



Using technology to facilitate partnerships between schools and Indigenous parents: A narrative review

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Abstract

Technological advances have the potential to support educational partnerships between schools and parents. While the positive benefits of technology for these partnerships have been reported in the literature, there is still incomprehension about how to best use this technology to meet the needs of Indigenous parents. Given the intergenerational impacts of colonisation, socioeconomic stress, structural barriers in schooling, and other critical challenges experienced by Indigenous parents, the use of technology as a tool for partnering with Indigenous parents requires careful consideration of their experiences. Therefore, the aim of this narrative review was to describe key attributes of the use of technology in home-school partnerships with Indigenous parents. Findings revealed that technology integration was beneficial to increasing Indigenous parental engagement, as it was connected to the wellbeing and future of Indigenous young generations. However, it could also exacerbate divide, raise cultural tensions, and bring undesirable consequences. Therefore, as a practical implication, schools should embed culturally appropriate approaches when adopting technology in their partnerships with Indigenous parents.

Keywords Indigenous · Indigenous parents · Parental engagement · Home-school partnerships · Technology · Digital

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1 Introduction

1.1 Technology and family-school partnerships

The benefits offered by technology have increased its use in schools. Literature has provided information on how the use of technology supports collaboration between parents and schools (Edwards-Gaura et al., 2014; Goodall, 2016; Lewin & Luckin, 2010), particularly in establishing a platform for innovative methods of communication (Patrikakou, 2016; Thompson et al., 2015). When technology was not adopted or utilised properly, family-school communication was considered “infrequent and unsystematic in most schools” (Kraft, 2016, p. 15). Integrating technology in home-school partnerships effectively facilitates bi-directional communication between schools and families (Bouffard, 2008; Lewin & Luckin, 2010).

1.2 Indigenous peoples, culture, and technology

Today, within Indigenous societies, a divide exists between those who perceive the use of technology and the Internet as an opportunity and those who regard it as a threat to the existence and dignity of Indigenous peoples (Hershey, 2009). The perception of using technology is influenced by the experience of colonialism and the efforts of Indigenous communities to maintain their dignity and cultures (Hamilton-Pearce, 2009). Those who consider technology to be a benefit to Indigenous peoples argue that technology has opened up new opportunities to enhance their standard of living (Lakhan & Laxman, 2018; Salazar, 2007), preserve and promote Indigenous cultural diversity (Ovide & García-peñalvo, 2016). Indigenous knowledge, which has been traditionally held by elders, can now be transferred into new and exciting digital materials for local communities, particularly for the younger generation (Kirmayer et al., 2009).

On the other hand, the counter-narrative considers technology merely a sophisticated tool designed precisely for the new wave of colonisation (Hershey, 2009). If Indigenous peoples are not in control of decisions about the use of technology, then technology is only benefiting the capitalists of the dominant modern society who reap the benefits from them (Kamira, 2007). Since the arrival of Western/European explorers in Indigenous lands, who now hold the dominant influence in society, negative stereotypes about Indigenous peoples have existed. Technology and the Internet have contributed to perpetuating these stereotypes (Hamilton-Pearce, 2009), in which Indigenous people are portrayed as the agonistic menace of the modern society (Casumbal-Salazar, 2017). Moreover, technology has been used to modify Indigenous culture, history, and language by those who have power (Casumbal-Salazar, 2017; Salazar, 2007).

2 Theories and approaches

This study contextualised decolonising theory and a continuum of culturally responsive practices as theoretical lenses to guide data interpretation and analysis. These approaches offer a promising strategy for improving education among

Indigenous communities and possibilities for sociocultural-educational services (Castagno & Brayboy, 2008; Davies, 2021). By prioritising authentic opportunities, educational equity frameworks become more firmly rooted in Indigenous community capability building, shifting power from Western-European hegemony to the Indigenous relational process which entails power-sharing among all parties (Barkaskas & Gladwin, 2021; Moodie, 2018).

Decolonising refers to a process to reverse colonisation (Hoon & Chung, 2019). It exposes the control of the colonial matrix of power, the politics of dominant knowledge construction, and the shadows of oppressing governance (Barkaskas & Gladwin, 2021). In educational research, decolonising theory supports Indigenous methodological contributions to interrupt the knowledge-power dialectic by centralising Indigenous narratives (Moodie, 2018). Epistemologically, decolonising conceptualisation eliminates sociocultural beliefs and global perspectives that devalue the Indigenous community's worldviews and knowledge (Barkaskas & Gladwin, 2021).

As colonial influences appear in schools, decolonising is also regarded as urgent to promote Indigenous education (Sianturi, Chiang, et al., 2022; Tuck et al., 2014). Decolonising education has a role in mitigating colonial impacts on educational systems to ensure Indigenous futurity (Tuck et al., 2014). Given those colonial education systems have left traces of oppression and assimilation, decolonising education involves resolutions for those who were harmed and lost their Indigenous culture due to colonial policies (Hoon & Chung, 2019; Tuck et al., 2014). As a cornerstone of decolonising education, relationality can stimulate empathy, trust, respect, and reciprocal sharing and learning (Barkaskas & Gladwin, 2021; Moodie, 2018) when establishing school partnerships (Garcia, 2014).

Culturally responsive practice is a way of allowing this relationality (Allen & Steed, 2016; Bishop et al., 2021; Sianturi, Chiang, et al., 2022). Cultural responsiveness implies respectful interactions with an individual or a group of people from a different culture (Green et al., 2016) in a multicultural and antiracist environment (Mayfield & Garrison-Wade, 2015). In family-school partnerships, culturally responsive practices highlight “working with rather than working on” (Munns et al., 2018, p. 440). Indigenous families will appreciate teachers' efforts to establish genuinely collaborative relationships with them (Allen & Steed, 2016), through culturally responsive communication. Such communication starts with proactively listening to Indigenous families' voices to allow schools to understand the Indigenous parents' cultures and experiences (Goodwin & King, 2002).

Recently, many schools have adopted technology in home-school partnerships. However, the emergence of the technology divide and the misuse of technology against Indigenous communities often bring significant challenges in integrating it into such collaborations. With the advent of the digital age, coloniality has become more prevalent (Bon et al., 2022; Cruz, 2021) argues that in this case, decolonising is also crucial. Decolonising technology opens new paths for responsible and socially sensitive knowledge production and ethical technology integration, thereby contributing to greater equality and reducing the misuse of technology against local communities (Bon et al., 2022). It highlights the need for collaborative work, requires a reorientated and contextualised approach that roots in local cultures, and shows respect for a local agency, as a strategy to maximise technology's benefits (Bon et al., 2022; Cruz, 2021; Gumbo, 2019).

2.1 The aim of the study

Although studies have examined how technology supports school partnerships, its use as a tool for partnering with Indigenous parents requires careful consideration from multiple perspectives. In addition, notes from the literature describing the consequences of colonial educational policy and structural barriers in schooling experienced by Indigenous families (see Sianturi, Lee, et al., 2022, for details) need to be considered. Thus, this review aimed to provide insights on how technology can be utilised to increase Indigenous parents' engagement in their children's education.

3 Methodology

The first author who led this review is an Indigenous researcher with over seven years of working with Indigenous communities and a former teacher with no parenting experience. This stance could be potentially biased on social and cultural grounds. Hence, guidance from co-researchers who have worked with parents from diverse cultural backgrounds enabled a comprehensive understanding of the issue.

3.1 Search strategy and data source

This study was comprehensive and therefore it required the flexibility of a narrative review. A narrative review helps present a broad literature coverage and provides flexible options about the inclusion of evidence to deal with evolving knowledge, concepts, controversy, and historical views (Byrne, 2016). Although a narrative review takes less rigorous methodological approaches than a systematic review (Jahan et al., 2016), this study adopted a narrative review approach because “the narrative thread could be lost in the strict rules of a systematic review” (Collins & Fauser, 2005, p.103). We also adopted some of the strengths of a systematic review, such as arranging specified search, selection, and analysis procedures. “By drawing from the rigor of systematic review”, a narrative review could provide the best possible contributions to the body of knowledge while also meeting readers' values and diverse needs (Byrne, 2016; Collins & Fauser, 2005, p. 104).

The literature search was conducted through online databases: ProQuest, A+Education, ScienceDirect, ERIC, Google and Google Scholar, specific journal websites, and citation chaining. All search strategies considered scholarly articles and grey literature reports, including working papers, theses, research reports, conference proceedings, and reports produced by academics or government agencies published between 2001 and March 2022 (considering the rapid changes in technology itself). Search term strategies contained combinations of the following terms: (indigen* OR aborigin* OR “native people” OR “native Americans” OR Māori OR Inuit* OR metis OR “first nations” OR “first Australians”); (engag* OR involv* OR partner* OR collaborat* OR participat* OR “work with” OR “works with”); (educat* OR school* OR classroom OR achievement* OR performance* OR attainment* OR attendance OR retention OR behav*); (famil* OR parent* OR

mother* OR father* OR carer*); (technology OR digital OR “mobile device” OR “mobile devices” OR online OR Internet OR computer* OR “social media”). After the search was complete and all duplicates were removed, title and abstract screenings were undertaken using Rayyan intelligent systematic review software (Ouzzani et al., 2016). The remaining articles were brought forward for full-text screening to ensure they were relevant and addressed the review aim, based on the inclusion criteria developed. Records that were written in English and reported on the use of technology in school partnerships (from preschool to high school) in both informal and formal settings, were included.

3.2 Data synthesis

The 34 articles included comprised scholarly papers (26) and grey literature reports (8) across countries worldwide within different school levels (see Appendix Table 1). All eligible articles were analysed by utilising a qualitative thematic synthesis outlined by Thomas and Harden (2008). The first author employed Nvivo software to code the results of articles based on the aim of the study. The coding scheme was further reviewed by the second and the third authors to ensure the accuracy of the synthesis. Three key findings arose from the analysis: (1) the function of technology; (2) barriers and concerns; (3) enablers of parental engagement.

4 The function of technology

Several articles highlighted two essential uses of technology: to support Indigenous family-school communication (8) and engagement of parents across different school levels (21).

4.1 Supporting Indigenous family-school communication

Technology facilitated synchronous or asynchronous communication with parents, informed parents about students’ regular activities and learning progress, supported those families in need, and maintained the connection with family members. The ways digital tools were used determined the level of success in communicating with parents. Indeed, such digital tools could be a double-edged sword promoting positive and negative responses, and thus required appropriate utilisation. On one hand, contact from the school to share students’ updated activities, especially when their children were having problems, might lead parents to extend feedback about student matters (Kanaŷiaupuni & Kawaiŷaeŷa, 2008). For example, teachers in Barblett et al.’s (2020) study commented that consistent phone conversations and posts of updated activities on a Facebook group increased parents’ participation. This positive benefit of using technology is also expressed by Bouffard (2008), in which parents in general who possess access to the Internet tended to communicate with the school regularly. On the other hand, some parents felt annoyed by too many negative

phone calls and were reluctant to be involved in school programs (Landon, 2012). Hence, choosing how to deliver information to parents based on what it is about would enable better reciprocal communication. Generally, informal, proactive, and assertive communication was desirable and allowed more positive feedback from parents (Muller, 2012), but for more delicate matters, such as student misbehaviour, face-to-face communication was found to be indispensable (Muller, 2012; Sims et al., 2012).

Several families encountered many obstacles in facilitating their children's learning, and sometimes these challenges were numerous and varied and therefore required more intensive support (Benzies et al., 2011). This is as specified by Sianturi, Lee, et al. (2022), who pointed out that such family circumstances impede parental engagement. In these instances, schools put forth the effort to stay connected by phone or texting to maintain their engagement (Gerlach & Gignac, 2019). For example, Mander (2015) discovered that regular and encouraging phone conversations and emails from school staff to parents of children attending boarding schools were helpful in reducing parents' anxiety and frustration, as well as fostering their sense of agency in their children's development and learning. This resembles the findings of studies involving parents in general that the flexibility offered by technology (e.g., text-messaging) allowed schools to reach out to families who might spend a plentiful amount of time on family demand and duties at work (Hurwitz et al., 2015; Smythe-leistico & Page, 2018).

The innovative and interactive methods of communication offered by technology also facilitated social connections with family members by bridging the distance between home and boarding school. Communication influenced the success of children's education (Mander, 2015). Parents viewed digital equipment as a primary medium to establish good communication routines, keep in touch, and support their children who were schooling away (Brady & Dyson, 2010; Mander, 2015; Lloyd & Cronin, 2002).

4.2 Increasing the level of parental engagement

Another reason many Indigenous parents had considered using digital technology was its wide-reaching, self-directed, and creative nature where users could learn wherever in multiple ways (Hermimo & Arifin, 2020; Hill, 2018). Young learners were comfortable with technology (Hermes & King, 2013). Regardless of children's school levels, parents across different countries expressed the belief that technology-assisted learning had completely shifted the way children learned, creating a new mode of home learning activities and increased chances to be more involved (Auld, 2007; Carlson et al., 2011; Garcia et al., 2013; Hermes & King, 2013; John & Edwards-Vandenhoeck, 2022).

Technology has produced opportunities for the interconnectedness of Indigenous communities around the globe, culturally rooted learning (Lapensee et al., 2020), and interpersonal interactions (Hill, 2018) for children, teachers, and parents. Children were enthusiastic to share their Aboriginal story about family trees on digital platforms, hoping many people could recognise their culture (Du

& Haines, 2017). Through the Indigenous stories on the Internet, some parents obtained more ideas on how they could perform their vital role of educating children at home. Although a father was geographically away from his son at boarding school, he could still strengthen his inextricable bond with his son by digitalising Indigenous knowledge for him (Mander, 2015). Digital technologies also created a channel for teachers to forge interactions with Indigenous communities and families, e.g., by requesting parents and elders to contextualise home learning materials related to Indigenous identity and culture by recounting their life stories (Fleer & Hammer, 2014; Lavoie et al., 2014; Thanabalan et al., 2014). This also enables intergenerational knowledge to be transmitted into a new digital resource, for example, the collection of Indigenous oral histories (Robust, 2002).

According to the young learners' perspectives, the use of digital devices could promote personalised and self-directed learning (Fran et al., 2012) and generate a sense of control and power over the pace of their learning (Greenall & Loizides, 2001). With the Internet, students could find information that helped them complete their homework and increased their knowledge (Hermino & Arifin, 2020). Some students perceived their freedom with online diaries where they entered their journals to their school's website at any time (Lloyd & Cronin, 2002). As the lessons were recorded and linked on a school's website, absent students could review the lessons and maintain their learning progress at home (Landon, 2012).

Parents noted some technology-driven changes. Some parents became more involved as they observed their children's enthusiasm and interest while learning with technology. These parents affirmed that such a tool became a site of self-representation and achievement, offering optimistic portraits of their children's learning progress (Carlson et al., 2011; John & Edwards-Vandenhoeck, 2022; Wexler et al., 2014). Some parents expressed their compliments when their children showed their work (Carlson et al., 2011; John & Edwards-Vandenhoeck, 2022). In other instances, parents became more passionate about spending time with their children, guiding them in their learning. A teacher reported that parents repeatedly commented that most of the time, their children learned by using the computer at home (Auld, 2007), and other school personnel also confirmed that parents became more involved in home-based learning as they saw their children enjoying such learning (Carlson et al., 2011; Garcia et al., 2013).

Language learning software called *Ojibwemodaa* prompted an extensive parent-child discussion and active interactions between parents and children (Hermes & King, 2013). A video recording of *Semaumaq Journey*, which showed children presenting their work and their parents reflecting on the activity, succeeded in influencing other parents to be more involved (Pan et al., 2021). Children's enthusiasm to learn with technology that prompted Indigenous parents to be engaged in their children's learning also resonates with Hollingworth et al.'s (2011) study, focusing on parents in general. Other studies indicated that technology could attract the younger generation to affirm their Indigenous cultural identity (Iseke & Moore, 2011) and provide the language community ownership (Galla, 2016). A study involving Indigenous youth learners found that more than 50% of participants indicated technology allows Indigenous language learning to be more enjoyable (Galla, 2016).

5 Barriers, concerns, and tensions in using technology

While technology appears to be contributing to building a network between schools and Indigenous parents, several challenges and concerns are inherent in the use of technology itself. Authors of eighteen studies discussed these obstacles and tensions, such as limited access and availability (14), cultural and language barriers (4), lack of awareness and skill (3), and fear of Indigenous culture degradation (4). These constraints influenced the level of parental engagement.

A common issue hindering the use of technology reported in fourteen studies was limited resources. Although parents experienced limited resources in several high-income countries, e.g., Australia and Canada, this problem was more eminent in middle- or low-income countries like Mexico, Namibia, Indonesia, and Ecuador. As many parents lived in isolated areas, infrastructural limitations became a primary concern, such as no electricity at home, limited access to a telephone (Auld, 2007), unstable connections of Internet satellite (Du & Haines, 2017) and weak signals (Hermino & Arifin, 2020). Given these limitations, Fran et al. (2012) and Garcia et al. (2013) argued that it is not surprising if such marginalised families did not have access to new technology at home.

In addition to the geographic isolation with a lack of infrastructure and low-density development, parents from low-income backgrounds more likely experienced pressure in addressing the cost of the new technologies. The adoption of technology required funds, time, energy, and resources to allow for families to be more engaged. However, parents from low socioeconomic backgrounds had difficulties in fulfilling the requirements to optimise the use of technology (Fran et al., 2012; Greenall & Loizides, 2001). Using such technology required the purchase of mobile plans (Brady & Dyson, 2010; Hermino & Arifin, 2020) and expensive school supplies (Bauchet et al., 2018), while some parents grappled to fulfill even their fundamental needs (Cwi & Hays, 2011). Moreover, the continual maintenance of a digital network was also costly, to the point of seeming impossible, since the earnings of some parents were usually below national averages (Du & Haines, 2017). In describing this problem, Srinivasan (2006) argues that technology is full of structural patterns of power that lead to the creation of hierarchical inequalities and new pressures. Although there is an increase in access to technology, there are always long gaps in the access to such technology between rural and urban areas (Joint Select Committee on Cyber-Safety, 2013). Asanov et al. (2021) also resonates with this, that technologies remain difficult to access for Indigenous children, children from low socioeconomic status, and those who live in isolated regions compared with other students.

Inadequate technological resources seen in several schools, generally, those located in marginal zones, also affected the smooth collaboration with parents. A teacher in Cwi & Hays's (2011) study asserted that he did not have access to either telephone or computer in his office, and the Internet connection was minimal. Similar issues occurred in other schools: the lack of Internet connection

(Veintie et al., 2022), computers (Landon, 2012), and other supplying utilities (Philpott et al., 2009).

Other concerns also appeared including low capabilities, insufficient training on existing and new technologies, and language and cultural barriers. Some participants had low computer literacy (Du & Haines, 2017) and confidence in using digital technology (Fran et al., 2012). Plus, a lack of human resources and technical support (Greenall & Loizides, 2001) made learning to use and practicing with technology difficult. Since digital technology was commonly released in the dominant language, cultural and linguistic issues emerged, as some parents did not speak that language (Cwi & Hays, 2011). For example, parents in Greenall's and Loizides's (2001) study could not help their children with homework, not because they did not want to, but because they did not speak English, the language used (Greenall & Loizides, 2001).

Concerns about Indigenous identity degradation and the increasing prevalence of online bullying also caused parents to hesitate to utilise technology. Although bullying and racism have often been experienced by children, parents feared that these would become more severe when they occurred online (Fran et al., 2012). Some feared that digital technologies gradually infused Western knowledge and ways of living into their children's minds and the children could not filter them out, which had a significant negative influence on the continuation of Indigenous knowledge and tradition (Du & Haines, 2017; Hermino & Arifin, 2020). When schools developed a digital project about Indigenous narratives with parents, several parents were uncomfortable with sharing these oral stories (Hill, 2018). It might be believed that contact with the outside world played a role in acculturation and greatly affected the loss of Indigenous traditions (Matemba & Lilemba, 2015). For example, in one study, a group of families from a least-acculturated ethnic group showed less participation in school technology programs relative to all other ethnic groups who had more contact with mainstream culture (Bauchet et al., 2018). In sociocultural and political views, this tension appears to be considered a by-product of the new wave of colonisation by those who have power, such as governments and the capitalists of the dominant modern society (Casumbal-Salazar, 2017; Hershey, 2009; Salazar, 2007). Technology projects involving Indigenous communities often left traces that were not appropriate for original Indigenous narratives. Some community members and parents regarded the government as indifferent to the problems (Du & Haines, 2017; Hermino & Arifin, 2020).

6 Enablers of improving Indigenous parental engagement

This section elaborates on approaches that schools might consider to optimise parents' engagement when using technology in their collaboration. On one hand, solid technological strategies and affordability should be addressed. On the other hand, appropriate ways of using technology that are culturally relevant for parents should be developed. Both were critical and mutually tied for the promotion of strong

relationships with parents. Thus, efforts to improve technology services in the education of Indigenous children were the work of a collective—could not be separated from the roles of the local community, schools, parents, and governments. Twenty-seven articles presented two enablers: culturally responsive approaches (24) and supporting access to new technology (6).

6.1 Facilitating access to new technology

Ensuring parents had access to and could afford technology was critical prior to adopting it in home-school partnerships. Du & Haines (2017) reported that nine out of ten participants wanted access to the Internet. User affordability and access should be a shared responsibility of governments, schools, and communities. Schools might ask the school committee to help them undertake fundraising to purchase equipment (Robust, 2002). Due to the familiarity with and widespread use of mobile devices among Indigenous people (Brady & Dyson, 2010), home learning activities could be strategically optimised for mobile phones instead of computers (Fran et al., 2012). Especially for those vulnerable and low-income groups, to some extent, governments can address technological inequalities by subsidising or providing free access to technology, such as mobile phones (United Nations, 2021).

These readily available devices are even more interactive and cost-effective than computers. Through email, Skype, and social media that could be accessed via mobile phones, boarding schools could stay connected with parents (Mander, 2015). In Veintie et al.'s (2022) study, a local community succeeded in overcoming these inadequate resource problems through cooperation among community members even when the government was indifferent. Furthermore, the human and technical support required for each tool (Greenall & Loizides, 2001) should be considered, such as employing technical assistants (Robust, 2002), offering training (Du & Haines, 2017), promoting media literacy and educating Internet protocols (Fran et al., 2012).

6.2 Incorporating culturally responsive approaches

The use of advanced technology would only be a small contribution to family-school partnerships unless accompanied by culturally responsive approaches. Regardless of students' school levels and locations, culturally responsive approaches significantly influenced parental engagement across different countries, such as applying Indigenous protocols, seeking Indigenous elders' support and advice, and providing proper homework and helpful guidance (Cwi & Hays, 2011; Du & Haines, 2017; Garcia et al., 2013; Hermes & King, 2013; Hermino & Arifin, 2020; Landon, 2012; Pan et al., 2021; Veintie et al., 2022). Schools often claim to have empowered parents, but in fact, parents are

commonly forced to fit into schools' ways. To avoid this happening, schools need to understand and apply Indigenous protocols. School personnel in Muller's (2012) and Sims et al.'s (2012) studies illustrated how they usually contacted parents first with a gesture of openness, making parents feel like they matter, to forge trusting relationships—avoiding bureaucracy, offering support mechanisms, and being informal and flexible in time.

Home-learning activities with technology, e.g., self-selected tasks which were embedded in the students' social-cultural contexts, along with helpful guidance, promoted children's autonomy and fostered parents' agency in supporting children's development. Such homework should be on an individual basis, and therefore consultation with the parents to identify the students' skills level and preferences might be required (Auld, 2007; John & Edwards-Vandenhoeck, 2022).

The *Hawaiian Indigenous Education Rubric*, which was developed from teachers' perspectives, emphasised that creating student assignments that allow parents to participate actively was critical (Kanaïaupuni & Kawaiāeā, 2008). This is in harmony with a strength-based framework based on research in Australia and worldwide described by Stronger Smarter Institute (2020). This framework elaborates on the necessity of knowing children personally and identifying their home experiences. Only when teachers were willing to redesign homework to suit the students' social-cultural contexts, could parents have a great contribution to home-learning activities with technology (Auld, 2007).

To accomplish that, a multimodality pedagogical approach was needed. This approach that incorporated multiple types of expression, e.g., visual, verbal, and non-verbal into home-learning activities was inclusive (Lavoie et al., 2014). There were four models of homework that were worth considering. First was using more stories (Du & Haines, 2017) or anything that was reflective of students' reality (Landon, 2012), experiences around their home (Thanabalan et al., 2014) as their schoolwork assignments. Second was granting more freedom for students to do self-selected tasks, such as animating, digital drawing, or video-recording to enshrine the family history and journey (John & Edwards-Vandenhoeck, 2022). Third was producing video games that compile social-culturally grounded science ideas (Lapensee et al., 2020). Fourth was constructing accessible and contextualising pieces of language homework within the software for low-level competence students that allow genuine communication with their parents (Hermes & King, 2013). What was significant was that there was an increase in personal autonomy among students (Auld, 2007), and the parents were able to provide many ideas (Kanaïaupuni & Kawaiāeā, 2008; Pan et al., 2021).

Constructing more socio-culturally embedded home-learning materials required collaboration with local communities. Cultural content that is included in the development of technology-based learning or was disseminated via the Internet must be contextualised, adhere to Indigenous protocols, and preserve cultural integrity. Here, the support and advice of elders were crucial. A valid concern was that some Indigenous cultural attributes—sacred narratives, and

religious objects, in particular—had been misused without elders' permission (Du & Haines, 2017; Hill, 2018).

Elders held a key role in managing the community, fighting for the sustainability of the Indigenous generation (Veintie et al., 2022), and finding solutions to many children's education problems (Hermino & Luangsithideth, 2017), even when the government stood idly by. Stanton et al. (2019) firmly believed that the recognition of Indigenous leadership in decision-making was fundamental and attested helpful in culturally responsive approaches to the use of technology. That is, every digital story work, narrative-based prototype, or any project that integrates cultural values, beliefs, norms, or traditions required participative discussion and final verification from community leaders (Hill, 2018; McIvor & Ball, 2019). The involvement of the community leaders was powerful (Muller, 2012), not only for decolonising digital media (Hill, 2018) but also for optimising the acquisition of Indigenous new words for children (Lavoie et al., 2014). This initiative is much aligned with what Bon et al. (2022), Cruz (2021), and Gumbo (2019) have suggested i.e., the importance of decolonising technology because it will facilitate such non-hegemonic groups by culturally designing the sociotechnical worlds. Several digital projects that were conceptualised through a decolonial lens, established on local initiatives, aimed to meet local needs, and contextualised to the local conditions by working together with community members, have successfully maximised the benefits of technology for Indigenous society (Bon et al., 2022).

7 Recommendations for practice, government, policy, and future research

The adoption of technology must be seen from a holistic angle, followed by a genuine commitment to creating an effective cultural design to increase parental involvement. Any choice of technology must be aligned with Indigenous protocol and the principles of collaborative work. An appropriate investigation and discussion with Indigenous parents and community leaders about the use of technologies must be conducted before deciding to use technology in family-school partnerships.

It would behoove schools to recognise that integrating technology in programs is not merely a means to communicate with families, but must be a response to local needs, collaboratively and contextually developed, rooted in Indigenous values, and locally available as much as possible. Hence, the affordability of technology and parents' capability to use it require consideration. School personnel might reach out to parents with culturally responsive communication when utilising digital tools. Moreover, teachers should consider cultural

appropriateness and the students' social-cultural contexts in designing home-learning activities with technology to allow a greater parents' participation.

In order to foster technology integration in schools, new programs must address, rather than broaden, access inequalities across the country. Governments might look for initiatives to make technology more accessible for Indigenous families and evaluate technology programs that could potentially lead to harm to Indigenous dignity and children's well-being. Policymakers might consider inviting Indigenous leaders to roundtables and panel discussions to gain their perspectives about educational technology policies that actively contribute to Indigenous communities.

While the studies cited here were undertaken in developed and less developed countries, it was apparent that Indigenous parents experienced limited technology resources in both types of countries. International collaborative studies involving more countries would further identify specific causal issues and provide insight on ways to facilitate technology access and programs through a decolonial lens. Given the importance of developing culturally contextualised strategies when utilising technology in home-school partnerships, more qualitative and quantitative research that is grounded in sociocultural contexts is urgently needed to provide information and guidance on how to enhance Indigenous parental engagement.

8 Conclusion

This study expands literature and explores the multiple uses of technology in home-school partnerships while exploring how schools and parents understand the importance of incorporating culturally contextualised perspectives and strategies that are collaboratively developed and rooted in local cultures. There is a great need for technology integration to improve Indigenous parental engagement as it knits to the success and futurity of Indigenous young generations. However, emerging technology is not seen as a replacement for face-to-face home-school communication; instead, it is viewed as a resource—complementary and supporting means—as good as its utility, accessibility, and purpose. Identifying the goals of home-school partnerships is the most critical element, then figuring out how technology can facilitate the achievement of those goals. Adoption of technology might not be the first order, but building culturally responsive relations should be schools' focus, and therefore it requires the work of a collective: parents, local community, schools, and government. Indeed, technology is beneficial but can perpetuate gaps, unintended outcomes, or other tensions. Therefore, its uses must be grounded in culturally appropriate approaches. Governments could facilitate all families to have access to and optimally benefit from technology while the offsetting hazardous consequences of its use.

Appendix

Table 1 The summary of study characteristics and code findings

Author(s), Year	Country	Setting/ ages	Site	SES*	Type & design	Participants	Function		Barriers		Enablers	
							Commu- nication	Engage- ment	Access	Culture	Skill	Degrada- tion
Auld (2007)	Australia	Primary school	Remote	Low	Scholarly Project-based	Community members and children	✓	✓	✓			✓
Barblett et al. (2020)	Australia	Early Childhood	Remote, regional, and metropolitan	Low	Scholarly Qualitative	33 family members, four community members, four teachers, four principals	✓					
Bauchet et al. (2018)	Mexico	Primary school	Rural	Low	Scholarly Quantitative	2922 individuals (all ages), 811 children (aged 7–16)			✓	✓		
Brady and Dyson (2010)	Australia	Primary school	Remote	Low	Proceeding paper Mixed method	47 adults and 6 children	✓		✓			

Table 1 (continued)

Author(s), Year	Country	Setting/ ages	Site	SES*	Type & design	Participants	Function		Barriers		Enablers	
							Communi- cation	Engage- ment	Access	Culture	Skill	Degrada- tion
Benizes et al. (2011)	Canada	Preschool	Urban	Low	Scholarly Quantitative	45 children and 38 caregivers	✓					
Carlson et al. (2011)	The United States	Secondary school	Regional	Not specified	Scholarly Project-based	Students, school officials, elders, parents, and project staff	✓					
Cwi and Hays (2011)	Namibia	Primary school	Rural	Very low	Scholarly Project-based	Six schools			✓		✓	
Du and Haines (2017)	Australia	Within community (aged 18–71)	Rural	Low	Scholarly Qualitative	22 community members (elders and parents)	✓		✓		✓	✓
Fleer and Hammer (2014)	Australia	Early Childhood	Rural	Not specified	Scholarly Qualitative	19 families	✓				✓	
Fran et al. (2012)	Australia	Youth	Urban	Low	Research report (aged 18–24) Qualitative (aged 12–17)	4 young men (aged 18–24) and 7 students (aged 12–17)	✓		✓		✓	✓
Garcia et al. (2013)	Mexico	Primary school	Remote	Very low	Proceeding Qualitative	96 students and their families	✓		✓		✓	✓

Table 1 (continued)

Author(s), Year	Country	Setting/ ages	Site	SES*	Type & design	Participants	Function		Barriers		Enablers	
							Communi- cation	Engage- ment	Access	Culture	Skill	Degrada- tion
Gerlach and Gignac (2019)	Canada	Preschool	Urban and rural	Low to middle	Scholarly Participatory	10 parents, 10 project coordinators and family workers, 6 elders	✓					
Greenall and Loizides (2001)	Canada	Primary and secondary schools	Urban and rural	Low	Research report Qualitative	Students, community representatives, teachers	✓		✓	✓		✓
Hermes and King (2013)	The United States	Primary and secondary schools	Suburban and metropolitan	Low to middle	Scholarly Project-based	2 families (parents with their children)	✓					✓
Herrmino and Arifin (2020)	Indonesia	Secondary school	Remote	Very low	Scholarly Qualitative	12 students, five teachers, five parents, one community leader and one religion leader.	✓		✓			✓
Hill (2018)	The United States	Middle school	Not specified	Not specified	Scholarly Qualitative	One community	✓		✓			✓

Table 1 (continued)

Author(s), Year	Country	Setting/ ages	Site	SES*	Type & design	Participants	Function		Barriers		Enablers	
							Communi- cation	Engage- ment	Access	Culture	Skill	Degrada- tion
John and Edwards- Vandenhoek (2022)	Australia	Youth (aged 14–18)	Traditional lands	Not speci- fied	Scholarly Qualita- tive	16 students	✓				✓	✓
Kanayiaupuni and Kawaiyae'ya (2008)	The United States	Children (7th- 10th grade)	Not speci- fied	Low	Scholarly Qualita- tive	Schools' curricu- lum coordina- tor, academics, government representatives	✓				✓	
Landon (2012)	Canada	Secondary school	Rural	Low	Doctoral disserta- tion Qualita- tive	Teachers, admin- istrators, and students	✓		✓		✓	
Lapensee et al. (2020)	The United States	Youth (aged 9–16)	Urban	Not speci- fied	Research report Qualita- tive	18 students, elders, and parents	✓				✓	
Lavoie et al. (2014)	Canada	Preschool	Rural	Not speci- fied	Scholarly Qualita- tive	30 students and eight elders	✓				✓	
Lloyd and Cronin (2002)	Australia	Secondary school	Remote	Not speci- fied	Research report Qualita- tive	Nine participants (principal, project direc- tor, the ICT coordinator, and teachers)	✓		✓		✓	

Table 1 (continued)

Author(s), Year	Country	Setting/ ages	Site	SES*	Type & design	Participants	Function		Barriers		Enablers	
							Communi- cation	Engage- ment	Access	Culture	Skill	Degrada- tion
Mander (2015)	Australia	Secondary school	Regional and remote	Low to middle	Scholarly Qualitative	11 parents	✓					✓
Matemba and Lilemba (2015)	Namibia	Youth	Rural	Not specified	Scholarly Mixed-methods	13 community leaders					✓	✓
Melvor and Ball (2019)	Canada	Children-adults	Not specified	Not specified	Scholarly Qualitative	Children and adults					✓	✓
Muller (2012)	Australia	Early childhood-university	Remote, rural, regional, metropolitan	A range of socioeconomic settings	Research report Qualitative	Parents, community members, school personnel	✓				✓	✓
Pan et al. (2021)	Taiwan	Early childhood	Rural	Middle	Scholarly Qualitative	Parents and children		✓				✓
Philpott et al. (2009)	Canada	Secondary school	Rural	Low	Scholarly Qualitative	56 participants (students, administrators, parents, teachers)		✓	✓			
Robust (2002)	New Zealand	Primary school	Rural	Not specified	Research report Qualitative	One community and its school		✓				✓

Table 1 (continued)

Author(s), Year	Country	Setting/ ages	Site	SES*	Type & design	Participants	Function		Barriers		Enablers	
							Communi- cation	Engage- ment	Access	Culture	Skill	Degrada- tion
Sims et al. (2012)	Australia	Early childhood	Remote, rural, regional, metropolitan	Not specified	Scholarly Qualitative	202 childcare providers, 210 community members, and 66 government representatives	✓		✓		✓	
Stanton et al. (2019)	The United States	Secondary school	Rural	Not specified	Scholarly Qualitative	40 individuals, students, academics, community members, and professionals					✓	
Thanabalan et al. (2014)	Malaysia	Primary school	Rural	Not specified	Scholarly Qualitative	Students, 12 professionals		✓			✓	
Veintie et al. (2022)	Ecuador	Secondary school	Remote	Low	Scholarly Qualitative	School directors and teachers			✓		✓	✓
Wexler et al. (2014)	The United States	Youth	Rural	Not specified	Scholarly Qualitative	196 students (9 years to 19 years)		✓				

* Socioeconomic status

Authors' contributions The first author played a critical role in all phases of this study as the corresponding author. The data collection and analysis were part of her responsibilities, along with conceptualising and designing the selection criteria. A draft of the manuscript was also written by her. As a member of the research team, the second author helped establish the research plan, develop selection criteria, verify the research data analysis, and write the manuscript. In addition to identifying pertinent studies, verifying the coding, and writing the manuscript, the third author was also involved in the development of criteria for selecting relevant studies.

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Data availability In this study, the data set is derived from published studies that already exist. The authors are able to provide data management and coding information upon request.

Declarations

Financial or non-financial interests The authors do not have any relevant financial or non-financial interests to be declared.

Ethical approval Due to the fact that this is a narrative review of published studies, we did not require ethical approval for this study.

Informed consent Informed consent was not necessary for the study, as it is a narrative review of published studies.

Conflict of interest The authors have no conflict of interest to declare.

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