

Theme: Training for Teachers & Effective Pedagogy (In-Person, Remote, and Hybrid)

This literature review will provide a critical analysis of past and current pedagogical approaches for teacher training with consideration for challenges and opportunities caused by COVID-19. The themes identified will be compared and contrasted with data collected from surveys with parents and students and a focus group with teachers from the *Youth Association for Academics, Athletics, and Character Education* (YAAACE) as part of their Community School Initiative. YAAACE is a non-profit organization offering programs and services in the Jane and Finch neighbourhood in Toronto, Canada. The *Community School Initiative* (CSI) is a public-private partnership with *Spirit of Math* that provides a structured math curriculum to high-achieving students in grades two to eight.

The COVID-19 pandemic changed many aspects of life for people around the globe and has led to many challenges and opportunities emerging in the area of teacher training and professional development for certified and pre-service teachers (PSTs) (Pozo-Rico et al., 2020; Toquero & Talidong, 2020; Llerna-Izquierdo & Ayala-Carabaio, 2020; La Velle et al., 2020; Assuncao Flores & Gago, 2020). The gaps in digital literacy amongst teachers made student learning experiences different depending on teachers' ability to use information communication technologies (ICTs) and various online platforms to teach remotely during emergency lockdown orders. This has led to some researchers claiming that teacher digital literacy is going to be an "indisputable challenge after COVID-19" (Sánchez-Crusado et al., 2021, p. 1). Many schools have teacher training plans that are updated annually (Rocha et al., 2021), however most did not include clear plans and strategies for high-quality online teaching.

What has become evident is that "distance learning is problematic when teachers are themselves not trained for it" (Bhamani et al., 2020, p. 16). This can put a lot of added pressure

on parents who now have more responsibility in teaching their child/children from home. Children with parents who work from home and could support their children with remote learning directly or through paying for a tutor were able to mitigate these issues much easier than children from low socioeconomic status (SES) homes where parents are more likely to be front-line essential workers in low paying jobs and at an increased risk with exposure to COVID-19 (Toronto Foundation, 2021). Following Hurricane Katrina in 2005 and the New Zealand earthquakes in 2010, researchers explicitly called for more work to be done in the field of education in order to support young people who were affected by the disasters (Fothergill & Peek, 2015, as cited in Rose & Bimm, 2021) to develop teaching resources and curricula, and to provide short and long-term support to teachers who were also recovering from disaster themselves. With COVID-19 being a global disaster, the impacts and responses are going to vary from region to region and it is important for researchers to stay up to date with the emerging findings and best practices in mitigating the negative effects on education. There are many new innovations and strategies emerging to deal with effective teaching during remote and hybrid learning, and there is an ongoing adaptive practice involved with this that will need flexibility from teachers, students, parents, and school administrators (Flores & Gago, 2020). The crucial role that teachers and schools play in responding to the struggles of young people, especially during times of social and economic disruption like the COVID-19 pandemic, is what will help mitigate some of the social, economic, and educational losses due to COVID-related disruptions (Rose & Bimm, 2021).

Before the pandemic, online education enrollment had been steadily rising (O’Keefe et al., 2020), and is expected to continue to rise as schools become increasingly reliant on embedding technology into schools and classrooms. Evidence from decades of studies on

effective online education suggest that with careful instructional design and development, teaching online can be a pivotal tool that educators can use to engage students (O’Keefe et al., 2020; Morgan, 2020; Hagerman & Kellam, 2020; Harasim, 2000). This has proven to be beneficial for some students, and detrimental for others, and further studies on the best pedagogical practices, teacher training programs, and student interventions are needed to ensure that these changes do not continue to increase inequities in education, but instead broaden opportunities for learning in new and diverse ways. A study by Orlov et al. (2021) found evidence that “instructor experience and course pedagogy played important roles in ameliorating the potentially negative effects of the pandemic on learning” (p. 3). These findings come from a collection of student data from PhD-granting institutions pre-pandemic (Spring or Fall 2019) and during the pandemic (Spring 2020).

Challenges in Education Caused by COVID-19

The pandemic put a spotlight on the pre-existing inequities in the education system (Allen et al., 2020; James, 2020). This has led to achievement gaps between students along socio-economic and demographic lines being exacerbated which has increased learning loss for the students that were already struggling pre-pandemic (Bailey et al., 2021). Recent studies by Dorn et al. (2020) and Pier et al. (2021) (as cited in Royal Society of Canada, 2021) have defined learning loss as “the discrepancy between the assessed academic skills and knowledge of students and grade-level curricular expectations and/or gaps between the academic performance of some groups of students compared to others” (p. 33). This loss is being accelerated due to differing levels of access to technology, with Black, Indigenous, and People of Colour (BIPOC) and low-income families experiencing inequitable access to high-speed internet and devices to accommodate every person in the house (Bonal & González, 2020; James, 2020; Toronto

Foundation, 2021). A study by Katz et al. (2021) found that students who were experiencing greater financial hardships were much more likely to have greater challenges with internet connectivity and access to devices compared to students who were from higher SES families. In the study, 2,913 undergraduate students from 30 universities in the United States were surveyed through an online questionnaire using the Qualtrics platform. They found evidence that students who reported experiencing these challenges were associated with lower remote learning proficiency (RLP) which they described as “a pandemic-specific manifestation of the differentiated digital skills and engagement that constitute second-level digital inequality (p. 6). With the economy and job opportunities shifting towards favoring employees with science, technology, engineering, and math (STEM) skills and higher levels of digital competence, and studies showing that automation, robots, and artificial intelligence (AI) will change the labour market and replace many jobs in the future (Shackleton, 2020), it’s important that research addresses these technological inequities with targeted interventions to prevent the digital divide from increasing after the pandemic.

These challenges have led to increased stress on many students and families (Toronto District School Board, 2021c), and the teachers who in many cases are dealing with their own stressors caused by having to drastically shift teaching strategies and learning expectations for emergency remote classrooms without extensive training or guidance from the Ministry of Education (Canadian Teacher Federation, 2020; Czerniewicz et al., 2020). Supporting teachers in gaining the skills to teach online will require significant training and support, especially with many who begin teaching online having “little knowledge of the process of designing, developing, and instructing an online course” (Cuellar, 2002, as cited in Keengwe & Kidd, 2010, p. 535). In addition, teachers have expressed that some of their top difficulties teaching remotely

includes getting students engaged and consistently communicating with parents (Bonal & González, 2020).

The challenges of online learning are further captured in a study by Thompson (2010), who researched the impacts of remote learning on students with exceptionalities. In the study, 35 instructors with an average of 6.3 years of teaching were interviewed about their experiences teaching students with exceptionalities in an online environment. The teachers stressed the importance of relationship building, having the ability to develop a well-organized site/course for students to navigate without feeling overwhelmed, tailoring assignments to each individual student's needs, and allowing students to be self-paced. The difficulty of this is captured in a quote by a teacher which states, "in a physical classroom, with a couple dozen students, a teacher must work with everyone simultaneously, and developing individual plans and differentiating instruction for two dozen individuals is the main issue in education today, in my opinion; it is simply very difficult to do" (Thompson, 2010, p. 33). This difficulty has been exacerbated with shifts to online and blended models of education.

The following sections will discuss the difference between optimal online learning and emergency remote teaching, teacher training/professional development programs that are preparing current and pre-service teachers for the future challenges in education, and finally an analysis of evidence-based pedagogies that educators can use for virtual and/or in-person classrooms.

Differences between Optimal Online Learning and Emergency Remote Teaching

Optimal online learning and emergency remote teaching are both virtual forms of instruction, however there are some key distinctions between the two. Optimal online instruction is pre-planned and intentionally designed with the help of instructional designers and content

experts (Saqlain, 2021). This development process leads to course designs that are meant to provide “immersive, adaptive and other innovative learning experiences” (O’Keefe et al., 2020, p. 7) and prepares educators for high quality delivery that considers important aspects of teaching such as community development, equity, and differentiated instruction. In a ‘faculty playbook’ called *Delivering-High Quality Instruction Online in Response to COVID-19*, O’Keefe et al. (2020) describe the importance of designing and delivering online courses with equity in mind and outlines five primary areas of consideration which are:

1. *Academic*: Students’ preparedness for learning and readiness for online learning.
2. *Pedagogical*: Course organization and design, quality interaction, and effective, equitable teaching practices.
3. *Psychological*: Students’ feelings of social belonging and ability to address stereotype threat, as well as perceptions of course relevance and instructor compassion.
4. *Social*: Students’ perceptions of connection versus isolation related to the course.
5. *Technological*: Students’ ability to access and use course technologies. (p. 13)

This is different from emergency remote teaching, which is what was seen during the pandemic, and doesn’t leave enough time for planning or development. Emergency remote teaching often takes on a one-size-fits-all framework, and leads to many challenges for learners, educators, and parents who are often unprepared for teaching and learning online (O’Keefe et al., 2020; Saqlain, 2021).

In another study about online education by Cavanaugh and Dewese (2020), they collected data from an education support site between January 2018 to March 2020 to analyze search trends by educators. The search history found that the use of the education support site “grew steadily each month from around 200,000 views of content per month in January 2018 to around 600,000 in February 2020. Content views in March 2020 were over 4 million, indicating the urgency felt by educators to learn about and succeed in teaching online” (Cavanaugh & Dewese, 2020, p. 234). Related findings by Whalen (2020) document teachers needing

significant support with shifting their practice and, as a result, mainly relying on informal, self-directed learning with their professional learning networks for assistance (Whalen, 2020). Some teachers who already had experiences and training with online teaching were able to provide their students with high quality instruction, and support their colleagues as a peer mentor, but this was not the case for many teachers who reported feeling unprepared to teach online, struggled to adapt their pedagogy, and resorted to teaching practices that were not beneficial for all of their students (e.g. rote learning exercises, showing too many videos, etc.) (Whalen, 2020). These key distinctions between emergency remote teaching and optimal online instruction highlight the importance of teacher training/professional development opportunities for in-service and PSTs to prepare them for multiple modes of delivery so they are knowledgeable, confident, and ready to support their students and the families they serve whether in-person, virtually, or through a blended model.

Distance Education/Remote Learning & Blended Models

As many schools and social services switched to remote and blended models, many students suffered from learning loss, however positive outcomes were also observed in many cases (Seage et al., 2020; Rasheed et al., 2020). A study by Seage et al. (2020) found that blended models of teaching and learning (i.e., a mixture of in-person and remote instruction) can lead to positive educational outcomes for many students because it offers the “benefit of hands-on learning, as well as independent, self-motivated learning” (p. 139). In the study, they randomly assigned 129 third, fourth and fifth grade students from low-socioeconomic schools to receive either a blended learning approach to science and a traditional approach and analyzed achievement scores by conducting a one-way two-group Multiple Analysis of Variance (MANOVA). The results indicated that a blended learning environment led to higher STEM scores being achieved than

traditional science instruction, and “the teaching method had a statistically significant effect on the linear combination of the science, technology, mathematics and engineering scores” (Seage et al., p. 133). Another study supports these findings by claiming that “the idea of blending instructional materials with online interventions has proven to be an upgrade to both face-to-face traditional mode and the fully online mode of instructions. Because, if done well, the approach combines the benefits afforded by both face-to-face and online learning mode of instructions” (Broadbent, 2017, p. 1 as cited in Rasheed et al., 2020). In our survey with YAAACE students and parents, there was a portion of respondents who agree with these sentiments and gave answers that were in favour of blended models of instruction. The success being documented in blended models could be attributed to what Darling-Hammond (2020) found which is that students have better educational outcomes when they are able to learn at their own pace, when they are given some choice over their learning strategies, and when they are able to critically engage with course content.

Professional Development: Training for Current Teachers and Pre-Service Teachers

The sudden shift to emergency remote learning meant that there wasn't enough time to effectively train educators to teach remotely using deliberate, and well-designed online methods and pedagogical strategies (O'Keefe et al., 2020; Saqlain, 2021; Morgan, 2020; Royal Society of Canada, 2021; Means et al, 2014). The significance of providing teachers with high quality professional development is shown in a report by Yoon et al. (2007) that reviewed evidence from more than 1,300 studies on how teacher professional development affects student achievement. In the report, they found that teachers who received substantial professional development (an average of 49 hours) “can boost their students' achievement by about 21 percentile points” (p. 1). In a separate and more recent study on the professional development of public school teachers in

Great Britain, Canada, and the USA, Mukan et al. (2017) describe one of the key tasks of any education system is preparing their citizens to function in society. With teachers playing such a big role in this process of getting their students prepared for life after school, it's important for school boards to determine the factors and strategies that make professional development for teachers successful. In the study by Mukan et al. (2017), they describe professional development of teachers as “a continuing process which covers three aspects, namely, initial preparation, introduction into the profession, and constant improvement of personal, social and professional competencies of educators and corresponds to their career advancement” (p. 8).

Professional development is a continuing process of lifelong learning and development, and important for teachers to continue receiving to evolve their pedagogical strategies throughout their career to support students they work with. The characteristics of high-quality teacher professional development, as described by Kedzior (2004), consist of:

1. *Content focused*: which includes considering students' prior knowledge on content and understanding strategies to engage students in learning new concepts.
2. *Extended*: Instead of one-time sessions, giving teachers increased opportunities for active learning.
3. *Collaborative*: Teachers learn better when they collaborate with their peers inside and outside of schools. Professional development opportunities should allow for opportunities that allow for teachers to connect and learn from one another's experiences.
4. *Part of daily work*: Something that should be a part of the day-to-day work of teachers.
5. *Ongoing*: Continuous rather than episodic. This will help support further learning and allow teachers to be informed of up-to-date teaching practices.
6. *Coherent and integrated*: Aligned with curriculum standards and informed by evidence-based best practices.
7. *Inquiry-based*: It should promote teachers to engage in meaningful discussions and planning, as well as continuous inquiry and reflection.
8. *Teacher-driven*: Responsive to the self-identified needs of teachers' by giving them ownership over what they want to learn.
9. *Informed by student performance*: Student performance should be analyzed to find areas of improvement for teachers' professional development.
10. *Self-evaluation*: To help with self-reflection and guide improvement efforts.

An additional design element of effective professional development suggested by Darling-Hammond et al. (2020) is that they provide coaching and expert support focused on teachers' individual needs. These characteristics can be found in different approaches/models to professional development including, mentoring, content-based collaborative inquiry (CBCI), cognitively guided instruction (CGI), and lesson study. Mentoring is a form of peer-tutoring, and a way to pair up novice teachers with experienced teachers and to provide them with opportunities to learn from one another. CBCI and CGI allows for teachers to work together collaboratively to "create deeper understandings of how their students think about and understand particular subjects" (Kedzior, 2004, p. 3). The goal of these processes is to collaborate on finding strategies to support student learning by building teachers' understanding of pedagogy and content. This deepened understanding can lead to implementation of new effective strategies by teachers to support students and their learning. For the lesson study approach, teachers worked together to "create, study, and improve their lessons" (p. 3). A teacher will run a lesson while others make detailed observations, and as a group they make suggestions for instructional improvement that can support teacher growth. This is similar to a community of practice approach.

In an article by Saqlain (2021), he found that the institutions that offered student-centered professional development opportunities for their employees were more successful than those that did not. In his personal reflection about how to best prepare for emergency remote teaching, Saqlain described that his university offered online training as well as financial incentives for completing the training. It was offered online as a self-paced training module and covered many important topics such as remote teaching approaches, and tools for remote instructions and online assessment. Additionally, he describes that a lot of his success in preparing for teaching

online was due to taking the initiative to prepare for remote teaching by attending webinars on how to use Zoom, watching YouTube videos on teaching and learning online, and the background knowledge he gained due to completing online courses through Massive Open Online Courses (MOOCs). MOOCs are an idea that was conceptualized by Siemens and Downes (2008, 2009, as cited in Goldie, 2016) who described them as “huge networks of connected people and resources that learners can access and use to design and direct their learning” (p. 1066). Saqlain’s observations provide evidence that the effectiveness of educators teaching strategies will be highly contingent on the type of professional development opportunities available and accessible offered by their education systems, as well as how much initiative they take to seek professional and personal development opportunities.

In another article on best practices for implementing remote teaching, Hani (2020) cites the importance of organizations such as the International Society for Technology in Education (ISTE) which offers guidelines and standards for educators in providing effective online education. ISTE standards offer 14 critical elements for embedding digital technology into learning, and suggest implementing methods that ensure equity, provide student-centered learning strategies, communicate expectations clearly, and provide “free online resources that may create learning opportunities” (p. 137).

The next section will be focused on pedagogical strategies that teachers can use in their classroom, and the importance of constructing personal pedagogies that are suitable to an educator’s teaching capabilities and the capabilities of their students in-person, virtual, and/or in a blended model.

Effective Pedagogical Approaches

Educators that are effective at critically engaging their students do so through effective pedagogical practices depending on the skills and field of knowledge that they are teaching (Bhowmik et al., 2013). Teaching pedagogy as described by Loughran (2006) is the “art and science of educating children... focusing on the relationship between learning and teaching such that one does not exist as separate and distinct from the other is crucial to such education” (p. 2). Rather than focusing only on content and what educators teach, developing a teaching pedagogy also has to do with *how* educators teach. As mentioned in previous sections, teachers found it difficult to move beyond their traditional pedagogical approaches used in-person, to online learning pedagogies needed for remote and blended learning (Keengwe & Kidd, 2010). The disruptions caused by the pandemic have led to the rapid emergence of new pedagogies in areas such as assessment, home learning, and blended learning (Breslin, 2021). New digital pedagogies that can maximize the usage of technology in the classroom are needed, and this will take time due to the varying levels of digital literacy in teachers and their students.

A critical examination of initial digital pedagogy adoption by Greenhow et al. (2021) found that many tensions have arisen between teachers, parents, and policy makers due to major differences in educational experiences for students who were subject to different deliveries of remote digital pedagogy. With the prevalence of online and blended models of education projected to increase in the future (O’Keefe et al., 2000), pedagogical approaches such as culturally responsive, student-centered, hands-on, inquiry-based, critical, and other currently utilized pedagogies are important in our classrooms. The challenge is going to be in designing and implementing high-quality instruction, both online and in-person, that supports the diverse cultures and learning styles that align with best practices to meet the needs of students from

various social groups and communities. There is no such thing as a one-size-fits-all solution in education and understanding how to implement new instructional practices and pedagogies is going to take some experimentation. Responses will be varied depending on resource availability, student and community needs, and teachers' capabilities. Some believe that this can have a positive impact on the future of teaching (Speck, 2020), as teachers have been challenged to rapidly develop skills and adapt their pedagogies (Greenhow et al., 2021).

Culturally Relevant & Responsive Pedagogy

A culturally relevant and responsive theory of education was proposed by Ladson-Billings (1995) who saw a need for the reform in teacher education. In the article, she builds on educational anthropological literature to argue the need for a culturally relevant pedagogy to reduce gaps in student achievement, especially for African-American students who have a well-documented and long history of educational struggle and poor achievement due to systemic barriers. She suggests that in order to be a culturally relevant teacher you must meet three criteria: "an ability to develop students academically, a willingness to nurture and support cultural competence, and the development of a sociopolitical critical consciousness" (p. 483). She also argues that this pedagogical approach is distinguishable by "three broad propositions or conceptions regarding self and other, social relations, and knowledge" (p. 483). Teachers and PSTs need to understand their own and other cultures and understand the importance of culturally relevant teaching to reduce the academic disparities along socio-economic, racial, ethnic, and cultural characteristics that have been observed for decades (Ladson-Billings, 1995; Toronto District School Board, 2021a). This takes a dedication to posing questions that require consistent and continual learning about self and diverse others (Allen et al., 2017). It has

similarities with the inclusive pedagogical approach which Florian and Linklater (2010) describe as a pedagogy that

[R]epresents a shift in thinking about teaching and learning from that which works for most learners along with something ‘different’ or ‘additional’ for those who experience difficulties, to an approach to teaching and learning that involves the creation of a rich learning environment characterized by lessons and learning opportunities that are sufficiently made available to everyone so that all are able to participate in classroom life (p. 370).

When race, power, and privilege are not critically analyzed and deconstructed in classrooms, teachers risk marginalizing other cultural perspectives while sanctioning the dominant ideology which in Canada is historically from a Eurocentric perspective (Allen et al., 2017; Eizadirad, 2019). A critical examination of race and other sociocultural concepts that disenfranchise K–12 students in schools must be an integral and reflective practice for teacher candidates, and requires teachers get a deeper understanding of their students and the communities and families they serve. Requiring teacher candidates to gain skills in critical reflection and critical consciousness to deconstruct the existing social order is imperative to support culturally relevant and responsive pedagogy in teacher education curriculum. This is program planning with equity in mind through taking “student differences in background, ability, and individual experiences into account and explicitly [working] to provide opportunities for success that are not impacted by these differences” (O’Keefe et al., 2020, p. 12) Most recently, Django Paris (2012) has coined the term “socio-culturally sustaining pedagogy” which builds off of the work of Gloria Ladson Billings. He argues that content and pedagogy have to not only be socio-culturally relevant but also sustain your tradition and culture such as your home language, etc.

Student-Centered Learning

Student-centered learning is a pedagogy that places students at the centre of their educational engagement and active meaning-making. It is a more collaborative teaching strategy than a teacher-centered classroom (Knowlton, 2000). A teacher-centered class is one where the teacher introduces “specific things that are worthy of being studied, and students are told how to interpret them” (p. 6). The assumption in a student-centered pedagogy is that “learners construct their understandings through their actions and experiences on the world” (Mascolo, 2009, p. 1). This is a shift away from the traditional “lecture-and-test” modes of instruction to co-creation with students. In a student-centered classroom the relationship and role between students and teachers is more dynamic and less regimented than the more rigid teacher-centered approach (Knowlton, 2000) which sees the teacher as the “sage on the stage” who has all the knowledge, rather than being a “guide on the side” and acting as more of a facilitator/mentor who promotes active and cooperative learning between students (King, 2013).

A study by Blonder and Dinur (2011) found that students that were in a student-centered environment experienced positive effects in their motivation to learn. The researchers used data from interviews and a semantic differential questionnaire to thirty-six female high-school students that were participating in a nanotechnology module to assess the effectiveness of using a student-centered pedagogy on students’ continuing motivation. Their results found that motivation increased when students got to learn about something that was personally interesting and “challenging, modern, and applicable” (p. 9). The benefits of a student-centered approach are also seen in the results of a study by Enriquez and Oliver (2021) who acknowledge the importance and added difficulty and discomfort for some teachers to shift from a teacher to a student-centered positionality because of the constant self-reflexivity needed to “deconstruct ‘old

ways' and merge them with 'new'" (p. 461). This is a human-centered approach to teaching that can prove to be beneficial for both teachers and students.

Inquiry-Based Learning (IBL)

Inquiry-based learning (IBL) in the classroom involves educators making a pedagogical shift towards more collaborative approaches to learning, and much like the student-centered approach it is a shift away from traditional direct instruction in classrooms. Educators that choose this pedagogical approach see themselves as co-learners and learning facilitators. They are focused on student-driven inquiry which allows students to play a bigger role as knowledge-makers and gives them flexibility to investigate the ideas that are important and interesting to them in alignment with their passions, interests, and lived experiences. In a study by Early and Kendrick (2020) on the opportunities and challenges of inquiry-based pedagogies on English language learner success, they describe that IBL should be used in the confines of school curriculum and content and competencies that are expected. In their study, which gathered information through semi-structured interviews with eight expert language and literacy educators, they found that an inquiry-based approach helped to “enhance ELLs’ understanding of content knowledge, give prominence to ELLs’ languages and literacies and promote respect for diversity, and utilize digital tools to support ELLs’ language and content learning and amplify their voices” (p. 140). They further describe the common structure of an inquiry-based approach to building units and/or lesson as having students explore “Big Ideas (i.e., understandings) and form “essential questions” related to their interests and real-world issues” (Wiggins & McTighe, 2005, as cited in Early & Kendrick, 2020, p. 140). When students are challenged to ask questions that interest them which requires critical thinking and inquiry, it can have a positive effect on students’ learning experience inside and outside of a school setting.

In a more recent study, Deák et al. (2021) found that IBL can also be beneficial for integrating subjects in STEM pedagogy. They believe that it will be a key teaching philosophy for post-pandemic scenarios of education. IBL and the aforementioned pedagogical approaches often have overlapping frameworks and ideas because educators are often adapting to new teaching and learning environments that require old theories to be built upon, adapted, and improved. All of these pedagogies holistically and in collaboration with one another can be adapted to fit into the existing and emerging digital pedagogies to help mitigate COVID-related disruptions in education.

Digital Pedagogy

There have been many attempts to research the impacts of online learning and to theoretically frame successful and effective digital pedagogies in online classrooms in the years prior to the pandemic (Knowlton, 2000; Rice & Carter, 2016; Archambault & Crippen, 2009; Keengwe & Kidd, 2010; Goldie, 2016). Post-pandemic teaching strategies are likely going to need to include training teachers to have the skills to develop and deliver lessons using best practices for remote learning (Morgan, 2020). There have been many studies of the benefits of high-quality remote instruction, and many reports of students preferring a blended learning model opposed to strictly face-to-face (Dreamson, 2020; Keengwe & Kidd, 2010). Teaching students to be learners in a digital age using online learning tools can provide students with more flexibility and self-paced learning opportunities. It can also teach them the skills needed to use digital technologies in a world that is increasingly reliant on these technologies.

Teaching and learning using the conceptual framework and application of connectivism can provide a useful lens for using digital technologies in a classroom. Connectivism is a conceptual framework “which views learning as a network phenomenon influenced by

technology and socialization” (Siemens, 2006, as cited in Goldie, 2016, p. 1064). Some key principles of connectivism include: “learning and knowledge rest in diversity of opinion; nurturing and maintaining connections is needed to facilitate continual learning; decision making is a learning process in itself; and ability to see connections between fields, ideas, and concepts is a core skill” (pp. 1064-1065). In a literature review about connectivism as a learning theory for the digital age, Goldie (2016) describes connectivism as “one of the most prominent of the network learning theories that have been developed for e-learning environments” (p. 1064). With the constantly evolving nature of technology and information (Brooks, 2015) it is important that students are provided the skills to learn online, which can promote further learning outside of school and give students more autonomy in their education. Without the proper teacher education, addressing of digital equity issues, and an understanding of how to adapt in-person classroom pedagogies to online education, schools risk failing to prepare students for future success and well-being.

Discussion

In addition to the research findings outlined in the previous sections, further data was gathered and analyzed through a research partnership with Youth Association for Academics, Athletics, and Charter Education (YAAACE), a non-profit organization in the Jane and Finch neighbourhood in Toronto, Canada. The 12-month partnership with YAAACE was initiated in response to the pandemic's impacts on YAAACE's capacity to deliver effective online, in-person, and hybrid programming. In the research project, the lived experiences of educators (n=7), parents (n=33), and students (n=33) was captured via surveys and a focus group between June to July 2021. The data was analyzed by triangulation and thematic analysis to identify the challenges in program delivery created by COVID-related disruptions. The findings from the

study provide recommendations to mitigate learning loss and reduce the achievement and opportunity gaps for racialized and under-resourced communities. The student-athletes involved in the research project, their parents/guardians, and the teachers and coaches involved in our study are all members of YAAACE's *Community School Initiative* (CSI) which is a supplementary education program (SEP) partnered with *Spirit of Math* to deliver a structured math curriculum to students who are in grades two to eight aged eight to fourteen years old. The CSI is one of the many holistic and socio-culturally relevant and sustaining programs YAAACE offers in the Jane and Finch community.

For participants in the study, there were many challenges associated with teaching, learning, and parenting in a remote and blended learning model. For parents, there were many barriers associated with technology access and challenges with getting their child/children to learn online and navigate the online educational platforms, with most parents, students and teachers preferring in-person learning. One parent observed that "remote learning is not an ideal model for a child with ADHD", and another parent also noticed that it was "harder to focus and learn compared to in-person learning". For students, more than 70% said they prefer in-person learning with one student stating, "I can't enjoy certain subjects by doing hands on activities to learn which then makes learning some subjects very boring and makes it a burden to complete those online worksheets and do the work." Teachers stated that teaching remotely made student engagement, their ability to support students one-on-one, and the collection of student work more difficult. Teachers also noticed more inconsistent attendance from the students in a remote context which made it challenging for teachers to progress through the Spirit of Math curriculum expectations. There were also challenges with gauging student engagements as body language was not observable since many cameras and mics were turned off during the learning sessions online.

Although there were many challenges and obstacles due to COVID-related disruptions to YAAACE programming, overall the CSI played a positive role for participants by offering students extra-curricular programming that was culturally relevant, instructed by certified teachers and basketball coaches that were representative of the mainly Black student demographics. The CSI addressed a need for affordable and accessible programming that can mitigate opportunity and achievement gaps in racialized and under-resourced communities. Teachers were challenged to alter their teaching practices and find new strategies and digital applications to engage their students and communicate with parents (e.g., Kahoots, Brightspace, Khan Academy, WhatsApp), and educate themselves in finding “new ways to get students more involved and excited about their education” as one teacher explained. In terms of implementing the Spirit of Math curriculum, a curriculum that is geared towards gifted and high-achieving students, teachers felt like the curriculum moved too fast for some of the learners, particularly older children who needed more time to adapt to a new system. Teachers felt there wasn’t enough time for teachers to effectively learn the curriculum as part of the Spirit of Math teacher training and expressed wanting more training to help them feel more confident implementing the expectations.

Conclusion

Our findings show that the public and private partnership between Spirit of Math and YAAACE has showed promise despite the pandemic effects, with lots of potential and room for growth and development to fit the needs of a more diverse range of learners. Using some of the recommended pedagogical strategies and offering targeted and intentional professional development/teacher training opportunities, the hope is that holistic, culturally relevant, and student-centered programs like the ones offered at YAAACE and other non-profits can continue

to adapt to a rapidly changing education system and offer programs that can support marginalized communities educationally, socially, and economically. This can act as an intervention strategy to prevent people from sliding down the socio-economic ladder and further exacerbate existing inequalities.

The aim of this literature review is to contribute to the rapidly evolving debate about effective teaching strategies and pedagogies for the 21st century education. The impacts of COVID-related disruptions on teaching, the importance of teacher education and professional development opportunities to prepare educators to deliver high-quality instruction to students whether in-person, remotely, or in a blended model, and effective teaching pedagogies for post-pandemic schools and classrooms were discussed as themes. The findings from the analysis of current and past literature are consistent with our findings through the research partnership with YAAACE and the surveys and focus group that was conducted with parents, students, and teachers involved in YAAACE's Community School Initiative with Spirit of Math. This is what makes community-based organizations such as YAAACE so important because of the success their programs have had on improving students' educational achievements and in reducing the opportunity gaps that currently exist. Further research on the effective implementation of teaching and learning strategies is needed as the effects of the pandemic on students, families, and communities continues to emerge.

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