



Research Article

Bridging Digital Equity and Cultural Responsivity in Elementary Schools: The Role of Family-School Partnerships

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Abstract

The COVID-19 pandemic triggered a rapid shift toward remote learning, revolutionizing family-school relationships. The pandemic brought digital inequalities into sharp relief coupled with new possibilities for culturally responsive teaching (CRT). Within the context of our selected schools, families emerged as crucial partners for supporting student engagement and cultural connection during virtual learning in elementary schools in Canada. The present qualitative case study explores how seven elementary school staff members in Eastern Canada navigated the intersection between CRT, digital access, and family-school partnerships during pandemic-driven remote teaching. Based on our semi-structured interviews with the school staff and through a Family-School Partnership theoretical lens, we found that family involvement was a key strength for CRT implementation, as parents and guardians served as cultural liaisons facilitating students' learning at home. The teachers adapted their teaching practices through the integration of cultural knowledge at home, the use of multilingual tools, and involving families with culturally responsive classroom practices. However, there were challenges because there was disparate access to technology, poor internet connections, and varying digital literacy among family members. These inequalities had a disproportionate impact on students from minority communities, particularly Indigenous, immigrant, and low-income communities. Our findings highlight educators' innovation and adaptability toward facilitating culturally responsive digital pedagogy but also notes an opportunity to reinforce institution-level professional development support for culturally responsive digital pedagogy. Based on our findings, we emphasize the need for sustained investment in digital infrastructure/resources, targeted teacher training, and adaptive family engagement models for ensuring equal access and culturally responsive practice for future hybrid or remote learning environments. This research contributes to broader discourse on educational reform emerging from a pandemic era through its demonstration of how school-family relationships grounded in trust can serve as a foundation for culturally relevant, inclusive, and equitable learning. With schools moving toward digital and blended learning, overarching policies should cover strengthening school-home relationships and sustainable efforts to bridge the digital divides for diverse learners.

Keywords

Culturally Responsive Teaching, Digital Equity, Family-school Partnerships, Virtual Learning, Educational Access, Teacher Professional Development, Online Learning Environments

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1. Introduction

The COVID-19 pandemic created a sudden transition to remote learning during 2020, revolutionizing family-school relationships and defining a new family role in learning. With students learning at home, families became more involved with supporting their children's academic and emotional growth. The transition exposed possibilities and challenges for family engagement with virtual learning, particularly regarding educational equity [1]. Research from Canada has shown that calls for family-school partnership increased during the pandemic, with a focus on establishing trust, enhanced communication, and shared responsibility for ensuring students' achievement [2]. The pandemic also exposed technology inequalities, further making it challenging for some families to participate at a level comparable with others [3]. The long-term effects of this transition continue to affect educational policy and practice, as schools look for ways to sustain effective family-school partnerships for virtual and hybrid learning [4].

Culturally Responsive Teaching (CRT) is a teaching strategy that emphasizes including students' cultural backgrounds, lived experience, and linguistic variety into learning to facilitate engagement and academic attainment [5]. The strategy has been particularly helpful for culturally and linguistically diverse (CLD) students due to its capacity for validating their identities and facilitating their sense of school belonging [6, 7]. With virtual classrooms, however, traditional application of CRT became cumbersome, with educators relying on family members as cultural brokers for providing cultural scaffolding for learning materials and keeping students engaged with culturally relevant information [8]. Family-school connections played a pivotal role in facilitating CRT during remote learning through enabling culturally embedded discourse, cultural knowledge sharing, and facilitating reinforcement of lessons at home [7, 5]. Educators relied on families for bridging cultural gaps, ensuring students' cultural backgrounds took center stage within learning, even within virtual spaces [8].

Despite the significance of family-school relations in maintaining CRT continuity, systemic issues persisted, particularly with regards to technological inequities and socio-economic disparities. Students from historically marginalized communities often lacked the digital infrastructure essential for effective engagement in digital learning—such as reliable internet, personal devices, and quiet spaces for learning—limiting their engagement in digital learning [9, 3]. Indigenous, newcomer, and low-income students in Canada disproportionately felt the effects of digital divides, further solidifying existing inequities in education [10, 11, 28]. Further, while some families were positioned to actively support remote learning, others were constrained through work requirements, language barriers, or limited digital literacy [12]. Thus, educators had to take innovative steps to ensure inclusion, maintain engagement, and translate CRT practices to digital learning environments.

While previous research has looked at family involvement in schooling and CRT's effects on traditional classrooms, there is limited insight on how these factors intersected with one another within virtual classrooms during the COVID-19 pandemic. This study seeks to bridge this gap through a case study of elementary school staff members as they worked through family-school partnerships, culturally responsive teaching, and equity concerns within virtual classrooms in Eastern Canada. Drawing on semi-structured interviews with seven elementary school staff, this research describes how family members played a role in CRT implementation, technological disparities that created challenges, and how educators maintained cultural relevance within remote learning spaces. The research contributes to the growing debate on educational practices following the pandemic, with a focus on including CRT within online and blended models and on constructing effective family-school partnerships for diverse learners.

2. Literature Review

2.1. Family Involvement in Education

Family involvement has long been a predictor of academic achievement, particularly at the elementary level [13, 14]. Research at schools within Canada has consistently indicated that family-school connections have a positive influence on students' engagement, academic achievement, and socio-emotional development [14]. It is especially crucial for low-income and culturally diverse students, as they are particularly assisted through additional family participation in overcoming educational obstacles [15].

With the COVID-19 pandemic, family engagement with learning expanded as parents and guardians took on a greater role for virtual learning [16]. Parents became co-teachers for most, not just teaching school subject matter but also digital tools [17]. While increasing participation for some, this also brought inequalities into focus around access to tools and parents' ability for effective learning facilitation. Those with higher digital literacy were able to better support their children, with others being restricted through socio-economic circumstances [18].

In Canada, there has been increased emphasis on family-school partnerships as a policy approach towards bridging educational inequalities. It has been proven that schools that engage families in learning and curriculum development have better academic outcomes and well-being among students [19]. However, participation is not equal, as work schedules, access to technology, and varying levels of language continue to limit full participation for most families [20].

2.2. CRT and Family Engagement

CRT is a teaching approach that seeks to make learning effective and relevant for students through the infusion of pedagogy with students' cultural contexts [21]. CRT has long been identified as a vital tool for working with diverse student populations, particularly Indigenous and immigrant students, at elementary schools in Canada [8]. Research, however, suggests that family engagement is a deciding factor for CRT's effectiveness, as parents provide valuable information on students' cultural identity and learning needs [14].

A recent study by [22] points out that CRT is most effective when teachers collaborate with parents to develop curricula that are relevant culturally. Virtual learning spaces, as challenging as they were, opened new opportunities for such collaborations. Parents became more directly involved with influencing learning, sharing cultural information, and enabling bilingual literacy development [15]. These are congruent with findings from [23], where digital tools can enhance CRT if family members and educators collaborate with one another to create culturally relevant digital learning opportunities.

Despite these benefits, implementing CRT into virtual environments created challenges. Some educators complained about lacking face-to-face interactions, which hindered their ability to form relationships with students and incorporate unplanned cultural learning opportunities [17]. Parents from minority communities also faced technological and resource constraints that limited their full involvement with virtual CRT projects [18].

2.3. Equity and the Digital Divide in Canadian Elementary Schools

The digital divide remains a challenge towards providing equitable education for Canada. Research carried out by [24] highlights that digital tools and Internet access are not equal for socio-economic communities, with a disproportionate effect on Indigenous and remote communities [28]. These inequalities increased with the pandemic, with students' unreliable internet access and limited computing devices as they struggled to fully engage in virtual learning environments. Research carried out by [25] further highlights that attempts at broadband expansion at a federal level have been successful but opportunities remain in addressing digital inequalities among remote Indigenous communities. Most households in these communities continue to experience digital adoption barriers, inhibiting children from effectively accessing virtual classes.

A digital divide is defined into three dimensions based on a study by [26]: access (internet and device availability), competence (digital literacy of students and family members), and meaningful use (integration into learning). Access problems have been met with policy initiatives for Canadian primary schools, such as technology initiatives backed by the gov-

ernment and devices distributed by schools [25]. These have been questioned regarding their efficacy, with authors such as [27] asserting that opportunities persist in addressing deeper systemic disparities, particularly among Indigenous communities where infrastructure constraints persist. Apart from access, family digital literacy also plays a vital part in shaping learning outcomes among students. [29] found that students with parents with high digital literacy skills do well in web-based classes. It, however, points out that bridging the digital divide is not a technology issue alone but also entails special training for households with a focus on increasing their digital skills. Additionally, [24] emphasizes that broadband extension efforts must also come with digital skills development efforts if digital engagement among all is to happen equitably. Without such interventions, there will still exist barriers for marginalized students, which will further reinforce educational inequalities.

2.4. The Role of Trust in Family-School Collaboration

Trust is a fundamental component of effective family-school partnerships. Research by [8] underscores that trust between educators and families enhances communication, collaboration, and overall student success. In virtual learning environments, trust-building became even more critical, as frequent teacher-parent interactions were necessary to support student engagement and well-being [18].

During the pandemic, some schools adopted proactive communication strategies to strengthen trust with families, such as regular virtual meetings, culturally inclusive outreach programs, and bilingual support services [17]. However, [15] caution that trust-building in diverse school communities requires long-term commitment and sustained efforts to address historical inequities in education.

Teachers who engaged in culturally responsive communication strategies—such as incorporating students' home languages into instruction and acknowledging cultural differences in learning styles—reported stronger relationships with families [29]. These findings highlight the importance of culturally sensitive trust-building approaches in fostering more effective and equitable family-school partnerships.

2.5. Research Gaps

Existing and reviewed literature demonstrates the strong interconnection between family engagement, CRT, and digital equity in Canadian elementary schools, particularly in virtual learning environments. While remote education provided new opportunities for families to become more involved, it also exposed disparities in technological access and digital literacy. CRT has proven effective in enhancing student engagement, but its success in online settings is contingent on meaningful collaboration between educators and families. Trust remains a foundational element in these part-

nerships, particularly in culturally and linguistically diverse communities. As schools continue to integrate digital and hybrid learning models post-pandemic, future research should explore sustainable strategies to maintain family engagement and CRT practices, ensuring equitable and inclusive education for all students.

2.6. Conceptual Framework

This study employs an integrated conceptual framework (see Figure 1) combining Culturally Responsive Teaching (CRT) and Family-School Partnership Theory to explore how family involvement supports equitable and culturally relevant pedagogy in virtual learning environments. These theoretical lenses help examine how schools and families collaborate to foster inclusive education while addressing the challenges of digital access and engagement.

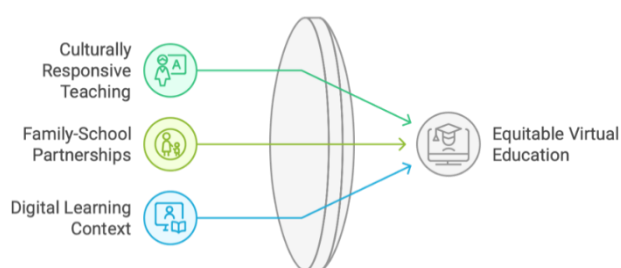


Figure 1. Conceptual Framework.

2.6.1. Culturally Responsive Teaching (CRT)

CRT is a pedagogical approach that incorporates students' cultural backgrounds, knowledge, and experiences into the curriculum to enhance learning outcomes [21]. In the Canadian elementary education context, CRT is particularly vital in supporting students from Indigenous, immigrant, and racialized communities [29]. The goal of CRT is not only to validate and affirm students' identities but also to increase engagement and academic success by making learning experiences more relevant and meaningful [30].

During the shift to virtual learning, teachers adapted CRT practices by incorporating students' home environments and cultural contexts into lessons [15]. Research suggests that in online settings, CRT relies heavily on family involvement, as parents serve as cultural liaisons who help bridge the gap between students' lived experiences and curriculum content [18]. However, effective CRT implementation requires equitable access to technology and strong school-family collaboration, both of which were disrupted by the digital divide [17].

While CRT has traditionally focused on in-person learning, its adaptation to virtual environments remains underexplored. This study builds on existing research by examining how CRT can be effectively implemented and amplified in virtual classrooms with active family engagement.

2.6.2. Family-School Partnership Theory

Family-School Partnership Theory by Joyce Epstein and colleagues [31] posit that student success is maximized when families and schools work together in a shared responsibility model. This theory emphasizes six types of parental involvement: parenting, communication, volunteering, learning at home, decision-making, and collaboration with the community [31].

During the pandemic, the nature of family-school partnerships shifted significantly, with parents/guardians assuming more active roles in their children's education [15]. This required schools to rethink engagement strategies, fostering more frequent and informal communication with families [14]. Research indicates that trust plays a central role in these partnerships—schools that successfully engaged families through culturally relevant and accessible communication saw higher student engagement and better learning outcomes [8].

However, existing studies have primarily focused on face-to-face family-school collaboration, leaving gaps in understanding how these partnerships evolve in virtual settings [18]. This study seeks to fill this gap by investigating how digital communication tools, virtual meetings, and online cultural learning activities influenced the effectiveness of family engagement in remote classrooms.

3. Methods

3.1. Research Gaps

This study employs a qualitative case study approach to explore how family-school partnerships supported CRT in virtual learning environments during the COVID-19 pandemic. A case study methodology was chosen because it allows for an in-depth examination of the lived experiences of educators navigating culturally responsive pedagogy in remote classrooms [32]. This approach is well-suited for understanding the complex interactions between teachers, families, and systemic educational challenges in Canadian elementary schools during a period of rapid digital transformation.

3.2. Participants

The study involved seven elementary school staff members who were actively engaged in remote learning during the pandemic in Eastern Canada. Participants were selected using purposeful sampling [33] from a broader Canadian research initiative, which focused on adaptive teaching strategies in virtual classrooms to enhance children's voice and agency. The participants represented diverse school settings, including urban and rural districts, and worked with culturally and linguistically diverse (CLD) student populations. This diversity ensured a range of perspectives on CRT

implementation and family engagement in online learning environments.

3.3. Data Collection

Data were collected through semi-structured interviews, each lasting between 45 to 60 minutes. These interviews were conducted via video conferencing platforms to align with the virtual nature of teaching during the pandemic. The interview protocol focused on three primary areas:

- 1) Culturally Responsive Teaching (CRT) – How educators adapted CRT strategies for virtual learning.
- 2) Family-School Partnerships – The role of families in supporting culturally relevant instruction.
- 3) Equity and Digital Access – Challenges faced by students and families in accessing remote education.

All interviews were recorded, transcribed, and anonymized to protect participant identities.

3.4. Data Analysis

Thematic analysis [34] was used to identify key patterns in participants' experiences. The interview transcripts were coded using Atlas.ti, a qualitative data analysis software, to systematically categorize themes related to CRT adaptation, family-school collaboration, and digital equity. The analysis followed an inductive approach, allowing themes to emerge organically while being informed by the Conceptual Framework (CRT and Family-School Partnership Theory).

Themes were refined through intercoder reliability checks, where two independent researchers reviewed coded transcripts to ensure consistency in interpretation [35]. The final themes were validated through member checking, in which participants reviewed a summary of findings to confirm the accuracy of interpretations.

3.5. Ethical Considerations

Ethical approval for the study was obtained from the relevant institutional review board. Participants provided informed consent before data collection, ensuring they understood the purpose, procedures, and confidentiality measures of the study. To maintain anonymity, all identifying details were removed from transcripts, and pseudonyms were assigned. Additionally, participants had the right to withdraw from the study at any point without penalty and was communicated at the onset of the study and throughout.

3.6. Limitations

While this study provides valuable insights into CRT adaptation in virtual classrooms, it is limited by its small sample size and geographic focus on Canadian elementary schools. Findings may not be generalizable to other educational contexts, particularly in secondary or postsecondary settings. Additionally, because the study relies on self-reported expe-

riences, responses may be subject to recall bias or social desirability bias [36]. Future research should explore these themes using longitudinal studies or comparative analyses across different educational systems.

4. Findings

The thematic analysis of interviews with seven elementary school staff members revealed three interconnected themes: the evolving nature of family-school partnerships in virtual learning, the adaptation of CRT to online classrooms, and the persistent challenge of digital equity and technological access. While educators acknowledged the difficulties of online teaching, they also highlighted positive experiences, particularly the deeper connections forged with families and students during this period. These findings (visualized in Figure 2) illustrate both the adaptability and resilience of teachers as they navigated an unprecedented shift to remote learning.

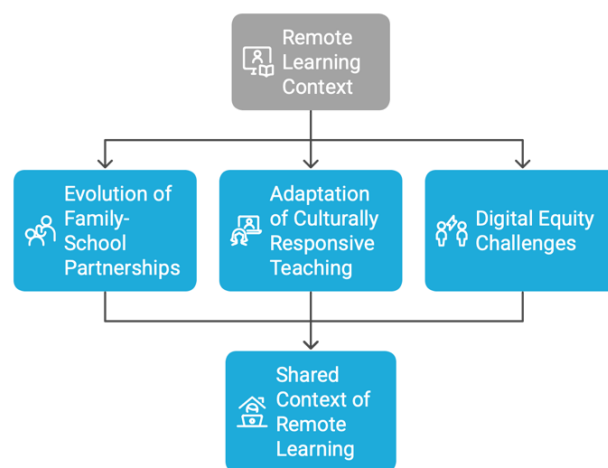


Figure 2. Visualization of Interconnected Research Findings.

4.1. Family-School Partnerships in Virtual Learning

Teachers overwhelmingly emphasized the critical role of families in facilitating student learning during remote education. Unlike traditional classroom settings, where interactions between teachers and parents were often limited to scheduled meetings, the online shift required daily collaboration. Parents became active participants in the learning process, supporting children with technology, maintaining engagement, and, in many cases, co-facilitating lessons.

One teacher described how parental involvement transformed the learning environment, making education a more holistic, family-centered experience:

"I was in their living rooms every day. Parents were in the sessions, sharing things with our children. It was really beautiful. I felt like I got to know some families on a deeper

level than I ever would have in a traditional school setting."

Another participant highlighted how this partnership enhanced student participation, especially for learners who previously struggled in a structured classroom:

"Some of the kids that normally wouldn't have done well really emerged. They grew wings because they were able to get more one-on-one time where there weren't so many things happening around them."

However, the sustained reliance on families came with challenges. By the third school shutdown, many parents were experiencing fatigue and struggled to maintain the same level of engagement:

"The first time, families were all in—eager to support and help. But by the third shutdown, you could tell some of them were exhausted. And I completely understand that. It was hard on everyone."

Similarly, another teacher reflected on the differential capacity of families to support learning at home, with some parents actively engaging while others had work obligations that limited their involvement:

"Parents were checking in more often to see how they could help. They were part of the team now. But not all parents had the same time or resources to be fully involved, and that was a challenge."

Despite these hurdles, the majority of teachers expressed appreciation for the strengthened relationships with families, acknowledging that such bonds were instrumental in sustaining student learning and engagement during a disruptive period.

4.2. Adapting Culturally Responsive Teaching (CRT) to Virtual Classrooms

The shift to online learning prompted teachers to rethink how they implemented CRT in a digital format. Traditionally, culturally responsive teaching relies on physical classroom interactions, peer discussions, and community engagement—elements that became difficult to replicate in a virtual setting.

One of the most notable adaptations was the use of family knowledge and home environments as key sources for cultural learning. Teachers encouraged students to share their experiences, traditions, and daily lives in ways that were not previously explored in in-person classrooms.

"I allowed kids to take time and space to show us their world through their eyes—not just tell us about their cultures but actually show us. That was really important."

Another teacher described how families contributed directly to cultural education, turning the virtual classroom into a more inclusive and representative space:

"One student's mom came and sang songs from India for the class, and that sparked a wave of other families wanting to participate. Suddenly, parents were sharing stories, recipes, and traditions, and it just brought the classroom alive."

Incorporating multilingual elements into lessons also be-

came an essential strategy for fostering inclusivity. One teacher shared how technology facilitated real-time translation and enabled multilingual students to participate more fully:

"I used Google Translate for a lot of things throughout the day. It wasn't perfect, but it helped bridge gaps, especially with new immigrant students who had limited English."

Yet, despite these creative adaptations, teachers expressed frustration over the lack of professional development on culturally responsive teaching in virtual spaces. Many felt they had to improvise strategies without sufficient training:

"We had a way of thinking about inclusion, but when it came to online learning, there wasn't really much guidance on how to make it truly culturally responsive. We had to figure it out as we went along."

Nonetheless, their experiences demonstrated the potential for virtual learning to expand cultural engagement, albeit with the right support structures in place.

4.3. Addressing Equity and Technological Barriers

A persistent challenge across all interviews was the digital divide, which significantly impacted students' ability to participate equitably in online learning. Teachers recalled how limited device access, unreliable internet connections, and technology literacy gaps disproportionately affected students from marginalized communities.

One educator described the stark reality of technological inequities:

"Some families didn't have enough devices, or their internet wasn't stable. It was frustrating because those students were missing out, and we had to be flexible in how we approached their learning."

Another teacher recounted how students had to improvise learning environments, often sharing spaces with working parents or siblings:

"One of my students did online learning from the restaurant his family owned because there was no one at home to watch him. It wasn't ideal, but we made it work."

In response to these challenges, educators devised alternative methods to ensure students remained engaged:

"For students who couldn't access online sessions, we sent home paper assignments, recorded lessons for them to watch later, and even made phone calls to check in."

Despite these efforts, the issue of technology access remained a major equity concern, with many educators stressing the need for long-term investment in digital infrastructure to prevent further disparities.

The findings illustrate that while virtual learning posed significant challenges, it also opened new avenues for family engagement and culturally responsive teaching. The integration of home environments into learning strengthened relationships, provided new perspectives on student engagement, and highlighted the adaptability of teachers in navigating an

evolving educational landscape. However, equity concerns surrounding technology access persisted, necessitating systemic policy changes to ensure all students can benefit from remote and hybrid learning models in the future.

5. Discussion

The findings of this study provide important insights into how family-school partnerships, culturally responsive teaching (CRT), and digital equity shaped virtual learning experiences during the COVID-19 pandemic. These themes align with existing literature while also offering new perspectives on the evolving role of families in education, the adaptability of CRT in remote learning environments, and the persistent challenges of digital inequities. This discussion critically examines the findings in relation to prior research and considers their broader implications for educational policy and practice.

5.1. Strengthening Family-School Partnerships: A Shift Toward Collaboration

This study affirms the importance of family-school relations to academic success, a topic amply addressed by past research [1, 5]. Nonetheless, parent participation in schools has long been framed as somewhat sporadic during school events (such as during consultation with teachers during parent-teacher meetings). With the move to virtual learning, however, the nature of these relations shifted, with daily communication between parents, teachers, and students becoming the necessity, rather than a courtesy. Teachers we interviewed discussed how parents, compelled by circumstance, became involved in their children's learning much more, creating the potential for greater engagement and collaboration. This transition affirms [1]'s model of school-family partnership, which calls for shared decision-making and teaching responsibilities as a way of enhancing engagement among students.

While involving families in remote learning areas had clear benefits, it also revealed the varying capacity for family members to engage with children's learning. In so much as some parents and guardians became engaged by supporting learning at home, reaffirming cultural connections, and attending virtual lessons, there were limitations for others, such as work obligations, digital literacy barriers, and linguistic challenges. These are also evident in [4]'s research, where they identified how virtual learning placed additional pressure on parents -- some of whom did not have adequate time, materials, and skillsets to enable their children's learning.

As school's build up from prior lessons, there is an opportunity to sustain and institutionalize family engagement beyond the pandemic, not allowing the benefits of increased cooperation to slip away. Schools will need to recognize family heterogeneity and move away from a one-size-fits-all approach for parent engagement. Flexible models of par-

ticipation, multilingual communications strategies, and parent training sessions on digital learning tools may provide families with what they require for sustained engagement, particularly among diverse cultural communities. Including virtual options for parent-teacher contact and school-home partnership may further ensure that engagement remains accessible, especially, as families navigate the hybrid school learning environments coupled with other work-life commitments.

5.2. Adapting CRT to Virtual Learning: Expanding the Scope of Cultural Engagement

The findings of this research highlight CRT's flexibility and adaptability within virtual learning environments -- further establishing the framework's widely documented benefits for engagement among students, as [5, 7] assert. While much that has been published on CRT conceptualizes it as a practice that occurs within a classroom through face-to-face interactions, this research illustrates how remote learning necessitated alternative pedagogical strategies for cultural inclusion. Teachers in our study adapted their CRT practices through innovative family sharing activities and digital storytelling tools, which served as a means for fostering engagement and inclusivity within virtual learning environments.

One of the most striking shifts in CRT practice was increased involvement for parents as cultural mediators. Per the accounts of the interviewed school staff, they reiterated how involving families allowed them to bring their traditions, languages, and lived histories into class discussions and make students see their cultural identities reflected within the curriculum. Such a trend is a development of [6]'s theory on culturally relevant pedagogy, which envisions learning opportunities are student-centered and firmly grounded in a sense of community. The parent involvement observed in this study presents an innovative approach, which demonstrates family-based cultural components could become a valuable relationship to boost student participation while promoting cultural responsiveness in virtual learning contexts.

Despite all these successes, educators still expressed a desire for more professional training on how to implement CRT within virtual learning environments. While some educators were able to find ways to integrate CRT into virtual lessons, others opined that they were doing this on their own with few resources and little guidance. If implemented, such training must include strategies for including family-school relationships into virtual lesson planning, strategies for reaching multilingual households, and strategies for ensuring cultural representation on virtual learning materials. As schools continue further into digital and blended learning models, ensuring that CRT is a core part of teaching will be crucial for ensuring engagement and equity among students.

5.3. Equity and the Digital Divide: Addressing Systemic Barriers

Digital inequalities were a core finding in our study because they determined how students could engage in virtual learning. The transition to online education became more challenging for students because of unequal access to technology, unstable WiFi connectivity, varying levels of digital literacy, and unfavourable learning environments within homes. The teachers reported that students without proper technology faced difficulties participating in schoolwork because they needed to share devices or connect through unreliable internet. Our findings further confirm those by [37], which showed immigrant and refugee families encountered more difficulties when adapting to remote learning because of their language barriers and unfamiliarity with digital platforms.

Students faced barriers beyond hardware availability because structural inequalities shaped which students could succeed in distance learning environments. Students who received support from parents could access dedicated learning spaces with reliable Internet, but many students had to manage educational disruptions in environments with limited support, crowded study conditions and inconsistent Internet access. The achievement gaps caused by digital inequities could persist in the long run unless educational institutions implement systemic solutions to close gaps instead of widening them according to [9].

A comprehensive solution to these disparities needs to transcend basic computer distribution to students. Schools together with policymakers need to dedicate sustained funding toward building digital learning infrastructure which gives all students from different economic backgrounds equal digital educational opportunities. The solution requires schools to

offer discounted internet services to disadvantaged families together with digital literacy classes for students and their parents and adaptable hybrid learning plans for students who need part-time online learning support.

5.4. The Future of Virtual and Hybrid Learning: Lessons Beyond the Pandemic

While this study focused on pandemic-era virtual learning, its implications have broader impact on the future of hybrid and digital learning. Blended learning models, which involve face-to-face and digital teaching, as per a study by [38], will persist beyond COVID-19, and there is a necessity for factoring these salient lessons into long-term educational planning. The strengthened family-school relationships, heightened CRT strategies, and equity concerns addressed through this study should impact school planning for future digital learning spaces so that remote and hybrid learning is not a pandemic-era solution but a deliberate, inclusive, and equitable model for learning.

If digital learning is ever to become a sustainable aspect of schooling, it will need to have a grounding in accessibility, inclusion, and cultural responsiveness. That will mean developing policies that create sustained family engagement, investing in teacher training that is culturally responsive, and bridging systemic technology gaps that impede equal access to learning. The evidence from this research suggests that remote learning, when well-planned and sustained, can enhance cultural inclusion and family engagement in ways that may not occur with traditional schooling. Unless a deliberate sustainable effort is made, digital learning will exacerbate existing inequalities rather than being an opportunity for educational transformation.



Figure 3. Pathways toward Inclusive and Equitable Digital Learning.

6. Conclusion

This research offers valuable insight into family-school

relationships, culturally responsive teaching (CRT), and digital equity within virtual learning spaces, as depicted in Figure 3. With traditional models of teaching altered through online learning, there existed great promise as well as persistent

challenges for facilitating inclusive, student-driven instruction. Our findings indicate that educators effectively employed family engagement and cultural literacy as a means for sustaining CRT in virtual learning environments. The digital divide remained a persistent obstacle, though, toward equitable access for learning. We found that family-school relationships not only became stronger but also fundamentally reconceptualized. Parents and family members became more active and habitual allies for their children's learning [13], introducing cultural background and support into the home environment. Such engagement played a significant role toward greater engagement on the part of students. Educators, for their part, developed new means for incorporating family input into educational planning, paving the way for enduring partnership beyond the pandemic. Yet, this increased level of family involvement was not universal across all communities. Time constraints, lack of digital literacy, and busy work schedules presented barriers for most families. As such, schools will have to implement adaptive and flexible engagement models that accommodate diverse forms of family involvement moving forward. These models will have to make parent involvement not just available but sustainable for face-to-face, blended, and all-virtual learning environments.

The adoption of CRT into digital spaces proved difficult but creative. Our research shows how students turned their homes as school extensions, bringing their lived realities into learning. Educators responded with family histories, multilingual texts, and digital tools embedded into lessons, with cultural sensitivity and inclusiveness. Despite this, many teachers reported that they would appreciate more training on how to apply CRT into virtual spaces. These findings suggest targeted professional development that provides educators with specific, actionable strategies for adopting CRT into digital and blended spaces.

Despite creative innovations that ensued, technological inequalities continued to limit student participation and achievement. Consistent with prior research on digital exclusion and equity gaps during the pandemic [10, 16, 23, 24], our findings reinforce that some students bore a disproportionate burden of erratic internet connections, limited device access, and poor digital literacy supports. For instance, [11] highlights that families in low-income urban communities continue to face barriers to stable and meaningful connectivity. Although some schools across Canada implemented temporal measures through loaner devices during the first lockdown – broader access occurred in the fall of 2020, at which point students were issued Chromebooks. Nonetheless, for a few others, even with device distributions, there remained structurally persisting gaps in digital access [25–27]. Closing these gaps will require long-term policy responses, as closing technological inequalities is not a short-term necessity, but a sustained imperative for all students, regardless of socioeconomic background, to have equal access for achievement within digital learning spaces.

Looking forward, our study emphasizes the importance of

deliberate and ongoing refinements in digital learning policy, teacher professional development, and home-school collaboration. As hybrid and online learning solidify their place in education systems, there is an imperative to maintain and refine the best practices that emerged during the pandemic—i.e., more family engagement, inclusive teaching, and purposeful uses of digital tools for differentiation—while addressing the structural problems that remain. Ultimately, this research contributes to growing conversations on how educational systems can evolve to respond to diverse learners' requirements in a digital age. The pandemic hastened these conversations, but what has been discovered presents a unique opportunity for a new vision for a more inclusive, adaptive, and equitable education. Educators, policymakers, and families will all have a role to play in ensuring that, moving forward, technology is a tool for empowerment, not exclusion, family remains at the heart of learning, and culturally responsive teaching is seamlessly transferable across all teaching modes.

Abbreviations

CRT	Culturally Responsive Teaching
CLD	Culturally and Linguistically Diverse

Author Contributions

Benjamin Boison: Data curation, Formal Analysis, Investigation, Methodology, Software, Writing – original draft, Writing – review & editing

Anne Burke: Conceptualization, Data curation, Investigation, Supervision, Writing – original draft, Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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