

Chapter 13

A Trinidad and Tobago Case Study of One Response to the Equity Challenge in Education Within the Digital Era



Seeta Jaikaran-Doe, Ian Hay , Andrew Fluck , and David Moltow 

13.1 Introduction

Previous and contemporary Trinidad and Tobago leaders have recognised that to achieve sustainable economic and social development, a quality education system is essential (Kalloo et al., 2020; Oxford Business Review, 2020). A skilled and educated workforce is considered vital for the effective functioning of an economy, for wealth creation, and for the wellbeing of a country's citizenship (Ministry of Education [MoE], 2012; Warner et al., 2021). There is also an extensive body of accumulated evidence that testifies to the strong correlation between educational attainment and economic outcomes, both for the country as a whole and for individuals (Lange et al., 2018; Spring, 2008). In addition, countries that have a history of investing more of their resources into developing a quality education system, to enhance the "human capital" of its citizenship, over time were associated with greater economic and social developments within that country (Lange et al., 2018).

According to human capital theory (Coleman, 1988) an equity focussed investment into individuals expands their capabilities to make a positive long-term contribution to their own financial, psychological, and social wellbeing, and the wellbeing

S. Jaikaran-Doe · I. Hay (✉) · D. Moltow
School of Education, College of Arts, Law and Education, University of Tasmania, Churchill Ave,
Hobart, TAS 7005, Australia
e-mail: Ian.Hay@utas.edu.au

D. Moltow
e-mail: David.Moltow@utas.edu.au

A. Fluck
School of Education, College of Arts, Law and Education, University of Tasmania, Launceston,
TAS 7248, Australia
e-mail: Andrew.Fluck@utas.edu.au

of their community and country. This is particularly the situation for those individuals and groups who historically have had limited access and opportunities to participate in quality education, because of one or more of these factors; discrimination, poverty, oppression, gender, race, location, and social disadvantage (Aitken et al., 2018; Becker, 2009). For these individuals from marginalised groups, additional support and interventions represent enhanced equity, social justice, fairness, and opportunity (Freire, 2018, 2021). Paulo Freire (2018) emphasised that the effective economic and social advancement and development of a country must involve the participation of all its citizenship, including those individuals and groups historically marginalised. This case study of an education equity initiative acknowledges Freire's argument that to assist marginalised students to access and benefit from education, they need ongoing support and schooling that is useful and relevant to them, delivered by teachers who are knowledgeable, sympathetic, and responsive to their needs.

The target equity groups in this study were teachers and students in Trinidad and Tobago who have had limited access to and participation with information and communication technology (ICT) in their classrooms. Before focussing on this ICT education concern, it is important to place it in its historical and contemporary contexts. The government of Trinidad and Tobago is operating an educational system that was initially constructed during the time of British colonial rule that mirrored the British "home" curriculum and structures (Coates, 2012; Laurence, 1963). One of the challenges within the post-British colonialism context is improving and increasing the quality of education and teaching to all Trinidad and Tobago citizens, a challenge that increasingly finds resonance in the twenty-first-century technology era (Brissett, 2021). For Trinidad and Tobago to prosper, it needs more of its citizenship to participate and to operate within a global, digital, and e-connected world (Ministry of Public Administration, 2019; Roztocky et al., 2019). This chapter uses a case study methodology to investigate how Trinidad and Tobago teachers reacted to the government's equity initiative of providing free computers to students. Teachers were the focus of the data collection because quality education in Trinidad and Tobago is dependent on having qualified and competent teachers (Ministry of Education [MoE], 2010a, 2010b, 2017).

13.2 Understanding the Context of the Equity Challenge

Understanding why equity and the UNESCO SDGs of quality education (SDG4), reduced inequalities (SDG10), and sustainable development (SDG16) are important to Trinidad and Tobago requires some knowledge of its people, its resources, and its history. Trinidad and Tobago is a dual-island Caribbean nation near Venezuela, with Trinidad occupying 4,828 square kilometres and Tobago an area of 300 square kilometres. The official language is English, but there is an extant rich body of dialects originating from the multi-ethnic groups who settled in the country.

Historically and politically, the country has undergone many changes since Christopher Columbus landed in 1498, including the granting of its independence in 1962, and its transition to republic status in 1976. The country changed hands from the Spanish, to the French, then to the Dutch, and eventually to the British. To underpin its economy, African slaves were brought in to work on the sugar cane, cocoa, coffee, and cotton plantations. With the abolition of slavery in 1834 (Brereton, 2007), Indians, and a small number of Chinese, Syrians, and residents from the Middle East were brought to the island to provide labour for agriculture (Reddock, 1986).

With a population of 1.39 million people, Trinidad and Tobago has to date, one of the higher Gross National Incomes Per Capita (GNIPC) in Latin America and the Caribbean (World Bank, 2020a, 2020b), principally due to its petroleum and natural gas wealth. The distribution of this wealth across the society is, however, uneven, with some 20% of the Trinidad and Tobago population living well below the poverty line (United National Congress, 2010).

13.3 Equity Challenges and Education

The education system in Trinidad and Tobago has evolved from the British model. The four-tiered education system commences with pre-school (3–5 years of age), followed by primary (5–12 years of age), secondary (12–17/19 years of age), and finally tertiary levels (>17 years). Formal education in government schools is free from early childhood to an undergraduate degree. The Trinidad and Tobago Ministry of Education (MoE) oversees all public and private schools, which in 2017 included: 900 early childhood care and education (ECCE) institutions; 540 primary schools, of which 477 were public and 63 were private; around 190 secondary schools, with 134 public and 56 private; and 74 tertiary institutions (Oxford Business Review, 2020). University education is obtained from two universities, the University of the West Indies (UWI) and the University of Trinidad and Tobago (UTT). This is supplemented by a total of nine local and international private institutions, along with an established Technical Vocational Education and Training college structure.

As a result of the ethnic diversity within the country, school types consist of denominational, government, private, and international schools. Whereas denominational schools are under the management of a religious board (e.g., Hindu, Muslim, or Christian), government schools are managed by the MoE (Steinbach, 2012). Denominational schools receive government funds. Privately owned schools and international schools are independently financed and controlled by their own managerial boards. Whereas the government, denominational, and privately owned schools deliver the national curriculum, the international schools offer the curriculum from their home countries, such as Canada, USA, and England. Some denominational schools are single gender (either male or female students).

13.3.1 Equity Challenges and Youth

The Trinidad and Tobago policymakers have worked to achieve the UNESCO SDGs, but challenges remain. This is particularly so for the youth cohort aged 16–19 (International Labour Organisation [ILO], 2018; World Bank, 2013). Student attrition rates in the Trinidad and Tobago vocational and training sector are high, in some cases 20–25%. These attrition rates have been associated with an inability of teachers to provide relevant teaching and instruction at the students' levels of ability and interest (Mack & White, 2019). This is not to suggest that the Trinidad and Tobago governments have not been mindful of the need to support education and youth programmes. Based on 2020 data, education in Trinidad and Tobago received one of the largest allocations of funding from the national budget, at 14% (Oxford Business Group, 2020). Even so, youth unemployment in Trinidad and Tobago is twice as high as the total unemployment rate, especially for females 15–19 and youth from poor, rural, and ethnic minority communities (ILO, 2018). There are also elevated levels of under-employment, with more than 50% of youth and young adults estimated not to be in education, employment, or training (NEET) (Caribbean Development Bank, 2015). The concern is that employment insecurity has a direct and indirect negative influence on individuals' overall wellbeing, and that of their families and communities (Abbas & Raja, 2019).

Many of these youth employment problems can be linked back to educational concerns, poverty, and inequalities, such that only half of the high school students in Trinidad and Tobago sit for the end of high school Caribbean Secondary Examinations Certificate (CSEC) (MoE, 2021). Low levels of secondary school graduation are a concern because higher levels of secondary school graduation are associated with higher levels of economic and social development, due to higher rates of “human capital” within the citizenship (Allen et al., 2018; Hanushek & Woessmann, 2015). Thus, a significant portion of school leavers find themselves in low paid, casual employment with a limited future (United National Congress, 2010) and typically join the upwards to 60% of the Trinidad and Tobago workforce that is unskilled and in vulnerable and insecure employment (ILO, 2018). In addition, retaining boys in school to the completion of secondary education remains a challenge. For example, of the students who sat the end of high school (CSEC) 45% were males compared to 55% females. Of those who sat the exam, only 61% of males achieved a passing grade in the CSEC, compared to 69% of females (MoE, 2021).

13.4 Initiatives to Achieve Greater Equity in Education

To try to facilitate higher levels of secondary school graduation, the Trinidad and Tobago government has made ongoing initiatives and investments in education and schooling. As noted in the Trinidad and Tobago MoE (2017) planning documents, the purpose was to implement programmes and strategies aimed at providing a higher

quality of education to more students, and to improve the skills and competencies of teachers. The objective was to work towards reducing educational inequalities and to enhance the access and participation of students from disadvantaged and marginalised backgrounds. The following summarises some key MoE initiatives (2010a, 2010b, 2017):

- No school fees for government schools.
- Free breakfast and lunch programmes in government schools.
- Books and related school resources provided at no cost to the family in government schools.
- Transportation to and from school provided at no cost to the family.
- Refocus the school curriculum to enhance all students' engagement with schooling and make it more future focussed.
- Improve the quality of teaching by enhancing teacher preparation programmes and providing more opportunities for teachers to reskill.

To address better the equity needs of students in the post-secondary education sector, the following initiatives were activated by the MoE (UNESCO, 2010).

- Develop a National Qualifications Framework (NQF) to facilitate greater horizontal and vertical student mobility and incorporate non-formal student learning experiences into the NQF.
- Improve the quality of teaching and student learning across the whole education sector.
- Develop additional post-secondary programmes that make graduates more employable.
- Accelerate the further development of alternative student learning systems, i.e., distance learning programmes.
- Develop and implement student capacity building initiatives.
- Encourage e-management and e-resources across the educational sector.

Thus, as part of the equity agenda and the need to skill more of its citizenship for a digital economy and world, the Trinidad and Tobago MoE has focussed on promoting ICT in schools. The following is a summary of some of these ICT initiatives (Government of the Republic of Trinidad and Tobago [GORTT], 2012; MoE, 2010a, 2010b; Mohammed, 2014).

- Promote high-speed internet services, dialup, broadband, and wireless hosting for businesses, residences, and schools.
- Promote ICT infrastructure upgrading across the country with a focus on rural areas to enhance access.
- Promote e-education across schools with free internet connections and computers.
- Offer teachers a four-year part-time ICT professional development course.
- Provide ICT services and e-resources to all students with a disability.
- Provide free personalised laptop computers to all students transitioning from primary schools to secondary schools.

13.5 Education as the Way Forward

The above initiatives have a strong focus on improving the quality of education by improving the quality of the teaching and teachers. There have been some positive developments within the country that can be traced back to these initiatives. Most noticeable, at the primary school level, the student enrolment rate has increased to 95% (MoE, 2017).

Even so, concerns remain about the quality of the teaching and often the lack of specific and relevant qualifications of teachers (Oxford Business Review, 2020; Warner et al., 2021). About 12% of Trinidad and Tobago primary school students fail the secondary entry examination (MoE, 2021), with concerns that students with learning difficulties and special needs are over-represented in this number. This along with high rates of youth unemployment, particularly from rural and disadvantaged communities (Caribbean Development Bank, 2015), has led to the recognition that additional resources are needed to address equity and educational concerns, especially at the start of secondary school education.

13.6 Equity and Technology

In terms of the Trinidad and Tobago equity initiatives, a core initiative was the eConnect and Learn program, to provide free personalised laptop computers to all students transitioning from primary schools to secondary schools (MoE, 2010a). The following section reports on the teachers' reactions to the equity initiative and their knowledge and teaching practices linked to this ICT initiative. The teacher surveys used in this case study were adapted from the relative literature related to teachers' Technological Knowledge (TK), and their Technological Pedagogical Content Knowledge (TPACK); see Jaikaran-Doe (2016) for additional information on these measures. The TK survey was an adaptation of the Williams et al. (2000) survey investigating teachers' confidence and knowledge to use digital devices. The TPACK survey reported in this chapter was developed by Jamieson-Proctor et al. (2013) and has been shown to be a reliable and valid instrument.

TPACK surveys were introduced into the educational research field as a method for understanding teachers' knowledge for the integration of ICT into their teaching practices (Mishra & Koehler, 2009). The teacher surveys were conceptualised from Shulman's (1987) Pedagogical Content Knowledge (PCK) research. Shulman maintained that in addition to teachers' subject content knowledge, teachers also needed specific pedagogical knowledge about how to teach that content to their students. The TPACK teacher surveys aimed then to identify teachers' levels of understanding and knowledge of the different types and forms of ICT, along with when, how, and why teachers incorporated ICT into their teaching practices (Schmidt et al., 2009; Voogt et al., 2012). Thus, it provides a "snapshot" of how teachers were responding to the provision of free computers to their students, and the teachers' level of competencies in teaching with ICT.

13.7 Case Study of an Initiative to Enhance Equity

In total, 226 secondary school teachers from Trinidad and Tobago participated in the two teacher surveys involved in the evaluation of the eConnect and Learn initiative; 173 (77%) were full time teachers employed in 12 high schools and 53 (23%) were final year pre-service teachers. The ratio of female to male participants for full time teachers was 3:1, and the ratio for pre-service teachers was 4:1. Ethical permission to conduct the research was provided by the relevant university and school authorities. The first author administered the two teacher surveys at each school, and after this, entered the data into an SPSS (IBM, 2016) spreadsheet for statistical analysis. The findings of this analysis are reported below.

13.7.1 *Technological Knowledge (TK) Survey*

The pattern in the Technological Knowledge (TK) survey data is that “newer” teacher graduates, compared to “older” and more experienced full time teachers were more confident and knowledgeable about ICT devices (see Table 13.1). The full time teachers were more confident with devices of a more general nature, such as using word processing, spreadsheets, the world wide web, and multi-media devices, such as a camera. The Trinidad and Tobago full time teachers’ confidence and knowledge dropped away when more specific classroom devices were considered. This reduction in confidence was associated with the use of white boards and video editing, and webpage construction and design. These last devices are often used in developed countries as part of their secondary school English and communication curriculum (Thomas & Thomas, 2022). The teachers also reported reduced confidence with Personal Computers (PCs), software programmes and devices, which are typically related to science, technology, engineering, and mathematics (STEM) education in high schools in developed countries (Banks & Barlex, 2020). This lack of teacher confidence with some devices and programmes in the survey is more of a reflection that when the survey was conducted, some programmes and devices, often used in developed countries were still unavailable in many of the Trinidad and Tobago schools.

13.7.2 *Technological Pedagogical Content Knowledge (TPACK) Survey*

Similar to the technology knowledge and confidence survey, “newer” pre-service teachers had a greater understanding of how ICT could be infused and incorporated into their teaching practices, compared to the full time teachers (see Table 13.2). The TPACK teaching practice survey used a 6-point scale, with “older” full time teachers

Table 13.1 Technological Knowledge and Confidence (TK) Survey: PS = pre-service, FT = full time teachers. Rating scale 1–6; 6 = highly confident, $N = 226$

How confident are you to use the following ICT devices?	Teacher	<i>M</i>	<i>sd</i>	<i>t</i>	<i>P</i>
Computer	PS	5.25	1.00	5.77	0.001
	FT	4.27	1.15		
World Wide Web	PS	5.25	1.04	5.58	0.001
	FT	4.21	1.22		
Multi-media devices	PS	5.13	1.00	7.02	0.001
	FT	3.78	1.28		
Word processing	PS	5.06	1.25	4.77	0.001
	FT	4.12	1.26		
Digital camera/document camera	PS	4.85	1.29	4.57	0.001
	FT	3.88	1.37		
Spreadsheet	PS	4.47	1.37	4.83	0.001
	FT	3.42	1.39		
Databases	PS	4.38	1.40	5.31	0.001
	FT	3.24	1.35		
Digital video for production and editing	PS	4.32	1.53	5.90	0.001
	FT	2.98	1.42		
Interactive whiteboard	PS	3.79	1.79	3.39	0.001
	FT	2.88	1.46		
Webpage design	PS	3.71	1.61	5.69	0.001
	FT	2.45	1.33		
PC provided software	PS	3.69	1.54	3.51	0.001
	FT	2.93	1.30		
Additional Installed PC software	PS	3.68	1.49	3.34	0.001
	FT	2.86	1.33		

typically scoring above the midpoint range of 3 (moderately confident). This pattern suggests that full time teachers were developing an appreciation of the worth and value of ICT to inform their teaching. The teachers recognised that software and ICT programmes had a role in students' engagement with learning and they gave a higher rating to teaching practices that related to students' developing an understanding of the world, by using the world wide web.

Table 13.2 TPACK survey: PS = pre-service, FT = full time teachers. Rating scale 1-6; 6 = highly confident, $N = 226$

How confident are you to use ICT to support your students' learning with ICT in the following?	Teachers	<i>M</i>	<i>sd</i>	<i>t</i>	<i>p</i>
To provide motivation for curriculum tasks	PS	3.14	0.77	2.58	0.011
	FT	2.79	0.88		
To develop competencies in your subject area/s	PS	4.40	0.98	5.14	0.001
	FT	3.62	0.96		
To actively construct knowledge that integrates curriculum areas	PS	4.32	0.98	5.50	0.001
	FT	3.44	1.02		
To actively construct their own knowledge in collaboration with their peers and others	PS	4.38	1.10	5.82	0.001
	FT	3.41	1.04		
To analyse their knowledge	PS	4.00	1.02	3.67	0.001
	FT	3.41	1.03		
To synthesise their knowledge	PS	3.96	1.02	3.55	0.001
	FT	3.38	1.05		
To demonstrate what they have learnt	PS	4.25	1.05	4.92	0.001
	FT	3.51	0.93		
To acquire the knowledge, skills, abilities, and attitudes to deal with ongoing technological change	PS	4.15	1.08	5.04	0.001
	FT	3.29	1.09		
To integrate different digital media to create appropriate projects	PS	4.72	0.97	7.62	0.001
	FT	3.45	1.07		

(continued)

Table 13.2 (continued)

	Teachers	<i>M</i>	<i>sd</i>	<i>t</i>	<i>p</i>
How confident are you to use ICT to support your students' learning with ICT in the following?					
To develop rich understanding about a topic of interest relevant to the curriculum area/s being studied	PS	4.40	0.88	6.11	0.001
	FT	3.45	1.01		
To engage in activities of the learning process	PS	4.70	0.95	7.27	0.001
	FT	3.56	1.00		
To develop understanding of the world	PS	4.52	0.96	6.39	0.001
	FT	3.48	1.05		
To plan and/or manage assigned curriculum projects	PS	4.21	1.07	5.08	0.001
	FT	3.37	1.06		
To engage in sustained involvement with curriculum activities	PS	4.02	0.95	4.18	0.001
	FT	3.32	1.09		
To undertake formative and/or summative assessment	PS	4.54	0.70	8.91	0.001
	FT	3.41	1.06		
To engage in independent learning through access to education at a time, place, and pace of their own choosing	PS	4.16	1.05	5.43	0.001
	FT	3.27	1.00		
To gain intercultural understanding	PS	4.53	0.85	7.60	0.001
	FT	3.33	1.05		
To acquire awareness of the global implications of ICT-based technologies on society	PS	4.33	0.99	6.50	0.001
	FT	3.23	1.08		
To communicate with others locally and globally	PS	4.64	1.09	6.46	0.001
	FT	3.55	1.07		

(continued)

Table 13.2 (continued)

	Teachers	<i>M</i>	<i>sd</i>	<i>t</i>	<i>p</i>
How confident are you to use ICT to support your students' learning with ICT in the following?	PS	4.15	1.06	5.62	0.001
	FT	3.22	1.05		
To understand and participate in the changing knowledge economy	PS	4.11	1.01	5.53	0.001
	FT	3.18	1.09		
To critically evaluate their own and society's values	PS	3.91	0.97	4.27	0.001
	FT	3.18	1.12		
To facilitate the integration of curriculum areas to construct multidisciplinary knowledge	PS	4.00	1.04	5.00	0.001
	FT	3.12	1.14		
To critically interpret and evaluate the worth of ICT-based content for specific subject area/s	PS	4.68	1.01	7.34	0.001
	FT	3.41	1.13		
To gather information and communicate with a known audience	PS	4.68	1.01	7.34	0.001
	FT	3.41	1.13		

13.8 Implications of the Equity Initiative

The two ICT teacher surveys were highly correlated ($r = 0.77$). This implies that Trinidad and Tobago teachers' knowledge of and confidence with ICT devices influenced and informed the teachers' abilities to incorporate ICT into their pedagogical practices.

The two tables revealed that the “older” Trinidad and Tobago teachers were in transition, in terms of their knowledge of and confidence to use ICT in their teaching practices. Most of these teachers rated their knowledge and skills in the moderate range, around 3.5 on the 1–6 scale. In contrast, most of “newer” teacher graduates rated their knowledge and skills to use ICT in the confident range, around 4.5 on the 1–6 scale. These results suggest that both the “older” and the “newer” teachers were aware of what that they needed to understand now to incorporate digital resources into their teaching. The evidence is that as teachers become more knowledgeable and confident with their content and how to teach it, the more positive the educational outcomes are for their students (Callingham et al., 2019; McKlin et al., 2019). In addition, as teachers become more interested and motivated in using ICT in their teaching, this interest and motivation, in turn, typically transfers to their students (Hay et al., 2015). The surveys used in this study were originally developed for teachers in more developed ICT classrooms. Thus, the findings of this study suggest that, at the time of the data collection, in comparison to teachers in more developed countries, the Trinidad and Tobago teachers still lacked many classroom based digital resources and infrastructures. Providing free PCs to secondary students was a start, but based on the teacher survey findings, more digital resources and infrastructures were still required in Trinidad and Tobago classrooms and schools.

This case study supports the notion that when implementing new initiatives into schools, teachers also need to receive meaningful professional development, along with adequate and appropriate ongoing support and resources (Apple Classrooms for Tomorrow—Today, 2008; Hargreaves, 2005). The findings of the teacher surveys also reinforce the claim that effective education requires a multidimensional focus, because there are teacher factors, student factors, and factors external to the school that impact on students' educational process and achievement (Monie & Hay, 2019). The reality is, schooling is embedded within a complex social network involving a range of variables and a range of stakeholders who may operate from different political, cultural, social, historical, philosophical, and economic perspectives (Bronfenbrenner, 1989; Nikel & Lowe, 2010). Consequently, policies that are “top down” directives, such as providing free PCs to students without adequately considering the other stakeholders, means that the implementation is likely to be problematic (Carlyon & Branson, 2018; Hargreaves, 2005). As noted, in this case study the needs of the teachers were not adequately considered, with the teachers often having to peer learn and self-learn how to incorporate additional digital resources into their teaching. In addition, they had limited access to specific PC devices and software that may have assisted their students.

The strong interrelationship between teachers' knowledge and confidence of ICT devices and incorporating ICT devices into their teaching practices is evident in the high correlation between the two variables ($r = 0.77$). This interrelationship highlights that teachers need resources and support when new initiatives are being introduced into schools (Ball et al., 2008). As this study has demonstrated, as the teachers' knowledge of ICT devices increased, so too did their knowledge of how to incorporate ICT into their teaching and into their students' learning. Acquiring this pedagogical and content knowledge takes time, resources, and teacher engagement (Park et al., 2011). The evidence is, students' learning increases when their teachers have the content knowledge and can confidently manipulate and modify it, to accommodate the needs of all their students (Gess-Newsome et al., 2019; Hay et al., 2015).

13.9 Knowledge Is Cumulative

This chapter has used the implementation of one equity intervention in schools to illustrate that educational change is both possible and a challenge. As noted in this case study, teachers' capacity to change practices may be incremental and uneven, but engaging with change helped the teachers to understand the problem more and it helped them incorporate more ICT into their teaching. The evidence is, as a consequence of past experiences, acquired knowledge, and confidence with digital technology in the classroom, teachers become more able to use and extend their knowledge into the future (John & Wheeler, 2015). This assertion that teachers' digital knowledge is acquired, cumulative, and adaptable, is illustrated in how the Trinidad and Tobago teachers responded to the COVID-19 pandemic. George (2020) reported that at the start of the pandemic and school closures, some 60,000 Trinidad and Tobago students did not have access to either PCs or internet data in their homes, again reflecting issues of poverty, inequality, and the difficulties of providing a quality education to all Trinidad and Tobago students. Even so, teachers worked to provide digital learning to a greater number of their at-home students, through the use of a variety of ICT devices and PC software (George, 2020). These devices included PCs, mobile phones, and television, with the teachers developing skills and knowledge related to using online software programmes, such as Notes Master, the Big Blue Button (a Moodle platform), and Google Classroom (George, 2020; Kalloo et al., 2020).

The pandemic provided teachers with new challenges and opportunities to rethink their pedagogical practices and consequently transition into using more ICT devices in their teaching (UNESCO, 2020). It also suggests that although the Trinidad and Tobago equity initiative of providing free PCs to students had its limitations, it seems to have assisted many of the teachers to develop the confidence and skills to meet better the new challenge associate with COVID-19. This illustrates that developing teachers' confidence and capabilities in the domain of digital technology, assisted them to extend and apply it when new challenges arose. It also recognises that

education interventions alone are unlikely to “cure” or to solve social and resource problems, particularly complex and entrenched social problems (Homel et al., 2001). Rather, interventions help to change the participants’ trajectory from a downward spiral to a more positive trajectory, on a curve related to school achievement and social and economic wellbeing (Cranston et al., 2016; Farrington, 2005; Pallas, 2003). Equipping teachers and students with additional competences, support, and resources contributes to their development of protective and resilience factors, which in turn, help the teachers and students countenance and mitigate against risk factors, such as poverty and disadvantage at the individual, school, and community levels (Jaikaran-Doe et al., 2016; Mansfield et al., 2016; Tomaszewska-Pękała et al., 2020).

13.10 Limitations of This Equity Case Study

In terms of limitations, this case study research had a strong equity focus and hence it needs to be interpreted in the context of a developing country at a particular time with a particular set of economic and social challenges.

The teacher data were collected before the COVID-19 pandemic and although the results were reflective of this period, the teachers’ knowledge and confidence with ICT may have changed since the start of COVID-19. On this point, Kalloo et al. (2020) identified that the Trinidad and Tobago teachers had, because of the pandemic become more confident with ICT devices and more knowledgeable of how to adapt and incorporate ICT into their teaching practices. A future research direction would be to conduct follow-up research, using the same or related surveys, to identify if and how the Trinidad and Tobago teachers’ ICT knowledge and practices has altered since COVID-19.

Although the surveys selected in this research had context validity and strong psychometric properties (Jaikaran-Doe, 2016), other researchers using related survey measures may produce somewhat different results. An extension activity could be to consider comparing the findings based on the survey instruments used in this study, with more recent ones develop by Lázaro-Cantabrana et al. (2019) and Tondeur et al. (2017).

13.11 Reflecting on Change

Trinidad and Tobago has many challenges that pertain to enhancing participation and equity for its citizenship because of underlying inequality, poverty, and social disadvantage issues. Even so, it is working on the UNESCO SDGs of quality education (SDG4), reduced inequalities (SDG10), and sustainable development (SDG16), with an emphasis on digital and technology development. This focus is because in a contemporary digital society, being technologically literate is an essential skill for both work and personal use.

This chapter investigated the initiative of providing free PCs to first year Trinidad and Tobago high school students, from their teachers' perspective. This perspective was selected because the quality of students' learning is highly correlated with and dependent on the quality of the teachers' knowledge and ability to teach (Ball et al., 2008; Hargreaves, 2005). This free PC initiative was one of a range of initiatives aimed at providing greater equity and a more sustainable and quality education system within the country. The evidence from this case study research with teachers was that, compared with the "newer" graduates, the "older" teachers typically had less confidence and knowledge of ICT devices. This was, in part, because when the surveys were conducted the schools had limited PC software programmes and related devices provided to the schools. The teachers were, however, aware of their limitations and recognised that they needed more support and resources. They also understood the possibilities of incorporating more ICT into their classroom practices and assisting more of their students to connect to digital resources.

Reflecting on the study, the following are observations related to the challenges associated with implementing educational change in Trinidad and Tobago. Change is a complex process and in this study involved building capabilities and competences with different stakeholders. Change was uneven across the teacher cohort in this study, and in part, it was dependent on the teachers' prior knowledge, qualifications, and current settings. The PC intervention identified new challenges as it progressed. The target concern was identified to be nested within an array of related concerns and in this study many of these related concerns were connected to poverty and disadvantaged communities. Change that just involves providing physical resources (PCs to student) is thus considered less effective, compared to change that involves providing ongoing services and support, as well as physical resources to a range of stakeholders (Carlyon & Branson, 2018).

In this investigated initiative, policymakers gave less consideration to the teachers and to those students whose home settings were less able to support the PCs, because of a lack of internet connections and in some home's electricity. In this study, the intervention was more of a "top down" directive, and additional consultation with stakeholders may have assisted in the implementation of the intervention. This study also highlighted that the first step involved in enacting change involves recognising the full and extended problem and its contexts, then recognising who are the intended targets for the intervention, who is going to do the implementation, and how are they going to be supported over time.

As noted already, change is multidimensional and so one set of interventions is not expected to solve the fundamental social problems of poverty, particularly for students in disadvantaged communities. In this study the intervention contributed to teachers obtaining and accumulating new skills related to digital technology. In reality, change is less about "curing" the underlying problems, but rather, it is more about changing and moving the participants' long-term trajectory in a more positive direction (Farrington, 2005; Homel et al., 2001). This movement in trajectory was demonstrated when the teachers were more able to extend and adapt their digital and ICT knowledge when the country was faced with the COVID-19 pandemic. When considering the outcomes of any intervention, the danger is to expect too much

too soon, and so ignore the latent effects associated with an intervention (Reynolds et al., 2001). In the Reynolds et al. study, many of the strongest latent effects of an education intervention for students from a disadvantaged community only became evident some 15 years after the intervention was finished.

This recognition that there are latent effects associated with an intervention is illustrated when reviewing how the teachers responded to the unexpected pandemic challenge. Providing free PCs to secondary school students required their teachers to begin the process of up-skilling their ICT competencies and so improving their confidence and knowledge with digital technology. The latent effect of their experiences with the free PC intervention better enabled the teachers to apply, adapt, and extend their acquired ICT skills, as they had to shift their teaching to an online digital framework, when schools closed because of the COVID-19 pandemic.

Achieving greater equity and a more sustainable quality education is an ongoing challenge for both developed and developing countries. Responding to that challenge requires educational policymakers to engage in a continuous process of reviewing, targeting, resourcing, implementing, and re-evaluating responses and adapting over time. For countries like Trinidad and Tobago, a quality education system is essential if it is going to achieve greater equity and more positive long-term social and economic trajectories for all its citizenship and the country.

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