

Online Learning Experiences of Canadian Black Nova Scotians during COVID-19: Adopting an Intersectionality Framework

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Though school closures due to the COVID-19 pandemic affected all students globally, the effect was significantly more for students from marginalized and vulnerable communities. In Nova Scotia, Canada, the concern was the racial achievement gap that the education system is addressing through an inclusive education policy. The worry, especially for Black Nova Scotian students, was the online learning demands and the associated challenges. Through an analysis of a household survey and intersectionality framework, we explored these challenges. We argue that students have multiple and simultaneously acting identities that lead to differential learning experiences and outcomes, and an intersectionality approach should be considered to inform education improvement decisions.

Bien que les fermetures d'écoles dues à la pandémie de COVID-19 aient touché tous les élèves du monde, l'effet a été nettement plus marqué pour les élèves issus de communautés marginalisées et vulnérables. En Nouvelle-Écosse, au Canada, l'inquiétude portait sur l'écart de réussite raciale que le système d'éducation s'efforce de combler par une politique d'éducation inclusive. L'inquiétude, en particulier pour les élèves noirs de Nouvelle-Écosse, portait sur les exigences de l'apprentissage en ligne et les défis qui y sont associés. Par l'analyse d'une enquête auprès des ménages et d'un cadre d'intersectionnalité, nous avons exploré ces défis. Nous soutenons que les élèves ont des identités multiples qui agissent simultanément et mènent à des expériences et des résultats d'apprentissage différents, et qu'une approche d'intersectionnalité devrait être considérée pour informer les décisions portant sur l'amélioration de l'éducation.

The advent of the COVID-19 pandemic led to the most significant disruption of education systems globally, affecting nearly 1.6 billion learners in more than 190 countries and all continents (United Nations, 2020). As governments across the globe struggled to contain the pandemic, most countries announced the temporary closure of schools, impacting more than 91% of students worldwide. With so many children out of school simultaneously, the pandemic disrupted learning, especially for students from vulnerable and marginalized communities (McKinsey & Company, 2020). To ensure that learning continued, schools went online overnight, and online learning became the new mode of education. Unexpectedly, the crisis also stimulated innovation in the education sector, with the creation of a set of solutions previously considered difficult or impossible to implement. Amid online learning becoming the new way of schooling, it triggered a

plethora of research examining the barriers to online learning resources and their impact on the academic achievement of students (e.g., Aurini & Davies, 2021; MacDonald & Hill, 2021; Yates et al., 2021). With technology becoming indispensable for schooling, the digital divide became even more conspicuous, impacting students and their learning journeys. Although extant research has demonstrated that the COVID-19 pandemic led to a significant learning loss for students, not only academically, but also socially and emotionally (e.g., Houlden & Veletsianos, 2022), research targeting minority students remains scarce (Kumi-Yeboah et al., 2018). A McKinsey & Company (2020) study reported a significant setback in achievement, particularly among Black and Hispanic students and students with disabilities. The school shutdowns further compounded the existing disparities in learning and achievement amongst students from minority and disadvantaged groups. Our study supports the contention to examine the online learning experiences of minority student groups and comprehend the challenges they experienced to participate successfully in the online learning climate (Cole et al., 2021). Given the scarcity of Canadian data that directly measured the impacts of COVID-19 school closures on student achievement (Aurini & Davies, 2021), and specifically minority students, this study aims to examine the online learning experiences of Black Nova Scotians (BNS) of the primary grades to Grade 12 during the COVID-19 pandemic. As education systems globally continue to navigate the aftermath of the pandemic, online learning is here to stay as we envision the future of education. Thus, understanding the impact of online learning on students from minority communities would provide insights to develop effective public policies and schooling strategies that respond to the needs of minority students and help them excel. Therefore, the first objective of this study is to understand the widespread challenges that learners, specifically BNS learners, faced in the new learning environment during the COVID-19 pandemic.

Furthermore, effective in 2020, the province of Nova Scotia broadened its inclusive education policy to include students not only with diverse abilities but also students “who are historically marginalized and racialized (Black Nova Scotian and Mi'kmaw students) or who come from other groups that have been traditionally under-represented and under-served” (Department of Education and Early Childhood [EECD], 2019, p. 1). Inclusive education has been a goal of education systems worldwide, with extensive policies in place to ensure inclusive learning environments, curricula, and pedagogy for all learners (UNESCO, 2017). The United Nations' Sustainable Development Goal 4 calls for countries to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (United Nations 2015, p. 14). Though ideals of inclusion and equity have been extensively adopted by education systems across different provinces of Canada, extant research has established that Black Canadian students struggle in public schools (Shizha, 2016), and a persistent achievement gap exists as compared to their peers (Henry et al., 2021). This situation calls for research to examine specific factors that impact the educational attainment of Black learners and contribute to their achievement gap. Therefore, the second objective of this study is to understand how different socioeconomic factors, such as race, gender, age, and social class impact the learning experiences of BNS students. We explore this understanding from an intersectionality approach (Crenshaw, 1989; 1991), where we argue that not only race but multiple other factors such as gender, social class, immigration status, ability, family structure, and economic capital are simultaneously intersecting determinants in the educational experiences of Black students that can lead to differential consequences (Battle et al., 2005). Bešić (2020) argued that taking an intersectionality approach is critical to broadening our understanding of inclusive education in order to “identify the interaction of multiple factors that lead to discriminatory processes in schools towards different student groups” (p. 111).

Similarly, Buchanan and Wiklund (2021) contended that only race does not “fully explain one's subjective experience because it is shaped by the other identities one holds” (p. 12). Using intersectionality as a theoretical framework, we aim to examine the online learning experiences of BNS students who belong to multiple “othered” identities (Proctor et al., 2017) and understand how different socioeconomic factors impact their online learning experiences. We expect findings from this study will help inform inclusive education policy and procedures in the context of a post-COVID-19 educational system.

Online Learning Experiences of Black Nova Scotians

In 2018–2019, before the Covid-19 pandemic, approximately 5.9% of the Canadian K–12 population was already engaged in some form of distance and/or online learning (Barbour & LaBonte, 2019). In March 2020, when Canadian schools shut their doors in response to COVID-19, over 120,000 students and approximately 9,500 teachers in Nova Scotia abruptly transitioned into a novel teaching and learning environment. Schools across Canada offered a combination of online and hybrid learning to overcome the disruption in learning due to the pandemic, and Nova Scotia was no exception. To facilitate learning in this new environment, the Department of Education and Early Childhood (EECD), Nova Scotia, developed and implemented a Learning Continuity Plan (LCP). The LCP ensured that students in Nova Scotia studying from the primary grades through to Grade 12 continued schooling using various home learning tools. Students were provided with a dedicated learning website, online learning tasks and assignments, bi-weekly at-home learning packages, and direct communication with their teachers and other support staff as and when needed. The EECD also took steps to support students who did not have a high-speed Internet connection or availability of electronic devices at home and those who needed additional support. For example, they developed at-home learning packages that did not require technology or access to the Internet and ensured teacher-to-learner communication could occur through telephone conversations. The EECD also made available non-teaching services such as student support workers, provisions for supporting student mental health and well-being, and resources for families to support their children during COVID-19. After almost one and a half years of online learning, schools in Nova Scotia fully transitioned to in-person schooling for the academic year starting September 2021.

In 1994, the *BLAC Report: Redressing Inequity—Empowering Black Learners* (Black Learners Advisory Committee, 1994) first identified the disparities in factors such as income, housing, education, occupation, and other aggrieved areas in the BNS communities for ages. The report was a landmark document related to education in the province. The committee developed an analysis of the Nova Scotian education system and identified several barriers that Black learners faced in schools. Barriers identified included a lack of Black role models in the school, low expectations for Black students, a lack of Black representation in the curriculum, and teacher insensitivity towards Black students. (Black Learners Advisory Committee, 1994). Over the years, the recommendations provided by the *BLAC Report* have been implemented to eliminate institutional racism in the education system and to improve opportunities for BNS students. Additionally, many positive changes and policy implementations have been completed to support BNS students' academic success further. Though much progress has been made since the *BLAC Report*, the annual assessment results still indicate a persistent achievement gap. For example, the 2019–2020 disaggregated data of annual assessments published by the EECD indicated that the percentage of BNS students at or above the Grade 6 math performance was nearly 20% lower

than that for all other students. This trend was similar for Grade 6 reading performance, with 59% of BNS learners at or above the expectation, while 75% of all other students were at or above the expectation. BNS learners have been experiencing this achievement gap for many years. This pre-existing achievement gap, combined with a seismic shift in the learning environment, is a cause for concern for the BNS learners as they move into a new normal post COVID-19. Thus, research must be conducted to understand the impact of different factors on the online learning experiences of BNS students.

Online learning is not a new concept; extensive research exists on the benefits it provides to learners globally. However, the COVID-19 pandemic has brought online learning to the forefront, especially in K-12 education. Though educators designed policies and plans for an emergency transition to a remote teaching mode, the infrastructure required to support the same was not readily available to the schools and learners. This transition highlighted several challenges, such as the need for high-speed Internet access, teacher training and readiness, learner readiness, home environments suitable for online learning, and the availability of devices. Recent research on online learning experiences during the COVID-19 pandemic has identified factors such as technology readiness, student self-efficacy, teacher support, and student motivation. (e.g., Chiu, 2021; Yates et al., 2021) that impact students' learning experience. Drawing from this research, we explore the impact of three factors, technology readiness, school & teacher support and COVID-19 assistance, on the excitement amongst BNS students about online learning. With an understanding of the challenges faced by BNS learners, this study will be able to offer evidence that can help inform a more productive and inclusive public education system in the post COVID-19 world. Given the above discussion, we present the first hypothesis of this study.

Hypothesis 1 (H1): Technology readiness, school & teacher support, and COVID-19 assistance will have an impact on excitement amongst Black Nova Scotian students.

The Intersectionality Analysis

Coined by Dr. Kimberlé Crenshaw, intersectionality refers to the “simultaneous experience of social categories such as race, gender, class, and nationality and highlights how social categories interact to create systems of privilege, power, discrimination, and oppression” (Proctor et al., 2017, p. 359). Intersectionality considers an individual's multiple categories of “identity, difference, and inequality” (Else-Quest & Hyde, 2016, p.155) and explores how human experience is shaped by various intersecting identities of race, gender, social class, ability, etc. Though intersectionality has been used in various disciplines with diverse epistemologies and methodologies, a persistent debate exists on whether intersectionality constitutes “a research/analytic approach or framework, a theory or hypothesis, or some combination of these” (Else-Quest & Hyde, 2016, p. 158). Given the diversity in intersectionality perspectives and approaches, McCall (2005) summarized three different types of intersectionalities, namely, *anti-categorical*, which deconstructs analytical categories; *intercategorical*, which documents the relationships of inequality among social groups based on multiple dimensions; and *intracategorical*, which focuses on neglected social groups to uncover their complex lived experiences. Similarly, discussing the definitional dilemmas of intersectionality, Collins (2015) proposed intersectionality in three ways:

- (a) intersectionality as a field of study, e.g., its history, themes, boundaries, debates, and direction; (b)

intersectionality as an analytical strategy, e.g., how intersectional frameworks provide new angles of vision on social institutions, practices, social problems, and other social phenomena associated with social inequality; and (c) intersectionality as critical praxis, e.g., how social actors use intersectionality for social justice projects. (p. 3)

Though the concept of intersectionality has been widely used in educational research to theorize the experience of inequality and discrimination among different student groups, it has been less commonly deployed quantitatively (Codioli McMaster & Cook, 2019). Similar to recent quantitative studies in educational research (e.g., Hseih et al., 2021; Proctor et al., 2017), we utilize intersectionality as an overarching framework for our study and examine how different socioeconomic factors explain variance in the online learning experiences of BNS students.

Browne and Battle (2018) indicated that “the study of Black families requires a historical and contemporary lens that situates Black life within broader historical and social forces” (p. 89). Although a voluminous body of research has identified several factors that influence the learning outcomes of Black students, such as the absence of Black teachers and top school administrators, a Eurocentric approach to school curriculum that lacks representation of African perspectives, social labelling of Black students as troublemakers, inherent racism, and perceptions of a dysfunctional family structure (Dei, 1995; Henry, 1993; James, 2012; James & Turner, 2017), research that takes an intersectionality approach remains scarce. Adedoyin and Soykan (2020) stated that students' academic performance might be affected by racial, economic and resource differences. According to Browne and Battle (2018), “intersectionality is crucial in analyzing the social and economic status of Black families since it simultaneously accounts for multiple sites of marginalization” (p. 78). Different factors such as class, gender, family structure, parental background, and financial ability simultaneously impact Black families and their children's educational experience (Case, 2016). For example, in many homes, especially in low-income families, students may lack access to good Internet connectivity, electronic devices, or a quiet place to study due to which they might rely on the computer and free Internet in school (Demirbilek, 2014). Using intersectionality theory, Proctor et al. (2017) investigated the intersection of race/ethnicity and two related factors, gender and bilingual status, and the experience of racial microaggressions in a sample of school psychology graduate students. Fisher et al. (2015) examined bullying amongst African American and White middle school students by studying the interaction between school diversity and student race and reported a variance in bullying experience. Similarly, Browne and Battle (2018) examined race, class, gender, and parental structure and their impact on shaping educational opportunities. They also stated that household structure is linked to differences in educational outcomes for children. Cho et al. (2013) stated that intersectionality focuses on the infinite combinations and implications of overlapping identities that can be used as an analytical tool to explain variance in outcomes. Along similar lines, we take an intersectionality approach and posit that several different salient variables, namely, parent/guardian employment status, immigration status, household income, learner gender, and learner with an individual program plan (IPP) will explain variance in the online learning experiences of BNS students. An IPP is developed for certain students in the Nova Scotia education system when the provincial learning outcomes may not be applicable or achievable, even with adaptations. We expand on Hypothesis 1 to include an intersectionality analysis and present Hypothesis 2 of the study. Hypothesis 2 examines whether certain socioeconomic factors explain significant differences in the relationships between technology readiness, school & teacher support, COVID-19 assistance, and excitement.

Hypothesis 2 (H2): Parent/guardian employment status, immigration status, household income, learner gender, and learner with an IPP will explain significant differences in the relationship between technology readiness, school & teacher support, COVID-19 assistance, and excitement among Black Nova Scotian students.

Methods

The Household Survey

The Delmore “Buddy” Daye Learning Institute (DBDLI) based in Halifax, Nova Scotia, is an Africentric institute that creates educational change and genuine opportunities for learners and communities of African ancestry to reach their full potential. The Institute is a center of knowledge and research on Africentric theories and practices and is endorsed by the provincial government. DBDLI seeks to understand and improve the standard of education for BNS learners from preschool to adult education (formal and informal) and educators through Africentric educational research and practices. DBDLI works directly with Black Nova Scotian /Canadian organizations, communities, government partners, and educational institutions to identify, develop, and implement educational and community capacity enhancement policies, programs, and services. The Institute supports teachers, other educational professionals, and community-based educators with knowledge about Africentric learning, historical and contemporary Black Nova Scotian communities, and their related educational needs. DBDLI also conducts research to identify alternate models of education that address the needs of Black Canadian/Nova Scotian learners. The important mandate of DBDLI is to carry out research that is expected to guide and inform policies needed to improve the educational experiences of BNS learners. Furthermore, DBDLI has recruited and trained BNS community members to help the institute engage in its research activities. These individuals are called Community Data Collectors (CDCs) and engage with the community in an “Africentric” way—where Africa-centered communal values are central to research engagement. The collaboration, framed from participatory action research (PAR) perspective, was intended to support DBDLI in developing an understanding of the challenges that the COVID-19 crisis created in the learning and well-being of BNS learners. Following Green et al. (1995), we define PAR as “systematic inquiry, with the participation of those affected by the problem being studied, for education and action or effecting social change” (p. 2). This perspective demands the active participation of the individuals or communities involved in the study. DBDLI, CDCs, and the BNS community were actively engaged in all crucial aspects of this research.

A household survey was designed in consultation with the community to understand the challenges facing BNS learners within the province due to online learning. Approval of the research ethics board at Dalhousie University was sought prior to commencing the study (REB #020-5156). The survey was designed using Opinio software and consisted of 52 questions that included students' demographics, parents/guardians' demographics, and questions related to online learning experiences during the COVID-19 pandemic. The survey was disseminated to Black households using the email contact information of Black organizations and community members available with DBDLI. DBDLI has been developing this database over the years to facilitate community engagement and participation in the institute's research activities. Also, the CDCs were actively involved in data collection activities. The survey was open for four months, from January 2021 to April 2021. Our analysis is based on responses from 1,736 BNS households

consisting of 2,488 learners studying in Nova Scotian schools in different grades (Primary to Grade 12).

Participants

The study population was Black Nova Scotian households with at least one BNS learner. Responses from households were primarily collected from parents or guardians of the learner(s). In the case if a learner did not live with a parent or guardian, the responses were collected directly from the learner. The learner had to be at least 18 years of age to participate in the study. We followed a purposive sampling strategy. Purposive sampling is a type of non-probability sampling method where respondents rely on their judgment to select the appropriate participants for the study to achieve a more diverse sample. Table 1 shows the sample profile of the respondents of the survey.

Table 1

Sample Characteristics

Household Characteristics		Learner Characteristics	
<i>Respondent Identity</i>		<i>Gender</i>	
Grandparent	91	Male	1413
Guardian	302	Female	1032
Other, please specify:	8		
Parent	1216	<i>Grade</i>	
Student, 18 or older	119	Primary	306
		1	250
		2	309
		3	331
		4	246
		5	237
		6	180
		7	135
		8	93
		9	83
		10	72
		11	70
		12	82
<i>Education</i>		<i>IPP</i>	
Bachelor's Degree	216	No	1064
College Diploma	553	Yes	1353
Highschool Diploma/GED	260	Chose not to answer	71
Less than Highschool	17		
Master's Degree or Higher	60		
Some College	501		
Some Highschool	123		
Chose not to answer	6		
<i>Household Income</i>		<i>Migrant</i>	
\$32,000 to \$44,999	488	Born in Canada	1413
\$45,000 to \$80,000	648	Born outside of Canada	281
Less than \$32,000	191	Chose not to answer	42
Over \$80,000	357		
Chose not to answer	52		
<i>Employment Status</i>			
Employed	1525		
Unemployed	207		
Chose not to answer	4		

Data Collection Procedure

The purpose of the study was explained to each of the respondents via a cover letter emailed to all the potential participants. The cover letter explained the aims and objectives of the study and addressed consent from the participants to participate in the study. A structured questionnaire was developed where we asked each household to respond for every school-going BNS learner at home. For a parent/guardian providing information for more than one child, we collected separate information for each of their children within the same survey. Data transformation was undertaken to convert household records into learner records. The data transformation ensured that if a parent/guardian provided information for two children, we had two corresponding learner records for the survey in our final data file.

Measures

We collected data on three aspects of BNS students' online learning experience during the COVID-19 pandemic. Technology readiness was measured using four items (e.g., please rate the quality of your internet connection, one being poor and five being excellent), and school and teacher support was measured using three items (e.g., please indicate the level of support you received from your child(ren)s teacher(s) over the time that schools were closed due to COVID-19) and COVID-19 assistance received from the government for the household was measured using three items (e.g., did you or any member of your family receive COVID-19 financial assistance?). The dependent variable, "excitement" was measured using a three-point Likert scale. Respondents were asked to indicate the level of learners' excitement to start the new academic year in September 2021, given their experience with online learning from April to June 2021.

Analysis and Findings

Before we began analyzing the household survey data, we examined whether the data was affected by common method bias (CMB). In SmartPLS, we performed a full collinearity test (Kock, 2015) that generates variance inflation factors (VIFs). These values are used to test whether a model is affected by CMB. A VIF value greater than 3.3 indicates pathological collinearity, which suggests that the model is contaminated by CMB (Kock, 2015). Table 2 shows the VIF values obtained from the tests performed below the threshold value of 3.3. This denotes that the study is free from CMB.

We used partial least squares-structural equations modelling (PLS-SEM) to test the conceptual model under study. The model included three first-order factors: technology readiness, school & teacher support, and COVID-19 assistance. We evaluated the validity and reliability of all the constructs under study. Factor loadings for each item, as indicated in Table 3, show that each item loads satisfactorily with its respective factor in comparison to its loading with

Table 2

Full Collinearity Test

Latent Variables	Excitement
Covid-19 Assistance	1.011
School & Teacher Support	1.049
Technology Readiness	1.055

Table 3

Confirmatory Factor Loadings of First-Order Constructs

Constructs/ Indicators	Covid-19 Assistance	School & Teacher Support	Technology Readiness
<i>Covid-19 Assistance</i>			
CD1	0.711		
CD2	0.908		
CD3	0.751		
<i>School & Teacher Support</i>			
STS1		0.803	
STS2		0.753	
STS3		0.677	
<i>Technology Readiness</i>			
TR1			0.577
TR2			0.627
TR3			0.598
TR4			0.634

Table 4

Construct Reliability and Convergent Validity

Constructs	Cronbach's Alpha	Composite Reliability	AVE
Covid-19 Assistance	0.727	0.836	0.631
School & Teacher Support	0.614	0.790	0.557
Technology Readiness	0.440	0.702	0.371

other factors. These values establish acceptable convergent validity of all the first-order measures of the study (Hair et al., 2019).

Additionally, average variance extracted (AVE), Cronbach's Alpha, and composite reliability values were used to assess the convergent validity and reliability of the proposed model and constructs under study. AVE values greater than 0.50 are used to establish the convergent validity of a model. As indicated in Table 4, all the AVE values for COVID-19 assistance and school and teacher support were above the threshold of 0.50, whereas for technology readiness, the AVE value was 0.371. However, AVE values less than 0.5 are acceptable, provided the composite reliability value is greater than 0.6 (Fornell & Larcker, 1981). The composite reliability value for technology readiness is 0.702. Next, we evaluated the reliability of the measures using a combination of two indicators used in SmartPLS: composite reliability and Cronbach's Alpha. The values for both indicators are provided in Table 4. According to Hair et al. (2019), Cronbach's Alpha is a less precise measure of reliability since the items are unweighted. In contrast, with composite reliability, the items are weighted based on the construct indicators' individual loadings; hence, this reliability is higher than Cronbach's Alpha. Furthermore, Hair et al. (2019) indicated that composite reliability values between 0.70 and 0.90 range as “satisfactory to good.” As seen in Table 4, composite reliability values are greater than 0.70, which suggests satisfactory reliability of all the study measures.

Table 5

Heterotrait-Monotrait Ratio (HTMT) Test for Discriminant Validity

Constructs	Covid-19 Assistance	Excitement	School & Teacher Support
Excitement	0.065		
School & Teacher Support	0.102	0.485	
Technology Readiness	0.210	0.288	0.395

Table 6

Results of the PLS structural models

Path	Impact on Excitement	
	Path coefficients	t-value
Covid-19 Assistance	0.097*	4.977
School & Teacher Support	0.374*	20.892
Technology Readiness	0.125*	7.261

* $p < 0.001$ level; ** $p < 0.05$ level

In SmartPLS, the Heterotrait-Monotrait ratio (HTMT85) method was used to assess the discriminant validity of the model. Table 5, which shows the results of the HTMT test in SmartPLS, indicates that the HTMT ratios between all constructs are less than 0.85. These values establish the discriminant validity of the model.

The results of the hypothesis testing are presented in Table 6. We performed a PLS-SEM analysis where we studied the relationship between technology readiness, school & teacher support, and COVID-19 assistance, and excitement. In PLS-SEM, predictive power is explained by the significance of the structural paths. To examine this significance, we performed the bootstrapping procedure (Hair et al., 2012). The values, as shown in Table 6, indicated a significant effect of technology readiness on excitement (path coefficient: 0.125 with $p < .001$ level), school & teacher support on excitement (path coefficient: 0.374 with $p < .001$ level) and COVID-19 assistance on excitement (path coefficient: 0.097 with $p < .001$ level). These values indicate that the first hypothesis of this study, H1, is supported. Furthermore, the model produced a coefficient of determination R^2 value of 0.178. This value indicates that the 17.8 percent variance in the dependent variable, excitement, was explained by three independent variables: technology readiness, school & teacher support, and COVID-19 assistance. Since our research aims not to examine all the factors but only three factors that impact excitement, the R^2 value was found to be satisfactory. An alternative way to assess a path model's predictive accuracy is by calculating the Q^2 value, which was found to be satisfactory at 0.173 (Hair et al., 2019).

Next, to examine how different demographic variables explain further variance in the relationships between technology readiness, school & teacher support, COVID-19 assistance and excitement amongst BNS students, we performed a partial least square-multigroup analysis (PLS-MGA; Sarstedt et al., 2011). PLS-MGA is a between-group analysis to examine whether significant differences exist across diverse data group parameter estimates (Hair et al., 2017). For the relationships between technology readiness, school & teacher support, COVID-19 assistance, and excitement, we examined if any variance exists if we consider parameters like parent/guardian employment status, immigration status, household income, learner gender, and learner with an

IPP. We created data groups for the demographic variables to be tested and then performed the PLS-MGA. Two data groups each were created for the five demographic parameters under study. Data groups created were as follows: parent/guardian employment status (employed vs. unemployed), immigration status (immigrant vs. not immigrant), household income (below \$44,000 vs. above \$44,000), learner gender (male vs. female) and learner with an IPP (without IPP vs. with IPP). For creating data groups for the household income variable, we used the Market Based Measure (MBM), the official poverty line used by the Government of Canada. As of February 2021, the Canadian poverty line was roughly at \$44,000 in Nova Scotia, based on which we created the two income groups. The results of the PLS-MGA are presented in Table 7.

The PLS-MGA draws a probability value to the difference between group-specific path coefficients. A result is significant if the p -value is smaller than 0.05 or larger than 0.95 for a certain difference in group-specific path coefficients (Hair et al., 2017). As depicted in Table 7, which shows the relationships significantly different for the different data groups, it is seen that differences in demographic variables can also account for variance in learning outcomes amongst students. Although no variance exists regarding parent/guardian employment status and learner gender, a variation in the relationships can be seen for the variables household income, immigration status, and being on an IPP. Where household income is concerned, for COVID-19 assistance (path co-efficient difference: -0.138, with $p < .05$ level) and for school and teacher support (path co-efficient difference: -0.082, with $p < .05$ level), the relationship was stronger for households belonging to the group with income below \$44,000. These values indicate that though overall COVID-19 assistance and school & teacher support impacted the excitement level of students, these factors were even more critical for those in households with income below \$44,000 compared to learners from the higher income group. Furthermore, the relationship between school & teacher support and excitement was stronger for students with an IPP (path co-efficient difference: 0.260, with p -value $< .001$ level), which indicates that school & teacher support was a more critical factor for students with an IPP. Finally, for immigration status, there

Table 7

Multigroup Comparison Test Results

Relationship	Comparison	diff	p-value
<i>Covid-19 Assistance -> Excitement</i>	Employed vs. Unemployed	-0.025	0.588
	Male vs. Female	-0.070	0.136
	Without IPP vs. With IPP	-0.059	0.241
	Non-Immigrant vs. Immigrant	-0.067	0.149
	Below \$44,000 vs. Above \$44,000	-0.138	0.008**
<i>School & Teacher Support -> Excitement</i>	Employed vs. Unemployed	0.073	0.166
	Male vs. Female	0.057	0.129
	Without IPP vs. With IPP	0.260	0.000*
	Non-Immigrant vs. Immigrant	0.147	0.001*
	Below \$44,000 vs. above \$44,000	-0.082	0.029**
<i>Technology Readiness -> Excitement</i>	Employed vs. Unemployed	-0.032	0.531
	Male vs. Female	0.017	0.662
	Without IPP vs. With IPP	-0.069	0.062
	Non-Immigrant vs. Immigrant	-0.140	0.004**
	Below \$44,000 vs. Above \$44,000	0.026	0.514

* $p < 0.001$ level; ** $p < 0.05$ level

was a significant difference for school & teacher support (path co-efficient difference: 0.147, with p -value < .001 level) and technology readiness (path co-efficient difference: -0.140, with p -value < .05 level). School & teacher support was more critical for non-immigrant families, whereas technology readiness was more critical for immigrant families.

Discussion

The current study investigated the impact of three factors, namely, technology readiness, school & teacher support, and COVID-19 assistance on excitement amongst BNS students. However, this study has certain limitations. The primary limitation of this study is the self-report nature of the survey, and that data were collected at a single point in time. Future research could utilize actual school assessment results to investigate how online learning impacted BNS students' learning outcomes. Furthermore, a comparison could be made between assessment results during online learning with in-person learning to get an enhanced understanding of how success factors differ as the learning environment changes. Also, another limitation of the study is that data were collected only from one province. Future research could collect data or compare similar studies from other provinces across Canada and understand the online learning experiences of Black students. Furthermore, although the “technology readiness” measure has composite reliability of about 0.7, its low Cronbach’s Alpha of 0.4 indicates the need for a more reliable measure of the construct. However, the results of this study provide important insights for understanding the impact of COVID-19 on students.

The findings of this study indicated that students who struggled with internet connectivity, access to electronic devices or insufficient digital skills of parents/guardians to support them had an impact on their excitement levels. Amongst the survey participants, 49% of the households indicated that they had access to Wi-Fi connectivity, whereas the rest relied on cellular data access or ethernet. Regarding the availability of electronic devices, only 5% of the households indicated that their children always had access to a device that was not required to be shared with other family members. In contrast, around 66% of participants indicated that their children had good to moderate access to devices for online learning. Access to technology regarding the availability of high-speed Internet or electronic devices is critical to success in online learning. Similarly, students who received support from the school and teachers in terms of either educational materials, consistent and timely help, or live contact with teachers exhibited higher excitement. 67% of the participants indicated that their children had access to at-home learning packages, and around 80% were satisfied with the school and teachers' communication and instructional support. Lastly, students from BNS families that received support from the government to overcome the barriers faced due to COVID-19 also reported higher excitement. Around 67% of the participants indicated that they received COVID-19 assistance from the government. The findings of this research confirm several other studies which indicate that factors such as information and communications technology (ICT) infrastructure and access to the Internet (Maheshwari, 2021), and institutional support (Howard et al., 2021) have an impact on the students' experience with online learning. Results of this study indicated that EECD's support with creating appropriate home learning environments, school & teacher support, and governmental assistance for BNS students positively impacted their experiences with online learning.

We further proposed that taking an intersectionality approach is critical because even amongst BNS students, multiple other factors might simultaneously play a role in impacting their experiences with online schooling. Proctor et al. (2017) stated that

as a theoretical framework, intersectionality compels researchers not to treat individual identity markers such as race, gender, and nationality as mutually exclusive categories of experience and analysis, but to account for participants' multiple identities when considering how the social world is constructed. (p. 359)

Lindsay (2020) argued that intersectionality does not explain how to mitigate oppression but rather how one can argue about their own or others' status. Different social forces such as household income, parents' background, and social class can interplay with other student characteristics such as race, gender, or ability and impact their overall learning experience. We utilized an intersectional framework and studied the impact of five different demographic variables on the BNS students' experience with online learning. The results of the study indicate that though technology readiness, school & teacher support, and COVID-19 assistance had a significant impact on excitement, there was a variation in this excitement level when we further studied BNS students by considering other socioeconomic factors. The findings of this study are consistent with other quantitative studies that employ the theory of intersectionality (e.g., Bešić, 2020; Buchanan & Wiklund, 2021; Cioè-Peña, 2016) and encourage researchers to look beyond a single identity factor when framing inclusive education policies.

While Hypothesis 1 helped us understand how factors such as technology, school & teacher support, and COVID-19 assistance impacted the online learning experiences of BNS students, these factors could be considered as some of the fundamental aspects required to create a successful online learning experience. With Hypothesis 2, we further developed an understanding of the impact of socioeconomic environments on online learning experiences within BNS communities. The findings of this study indicate that learning does not happen only in the school environment but also at home and in the community. Factors related to home/ family or the community can also impact students' educational attainment. A nuanced understanding of these factors is critical to ensure that appropriate student support is provided. We contend that Black students will likely participate and succeed in a community-based new normal that embodies the Africentric “it takes a village” thinking. This thinking is consistent with the African proverb “it takes a village to raise a child,” where family and community engagement, particularly with Elders, is key to the successful schooling of BNS children.

Concluding Remarks with Policy Implications

As the world continues to navigate these uncertain times, online learning is set to become a central mode of learning in the post-COVID-19 era. Educational institutions need inclusive policies to support the educational experiences of minority students. We foresee a new post COVID-19 normal where the education system relies more heavily on technology innovation in the delivery of curricula. Several studies suggest that well-designed online learning environments can provide improved student learning outcomes than traditional methods (e.g., Lockman & Schirmer, 2020). However, disparities in primary conditions for learning can result in differential outcomes, especially for students from vulnerable and marginalized backgrounds. Browne and Battle (2018) indicated that factors such as family structure, economic forces, class, or gender may not exert equal force but are “influential in relation to each other while serving as the basis for discrimination and inferior life chances such as access to quality education” (p. 81). Understanding the interplay between such factors that better explicate educational outcomes is critical, especially for inclusive education policies, which tend to consider single factors such as

ability, race, gender, or economic background when framing appropriate interventions. As Cioè-Peña (2016) noted, “children who represent intersectional identities are often passed over and continually left on the margins of inclusive classrooms, schools and society” (p. 906). Such information could help educational institutions to bring about policy change to help improve the learning experiences of minority students when considering their multiple and simultaneous identities. Further, MacDonald and Hill (2021) recommended that extra attention and support be given to vulnerable groups, including single-parent families; parents with at-risk children; or children who require additional educational services, tutoring, or support. Greenhow et al. (2021) suggested that schools may implement different socioeconomic interventions to factor in different socioeconomic conditions rather than only race, which may result in vastly different educational experiences. Although studies have reported that the achievement gap trickles into the online/distance learning environment as well (e.g., McKinsey & Company, 2020), Ferdig (2010) stated that “students who are considered at-risk, including those who have dropped out, been expelled, or who have health problems, can succeed in online K–12 learning, given learning contexts and support personnel that meet their individual needs” (p. 23). With appropriate policies and procedures in place, it is possible to ensure BNS learners succeed in this new normal and make the most of the opportunities presented to them.

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References

- Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments*.
<https://doi.org/10.1080/10494820.2020.1813180>
- Aurini, J., & Davies, S. (2021). Covid-19 school closures and educational achievement gaps in Canada: Lessons from Ontario summer learning research. *Canadian Review of Sociology*, 58(2), 165–185.
<https://doi.org/10.1111/cars.12334>
- Barbour, M. K., & LaBonte, R. (2019). *State of the nation: K-12 e-learning in Canada*. Canadian eLearning Network. <https://k12sotn.ca/wp-content/uploads/2020/02/StateNation19.pdf>
- Battle, J., Alderman-Swain, W., & Tyner, A. R. (2005). Using an intersectionality model to explain the educational outcomes for Black students in a variety of family configurations. *Race, Gender & Class*, 12(1), 126–151.
- Bešić, E. (2020). Intersectionality: A pathway towards inclusive education? *Prospects*, 49, 111–122.
- Black Learners Advisory Committee. (1994). *BLAC report on education: Redressing inequity—empowering Black learners*. <https://www.ednet.ns.ca/docs/blac-report-education-redressing-inequity.pdf>
- Browne, A. P., & Battle, J. (2018). Black family structure and educational outcomes: The role of household structure and intersectionality. *Journal of African American Studies*, 22, 77–93.
<https://doi.org/10.1007/s12111-018-9395-7>
- Buchanan, N., & Wiklund, L. (2021). Intersectionality research in psychological science: Resisting the tendency to disconnect, dilute, and depoliticize. *Research on Child and Adolescent Psychopathology*, 49, 25–31. <https://doi.org/10.1007/s10802-020-00748-y>
- Case, K. A. (2016). Toward an intersectional pedagogy model. In K. A. Case (Ed.), *Intersectional pedagogy: Complicating identity and social justice* (pp. 1–24). Routledge.

- Chiu, T. K. (2021). Applying the self-determination theory (SDT) to explain student engagement in online learning during the Covid-19 pandemic. *Journal of Research on Technology in Education*, 54(1), S14–S30. <https://doi.org/10.1080/15391523.2021.1891998>
- Cho, S., Crenshaw, K. W., & McCall, L. (2013). Toward a field of intersectionality studies: Theory, applications, and praxis. *Signs: Journal of Women in Culture and Society*, 38(4), 785–810. <https://doi.org/10.1086/669608>
- Cioè-Peña, M. (2016). The intersectional gap: How bilingual students in the United States are excluded from inclusion. *International Journal of Inclusive Education*, 21(9), 906–919. <https://doi.org/10.1080/13603116.2017.1296032>
- Codioli McMaster, N. & Cook, R. (2019). The contribution of intersectionality to quantitative research into educational inequalities. *Review of Education*, 7(2), 271–292, <https://doi.org/10.1002/rev3.3116>
- Cole, A. W., Lennon, L., & Weber, N. L. (2021). Student perceptions of online active learning practices and online learning climate predict online course engagement. *Interactive Learning Environments*, 29(5), 866–880. <https://doi.org/10.1080/10494820.2019.1619593>
- Collins, P. H. (2015). Intersectionality's Definitional Dilemmas. *Annual Review of Sociology*, 41(1), 1–20. <https://doi.org/10.1146/annurev-soc-073014-112142>
- Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A Black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *University of Chicago Legal Forum*, 1989, Article 8.
- Crenshaw, K. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review*, 43(6), 1241–1299. <https://doi.org/10.2307/1229039>
- Dei, G. (1995). Examining the case for African-centered schools in Ontario. *McGill Journal of Education*, 30(002), 179–198.
- Demirbilek, M. (2014). The digital natives' debate: An investigation of the digital propensities of university students. *Eurasia Journal of Mathematics, Science and Technology Education*, 10(2), 115–123. <https://doi.org/10.12973/eurasia.2014.1021a>
- EECD. (2019). *Inclusive education policy*. https://dbdli.ca/wp-content/uploads/ns-inclusive-education-policy_en.pdf
- EECD. (2020). *Nova Scotia assessments and examinations results for students with Mi'kmaq or other Indigenous ancestry and students of African descent*. https://plans.ednet.ns.ca/sites/default/files/documents/2019-20_Disaggregated_Results_Release_RWM6.pdf
- Else-Quest, N. M. & Hyde, J. S. (2016) Intersectionality in quantitative psychological research: I. Theoretical and epistemological issues. *Psychology of Women Quarterly*, 40(2), 155–170. <https://doi.org/10.1177/0361684316629797>
- Fisher, S., Middleton, K., Ricks, E., Malone, C., Briggs, C., & Barnes, J. (2015). Not just Black and White: Peer victimization and the intersectionality of school diversity and race. *Journal of Youth and Adolescence*, 44, 1241–1250. <https://doi.org/10.1007/s10964-014-0243-3>
- Ferdig, R. E. (2010). *Understanding the role and applicability of K12 online learning to support student dropout recovery efforts*. Lansing, MI: Michigan Virtual University. <https://michiganvirtual.org/wp-content/uploads/2010/07/understanding-role-applicability-k12-online-learning-support-student-dropout-recovery-efforts.pdf>
- Fornell, C. & Larcker, D. F. (1981) Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Green, L. W., George, M. A., Daniels, M., Frankish, C. J., Herbert, C. J., Bowie, W. R., & O'Neill, M. (1995). *Study of participatory research in health promotion*. The Royal Society.
- Greenhow, C., Lewin, C., & Willet, K. S. (2021). The educational response to Covid-19 across two countries: A critical examination of initial digital pedagogy adoption. *Technology, Pedagogy and Education*, 30(1), 7–25. <https://doi.org/10.1080/1475939X.2020.1866654>

- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 3(1), 2–24.
- Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The use of partial least squares structural equation modeling in strategic management research: A review of past practices and recommendations for future applications. *Long Range Planning*, 4(5/6), 320–340. <https://doi.org/10.1016/j.lrp.2012.09.008>
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*. SAGE Publications, Inc.
- Henry, A. (1993). Missing: Black self-representations in Canadian educational research. *Canadian Journal of Education*, 18(3), 206–222. <https://doi.org/10.2307/1495383>
- Henry, F., James, C., et. al. (2021). *Impacts of Covid-19 in racialized communities*. Royal Society of Canada. https://rsc-src.ca/sites/default/files/RC%20PB_EN%20FINAL_o.pdf
- Houlden, S., Veletsianos, G. (2022). A synthesis of surveys examining the impacts of COVID-19 and emergency remote learning on students in Canada. *Journal of Computing in Higher Education*, 34, 820–843. <https://doi.org/10.1007/s12528-022-09323-4>
- Howard, S. K., Tondeur, J., Siddiq, F., & Scherer, R. (2021). Ready, set, go! Profiling teachers' readiness for online teaching in secondary education. *Technology, Pedagogy and Education*, 30(1), 141–158. <https://doi.org/10.1080/1475939X.2020.1839543>
- Hsieh, T., Simpkins, S. D., & Eccles, J. S. (2021). Gender by racial/ethnic intersectionality in the patterns of adolescents' math motivation and their math achievement and engagement. *Contemporary Educational Psychology*, 66, 101974. <https://doi.org/10.1016/j.cedpsych.2021.101974>
- James, C. E. (2012). Students "at risk": Stereotypes and the schooling of Black boys urban education. *Urban Education*, 47(2), 464–494. <https://doi.org/10.1177/0042085911429084>
- James, C. E., & Turner, T. (2017). *Towards race equity in education: The schooling of Black students in the Greater Toronto Area*. York University.
- Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of E-Collaboration*, 11(4), 1–10. <https://doi.org/10.4018/ijec.2015100101>
- Kumi-Yeboah, A., Dogbey, J., & Yuan, G. (2018). Exploring factors that promote online learning experiences and academic self-concept of minority high school students. *Journal of Research on Technology in Education*, 50(1), 1–17. <https://doi.org/10.1080/15391523.2017.1365669>
- Lindsay, K. (2020). In a classroom of their own: The intersection of race and feminist politics in all-Black male schools. *Alberta Journal of Educational Research*, 66(3), 360–363. <https://doi.org/10.11575/ajer.v66i3.70652>
- Lockman, A.S., & Schirmer, B.R. (2020). Online instruction in higher education: Promising, research-based, and evidence-based practices. *Journal of Education and E-Learning Research*, 7(2), 130–152. <https://doi.org/10.20448/journal.509.2020.72.130.152>
- MacDonald, M., & Hill, C. (2021). The educational impact of the Covid-19 rapid response on teachers, students, and families: Insights from British Columbia, Canada. *Prospects*, 2021 Jan 15, 1–15. <https://doi.org/10.1007/s11125-020-09527-5>
- Maheshwari, G. (2021). Factors affecting students' intentions to undertake online learning: An empirical study in Vietnam. *Education and Information Technologies*, 26, 6629–6649. <https://doi.org/10.1007/s10639-021-10465-8>
- McCall, L. (2005) The complexity of intersectionality. *Signs: Journal of Women in Culture and Society*, 30(3), 1771–1800.
- McKinsey & Company. (2020). *Covid-19 and learning loss-disparities grow and students need help*. <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-and-learning-loss-disparities-grow-and-students-need-help>
- Proctor, S. L., Kyle, J., Fefer, K., & Lau, Q. C. (2017). Examining racial microaggressions, race/ethnicity, gender, and bilingual status with school psychology students: The role of intersectionality.

- Contemporary School Psychology*, 22, 355–368. <https://doi.org/10.1007/s40688-017-0156-8>
- Province of Nova Scotia. (2019). *Inclusive education policy*. <https://www.ednet.ns.ca/docs/inclusiveeducationpolicyen.pdf>
- Sarstedt, M., Henseler, J., & Ringle, C. M. (2011). Multi-group analysis in partial least squares (PLS) path modeling: Alternative methods and empirical results. In M. Sarstedt, M. Schwaiger, & C. R. Taylor (Eds.), *Measurement and research methods in international marketing (Volume 22)*, pp. 195–218). Emerald Group Publishing Limited.
- Shizha, E. (2016). Marginalization of African Canadian students in mainstream schools: Are Afrocentric schools the answer? In A. A. Abdi, & A. Ibrahim (Eds.), *Education of African-Canadian children: Critical perspectives* (pp. 187–206). McGill-Queen's Press.
- UNESCO. (2017). *A guide for ensuring inclusion and equity in education*. <https://inclusiveeducation.ca/wp-content/uploads/sites/3/2013/07/UNESCO-InclusionEducation.pdf>
- United Nations. (2020). *Policy brief: Education during Covid-19 and beyond*. United Nations. https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf
- United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>
- Yates, A., Starkey, L., Egerton, B., & Flueggen, F. (2021). High school students' experience of online learning during Covid-19: The influence of technology and pedagogy. *Technology, Pedagogy and Education*, 30(1), 59–73. <https://doi.org/10.1080/1475939X.2020.1854337>

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