# ICT Professional Development Workshops and Classroom Implementation Challenges: Perceptions of Secondary School Teachers in Trinidad and Tobago

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## Abstract

The Ministry of Education (MoE) of The Republic of Trinidad and Tobago has recently embarked on another teacher training program to equip secondary school teachers with the necessary competencies for ICT infusion in their physical classrooms. This study aims to investigate the impact and usefulness of that program, and challenges that the teachers have been facing in its implementation. Thirteen interviews (eight one-on-one and five focused group) were conducted from forty trained teachers. The findings showed that almost all the teachers were quite content and even ecstatic about the workshops and were willing to use the acquired knowledge and skills. Those who were able to use the knowledge and skills attained in the workshops reported improved students' interest, classroom interaction, and academic performance. However, many expressed disappointments due to the multiple obstacles at their schools which prevented them from fully and effectively using the knowledge and skills from the workshops. They specifically reported insufficient number of computers, poor and inapt ICT environment and most importantly, unreliable internet access and connectivity. This study identifies three important elements in the successful implementation of any ICT in education program: willingness (mainly of administrators, teachers and students), training (especially for the teachers) and infrastructure (physical, hardware and software). Although, there was an overwhelming willingness from the teachers (even excitement) and adequate training, issues with infrastructure appear to be preventing the policy from yielding desired results. In order to ensure that the current policy brings the desired results, the MoE must not only provide effective professional development training for teachers, but also furnish schools with the necessary ICT resources and infrastructure. Only then, the MoE may revolutionize the education system through ICT.

***Keywords:*** *ICT in education, professional development, teacher training, 21st century skills, Trinidad*

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## 1. Introduction

Present-day education which focuses on current technologies and 21st century thinking and skills is an important element in the growth and development of any country (Bellanca & Brandt, 2010). As a result, countries generally contribute substantial amounts of their national budget on education, with the assumption that an educated population would contribute better to socioeconomic development at a personal and national level (Schultz, 1987). The viability of educational expenditure is accentuated by the rapid development in technology and other teaching tools and resources. The frequency and intensity of these changes demand corresponding flexibility and adaptability (Fagerlind & Saha, 1989). Realizing this, successive Trinidad and Tobago governments have been trying to provide the necessary ICT in educational tools and trainings so that future generations can be equipped to use it effectively (MoE, 2019).

Information and Communication Technology (ICT) has been applauded for its developmental potential. It can be beneficial for several developmental initiatives including education. Previous studies validated the effectiveness of computers and digital technologies as educational resource (Renshaw & Taylor, 2000; Duran & Aytac, 2016; Noreen & Malik, 2020). Given the level of technological and digital illiteracy facing many developing countries, it is incumbent upon schools to provide the students with the exposure and expertise to ICT and contemporary technologies; so as to prevent them from becoming handicapped in this increasingly digital world. This would also ensure the inclusion of elements of 21st century thinking, knowledge and skills in the curriculum. However, for this, teachers must first equip themselves with these essential skills, and revolutionize their thinking (Cheng, 2017). This places a strong demand on them to become technologically competent with the objective of infusing ICT into their teaching-learning process and equip the students with those skills. Since 1983, the MoE (Ministry of Education) in Trinidad and Tobago has been launching various ICT training programmes such as Computer Literacy Programme, Secondary Education Modernization Programme (SEMP), and the eConnect and Learn (eCAL) Program.

The latest in the series is a new training regimen under its 5 Star Program. However, many people question the effectiveness of those programs, claiming that they are ill-prepared or ineffective in bringing the desired changes. This invites the need for this study which has been carried out to investigate the teachers' perspectives about the ICT training program under the

5 Star Program, its effectiveness, and challenges in its successful implementation in classrooms.

### 1.1 Objectives of the Study

The study focuses on the ICT teacher training program under the MoE's 5 Star Plan presented in 2017 with the following main objectives:

1. To investigate the perceptions of the teachers about the workshops training,
2. To investigate the usefulness of ICT for classroom instructions,
3. To find out the challenges faced by teachers in infusing ICT in the classroom.

### 1.2 Research Questions

1. What are the perceptions of teachers about the ICT training workshops?
2. How do the teachers feel about those workshops?
3. What are the perceptions of the teachers about the usefulness of the training workshops?
4. What are the challenges encountered by teachers while infusing the acquired knowledge and skills in their classrooms?

### 1.3 Significance of the Study

This study is significant from multiple perspectives. It would help the policy makers to find out if such programs are effective in infusing ICT into the educational landscape and improving the overall teaching-learning process. It would also reveal the perceptions of the teachers about the effectiveness and usefulness of the program. The MoE should also be interested to learn about the challenges that the trained teachers are facing in incorporating ICT techniques in the classroom. Based on the findings of the study, the policymakers might be able to revise the current program with relevant strategies to make it more effective.

## 2. Literature Review

Infusing ICT and other digital technologies into the teaching-learning process can be achieved only when there is a holistic coordination for change in education (Warner, 2015). National alterations in students' learning have to be supported by shifts in their attitudes and roles of the teachers. Thus, reforms in teaching can only be effective when teachers learn not only the techniques and strategies; but also inculcate the culture and philosophy behind it. Education reforms of a country also require a synchronized effort within the government. Cheng (2017) said that educational development and reform

required an alliance, support and input of all political parties, businesses, non-profit organizations and other stakeholders. In order to have a proper idea about any program, one must also look at the background and overall picture. It is, therefore, imperative that this study looks at the role and need of ICT in education, reforming the education system through ICT, and the MOE 5 Star Plan which is being investigated in this study.

ICT is not easily defined since there is no globally accepted definition. It is due to the fact that technology is rapidly evolving and changing. Gay and Blades (2005) suggest that ICT in education means an effective use of technological programs to connect, retrieve, convert, save, manipulate and transfer data and information for education related purposes.

During the industrial era, the key skills were knowing a trade, following directions, getting along with others, working hard, and being professional- efficient, prompt, honest, and fair (Friedman, 2005); but to hold information-age and knowledge-based jobs in the present era, students also need to think deeply about issues, solve problems creatively, work in teams, communicate clearly through up-to-date media, learn ever-changing technologies, and deal with a flood of information in this digital world (Friedman, 2007).

Given the rapid regularity of change in a technologically driven world, life will be very different for the students when they graduate from any academic institution and enter the world of work. Most of the current educational systems are not adequately preparing the students for the kinds of jobs and lives they are likely to encounter in their lifetime (Friedman, 2005; Pink, 2006). Wenk (1986) also said that despite the changes in students' lives, amplified by the proliferation of technology, our schools have not changed in most of the cases. Consequently, schools must do a better job with engaging students in the application of knowledge, skills and present-day technologies, as opposed to having them reproduce what they are taught in familiar contexts (Jerald, 2009).

It is thus important to acknowledge that yesterday's education is not adequate and sufficient for today's learner (Levy & Murnane, 2004). Excellence and prowess in education must now be categorized "within the context of today's technological environment in order to fully prepare students to thrive in the Digital Age" (Burkhardt et al., 2003, p. 4). Spring (2008) states that goals and objectives of schooling are directly associated to the world's economy as today's world is a global village. Most significantly, technology

has influenced the job market by eliminating work that can be easily automated or offshore to cheaper world labor markets (Levy & Murnane, 2004; Friedman, 2007). This demands radical changes in the schools and education system.

Some researchers hinted that the integration of technology has mostly been cosmetic, and the system still focuses on rote learning and traditional ways (Cuban, 2003; Jonassen et al., 2008). Research has shown that schools are not preparing students for the best-paying jobs of the 21st century (Friedman, 2007). There is a dichotomy between schooling and society characterized by the seemingly immovable institutional structures of schooling and constant change in a technology-rich, networked society (Collins & Halverson, 2009). Without incorporation of ICT in education, education systems across the world may not only fail to thrive, but even to survive.

In order for teachers to effectively implement ICT in their classrooms, they have to be willing to not only learn the new technologies, but also use those new technologies in their lesson planning and its implementation (Rossacci, 2016). For this, teachers also require the necessary infrastructure, hardware and software, reliable high-speed internet connectivity, continuous professional development and the support of administrators (Buabeng-Andoh, 2012, Noreen & Malik, 2020).

Contemporary societies and economies have changed a great deal over the years. The world has been transformed through the concept of globalization which occurred with the continuous advancement and infiltration of modern technologies in every sphere of life. It is imperative that students are exposed to information and communication technology so that they are well prepared for their future professional careers (Richards, 2013).

Consecutive governments of Trinidad and Tobago over the past four decades have realized the demand for scientific and technological knowledge and skills (MoE, 1983, 2019). Governments through the MoE have always been championing the development of quality education plan with their main objective to provide the means of continued learning and acquisition of skills through creative and critical skills, and modern technologies (Ministry of Education, 2004).

The least the education system should do through its teachers, is to provide learners with the skills that will meet their future needs (Warner, 2015). It is a truism that a new generation with new meaning to life is evolving. Graduates are thus in need of learning digital and modern technologies from schools otherwise their education will be incompatible with

a changing world. At the heart of any development, are teachers who are the backbone of any education system (Danielson, 2005). Any reform or revolution should begin and continue with the training of teachers and administrators. How can teachers be asked to prepare students for a world of work that they themselves are not trained properly for?

Realizing this, the MoE has launched multiple programs and training workshops to train all teachers at secondary school level in the country to infuse technology in classroom instruction as one aspect to the reform movement. In as early as 1983, the MoE believed that it was important and relevant to conceptualize, plan and implement ICT and computer literacy programs along with the integration of computers in various subjects for secondary schools (MoE, 1983). The pilot initiative, spanning from 1983 to 1984, included knowledge of hardware, software, and low-level programming skills through hands-on experience. In 1997, the MoE through the National Energy Skills Center (NESC), created a Computer Literacy Programme for MoE employees, and primary and secondary school teachers and students (NESC, 1997; Hosein, 2006).

The Secondary Education Modernization Programme (SEMP) was a major undertaking and was conceived in the latter half of the 1990s and launched in 1999. To reform the secondary education system of the twin-island state, it offered training in ICT and computer literacy to the entire secondary school system. The main goal was geared towards establishing a computer laboratory with 18 workstations in each secondary school (SEMP, 1998). This programme was costly, and eventually unsuccessful in training all secondary school teachers.

In 2005, a draft policy was formulated for ICT in schools (MoE, 2005). That policy was intended to ensure that ICT was substantially infused into the teaching-learning process (Maharaj-Sharma et al., 2017). The training of teachers was seen as a priority in this draft. In 2010, the eConnect and Learn (eCAL) Program was started with the main objective of providing and giving access to laptops to every secondary school teacher and student. The MoE also provided training to both teachers and administrators on curriculum integration and classroom facilitation.

Although as a result of these programs, teachers were expected to use ICT as a resource to engage with the students and refine the teaching-learning process (MoE, 2012), many doubted it. They claimed that the whole practice of infusing ICT into teaching-learning process seems to be a mere lip service, and teaching and learning have generally appeared to remain unchanged.

In 2017, the MoE launched a 5-STAR Education Plan that encompasses a governance structure, an ICT in education policy, an upgrade of ICT supporting infrastructure, an enhanced training for teachers, and curriculum reform. The pillars of this plan are to upgrade the ICT infrastructure in schools, teacher training for effective use of ICT in curriculum implementation, and curriculum reform and support to inculcate 21st century skills amongst the students (MoE, 2017). Under it, the MoE embarked on a series of teacher training programs for developing competencies in ICT for all its over 7,000 secondary school teachers in Trinidad and Tobago (MoE, 2018). This is expected to continue until every teacher has participated in the training.

The foundation of the training materials and the philosophy of the 5-STAR Education Plan was adapted from UNESCO ICT Competency Framework (UNESCO, 2011). One of the key facets of the framework is to acknowledge multiple aspects that ICT in educational approaches have to grapple with for successful implementation. For example, teachers' competencies; facilitation and learning materials; ICT equipment; student, teacher and parent motivation; curriculum reform and assessment practices are the challenges which have been identified and focused upon in the National ICT plan and accompanying policies (MoE, 2017).

Despite its apparent effectiveness and importance, there have been many questions about it. Brown (2012) has spoken specifically about the speed with which the technology revolution is unfolding. It has been questioned if the people really know about the transition that is occurring, its impact and requirements. Educational theorists have also raised concerns about maximization, efficiency and effectiveness of ICT resources in the context of teachers' beliefs, their proficiency levels and how prepared they are for the use of ICT-based instructional technologies in their classroom instruction (Otten-Leftwich et al., 2010; Tezci, 2011). They argue that not enough is known about how and how much the teachers are using ICT tools and techniques in their classrooms (if they are using it at all). The 2017 ICT training program for secondary school teachers have been questioned by some in the same way. It has been argued that it is just another training to give credence to the MoE's statements on ICT infusion in schools (Bascombe-Fletcher, 2018).

Under the umbrella of the 5 Star program, the training workshops were designed for the participating teachers. They would be engaged in seven, one-day workshop sessions during the first and third terms of the school year. Teachers were to attend the sessions once a week with no sessions on Fridays. Principals of secondary schools were asked to select twelve teachers from 3

groups: Group 1 - Natural Sciences, Mathematics, Information Technology and Business; Group 2 – Modern Studies and Technical & Vocational; Group 3 - Modern Language, English Language and Visual and Performing Arts. Schools were directed to send four teachers from each group (MoE, 2017).

The aims of the ICT Teacher Professional Development Program include equipping teachers with skills and competencies for effective integration of ICT into their facilitation and learning practices; developing an appreciation of the usefulness of technology to enhance assessment and provide teachers with the tools to incorporate E-testing into their assessment strategies; and fostering learning communities among both teachers and students (MoE, 2017). The program is centered on the integration of ICT in the curriculum implementation. In all subject areas, the overarching objectives are to enable teachers to integrate ICT into their facilitation and learning approaches. The training exposes teachers to a superfluous amount of computer and online applications, tools and instructional strategies.

This program consists of seven different modules. The first is denoted as Policy of Understanding. It is about understanding ICT and its importance in education. It engages participants with discussions about the importance of policy and its direct linking and bearing on classroom exercises. It also encourages participants to have an in-depth knowledge of national policies and social priorities so that they will be able to design, modify and implement their classroom practices to support these policies.

The second module, Complex Productivity Tools, places the focus on teachers' use of ICT tools to infuse in their facilitation and learning and increased productivity. It intends to expose teachers to both hardware and software that can be employed in the classroom delivery and extend their classroom, thereby making it borderless.

The third module, Knowledge Application, addresses subject-specific methodologies to ICT integration in the curriculum. In it, the merger between ICT, curriculum and pedagogical approaches are explored. The fourth module, Pedagogy I, contained Complex Problem Solving. The MoE has recently become interested in meaningful integration of technology into the teaching and learning process (MoE, 2019). This module introduces participants to strategies and approaches for student-centered and technology-driven classroom practices.

The fifth module, Pedagogy II, includes Differentiated Instructions, and prepares teachers to use ICT tools for tackling students' unique differences, learning styles and multiple intelligences. Differentiated instruction is an approach for teaching in which educators actively plan for

students' individual learning differences, so that all students can optimize their learning potential.

The sixth module, entitled Teacher Professional Learning, encompasses complex internet tools, familiarizes participants to the possibilities of the World Wide Web and Web 2.0 digital literacy tools; and to augment teachers' professional performance and support their facilitation. It allows teachers to gain competence in the use of Web 2.0 tools to improve and deepen their interaction and collaboration facilitating modes.

The seventh and final module, labelled Organization and Administration, comprised Collaborative Workspaces. It extends teachers' knowledge and provide skills in the use of Microsoft OneNote Class Notebook for teacher-student collaboration. This digital notebook is designed to help teachers automate their classroom experiences and be more efficient and productive. Teachers are expected to use the full features of this application in schools and for online collaboration.

## 3. Research Methodology

### 3.1 Research Design

This study used a qualitative research design as it allows in-depth probe of an issue (Patton, 2002).

### 3.2 Population and Sample

The population of the study consisted of 1700 trained government and government-assisted secondary school teachers in Trinidad. Stratified purposeful sampling strategy was used as suggested by Patton (2002) and Ottenbreit-Leftwich et al. (2010). Strata were based on the different subject groupings (Group 1- Natural Sciences, Mathematics, Information Technology and Business; Group 2- Modern Studies and Technical & Vocational; Group 3- Modern Language, English Language and Visual and Performing Arts), and government and government-assisted schools. Forty teachers were selected. All the participants had sufficient time to integrate or attempt to integrate the ICT competencies into their classroom teaching.

### 3.3 Instrumentation

This study used interviews as data collection tools as it could allow detailed responses and further probe (Patton, 2002). Both one-on-one and focused-group interviews were used. Thirty-two participants were interviewed through five focused-group interviews with 6-7 interviewees in each group. Eight teachers were interviewed one-on-one. Focused-group interviews were 22-34 minutes long while one-on-one 8-12. All in all, thirteen interviews produced 208 minutes (3 hours and 28 minutes) of data. Their details are given in Table 3.3.

Table 3.3
*Details of Interviews*

| Interview Code | Interview Type | Number of Participants | Participants | Strata | Duration |
|---|---|---|---|---|---|
| FG1 | Focused-group | 6 | P1-P6 | Group 1, government schools | 25 min |
| FG2 | Focused-group | 6 | P7-P12 | Group 1, government schools | 30 min |
| FG3 | Focused-group | 7 | P13-P19 | Group 2, government schools | 34 min |
| FG4 | Focused-group | 7 | P20-P26 | Group 3, government schools | 22 min |
| FG5 | Focused-group | 6 | P27-P32 | Group 3, government assisted schools | 24 min |
| Int1 | One-on-one | 1 | P33 | Group 3, government school | 10 min |
| Int2 | One-on-one | 1 | P34 | Group 3, government school | 8 min |
| Int3 | One-on-one | 1 | P35 | Group 3, government-assisted schools | 9 min |
| Int4 | One-on-one | 1 | P36 | Group 3, government school | 12 min |
| Int5 | One-on-one | 1 | P37 | Group 3, government-assisted schools | 7 min |
| Int6 | One-on-one | 1 | P38 | Group 3, government school | 10 min |
| Int7 | One-on-one | 1 | P39 | Group 3, government school | 9 min |
| Int8 | One-on-one | 1 | P40 | Group 3, government-assisted schools | 8 min |

Interview guide for this study consisted of five main interview questions pertaining to the research objectives. One interview question was about participants' perceptions about the workshop, one about its usefulness, and three about different kinds of challenges that they might have faced in implementing the acquired knowledge. When the interviewees had difficulties in answering a question or hesitated, the researcher probed further through supplementary questions. Three types of probes were used as stated by Barriball and While (1994): the detailed-oriented probe, the elaboration probe and the clarification probe. Both face-to-face and WhatsApp interviews were conducted.

## 3.4 Data Analysis Technique

This study employed Marshall and Rossman (2006) model to analyze the interview data. Under this model, the study generated codes and categories and then presented them in the form of a report. Verbatim quotations were also

used due to their significance in qualitative research (Corden & Sainsbury, 2006).

## 4. Data Analysis & Interpretation

The findings of the study are as follows.

### 4.1 Perceptions of the Teachers about the ICT Training Workshops

First research question was about the perceptions of the teachers about the training workshops. The teachers by and large showed contentment and excitement about those training workshops. Talking about the impact of the workshop, P36 said, "I realize the importance of technology now. We may have computers and all those gadgets, but we, teachers, can make them useful and beneficial." Almost all the teachers agreed to it, saying that after these workshops, they realized the importance of technology as a teaching and learning resource.

Many teachers talked about the knowledge and the competencies gained through them. Almost all said that they left knowing more at the end of the workshops than what they knew at the start. P8 said, "I am excited. Now I know many things about ICT." She said that the workshops taught many new things to her. She further added, "I already know about the computer, but now I know how I can use it for better teaching."

Most purported that they understood the role and importance of such workshops, and the need for ICT infusion. P3, an experienced government school teacher, explained how those workshops helped changing his attitude about ICT in education. He said, "As a teacher of more than 20 years and not being a fan of technology in my classroom, I am convinced that I can use Web 2.0 tools in my science instruction."

### 4.2 Usefulness of ICT Training Workshops

The second research objective was about the usefulness of ICT training workshops. Teachers were asked about both perceived usefulness and actual usefulness. Most of the teachers were excited and overjoyed with the possibilities to use ICT in their classrooms. They commented that they saw how it would benefit their students. Learning about various Web 2.0 and Microsoft Productivity tools like "Sway" and implementing them in their classrooms was indeed exhilarating to most. They were also thrilled about the unique possibilities that they could have in their lesson planning using those tools and techniques.

When it came to actually implementing those tools, techniques and strategies; many reported a multitude of issues which prevented them from applying them effectively. Those who were able to integrate ICT in their classrooms, reported encouraging results. They said that the students were

excited about them. P27 said, “It was amazing to see the excitement in the eyes of my students when I used ICT in a mathematics lesson to construct angles. One child asked me if we can use the computer more often.”

P34 described how he employed some of the techniques in these words, “I placed my students in groups on WhatsApp and the interaction was fantastic. Using Excel to compute my marks at the end of the term was great.” Those who were able to employ ICT tools and strategies, also reported improved students’ performance in the academics.

A few teachers said that they were so motivated to integrate them that they brought their own multimedia and other tools. They said that their students were overjoyed and were really into the classroom learning. They further added that due to the extra enthusiasm and involvement of the students, their classroom participation and communication skills improved. P11 described her experience about using ICT tools and its usefulness in these words, “Using ICT in the classroom is a challenge for me, but the gains for my students are worth it.”

### 4.3 Challenges faced by Teachers in Infusing ICT in the Classroom

Despite their eagerness and potential benefits of ICT, many teachers pointed out various challenges that prevented them from either utilizing the gained skills fully, or in many cases, utilizing at all. When it came to those challenges, the most recurring theme was about infrastructure. Concerning the questions pertaining to the integrating the ICT tools, techniques and strategies in their classroom, many trained teachers said that they were unable to do so due to either the lack of relevant infrastructure or improper one. P37 said that “lack of computers, internet and other infrastructure” was an acute issue. Many teachers questioned the practical usefulness of the trainings in this situation as they were not able to integrate anything. P40 explained her disappointment in these words, “I was happy for the training, I was excited to use most of what I learned. And then I returned to school and realized that I was dreaming.”

While talking about issues pertaining to the lack of infrastructure, most of the teachers pointed out limited number of computers and internet issues. P7 reported that in these words, “The training sessions were generally good but when I returned to school there was limited computers in one computer room, one multimedia for 60 teachers and no internet access in the classroom.” P35 also echoed the same, saying, “It is impossible for two multimedia to serve more than 80 teachers and unreliable internet access and not sufficient computing devices.”

When one tries to use computers and multimedia in the classroom, one needs additional space for those devices. Also, students need to sit some distance away from the multimedia screen to view them properly. P35 pointed it out, saying, "The classroom is so full of students that it is difficult to use a multimedia comfortable in most classrooms."

Finally, many teachers highlighted compatibility issues. P18 questioned the proper planning and thought-process by saying, "They gave us Office 365 accounts and our students in school do not have Office 365 accounts. How will we use Sway and other Microsoft Apps if our students do not have Microsoft accounts?"

Many teachers who tried to integrate ICT into the teaching-learning process said that the classrooms at school are not ICT ready. As a result, despite their willingness and students' excitement; they could not integrate it properly. This rendered those workshops with very little practical benefits.

## 5. Discussion and Conclusion

The findings of the study revealed that the teachers were quite excited about the training workshops and were more than willing to integrate them in the teaching-learning process. It shows that the secondary school teachers in Trinidad were open to professional development, and integration of modern tools, technologies and new strategies into their practice. The literature also points towards teachers' excitement and willingness in this regard (Haydn & Barton, 2008; Semerci & Aydin, 2018). Actually, some of the teachers were so motivated that they would bring their own tools and devices to use ICT in their classroom; showing their love and loyalty to their profession. Those who were able to implement it, reported improved students' excitement, better classroom interaction and an increase in their students' academic performance. Many of the previous studies also reported these points, highlighting how ICT and modern tools improve students' interest, classroom involvement and better academic scores (Eng, 2005; Bindu, 2016).

When it comes to ICT, teachers and students' passion and excitement are not enough for its successful implementation into teaching-learning process. Availability and access to infrastructure is as important as anything else (Lu et al., 2015). Unfortunately, the situation did not turn out to be that encouraging and rosy in this regard. Most of the teachers reported that their school and classrooms were not ICT-ready. They reported issues with internet, computer-student ratio, small size classrooms, and compatibility issues. These infrastructure-related issues are a recurrent theme in many of the developing countries (Lu et al., 2015; Noreen & Malik, 2020).

The study shows that the teachers stand ready and willing to infuse technology in their classroom instructions, but the relevant government bodies and policymakers must realize that the ICT training programs can only be successful and effective if the schools and the teachers are provided with proper infrastructure and resources. It may be futile to train teachers to integrate ICT in classrooms if a conducive environment and infrastructure do not exist. When it comes to successful implementation of ICT into education, willingness, training and infrastructure are three basic ingredients for success. Unfortunately, it seems that the last element is missing in Trinidad secondary schools, making that desired success an illusion.

## 6. Recommendations

The study reveals that despite all the efforts of the successive governments, the infrastructure for ICT in education in Trinidad remains weak. Successful implementation of any ICT in education program depends on three different elements: willingness (of the stakeholders, especially teachers and students), training (of the teachers and relevant personnel), and infrastructure (relevant to ICT in education). It is clear that the current program fails in the last criteria. The Trinidad and Tobago government should take the following steps to ensure effective implementation of this program:

1. The existing ICT related infrastructure in the schools must be improved so that the broader 5 Star program in general and ICT training program in particular could meet the desired results.
2. There must be sufficient number of computers in every school to meet the students' needs.
3. The relevant authorities must also ensure that students have access to the software being used in the training such as Office 365 accounts.
4. There should be proper internet access not only in the schools, but also for the teachers and students at home so that they can do further study and work.
5. The rooms, especially those used for ICT in education-based classes or activities, should be spacious enough so that the teachers, students and gadgets can be accommodated easily.

This study has strong implications especially for the policymakers. Successive ICT related policies and reforms have failed to bring the desired results in Trinidad and Tobago. This study probes into it and identifies some of the real issues that have been hampering a proper and smooth implementation and progress of ICT related policies and reforms. The policymakers must either revise the current policy or work more rigorously on ICT related

infrastructure to ensure its successful implementation. The same can be said about many of the developing countries where policies are quite good on the paper, and relevant training is also provided, but inadequate infrastructure on the ground prevents the policy from bringing the desired results.

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