "watch something which is good." She described herself as "one of the mothers who will be checking the phones of her children every day and… who they were calling and with whom they were contacting or sending [messages to]" Given the TikTok videos he had seen on Facebook, Leki likewise said that he "regularly check his [daughter's] Tik Tok" for "bad videos or bad TikTok [content]." Shoaib also noted that his daughter's mother had insisted on Roblox being deleted because "there was like paedophiles" and "she was like getting asked questions by random strangers."

In addition, some parents set screen time limits. Mariana said that "we allow him … to play with the game or use the iPad only one hour a day… during the week, and three hours a day… on weekends." Penjor made similar comments about his son, stating that "if I think it is too much to play with the digital, then I just take him out [to visit people]." Leki delegated his older son with the task of ensuring that his younger son, Tika, was doing his schoolwork and not only playing online, and mentioned "his brother is solely responsible for that, so he set the time." Ibrahim, in contrast, "did not give any kind of restriction" on his son's screentime "even if he would want to spend 24 hours with the technology, is, is fine since he's learning something beneficial and he's not just spending time on games." In summary, five of the Hakea parents played an active role in regulating their children's digital experiences.

### Parents' Experiences Interacting with the School

The analysis in this section is based on the interviews with four of the six Hakea parents. While Leki and Mariana both mentioned their interactions with teachers in response to a question about how their child was going at school, neither interview provided the necessary details for the analysis. Shoaib, Haleema, and Ibrahim were all explicitly asked whether they as a parent needed to access any specific technologies or platforms, such as Seesaw. All three provided an account of their experience with this LMS.

Ibrahim was uncertain about what the name of the LMS was. In the interpreter's words, "he didn't also remember exactly what is the name of the application." However, he mentioned that parents needed to download the LMS and also received links to it by SMS when the school wanted the parents to access content. By his appraisal, the LMS "is not something beneficial because it is in English," which, as the interpreter explained, was the "main reason behind that they're not downloading it, because it's not in Arabic." As noted earlier, Seesaw has a translation function that enables messages to be sent in dozens of languages and this feature is highlighted in Seesaw's marketing. Ibrahim was pre-literate in Arabic. Even if the written texts sent out by the school were translated into the languages of the home, written communication would not be sufficient to ensure school-home connection at Hakea. This finding highlights that parental literacy needs to be considered alongside the language of the home and digital competence.

In contrast to Ibrahim, Haleema, Shoaib, and Penjor had all downloaded the LMS. As stated by the interpreter, Shoaib said that "when he received it [the regular links from the school to Seesaw], he will check it, but he doesn't know how to reply because it is all in English." Nonetheless, Shoaib had a strategy for interacting with his daughter, Fatima, regarding the LMS. He had his eldest son translate the content on the LMS for him, and then would tell Fatima that

he had translated it himself with Google Translate. In other words, by using a traditional immigrant solution of treating a child as a language broker in transactions, Shoaib created (the illusion of) a multilingual digital fix to a monolingual problem of digitized communication between the school and home. This method seems to have enabled him to act authoritatively with his daughter as he monitored her schooling. Notably, Shoaib was a user who had skills in and experience using Google Translate. As explained by the interpreter, "he's usually using that program [Google Translate] for translating from Arabic to English, to translate any kind of SMS."

Penjor stated that he used Seesaw to assist his son, Pema, with his schoolwork: "I have what I downloaded for the school, so whatever the work Pema has to do, they send through SMS, so text, so yeah, just I am accessing it, and help Pema to do" Penjor did not indicate that he experienced any difficulties in this regard.

In contrast, although Haleema had downloaded the app, she rarely clicked on the links sent by the school. Through the interpreter, she explained that "everything that was sent in Seesaw, her child will bring as a handout." Therefore, Haleema relied on the print alternative to Seesaw. The printout was similar to a preschool newsletter with its mix of photographs and descriptions of the children's activity. However, the printout was sent home once a term whereas Seesaw notifications were much more frequent, with some teachers sending daily updates. Despite engaging with Seesaw, Shoaib also made use of the printout. Other alternatives to communication through Seesaw, utilized by all four parents were voice "calls" and face-to-face interaction.

These traditional means of contacting parents were more amenable to the use of translators than the digital system appeared to be. The school's multilingual support staff assisted with the translation of direct messages received by parents on their phones. In Ibrahim's experience, when "there is something sensitive or important, they will send it [a message] Arabic" by SMS. Such messages were sent by an Arabic-speaking "teacher" when a child took ill at school, or the school was to be closed the next day. Haleema made similar points. She said that while "everything from school is in English," nonetheless, "if there are something that is very important … the teacher who is speaking Arabic will contact them." Haleema's example was a call in Arabic to set up the interview for this study.

Finally, Shoaib spoke at length about a series of Friday meetings in which the school provided some settlement services for families newly arrived in Australia. These meetings provided opportunities for learning English, for instance, by taking guided excursions into the local community, such as to a coffee shop and the zoo. More recently, the school had begun using WhatsApp in services "for the whole families," especially those who attended the Friday meetings. Shoaib spoke of this approvingly, indicating that when he had been unable to attend the last two Friday meetings, he had been able to use WhatsApp to let the school know. Shoaib also indicated that the school had given newly arrived parents help with the "many mails in English … in their mailbox." Parents were invited to "bring those mail to the school" on specified days, and "some teachers help the parents with filling the forms." These are traditional means by which schools in multilingual communities in Australia reach out to families. However, it is notable that there had been some digitization of these activities, by utilizing WhatsApp, suggesting that even traditional communication methods were incorporating digital resources.

### Teachers' Perspectives on Parents' Digital Involvement

When Hakea teachers were asked about how they connected with parents, they all mentioned Seesaw immediately. Seesaw was described as the main system for communicating with parents, as well as for undertaking multiple teaching and administrative functions. The enthusiasm of school management for the app was indicated by the school's IT coordinator, Damien: "We kind of threw a blanket rule over it and said 'this year everyone is going to use Seesaw.'" The teachers referred to Seesaw as "the main app that's used" (John), and "the only main one that I use" (Lisa), indicating that the push to use the app had been successful.

Hakea teachers saw Seesaw as offering many potential advantages to engaging parents. John appreciated that he could "message [parents] instantly, share photos and videos [and] communicate in a digital way … it works really well." Lisa echoed these comments: "I can post things that either particular parents I've selected or all parents can see." Amber spoke of "posting positive things on Seesaw and things to engage the families, whether it's student work or what they've done that was really kind that day."

However, teachers were also frank that actual take-up was less than they had hoped. For example, Lisa estimated that "maybe a third" of her students' parents used the app. John said "probably about seven families that really actively engage in it with me." Amber regretted that compelling parents to use the app was impossible: "Unfortunately, it is up to the family whether or not they respond or communicate." Lisa also mentioned that Seesaw operated as a place for teachers to merely "post things," and this level of activity seemed to discharge their responsibility for communicating with parents regarding basic administrative issues and class activities.

The teachers were also aware that the school's community included many immigrant families and that English was not the first language in many homes. Bradley acknowledged that parents were "not [from] a strong English-speaking background." He knew these parents did not use Seesaw, though he had clearly asked them to use the app. Bradley noted, "Families have told me, 'We looked at it. Like its nice.'" Such a response indicates that the parents attempted to give a polite response regarding an official school system that was not serving their needs.

Lisa attempted to cater to the parents' English proficiency by adapting her communication approach. She highlighted that "rather than, you know, creating big long spiels of written text, like I'll post lots of pictures of things, or like diagrams and things like that. Or try and keep text very short." Notably, Lisa had more success with parents joining and becoming active on Seesaw: around 18 of 22 families in her class participated in some way. This proportion indicates that reducing the English language processing burden supports parents' comprehension and engagement.

Children were inevitably drawn into the interaction between the school and their parents. Indeed, IT coordinator Damien spoke of the importance of "getting the students on board" in supporting parents' engagement with Seesaw. Children's services as translators appeared to be a given. Lisa said her students would "work out what I've written". This implied that children might be deciding whether communication would be passed on to their parents. In support of this impression, Bradley reported he would say to students: "Just if you want to, read it to your parent" (Bradley). This quote suggests that children might not be simply "reading" (translating) messages to their parents but also serving as the decision-makers in place of their parents, and this practice was acceptable to teachers.

Concerningly, it appears that when parents took the initiative of asking for assistance, the teachers perceived such requests as evidence of their lack of competence. As an example, Amber mentioned one occasion when she posted a link to an education department website on Seesaw and one parent asked, "How do I navigate the website?" Amber commented, "So, I mean like, it was the most easiest website to access and to navigate. … I have the skills to be able to navigate it, she clearly doesn't." The possibility that a teacher's "skills" were linked to familiarity with the language and structures of official educational discourse was not considered.

Moreover, parents' concerns about data privacy were dismissed by Bradley. He noted that "[S]ome of them thought the QR code was a government thing and blah blah blah … So they're not going to bother. Lovely parents, but it's just, that's the issue they're having." Parents' skills and experience in using digital technology in their daily lives, which were revealed in the parent interviews, did not seem to be visible to teachers.

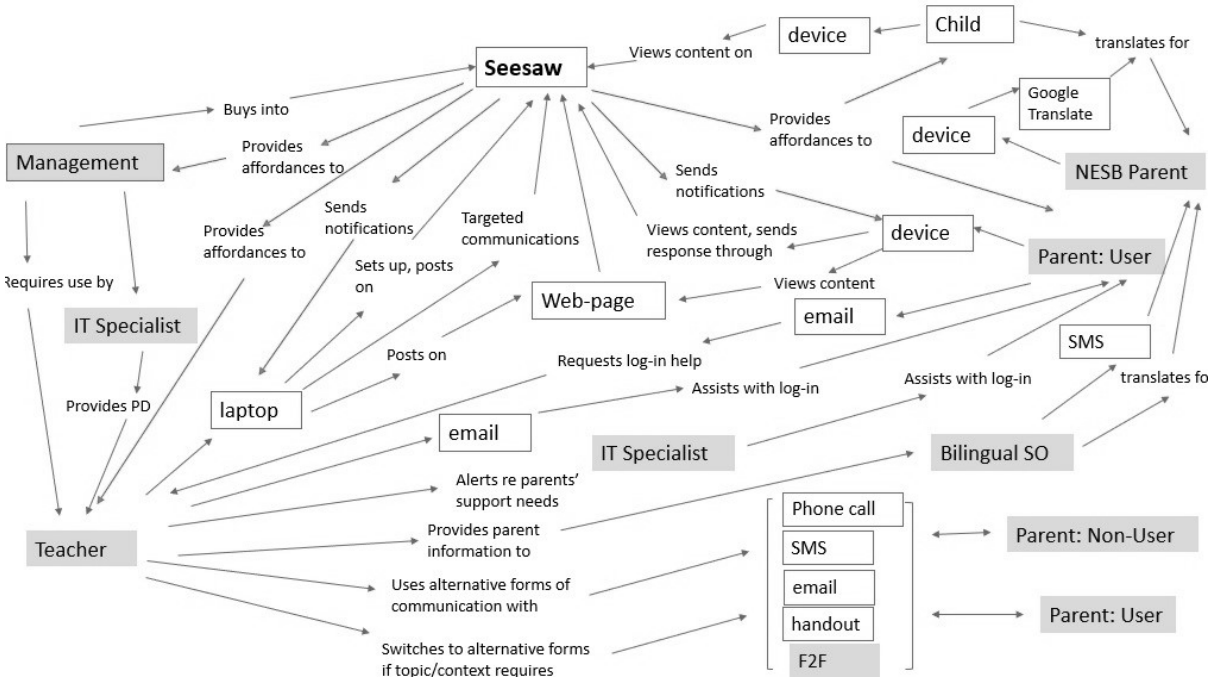
**The Seesaw Network**

Based on analysis of the interviews, in which every actor, action, and resource was identified, a snapshot map of the Seesaw network was produced. This map is not an exhaustive and definitive representation of every potential or actual interaction in the network, but it enables

a visual appreciation of the complexity of this system in action. Furthermore, the picture it creates is considerably different from the marketing descriptions of digital learning management systems. In the network diagrams, white boxes with black outlines represent non-human entities, which may be digital (e.g., apps, devices) or non-digital (e.g., printouts). Boxes filled in with grey and no outlines represent human participants, including educational personnel, parents, and children. Arrows indicate active connections between participants, whether human or non-human, as described by the interviewees.

Figure 1 represents a snapshot of the whole Seesaw network based on the available data. Figure 2 is the segment of this network most relevant to those parents for whom English was not their primary language, which was the case for all the study's parent participants. This group is referred to as non-English-speaking background (NESB) parents, rather than as a designation that refers to cultural difference or immigrant status because language emerged as a key factor that produced different experiences linked to the Seesaw network.

**Figure 1**
*Seesaw Network*

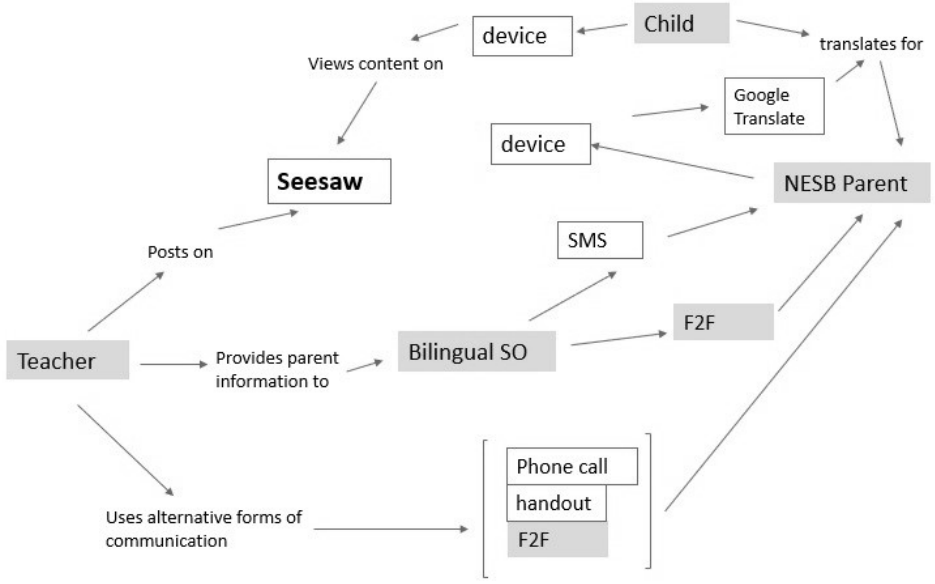



According to the participants, looking at the entire Seesaw network is a bewildering experience; any claimed simplicity of operation indicated in the promotional materials, is not an accurate description of what parents experienced in practice. Despite being promoted as a single solution to address multiple needs of a school, Seesaw does not operate alone. Rather, it relies on access to digital devices by human participants and to specific processes (such as registration and log-in) to enable interaction by humans with Seesaw. For instance, pathways exist from parents to teachers and the IT specialist who requests and receives log-in help. Requests for help are sent through emails and SMS, showing that the implementation of Seesaw relies on a supporting techno-social ecology.

Seesaw, despite its advantages, is insufficient to provide for the needs of participants. While educators continue to add content to the Seesaw platform so that it can be available to parents, they also maintain a suite of alternative communication processes for when Seesaw does not reach its target audience. Following the pathway from the teacher, these alternatives are bracketed together: phone calls, SMS messages, emails, hard copy print handouts, and face-to-face meetings.

These diverse practices are needed not just for parents who do not access Seesaw, but also for occasions when the issue to be addressed makes digital communication an unsuitable choice. For instance, the teacher may need to discuss a child's behavior with the parents, which educators consider as more appropriate for an in-person meeting if possible.

**Figure 2**
*NESB Parent Seesaw Relay*




The presence of NESB parents within the network necessitates a range of workarounds and diversions actioned by different participants (see Figure 2). To render communications comprehensible by parents, many players must be added to the network, including translation apps, bilingual children, and the bilingual school services officer. This complication inevitably creates delays in the parent's reception of the information contained in the message sent by the school. This more complicated relay challenges the representation of Seesaw and similar apps as enabling instantaneous communication.

## Conclusion

Commercial providers of digital tools promise to enable enhanced connections between schools and parents, especially in linguistically and culturally diverse communities, with features such as translation functions and mobile apps. Seesaw, the recently implemented LMS at Hakea, exemplifies such a system. This study explored the impact of this digital technology on school-home connectivity in the Hakea community. The study was conducted from an ANT perspective that enabled fine-grained attention to the particularity of digital and other connections between school personnel and parents. The findings pointed to the heterogeneity of school-home connections at Hakea; Furthermore, they provided a nuanced understanding of the digital connectivities between human and non-human actors that serve several purposes crucial for reducing the digital divide between socially disadvantaged and advantaged groups.

The Use of an LMS for School-home Connectivity in a Linguistically Diverse Community
This analysis provides a snapshot of aspects of the transnational and multilingual digital lives of the parents. It also highlights the positive value parents placed on digital technology as a tool for their children's learning. However, the parents perceived a generational and social gap between them and their children. To some extent, this context might explain why some were apprehensive about their children's screen time and sought to have more control over what their children were consuming and producing digitally. The parents were also pro-active in monitoring and making

connections with their children's digital activities. However, there was heterogeneity even within this small group of parents in this regard, with one parent trusting that their child was using their unlimited screen time for learning.

The study provided insights into the sustained monolingual problem of digitized school-home communication confronted by parents such as the participants in the study. This analysis shows that the existence of English-only written communications from the school—in an LMS with translation functions for dozens of languages—prompted different responses from the participants. Older children and (feigned) use of tools such as Google Translate became part of these actors' networks. However, not all those who used the LMS created such a network. Moreover, using the LMS did not preclude the print-and-paper communications provided by the school being incorporated into a parent's network.

The findings about teacher perceptions of NESB parents' digital capabilities resonate with the study of Pavlakis et al. (2019). These researchers found that teachers in a technologically advanced school conflated the language barriers that Latinx parents faced with being "digitally limited"; in turn, these teachers underestimated the parents' digital capabilities. The monolingual English-speaking teachers failed to recognize the digital capabilities of parents in everyday digital transnational connections in a culturally and linguistically diverse community. This deficit perspective can lead to a misalignment between teachers' views of parents' digital engagement and the actual nature of their everyday digital capabilities. Such misalignment is further complicated and overlooked when teachers do not consider the limitations of how they make use of digital tools and how the parents may not use the translation function of the LMS in use at Hakea.

Based on the findings, connecting with parents should not be solely reliant on an LMS; rather, coupling the use of an LMS with a pedagogy of "authentic" dialogue holds considerable value (Goodall, 2018). Such a pedagogy is co-creative and requires that relationships be formed with the parents of different learners. Through such relationships, the multilingual and transnational digital lives of parents might become visible to school personnel, along with parents' digital support of and aspirations for their children. This approach is a means of developing alternatives to deficit representations of the capabilities of parents in digitized home-school connections.

## The Potential of Actor Network Theory for Understanding Digitization of School-Home Connectivity

Theoretically, the use of Actor Network Theory (ANT) does help explain parents' digital engagement, and our Seesaw network analysis harmonizes findings from previous studies with the theory. The Seesaw network analysis shows how humans and non-humans are necessary network actors. However human actors are not only those that the digital system assumes and caters for. This study shows how some parents had to resort to other human actors (e.g., their older children or the school's bilingual liaison officers) to provide extra support that the LMS fails to provide. By expanding Fox's (2005) concept of a techno-social system, this study investigated the shortcomings of perceiving Seesaw as a "unified actor" (op. cit.) in facilitating digital engagements and connections between parents and teachers. Additionally, school personnel continued to bring non-digital human actors (e.g., the printed newsletters) into networks with parents who relied on these as alternatives or complements to the LMS. These networks in all their complexity, fragility, and even unexpectedness, trace translations through the hands of multiple human and non-human actors (Latour, 2005) in the Hakea school and its community. This context raises the question of how school personnel might act in the interest of enhanced equity in these processes.

The theorization and mapping determined from this study has several strengths in this regard. First, the qualitative analysis provides new perspectives in a research field that is increasingly focused on "non-human" actors. Second, the mapping integrates the fields of sociocultural studies of digital involvement and digital network analysis to promote digital equity. Such type of equity is proposed by Goodall's work (2018), which builds on Freire's (1994) critique of the current schooling system. Third, the identification of human and non-human participants

within the Seesaw LMS operation can help identify appropriate initiatives that teachers can adopt to better connect with parents. This approach is seen in Lisa's example of reaching out to her students' parents through the LMS. What else might teachers do if the parents were visible to them as actors in complex human and non-human networks? How might they leverage the potential actions of the non-human actors—in this case an LMS—differently? How might they make account of the non-digital non-human actors in these networks? What might they strengthen or add?

To conclude, the practical value of parental digital engagement to support children's learning rests on what theory-rich notions such as "digital connectivity" and "authentic dialogue" mean to teachers in practice. This understanding concerns the individual development of students in culturally and linguistically diverse school communities. More broadly, it concerns the "transformations undergone by actors" argued for by Latour (1990, p. 109). Of particular interest is whether these transformations enable a reduction of the digital divide between the socially disadvantaged and advantaged. However, the social and educational gaps in contemporary societies are unlikely to be solved through existing structures and practices that led us to the *status quo*. Therefore, school systems need to remain aware of claims that an LMS can improve parent involvement in schooling. It might render such success—but that is dependent to a considerable extent on the other actors in the network around the LMS and how they use the affordances of the LMS. Future research should articulate a *critical* perspective that explores the potential of authentic dialogue (Goodall, 2018) within the field of sociocultural studies of digital involvement and parental-teacher engagement more fully.

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