THE LAPTOP IN SCHOOLS PROGRAMME

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Abstract.

The laptop in school programme was introduced in secondary schools without teacher preparation. The data presented in this study were collected to determine the challenges encountered and the extent to which the project's goal were achieved. This study examined how the laptops were used in the classroom by teachers and students, how the program was implemented, and the benefits of the programme to a secondary school in central Trinidad. The research drew on a mixed methods approach. Qualitative and quantitative data were collected and analyzed. The carefully crafted mix of research methods included survey questionnaires, participant observation, a focus group in addition to interview sessions with teachers and the principal of the school. The findings of the study revealed that the purpose for which the laptop was intended was unclear to students and that owning the device, appeared not to make a significant difference in their attitude toward learning. Additionally, teacher efficacy and understanding about the educational purpose of using laptops as well as the use of technology in the teaching and learning processes was also important. Findings also showed that the decisions made with regard to the implementation of the programme might have been more successful if the pre- implementation activity had sought buy-in of parents, teachers and the principal. The laptop programme should have been designed according to the teachers and school's needs readiness level, school culture and current teaching styles. Teachers were fully aware of the benefits which could be derived from the program however barriers to effective implementation appears to have resulted in the laptop being infrequently used in the classroom and consequently the students not attaining the full benefits of the programme. Some of the barriers included an un- sustained support for teachers on integrating the laptop with the curriculum and students who were not provided with training in basic use and proper care of the laptop. The findings of this

study should be considered, as they present suggestions for policy makers, researchers and educational practitioners who are interested in the implementation of effective laptop programmes in schools in Trinidad and Tobago.

Keywords: Nerlene Callender-Sampson, One-to-One Laptop Programme, Laptop in Schools Programme, Trinidad and Tobago

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CHAPTER ONE

Introduction

In recent years, the introduction of computers into education has been gaining momentum in Latin America and the Caribbean. Governments are rapidly deploying laptops to students introducing what has become known as the "Laptop in Schools Programmes". This laptop programme is essentially a programme which provides students, with a portable laptop computer, for continuous use, both in the classroom and at home. One model which is used to incorporate the technology is referred to as "One to One" computing.

The term "One to One" refers to the ratio of digital devices per child so that each child is provided with a digital device. (Severin & Capota, 2011). There are several reasons why educators choose one-to-one computing programmes to introduce computers in education. These may include the intention to improve the in-class educational experience and providing universal Internet access to disadvantaged students (Standley, 2010).

Almost 29 years ago Alfred Bork presented his vision of how computers would soon affect education. He believed that in the future the dominant delivery system in education would be computers (Bork, 1985). However, according to the Center for Digital Education, (2004), several factors must be taken into consideration before any successful laptop programme can take root in a school. Severin & Capota (2011) suggest that for this method to be beneficial and sustainable, the pedagogic foundation needs to be grounded in types of learning that have the greatest impact on the student.

Computers and associated technologies led man into the information age. It was found that the new information thrust brought about by these technologies held much wider implications than had been imagined. Today we are living in a world where technology has been diffused into almost all spheres of human activity at an unprecedented rate (Kuyoro Shade, Awodele & Okolie Samuel, 2012).). Computers have accelerated the evolution of the global economy, the workforce and the education system. Globally, technology has brought interaction and integration among people, companies, governments of different nations and driven international trade and investment (Levin Institute, 2014).

A critical issue therefore in the educational sector, was to prepare students to become competent with regards to the concepts of using technology. Hogenbirk (2000) demonstrates that these skills could be taught from the earliest levels of formal schooling. He further stated, that education must be efficient and responsible in training citizens who are able to produce new knowledge and to use it in a creative manner

Laptop programmes require considerable human and non-human resources to be implemented and maintained. This fact usually resulted in laptop programmes being found in schools that serve affluent communities, resulting in unequal access to students. Unequal access has been a prime motivation for the launch of laptop programmes in many countries.

Background

The laptop programme in Trinidad and Tobago was the result of a promise that "Every child going on to secondary school from the Secondary Examinations Assessment (SEA) will be provided with a laptop to begin their secondary school education." (People's Partnership Manifesto, 2010 pp 11). The goals of the programme as stated in the e-Connect and Learn Programme Policy was:

1. To enhance the learning environment for students in an ever-changing information age;

2 To improve the quality of instruction and support the infusion of ICT in teaching and learning and the development of 21st Century skills in students.

3 To reduce the inequity in access to computers and information between students from wealthy and poor families.

4 To raise student achievement through specific interventions such as improving students' understanding through the use of education software;

5 To facilitate the development of collaborative teaching and learning between peers within the school, among schools and between teacher and student. (Ministry of Education, 2010).

The promise of one laptop per student materialized in September 2010 at the West Central Secondary School under the government's *'e-Connect and Learn'* laptop in school programme.

Summary of Literature Review

One of the major goals of the e-connect and Learn programme was creating a collaborative learning environment by encouraging active student engagement in the teaching/learning process. Constructivist theory informs this type of learning environment.

Constructivism is a learning theory based on observation and scientific study about how people learn. Doolittle & Camp (1999) think that the essential aspect of constructivism is that learners construct their own knowledge and meaning from their experiences, and that knowledge is gained from the active thinking and performance in an authentic setting. Engestrom (1999) believes that activity allows for a deeper understanding of the phenomenon being studied. Constructivist practices have been predicted as most suitable for use with ICTs.

The Laptop Programme at West Central Secondary School

The West Central Secondary is a five year, co-educational institution which was established on the 2nd September, 1978. It is located in central Trinidad. Some of the challenges experienced at the institution are partially the results of it previously being a junior secondary school. A junior secondary school originally catered to post primary students from the ages of 11 to 14-plus. After which they moved up to the senior secondary and comprehensive high schools. For their entire history, junior secondary schools accommodated their students in shifts, one in the morning and another in the evening. The original building was extended after secondary schools were de-shifted in 2006 to accommodate the accumulated student population. There are six hundred students enrolled. The physical structure facilitates twenty-two (22) "home" rooms and fifteen (15) special subject areas. There is difficulty at times to accommodate some classes, due to lack of space and particularly because of the expansion of the Caribbean Vocational Qualifications or CVQ. This is a competency based approach to training in which students are expected to achieve standards of competency which have been developed by relevant industry.

The school was involved in the single sex school project and therefore the current Form Two (2) to Form Four (4) students are exclusively girls. The single sex project was an attempt by the Ministry of Education to address the problem of rising school violence, by segregating the sexes into separate schools. Forms One (1) and Five (5) are co-ed classes. There are Fifty (50) teachers on staff – this includes both trained and untrained educators. The curriculum offers a combination of academic, technical vocational based subjects which prepare students for NCSE, CXC, CSEC and CVQ examinations. Students and staff expect to move into a new school building in the near future.

In September 2010, students entering Form One at the West Central Secondary school were provided with a laptop computer. This was the first phase of the e-Connect and Learn (e-CAL) programme, an initiative of the Ministry of Education of Trinidad and Tobago.

Within its e-Connect and Learn Programme Policy, the government stated that the primary focus of the programme is to increase ICT accessibility to the nation's students, because education is fundamental to meaningful national development. They further stated that ICT enabled education has proven instrumental in improving the transfer of learning to students as well as in preparing them adequately for working in the Information Age. (Ministry of Education, 2010)

The laptop project has made over 20,000 HP (Hewlett Packard), laptops available to secondary school students throughout Trinidad and Tobago. Students received a laptop bag containing: one laptop, a mouse, one charger and a manual. The Installed software included: Windows 7, Microsoft Office Suite 2010, Adobe Reader 9, Bing Maps 3D, World Wide Telescope and WWT Mars. An anti- virus protection software program; Microsoft Endpoint

Security was also built-in to prevent infection of the laptop. The laptops were on a one year warranty which covered the repair of any hardware related issues. After the warranty expired, the parent/guardian was responsible for repairing the laptop. To facilitate delivery of the device, parents and guardians were called in to sign the "Terms of Use" contract document, before the laptop computer was delivered to their children to be taken home and brought to school as required. The "Terms of Use" contract document stated the guidelines governing the responsibilities of students and parents, with regards to the use and care of the laptop. The Form One class teachers in collaboration with the IT technician and the school's administration managed the distribution of the laptops which students were allowed to take the laptop home. It might be assumed that student would bring the device to school for use. There were unfortunately, at this time, no systems in place to manage the use of the laptop at school.

The students were eager to use the laptop computer however. From the very next day many pupils brought the device to school daily. They downloaded games, pictures, music, uploaded personal pictures of themselves and family members. Some of them removed the sticker which the Ministry of Education had placed on the laptop, and in some instances tried, (and some successfully) to delete information which came pre-loaded on the laptop. This information related to the care of the machine.

The way in which the students were using the device, generally did not meet the objectives for which it was intended, which were basically, to aid teaching and learning in the classroom and to conduct research and the preparation of assignments. There was a report of a parent who deliberately destroyed his child's laptop. He thought that his daughter was taking too long to respond to a household chore he had instructed her to carry out; he therefore smashed the device to the floor. Another student said that he placed his laptop on the wardrobe because he

did not have any use for it. However, some students used the machine quite impressively. They used Microsoft Word and PowerPoint software to prepare beautiful portfolios and assignments. They used a variety of fonts, created designs, used colour, downloaded images into their work and truly presented attractive projects. It is important to note that many of the students who used the laptop had come into Form One with a previous knowledge of basic computer use.

The lack of connectivity in the classroom did not allow students to work online during class sessions and this may have demotivated them. Chiefly, because the students felt that they needed to be on the Internet in order to work with the laptops. Generally the laptops were not used by teachers in the classroom. However, teachers in the various departments such as Technology Education, Mathematics, Science, Social Studies and Home Management, still attempted to have students use the laptop in classroom sessions to document work and to work on group projects. In the Instructional Technology classroom there was not an issue of laptop use because students used the desktops which are available to the lab. Students were also encouraged to use the device at home to do research if they had the Internet and to produce the projects and assignments. Some students used the computers to produce their work at home, yet others refused, even though they had the laptop, and on many occasions claimed that the laptop was not working. There were instances when students could connect to unknown external sources in school and they took this as an advantage to do research for topics in the classroom, teachers also used this situation to go online to work with their computers in the classroom.

This scenario indeed seemed to suggest that there was not a co-ordinated plan for the integration of the laptops into the classroom learning and teaching. The physical infrastructure of the classroom could not support the use of the laptops anywhere. The average classroom

contained two electrical outlets or less, and there were no cupboards for storage or desks to accommodate proper use of the laptop.

Many teachers were willing to use the laptops in the classroom, but were either not or were inappropriately trained, therefore they lacked the confidence which was required to use the device with students.

The National Energy Skills Centre (NESC) conducted workshops for technology integration on behalf of the Ministry of Education. A three day course titled 'Integrating ICT's into the Classroom' was prepared for principals. Course content covered: 'Planning for ICT integration'; 'Developing an ICT integration Plan' and 'Evaluating and Revising an ICT integrated Lesson'. In addition a Digital Literacy was prepared for teachers as well as non-teaching staff. This course content included information on Computer basics, PC health and safety, The Internet and the World Wide Web, Productivity Programs, Computer Security & Privacy and Computer Ethics. The West Central school administration also hosted some workshops which were facilitated by invited guests, the internal IT technician, and the IT department. . The "cloud" was demonstrated as an option for storage of documents online, and "Wiki spaces" was also presented as a means to interact with students. Teachers engaged in hands-on activities during the workshops and some even set up their personal Wiki spaces. It was evident from their level of participation that they enjoyed these workshops.

However certain barriers to implementation, as indicated in this research, may have made these efforts unsustainable in the classroom. The laptops were consequently not used in the manner that many teachers and students would have liked. Students were instructed to leave the laptops at home unless instructed by a subject teacher to bring the device to their class.

It must be noted here that there were parents who managed and supervised their child's use of the laptop. These parents asked teachers to send a note to them whenever the device was required for use in school. My observation has shown that in most instances these were the pupils who up to the time of this research still had working laptops from the first phase of deliveries to the school .

Students soon began to leave laptops at home and to complain about having problems with the device. Difficulties included power adapters not charging the laptop, keyboards sticking, systems freezing and flickering and cracked screens. The IT technician allocated two days a week, during the lunch break when students could meet with him to sort out any issues they had with the laptops. He commented that in most instances (these were his words) "nothing related to school work was on the laptops" when they were brought in. There were music videos, pictures and in some instances, objectionable materials for which some parents were summoned to view on their children's laptops.

Additionally, there were limitations with regards to the capacity of the school building to support the systems required to effectively implement the technology. The apparent stress of increased use of the old electrical system would cause it to "trip off" on many occasions. This meant that there would be no electricity in some parts of the school and this interrupted the effective functioning of the servers and switches. A small section of the already small staff room was blocked off to create a computer lab for teachers inclusive of the teacher's sick room which was used to store the servers and switches.

The IT technician said that a general policy was created by the 'e-Connect and learn' administrators which contained what was referred as a "blue coat" to block You Tube

connections at schools. The policy was revised because some schools were requesting You Tube for teaching purposes. The "coat" was therefore removed and school administrators became the custodian of the Internet system at their school.

At West Central Secondary, Internet access was restricted to the staff room, IT class room, library and the teacher's lab. The issue was that connectivity in the classroom led to many students spending time using the Internet to access materials which was objectionable. The school administration was therefore looking at ways to appropriately manage Internet access school wide. A committee chaired by the Principal was set up to determine the best way to manage the project. The team was mandated to create an internal policy for laptop use.

It is the opinion of the researcher that the lack of connectivity to the Internet and the inability of the physical structure to maintain the use of the laptop in the classroom affected the student's ability to fully appreciate ownership of the laptop. To my mind, this was and still is a limitation and prevented a fair evaluation to be made of the laptop programme at the school. An appropriate front end analysis was required, in order, to give the effort sustainability.

It was important to note that the number one goal of the Ministry of Education, as stated in the e- Connect and Learn policy was "to enhance the learning environment for students in an ever-changing information age"(pp 3). Our particular focus is on those aspects expected to influence most directly the quality of student learning, namely the implementation of the programme, the ways the laptop were used and the benefits if any generated by the programme.

Statement of the Problem

The laptop project was introduced in secondary schools without adequate preparation of the schools or teachers. In this study, data were collected to determine the challenges encountered and the extent to which the project's goals were achieved.

Purpose of Study

The purpose of the study was to evaluate the state of the laptop programme by eliciting the perception of teachers and students participating in the one-to-one laptop programme, after the first four years of implementation at the school.

Research Questions

1. How were the laptops used in the classroom?
2. What were the challenges of implementation n the West Central Secondary School?
3. What were the benefits of the laptop programme in the West Central Secondary School?

Research Objectives

1. What were the goals of the Ministry of Education relative to the laptop in schools programme?

2 To what extent were the goals of the laptop in schools initiative achieved in the West Central Secondary School?

Significance of the Study

This study is significant because it contributes to a developing area of research. In addition, it provides insight into how a secondary school responds to the implementation of a laptop programme in the specific context of the Caribbean.

This study aims to describe both qualitatively and quantitatively the state of the laptop in school programme as implemented in the West Central Secondary School in Trinidad and Tobago. The findings of this study paints the picture of this programme as it stands currently, and thus can provide the governmental agencies, teachers, parents and all interested parties with a way forward. The successes can be recognized and further improved upon. The problems listed can be addressed and the programme adapted to best suit the conditions as described on the ground. Benchmarks can be set and the programme can be evaluated comprehensively in the next four years.

Conceptual Definitions of Terms

One-to-One laptop programme - This is an implementation of laptop computers in a school environment on a ratio of one laptop computer per student and one laptop computer per teacher.
Laptop computers - also known as notebooks, are portable computers that you can take with you and use in different environments.

Ubiquitous Technology- Personal and individual access to information and communication technology twenty-four hours a day, seven days a week for every individual student and teacher is described as ubiquitous technology.

Digital Natives - Individuals who grew up with digital technology from birth.

Teaching-learning environment -This term is used to describe the whole set of teaching, learning support, as well as the facilities and resources provided within a course.

CVQ-Caribbean Vocational Qualifications is a competency based qualification. Students must demonstrate competence in various areas of technical vocational skills.

CXC-Caribbean Examination Council is the regional examination and certification body.

CSEC-Caribbean Secondary Education Certificate is offered by the CXC to students leaving high school.

NCSE-National Certificate of Secondary Education is the new assessment and certification for secondary education in the Republic of Trinidad and Tobago.

Limitations and Delimitations

This research is limited to the achievement of the goal at the West Central Secondary School where school-wide Internet service was unavailable and therefore may have inhibited the achievement of the goals of the laptop in schools programme. A great deal of the research on laptops and classroom experiences, which were referenced in this research, have been done in wealthy countries and may not reflect the experiences of schools in Trinidad and Tobago.

CHAPTER TWO

LITERATURE REVIEW

Introduction

Over the past decade, the infusion of computers into education has radically evolved with the introduction of one-to-one student laptop programmes. With ubiquitous access to laptops, students in these programmes are also taking their personalized computers home and bringing them back into the classroom daily.

This review and hopes to gain insight about the methodology for undertaking this research, the experiences of schools worldwide with their laptop programmes, the kind of teacher training which was offered and other aspects related to safe use and care of the device.

The first section of the review examines the use of the laptop in schools and also focuses on how the programme was implemented to achieve desired goals. This investigation then looks at how the laptop programme could be beneficial to students. Collectively, the three objectives provided a basis for research into the laptop programme and the potential impact on teaching and learning at a school.

Learning Theory

Potential of the laptop for learning

One exploration of the use of laptops in the classroom is grounded in a socio-cultural theory of learning that sees learning as a social process where students develop and grow intellectually in interaction with other people (McLeod, 2007). Some researchers have argued that students with ubiquitous access to Wi-Fi have the potential to change their learning

environments and improve student learning outcomes (Vahey, Tatar, & Roschelle, 2004). Being connected to a wireless network in the classroom can facilitate collaborative learning and can also help students to stay on task and if they are working as a group, to help each other learn (Zurita & Nussbaum, 2004). In addition, students can make contributions to solving problems on line that may be difficult for them to understand individually and also motivate them to participate in class (Hegedus & Kaput, 2004; Kaput & Hegedus, 2002; Stroup, 2002). In addition, when all students have computers that are connected through a network, they can participate in discussions that allow them to better understand authentic topics like population issues in social studies (Colella, 2000; Wilensky & Stroup, 2002).

Constructivism is a learning theory based on observation and scientific study about how people learn. Doolittle & Camp (1999) think that the essential aspect of constructivism is that learners construct their own knowledge and meaning from their experiences, and that knowledge is gained from the active thinking and performance in an authentic setting. Constructivist practices have been predicted as most suitable for use with ICTs. It has been widely assumed that the introduction of ICT will be more or less automatically accompanied, by the implementation of this approach to teaching.

Situated cognition theory is a constructivist based learning theory which has been brought into fuller focus through the use of ICT as a tool in learning. Wolfson & Willinsky (1998) explained that situated learning focuses on the nature of learning that takes place in work environments around communities of practice. The ICT mediated classroom members share and contribute information on topics of interest and provide assistance to members in basic communication activities. Collins, Brown and Newman (1998) provided a cognitive apprenticeship model that gave practical steps for applying situated learning. They added that

students may achieve intrinsic motivation by using e-mail to communicate with peers. ICT tools may be used to record the clarifications of experts and their answers to questions as the work is demonstrated and explained. Learners might ask experts to critically assess their recorded presentation that is displayed in a social networking platform.

Billet (1994) added that scaffolding could provide long distance support and could provide learners with the opportunities to acquire knowledge and skills that are suitable to their ability. Students can receive scaffolding by replaying recorded video podcast demonstrations by experts and also provoke suggestions and opinions on social networks. Virtual environments based on ICT can help to create realistic contexts for communities of practitioners. The sociology of the learning environment discusses the use of ICT tools for communication and sharing of experiences. Collins, Brown and Holum (1991) also noted that displaying work, receiving comments and discussing issues with remotely located experts can all contribute to intrinsic motivation.

Schools should have a clear idea about why they are implementing one-to-one laptops. Educators may not feel comfortable with using the device; however they must recognize that education needs to keep abreast of the continuing digital revolution that is occurring through its use (Clarke, Svanaes & Zimmerman, 2013). These researchers also advise that it would be highly beneficial if schools considering the introduction of one-to-one initiatives seek advice from schools that have undergone this process. Livingston (2006) makes reference to two schools in Oregon with very successful programmes. They took the time to survey what some other schools were doing, and took what was relevant and effective in those programmes then adapted it to suit their needs. This strategy led to a successful implementation of their programmes.

Implementation Issues

International experiences of implementation

Standley (2010) in his research has sought to better inform researchers and practitioners regarding the design and implementation of one to one programmes to accommodate the learning patterns of students. In England, an evaluation study looked at the feasibility and educational impact of giving one-to-one tablets to every child in school (Clarke et al, 2013). Brown and his colleagues have also long advocated the benefits of universal and constant access to computers (Brown et al., 1998; Brown & Petitto, 2003). All these studies concluded that one to one initiatives are were highly beneficial for schools (Clarke et al, 2013).

Daniel Light has been studying the conditions that allow one-to-one initiatives to succeed. His research took him to schools in Russia, Argentina, and South Korea. The lessons he has discovered have been found to be applicable in the United States, where, according to him, the appetites for laptops continue to grow (Education Development Center, 2013). Severin and Capota (2011) agree that one to one initiatives have so far had little time to be implemented and should have at least four years of implementation before a fair assessment of success may be made.

The studies of large-scale educational reforms and organizational change revealed that the level and quality of implementation largely determined the achievement of desired outcomes (Datnow, Borman, & Stringfield, 2000; Borman, Hewes, Overman, & Brown, 2003; Fullan, 1993). According to Clarke et al. (2013) there are some key components which should be considered when implementing laptop programmes. These should include adequate technological infrastructure and support, a high-quality professional development programme,

and leadership in attaining stakeholder buy-in for the programme (Gierl, 2012). Clarke et al. (2013), supports that variation in outcomes is largely attributable to how the programmes are implemented. Barrios (2004) contributes very pertinent information when she states that state-wide curriculum integration centres should be responsible for collecting appropriate examples of technology integration, specifically those related to laptop implementations which would then be shared state-wide to all participating schools in any laptop initiative.

The Texas Education Agency (TEA) invested more than US$20 million to fund Technology Immersion projects in their schools. The plans of the vendors tendering to become providers of the technology packages to the TEA , were required to include six components: (a) a wireless mobile computing device, (b) productivity, communication, and presentation software; (c) online instructional resources supporting the state curriculum in language arts, mathematics, science, and social studies; (d) online assessments to diagnose students' mastery of the core curriculum; (e) professional development designed to help teachers integrate technology into teaching, learning, and the curriculum; and (f) initial and ongoing technical support (Wurster, 2006). In Oregon the primary goal of their initiative was to use technology as a means to improve student performance. They spent approximately US$300,000 annually on their initiatives. Their technology packages included components which were similar to the Texas Education Agency (Wurster, 2006).

Light, (2014) discovered that in Moscow, Russia; implementation was successful because the focus was not on the physical laptop but more about the power of a well-designed technology supported lesson to transfer learning, in addition to a full ecosystem of technology, laptop, whiteboard and wireless connectivity.

Professional Development

Barrios (2004) reported that a lack of targeted, sustained support for teachers on integrating technology with the curriculum had been identified as a major barrier to a successful one-to-one computing environment. Kimberley Ketterer, an instructional technology specialist and a columnist says that total teacher buy in throughout the institution before technology was also important… the next step is to help teachers become comfortable" (Wurster, 2006). Barrios (2004) reasons that an effective approach, was to provide an ongoing hands-on professional development programme, in which teachers learn applications in the context of an actual project, that they would then implement with their classes (Becker & Anderson, 2000; Becker, Ravitz, & Wong, 1999). Barrios (2004) proposes that in addition, professional development should be tailored to the teacher's and school's needs, readiness level, school culture, and current teaching styles, views also held by Slavin & Madden(2004). Teachers who have supportive professional networks and common planning time to tackle problems related to school reform programmes are more likely to implement programmes with higher fidelity (Cooper, Salvin, & Madden, 1998 ; Shapley, Sheehan & Caranaikas-Walker, 2010). Teachers at all stages of technology implementation were taught to develop technology applications that promote engaged learning. Teachers at the beginning stage were trained to develop basic computer skills (Barrios, 2004).

Leadership

Pam Buffington was a key consultant to the Maine Department of Education in the early stages of its programme implementation. She agrees with both Light's and Severin & Capota's

findings that a whole system approach was a necessary component of the success of one-to-one programmes. She states that the presence of strong leadership and support led to more integration and use of transformational applications in the classroom where there was strong leadership and support, there was also a lot more integration and use of transformational kinds of applications in the classroom (Silvernail & Lane, 2004). Although teachers were the ultimate implementers of the reform programmes, the principal's leadership skills also made a significant difference. Principals who secured adequate resources, were involved in everyday instructional decisions, and/or were charismatic leaders were associated with higher levels of implementation (Berends, Kirby, Naftel & McKelvey, 2001). Light suggested that successful implementation was a deliberate process which should be guided by strong principals and administrators working closely with their teachers to carefully move these new tools into their practice (Light, 2014).

How were the Laptops used in the classroom?

It is worth keeping in mind that laptops are only a tool. They are at our disposal to make learning easier, more enjoyable and meaningful for students (Holmes, 2008*).* It is generally agreed that a sound understanding of the issues surrounding the use of laptops in the classroom is becoming increasingly important to educators as the schools have been given the mandate to prepare students with the skills they must master to meet the demands of the 21st century. This has become a high priority in Latin America, the Caribbean, and the world at large. (Severin & Capota, 2011).

It was discovered that using the laptop computers transformed the classroom and student experiences as a result of both teachers and students having the same tool to do class work (Center for Digital Education, 2004).

Students used the laptop to create e-mail addresses to interact with their teachers and peers to ask questions about assignments or to use web links, PDF files or text books sent by teachers. They conducted research, organized the subject matter, processed the information them wrote reports or created portfolios and power point presentations to share with the class. Digital cameras and projectors were also used in conjunction with the laptop. Adding to this conversation, Zhu , Kaplan, Dershimer & Bergstrom (2010) suggested this was also very effective because teachers could plan carefully how to manage students use of their laptops, however Lowther, Ross & Morrison (2003) says that whether there were many or few computers at a school, the key factor influencing teaching and learning environment was in fact how computers were used. It is important to note that studies show a positive association between laptop usage and student learning involved courses in which the integration of technology had received significant attention from faculty (Zhu, et al., 2010)

The teachers' goal was to define and incorporate into learning the skills that are necessary for students to succeed in the 21st century. To this end, the core subjects, reading or language arts, English, mathematics, foreign languages, science, civics, economics, government, art, geography and history have been identified as critical subjects to provide a foundation for 21st century skills. Students used the Geometer's Sketchpad (GSP) to learn geometry and to do numerical analysis. In language arts, the laptop was used to connect to books on line. Social Studies teachers used the software tutorials and drills to reinforce factual knowledge.

In addition to core subjects, students need to develop the necessary skills to continue as lifelong learners. These include critical thinking and problem solving skills, information and communication skills, and interpersonal and self-directional skills (Barrios, 2004). Learning tasks used in developing these skills include asking students to evaluate comparable websites using Internet resources to guide or challenge their thinking or to use software that allows them to record and or defend their thinking.

Most frequent uses

Dunleavy, Dextert and Heinekert (2007) discovered that the laptop's most frequent use by students was for online research used in conjunction with productivity tools such as the Microsoft Office suite components Word, Excel, or PowerPoint which were used to record and communicate the results of these searches in notes, papers and presentations. Secondly, was drill and practice exercises used for instruction, remediation, enforcement and the assessment of concepts. Next in line was participation in classroom websites and video/audio/data to disseminate information, facilitate communication and enhance instruction. In this arena, students also used their laptops frequently to communicate with friends, develop personal interests, and for exploration.

How teachers use laptops

Much of the laptop classroom research to date also focuses on the ways teachers use the laptop and the general benefits gained as a result. Teachers primarily used productivity and

research applications, such as word processors, spreadsheets, presentation software and Internet browsers on the laptops, employing it both for their instruction and for their students' research (Fouts & Stuen 1997; 1999; Lowther et al., 2003; Hill & Reeves 2004; Russell, Bebell & Higgins, 2004; Silvernail & Lane 2004; Dunleavy et al., 2007). Teachers used multimedia to create electronic storybooks and to publish reports that were supplemented with their own illustrations. They also implemented much more cooperative work. As a result of networked laptops, teachers reported greater access to 'up-to-date' instructional content in the form of online and computer-based resources, and content that was available to them in a wider variety of modes (Zucker & McGhee, 2005). The device allowed teachers to present information in a variety of presentation styles and overall contributed to their increased instructional flexibility (Zucker & McGhee, 2005; Silvernail & Lane, 2004).

In the classroom teachers reported an increased ability to receive and give rapid feedback on class and student progress which allowed for more targeted remediation (Kerr, Pane & Barney, 2003; Russell et al., 2004). The teacher was able to serve more of a facilitating role than before, she was able to provide individual support which enabled sharing among students (Mouza, 2008). Researchers have described the findings reviewed above in terms of benefits, or advantages to teaching and learning that are provided by networked technologies (Dunleavy et al., 2007).

For many teachers the first time was a little frightening. They were not quite sure what to do or say when every one of their students had a laptop computer in front of them. They also wondered how they would change their lessons to take advantage of the opportunities that computers and Internet access offered. However in the voice of one teacher the success he observed motivated him and he would not exchange the experience for anything (Barrios, 2004).

Challenges to use

The path of technology integration in education is rife with opportunities, and distractions. After hearing teacher complaints some schools have turned off wireless connections, others have ended their programmes. Fang (2009) discusses integrative methods which may be used to manage distractions and gain benefits. Jason Ediger, Director of iTunes U and Mobile Learning of Apple, says that students are accustomed to using technologies all the time and when they enter classrooms they are forced to turn off their digital devices and sit tight. Cole & Engestrom (1993) is very instructive when they say that learning with computers is a tool-mediated social function, and that conflicts and disturbances occur as various activities take place, but then again they also create opportunities to change a system because in social systems "equilibrium is an exception and tensions, disturbances, and local innovations are the rule and the engine of change."

Benefits of the laptop programme

Holmes (2008) in contributing to this conversation stated that ‘None of the current curriculum will disappear, but the laptops will provide teachers and students with choice in their learning.’ That is to say that with a One-to-One programme there was a range of ways to complete any set task. Being able to present different ways to perform the same tasks was found to motivate students and this was beneficial.

Advocacy for orientation, "Interpersonal Intelligence," to enlighten first-year students about when, where, and for what purpose technology is appropriate or inappropriate, should have been encouraged (Bugeja, 2007). The rationale being given is that educators could create awareness in students of the value of the device and the responsibility of ownership.

Disconnecting connectivity or shutting down the programme should not be accepted as options. These are confrontational or restrictive policies which can result when structures are not put in place before implementation. Taking this pathway, as Fang puts it- of a teacher versus technology perception, will not be helpful to educators and in the long run hurt student-teacher relationships and in some cases the school's reputation. He thinks that it might also cause a teacher to appear as straggler in technology adoption or as someone who resists positive change.

To begin deriving the benefits of using technology in education, some schools are relying on beginning with educational campaigns to make students more sensitive to classroom etiquette. The University of Wisconsin at Madison provides information via links to Web pages that faculty members can note in their syllabi. One link encourages students to stay on task and not distract others or themselves. Another provides ground rules for wireless use and classroom laptop etiquette. The School of Journalism and Communication at Iowa State University includes clauses in their syllabi to warn students against inappropriate use of technology in the classroom. They feel that contracting with students implies that faculty trust individual students to make the right choices. It is also an important part of individualized, self-directed learning that works well with students. (Bugeja, 2007; Fang, 2009)

Laptops in the classroom can bring change to teaching practices (Rockman, 2003). The study found that teachers in laptop schools showed significant movement toward constructivist teaching.

The teacher can put content better suited for individual study into video lectures and devote "in-class" time to activities better suited for learning activities requiring constant feedback, group collaboration, and hands-on activities. Computers in the classroom then can

become an extra resource instead of a barrier between the teacher and their students. With active learning, students develop their own cognitive or operative skills. The use of wireless laptops might even enhance "student- centred, hands-on, and exploratory learning" as well as "meaningful student-to-student and student-to-instructor interactions." (Fang, 2009; Gagne, 1985; Barak, Lipson, & Lerman, 2006).

Fang also mentioned “Re-mix" Lectures as a method for engaging students. The traditional lecture is deconstructed by breaking it up, re-mixing it, and redistributing it in a variety of formats and settings. Determining the anatomy of a lecture revealed a series of instructional tasks that could be distributed to students in a variety of ways

Many of the world's best teachers share their video lectures through educational portals such as iTunes, Academic Earth**,** and the recently launched YouTube EDU, students have access to the best lectures online in many subject areas. YouTube, the website, has been credited with being at the forefront of the social media revolution, and offers a series of platforms alongside traditional ICT to assist the process of learning. It has opened up prospects for rich and innovative approaches to tackle educational issues and provide solutions to the increasing demands for learning resources. (Fang, 2009; Kitchenham, 2011; Alwehaibi, 2013).

The results of a recently released study of students participating in Maine’s laptop initiative (Silvernail, 2004), indicated that there was an extremely positive attitude about laptop use in school. Silvernail identified increased student enthusiasm, a substantial drop in absenteeism and a decline in discipline problems among students. . In the Maime implementation experience, the leadership had a vision. They implemented a task force which conducted a mixed methods approach to do the research. Evaluation evidence was collected by

using online paper surveys, site visits, observation and relevant documents. Plans were then made to peruse the recommendations of the task force. (Silvernail, 2004).

Rockman (2003) has concluded after years studying laptop programmes in schools, that one of the most important benefits is the development of 21st century skills,"developing the ability to learn independently, collaborate with peers to accomplish work, and communicate the conclusions of your work." These skills as agreed to by (Severin & Capota, 2011), are a set of valued competencies in the workforce. (Rockman, 2003; Severin & Capota, 2011; Services, May 2008), have taken the position that a workforce with 21st century skills will attract new businesses and contribute to a nation's economic well-being

The above review highlights the myriad of issues informing and contextualizing the One to One computing programmes in schools around the world. From this overview, it is apparent that in order for a rollout of these programmes to be successful that many factors need to be taken into account, such as teacher buy in, professional development and leadership, as well as the physical infrastructure and the technology environment that needs to be created. From these observations, we can reasonably expect that in the absence of these necessary components in the programme in the selected school, the programme will not be as effective as its stakeholders would hope. The benefits touted in theory and by the programme's planners would not be realized.

CHAPTER THREE

METHODOLOGY

Introduction

The primary purpose of this descriptive case study was to evaluate how the existing Laptop in Schools project was being realized at the West Central Secondary School in the fourth year, of implementation of the Government's "e-Connect and Learn Programme". A variety of data were collected to gain a comprehensive picture of the programme from multiple perspectives

Research Design

The research drew on a mixed methods approach because according to Johnson, Onwuegbuzie and Turner (2007), it incorporated the diverse perspectives, qualitative and quantitative viewpoints, data collection, and analysis and reference techniques. A carefully crafted mix of qualitative research methods: participant observation, focus groups and interviews, and quantitative research methods and survey questionnaires allowed the researcher to build on the strength of each type of data collection. This minimized the weaknesses of the individual approaches and it also increased both the validity and reliability of the evaluation data (Johnson et al., 2007).

The strong point of the qualitative research is that the participant observation, face to face communications using interviews and the focus group sessions provided information about the "human side" of this issue. It provided rich contextual descriptions of the participant's involvement, their personal experiences and perceptions of the laptop programme (Joniak, 2003

; Power, 1998). Quantitative research information is obtained from numbers. The strong point is that when the data from the survey questionnaire is organized because it is based on numbers it is easy to put together to form a chart. It is easy to read. A good example was being able to identify that 75% of the students said that their laptops were not working well. When both methods are combined it is possible for the researcher to find out why 75% of the laptops were not working well.

Population and Sampling

In selecting sampling procedures for mixed methods that Greene (2007) called the "multiple ways of seeing and hearing" the researcher sought to identify the most appropriate individuals, and the most suitable procedures to get information: all the while, keeping in mind the questions which related to the use, implementation and benefits of the programme to staff and students at the school.

The sampling frame included members of the administration of the school. The principal, heads of departments, subject teachers and students in Forms 1 to 4. The students who received laptops comprise the population from which the sample was drawn. Interviews, focus group, survey questionnaires, and data from observation were used to gather information, as shown in Table 1. In addition, the review was guided by a document review frame that indicated what was relevant and what was not. The sampling frame and the population are different because students in Form Five did not receive laptops. Participants included 8 students, 3 Heads of Department, 5 teachers, and the Principal of the West Central Secondary School.

Research Questions	Data Collection instruments	Participants
1. How were the laptops used in the classroom?	Focus group schedule	Students
2. How were the challenges of implementation of the secondary school laptop programme in the West Central Secondary School?	Teacher Questionnaires Student Questionnaire	Teachers/Students
3. What were the benefits of the laptop programme in the West Central Secondary School?	Interview Schedules/Observation	Teachers/Principal

Table 1 Reports Sub questions, Data Collection Methods and Participants

The preferred sampling methods for quantitative studies are those that will enable researchers to make statistical inferences from the sample to the population (Lund Research, 2012). Simple random sampling was therefore an appropriate method for this purpose. Sixteen students were selected from Forms One to Four. Each Form consisted of four classes and one student was selected at random from each class of the four forms. Their names were then written on a list in order of class and form and numbered one to sixteen. Numbers 1 & 4: 5 & 8: 9 & 12; 13 & 16 was selected to form the focus group.

The qualitative investigation was primarily interested in locating information which would relate exactly what was occurring in the laptop programme at the school so that this could be studied to some extent. Purposeful sampling also known as selective or subjective sampling was therefore practiced (Lund Research, 2012); it is virtually synonymous with qualitative research and reflected a sampling technique that relied on the judgment of the researcher when units of the sample were being selected. Thus certain individuals were chosen, not randomly, but due to their specific positions at the school and the discretion of the researcher.

The two Heads of Department, (HOD) who were interviewed, were appointed to this position and are required to oversee implementation and use of the laptop in the classroom. The third individual was included because he is a senior teacher who has engaged his form 4 students totally using ICT in the classroom. The teachers were selected as representatives of their departments in the school.

Instruments

The instruments used to collect data were structured schedules. The data collection methods used was participant observation, face to face interviews and a focus group session A structured questionnaire, (Appendix A) was created for the principal. It consisted of eight, pre-planned open ended questions. The questions were structured to allow a greater depth of response and only long enough to get essential data from her responses in the face to face interview. The researcher had hoped to gather data mainly related to the implementation of the program and benefits for the school.

A structured paper pencil questionnaire (Appendix B) was prepared for teachers. The questions were Likert scale type asking about agreement or disagreement with implementation of

the technology and frequency of their use of the laptop to enhance teaching. Open ended questions also presented to allow for a greater depth of responses. This instrument was intended to address how teachers were using their laptops to enhance instruction, and barriers to successful implementation with students.

A structured questionnaire (Appendix C) consisting of seven opened questions was prepared for the heads of department. They were presented in a face to face interview. It was intended to shed light on how teachers in their departments were implementing laptop in the class room to enhance learning.

Two questionnaires were prepared for students (Appendix D). The first one was a paper and pencil questionnaire, Likert scale type, asking students to agree or disagree to state yes or no and to rate their abilities with computer use. Two open ended questions were also added to this first questionnaire. The second student questionnaire was prepared for the focus group (Appendix E). It contained five open ended questions which were intended to reveal how students were using their laptops and the benefits they gained from the programme. The focus group session also allowed the researcher to observe students behavior in the context of laptop use and implementation.

Piloting of Instruments

Before the creation of the final questionnaires, the survey was administered to a group of teachers and students of the type described in the sampling subsection. From their responses, it was seen that the questions as written did not elicit sufficiently, the type of information needed for this study. Thus the wordings of the questions were adjusted, sent for approval to my supervisor and re-administered.

Data Collection

The significance of this research was clearly communicated to each participant before the instruments were presented to them. (Jacob & Furgerson, 2012). They were informed of the purpose of the research and were assured of confidentiality and anonymity of any information they contributed. Participants were also given the option to participate or to refuse.
The students who participated were given tokens. All participants were thanked for their contributions.

Formal interviews were conducted on the schools compound. The principal was interviewed after school in her office. The HOD's were interviewed during their free periods in the staff room and the paper pencil questionnaires were also delivered to teachers in their free periods to be completed their own time. These were returned within two days. Work was done with students during their lunch break. It was a bit challenging to get students to give up their lunch period sometimes however they worked with me even as they often promised to come the next day. It just meant that the students' data collection exercise took a while longer to be collected.

The HOD's and the students gave their permission to be audio recorded the principal opted to have her comments written as she spoke. The interview sessions lasted between 30 and 45 minutes and were recorded on a Samsung tablet.

These interviews allowed the researcher to capture the perspectives of the participants related to the implementation, use and benefits of the laptop programme. Their views were meaningful, knowledgeable and provided information on the early stages of the programme and

problems encountered. All the information collected was kept safely in separate files until it was required for analysis.

Data Analysis

The analyses for this research were based upon inductive analyses, thematic analysis, and statistical analyses. The inductive approach allowed for the collection of data that was relevant to the laptop programme. From the quantitative and qualitative data collected at the school the following procedure was engaged to process the information.

The quantitative data were collected using survey questionnaires. This was put into a database for processing. The sample data was then analysed using percentages and counts. Number codes were assigned to the question options and compared along different parameters and relationships.

The narrative recordings were transcribed and the brief responses to the open ended questions on the surveys were added to the script. The data was read intently and information considered to be irrelevant was removed. The researcher wanted to find out what were the responses of individuals at the school who were connected to the laptop programme therefore the analysis was guided by the pre-set research questions. These questions allowed the researcher to easily create codes and to tag these into the text as it was read. The coded data were then selected and put accordingly under the categories of use, implementation and benefits. At the end of the reading, these three broad categories were formed. Under the broad categories, sub categories were further identified. The categorized data was brought together and typed into Microsoft Word and colour coded for easy reference and interpretation. The respondents were

all very helpful, and supported my efforts to collect this data. The students appeared to be excited when they were approached for assistance with the data collection. They thought that a solution was being brought to solve their problems with the laptops as their first response was to complain about the problems they were having (Taylor Powell &Renner, 2003).

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF FINDINGS

The purpose of this study was to evaluate the Government of Trinidad and Tobago's laptop in schools programme - "e-Connect and Learn (e-CAL), by investigating the perception of teachers and students and administrators participating in the laptop programme and the possible impacts on teaching and learning after the first four years of its implementation at the West Central Secondary School.

In this chapter, findings are presented in three major sections that align with the three research questions presented in Chapter One; how the laptop was used, how the programme was implemented and what were the benefits gained from the programme.

The first section examines the use of the laptop by students and teachers based on the collection of quantitative and qualitative data. The second section presents the perceptions of the subjects of the implementation of the programme. The third section further discusses benefits as they can be derived from the implementation of the laptop programme. It must be noted that the researcher has made a concerted effort to present the data with as little comment as possible in order to paint the clearest picture. However there has been some editing for clarity. The quantitative data has been added in each section in order to strengthen the subjects' assertions.

How were the laptops used?

Student Responses

Students were asked how they used their laptops in school, they responded

> Like projects, some recreation,

> Some children use the laptop for educational purposes mostly school work, mostly games, to look at pictures, use Google to do research and use Microsoft Word to do assignments, we listen to music, we download music videos and movies using our flash drives, use YouTube, Facebook, we cut and paste to print, download information.

75% of the students rated themselves as advanced or expert when it comes to use of the Microsoft Office Suite and all of them rated themselves highly as regards social media.

Students feel that the main impediment to their laptop use is the lack of an Internet connection at the school. Because they feel they need connection to complete assignments, students without internet connection at home, take their laptops to the internet café to get an Internet connection to do assignments then print work and bring to school. However of the students that took the questionnaire, nearly three quarters of them had the Internet at home. Many students use the laptop to prepare beautiful portfolios for Technology Education in Form One; however the laptop is not usually working by the time they get to Form Four. In Form Four the machine is required to prepare SBA's and CVQ assignments. Most students (75%) believe that the laptop is not working well.

As regards inappropriate use of the laptops, the older students suggest that laptops should be given from Form Three or Four. They think the lower form students tend to use laptops for the

wrong reasons, which have included the downloading of pornography. Many students agree that, "Students should not be allowed to use laptops as they please".

Most of the students questioned believed that there should be more parental involvement in order to reduce instances of inappropriate use.

> Parents should sit with their children and look at what their children are doing by the time they leave them on their own they doing they own thing.

75% of students stated that the laptops provided didn't work. Some students allow their younger siblings to play with laptops which contribute to a reduced life of the device

On the negative side, students reported that their while their laptops are helpful for learning, they also clearly recognize that laptops can become a distraction for themselves and others during class----,

> When you know you could go up on this and go up on that, laptop with internet is a distraction to me; you just want to be on Facebook…

> Students going on sites while the teacher is teaching is a distraction

> Using the laptop is a distraction in the classroom I doh get to play games till holiday because it is a big distraction.

Teacher Responses

Like the students, the teachers interviewed were quite knowledgeable of the programme's goals as set out by its creators and spoke on a personal level as well.

> Those laptops which came to the school, at the Form 4 level did not make any sense. We do not have them, that initiative did not make any sense. The Form 1's presently, within a few weeks there were problems so the laptops are not sturdy, the students cannot use them, The work I do with my students is mainly from their personal desktops and laptops.

Teachers lament that students do not bring the laptops when requested for use.

> Teachers are mandated by the Ministry of Education to use the laptop in terms of teaching as well as for assessment and student assignments in at least one lesson per week. Some teachers may borrow a laptop for use at school however in most instances personal laptops are used.

As to the laptop's use as a teacher's tool in the classroom, the teachers reported that whenever possible, teachers try to make use of the machine. Teachers use YouTube videos as teaching aids when possible. The laptops are used extensively in conjunction in the classroom with cameras, camcorders, tablets and with projectors to enhance the delivery of lessons. It is also used to prepare PowerPoint presentations, assignments for students, to conduct research for lessons, to prepare exams scripts.

One particular teacher uses ICT all the time in the teaching of his lessons. He sends his students their lesson notes and assignments via e-mail, or puts it on their flash drives for those without internet connection. Students must return assignments in like manner. When he gets to class he hooks up his computer to a projector at which time there is lively interaction and discussion because students already know what is to be discussed and the images presented are interesting.

The laptop is also used to communicate with other teachers from other schools with the intention of sharing resources, ideas, strategies on what could be useful for the subjects in question. This is done through the use of the social media. Many teachers are unable to use the laptop effectively however because students are not bringing the laptop and the Internet is not available school wide but is restricted to the school library and the staff room.

All of the teachers however report using their computers less than twice a week and in many cases, not at all. The most frequent use reported were those outside of the classroom such as lesson planning and research.

How was the programme implemented?

Student Responses

When asked about barriers to implementation, or what they felt affected how useful the computers were to them, the students stated---

> I feel we should have internet in school. Children are not told how to use the laptop they should give us information about how to use the laptop and put programmes on it we could use.
>
> Miss they could put more work on the laptop. They could have like Tech Ed, Spanish, English, Maths, they could teach us about those subjects. We do not mind bringing the laptops but sometimes it is difficult to carry together with our books. We need some new things what they have on it is things we know already from primary school. They should have given us books - the laptop I doh think is a good thing.
>
> Some students like to do big people they like too much ah Facebook, you should have like the children bring in the laptop so they could check it to make sure they doing the right thing and take it if necessary, but miss you know they have something call delete, dd-ee-l-e-t-e (making a rhythm and clapping) right?! I find like children even though they are checking on us we can still delete history, we can still refresh the computer, I do not think it is a good I feel that they should give us books because the same thing we do on the computer we can get from books.

Students usually pick up Wi-Fi from external connections and while they sometimes use this to assist with school assignments; they also take the opportunity to go into various websites at their leisure. Some teachers do not allow students to bring laptops because there is no Internet, many sites are blocked, and in any case due to lack of outlets in the classroom, students are unable to charge their computers in school.

Lack of parental involvement and lack of Internet connectivity, were also a barrier to implementation. They also believe that there needs to be more infrastructures in order to facilitate better implementation. Again 75% of them wish to use the laptop more often in class.

> Students should not have their own way; notes should be sent to parents when they want us to bring the laptop. The teacher should have a structure in place to manage the use of the laptop in class , we had Mrs_____, you could not do what you wanted, yes miss and they should take the laptops and give it to parents, no…no they should not do that , and I know, some parents does play games all day. They should give us some free internet …yes… when we doing projects we should be able to do it in school. I think that laptops are not being used because they have no Internet and they need to block certain sites. I doh know why they give us the laptop they not good, mine not working. Sometime the laptop just malfunctions. They should be able to give us help with restoring our chargers and keeping it safe from classmates who steal the battery or the chargers. I doh know why they give us the laptop, my mother just pay $800 dollars to fix the screen, when we carry it to fix we doh get them back, you know how long I carry mine to fix. My parents willing to pay to fix my laptop. We would have liked to use the laptop to type notes from the black board and use the Internet to do research.

As related by the students, the lack of technical infrastructure, the hardware problems with the computer and lack of parental involvement are the main obstacles to effective implementation.

Teacher Responses

The physical infrastructure and lack of relevant training of teachers at the school does not facilitate effective use of the device. 75% of teachers believe that lack of physical infrastructure items such as projectors hinder their use of ICT in the classroom. 100% of them wish they had more time to explore the use of the laptops.

> Many of our classrooms do not have outlets for charging the devices; there is no storage space in the classroom and there have been challenges with the electrical system.

The teachers feel that an education plan should have come with the laptop. Teachers believe that they should have been trained in their individual schools because of the fact that every school comes with a different environment and different needs, the training given to teachers should match the needs of the school.

One teacher even states that "A blanket training of people I think that was unsuccessful."

The same teacher noted that she was unable to benefit from the training due to its distance from her coupled with her domestic situation made it inconvenient.

> Actually I myself did not do that training okay because it was inconvenient for me; I am a mother I live very far away from where I work so I never had the time to access the course. The use of laptops in the classroom can be a distraction therefore systems should be instituted so that it enhances teaching and learning.

Some teachers are not very comfortable using the laptop in the classroom because they do not feel confident enough to integrate its use and apart from being uncomfortable, some of the laptops are not working properly.

Because of the barriers to implementation that teachers see they believe that the primary focus should have been on computer labs. This would allow for more control over the care and use of the laptop. The Form One students who receive the laptops are very young and this leads the teachers to believe that this leads to the lack of adequate maintenance and upkeep of the laptops.

> An investment should be made in setting up labs. The laptops should have stayed in school and this would have ensured that they were available when required. The students just do not bring the laptops to school when instructed to do so. Many of them say that it is not working. Form One students are too young, imagine 11 or 12 year olds, putting this kind of technology into the hands and telling them to keep it safe and having them to be responsible for it. It is expensive as well and many of them will not be able to pay to have them repaired, with the limited warranty many students are unable to pay for repairs.

One teacher recounted an experience with her students.

> I went into a classroom I asked them where are your laptops, all of you have it? And one child told me that her laptop is spoilt, more than one of them told me that her laptop is spoilt so I said did you take it to the ICT technician to fix it, they said yes but when they took it to him he said that the contract was up and he was no longer going to be fixing them, so the critical period of time when the children really need to use the laptops at Form Three and Four for SBA's, portfolio preparation, CVQ, they are unavailable.

The teacher also lamented the lack of Internet connectivity, and the resulting negative impact that it had on their teaching.

> Another thing that happens here in this school is that we don't have the Internet access for the students to be able to go in. One of my teachers in trying to teach social problems was trying to access a YouTube video on teenage pregnancy; they were unable to do that for their kids because YouTube is blocked so the students were unable to appreciate the extent to which it could be used to have a more personal interaction with the information.

The teachers also cited the Internet as a distraction as well. Despite the benefits of the connected laptop it nevertheless posed a problem in the commanding of the students' attention

> Children are using them inappropriately, the teacher is unable to monitor the whole class when they have laptops yuh know it kinda takes away from the teaching, learning exercises where the teacher has to be trying to get the child to stay on task to follow the instruction the teacher is actually giving

Despite the included anti-virus software- Microsoft Endpoint Security, students still get viruses and then have infected other laptops and the whole system. The teachers believe that this is as a result of ignorance and carelessness on the part of the students.

> Students get viruses when they try to download music and do not realize it and then on the same system they putting all their personal stuff with the music and so on and then lose school stuff which they should not be doing but they do not know better. They lose our assignments when they do this and they often spread the virus when they share information and infect the desktops in the library as well. This affects all the students who have to use the library facilities. I have lost years of work on two flash drives from allowing students to use the laptop I had in my department, the Internet needs to be connected school wide, teachers need connectivity to assist with their teaching.

Like the students, the teachers also suggested that there needs to be more structure and control with regards to the use of the laptops. They desire more facilities to monitor students' use and physical infrastructure like whiteboards and projectors so that they may address the entire class rather than work one on one.

> There needs to be a structure to manage how laptops and the associated technology are used in the classroom. Systems that allow teachers to see what students are looking at are necessary. There should be a whiteboard and projectors for each class so that teachers could teach the entire class comfortably and not individually. Teachers also need time to do research and plan for integration and yes we also need to change our teaching methods. Students need to use the Internet for assignments and projects. The school is streaming the social network (*sic)* (blocking the internet) to prevent students from downloading inappropriate content but students laptops are still accessing Wi-Fi from sources outside the school. They use the connection to do school work and for their recreational purposes as well, and some teachers also connect at times and use this connection to assist them in the classroom. The technicians need to block the computer itself, from picking up the sites.

The teachers prefer a more nuanced approach to prevent access to objectionable sites. Rather than blocking access completely, the network can employ types of software programmes that blocked the content instead.

Teachers feel that parents should become more involved and monitor how their children use the laptop to ensure appropriate use.

> It appears that laptops under parental management last longer. The students should be required to do basic computer classes and be orientated on entry to secondary school. They should probably spend that time after SEA doing courses to help them prepare to use the laptop appropriately when they come to secondary school. I think the children still see the laptop as something to do email or go on Facebook and the social media, use of games to play music, ah doh think they grasp the relevance of using it for school work. Maybe students are not quite ready. The class level should also be considered for distribution of laptops, maybe from Forms Three or Four.

As well as the physical infrastructure such as electrical sockets, desks and technological infrastructure like the Internet connectivity and monitoring programmes, the teachers believe that there should be more tailoring of the computer to the students' educational needs.

> The general features of the device should meet the educational needs of the students. A maintenance programme should be on going by computer providers and technology specialists should be employed. The laptop should have sufficient memory, disk space, CPU power, speakers, microphone capacity and other supporting features. (Microsoft) Office programs should be available- Microsoft Word, PowerPoint and Publisher. There should be reliable anti-virus protection, password protection and Windows security software. The limited warranty may be an issue; many students are unable to pay for repairs therefore at the critical period of time when they are required for use they are no longer working.

One recommendation, which the teachers had for improving the programme, was a more knowledgeable and involved administration. Since each school's needs are different, a more

responsive administration would be able to adapt quickly and effectively as time goes on. More than 80% of the teachers agreed that the administration was not doing its part (Appendix).

> A policy document should be created by the school to manage the internal use and implementation of the device. But you see we need administration who is also technology savvy because once they understand technology, remember they are the one to push this whole thing , now if they don't understand the importance of it they will just go along with the flow. If you are in administration and you understand, you will put the infrastructure in place.

The teachers held that overall, the programmes was not running well. Mainly due to the lack of training offered, lack of technical assistance, physical and technical infrastructure and a less than tech savvy administration. These affect the efficacy of the programme.

What were the benefits of the programme?

Student Responses

The students gave quite a comprehensive overview of the benefits and disadvantages created by the programme and seemed to be quite aware of the goals of the programme.

> Miss the program is good and bad, according to what you use it for. We appreciate it and enjoy using it and will say thanks. They give us the laptop so that we could learn, so that we could read better. It is a good thing for students who do not have a computer at home, they get to own one. Students can access a wide range of information to do school work.

The students believe that the main benefits of the programme are access to technology and improved learning strategies. And as the data shows their rating of their technological abilities increase as they advance in school. While the main drawbacks are lack of access to the Internet, lack of physical and technical infrastructure and the distraction that the Internet provides.

Teacher Responses

If the laptop program was implemented properly there would be many benefits to the students, teachers and to the society. The main problem is that there is no Internet and the fact that only higher class levels should have gotten the laptop. Teachers can access a wide range of information and programmes which allow the teacher to make lessons much more interesting and interactive as students look at PowerPoint presentations or YouTube videos which demonstrate so many things. Students are more actively engaged in the lesson; they can participate in discussions because having the laptops allows them to receive lesson notes beforehand to read therefore when they come to the classroom lively discussions can occur. The teacher can also pay more attention to doing group work and other types of work which must be done in the classroom to facilitate students who require assistance. The teacher is also able to communicate with large numbers of students at the same time.

One teacher, who is dedicated to the use of ICT in his classroom, recounts the benefits of that to his student and himself.

> I plan my lessons from the beginning of the term, what I do, I email my lessons for the term to students those who do not have email they have flash drives, they bring them and I put the information on their flash drives. From the beginning of the term they have all the lessons we are going to do for the term. One parent has asked me to send the work I send to his daughters as well so that he can open it at his convenience to see what they are doing at school. ..I have my diagrams, my interactive diagrams so like when I am talking about population pyramids for example, it is not just a concept, and sometimes I have them in 3D so they can see how it is built. The visual, auditory, kinetic are catered too in my method… it caters to all learners

Summary of Findings

The first research question dealt with the use of the laptops in the West Central Secondary School. According to both student and teachers, the laptops are used for research and presentation of projects when they are available for use. The teacher try to use them in their class plans as mandated by the Ministry of Education, however due to various obstacles to implementation, this is not as often or effective as they would like. Social media is a primary use for both students and teachers. The students like to communicate with their friends, while the teachers used it as a networking tool among colleagues. In fact all the students rated their social networking skills very highly (Appendix E). While they self-reported that their research and Microsoft Office skills were less advanced. Both teachers and students also understood the distracting nature of the laptops in a classroom setting, with both agreeing that more active teacher participation would alleviate this. There is a strong call by both parties for more parental involvement.

Most students and teachers recognise that the programme has not fully realised its full potential and benefits to those involved. The main reason for both groups is lack of infrastructure; physical infrastructure, technological infrastructure and personnel infrastructure. Teachers and students lament that the school building is incapable of supporting that level of technology use due to an aging electrical system. There is also no Internet connectivity which affects both how teachers and students use the system. While the students want more teacher involvement, the teachers admit that not all of them are trained enough to do this. There is also a need for a more knowledgeable and flexible administration.

Although the programme is not as effective as it should be, the theoretical benefits are clear to both students and teachers. The students state that improved research and reading skills are the main benefits to them and the data shows that these skills improve with time and the increased access to technology. The teachers recognise the utility of the laptop computer as a teaching tool, and believe with improvements that the use of the laptop can be used to enhance the learning experience of their students.

CHAPTER FIVE

DISCUSSION AND RECOMMENDATIONS

The study aimed to evaluate the Ministry of Education's Laptop in Schools programme in Trinidad and Tobago by investigating how laptops were used, the implementation of the programme and the benefits of the initiative at a secondary school in central Trinidad. The research focused on a selected group of students, teachers and members of administration, who formed the sample, in order to provide data related to their experiences in the programme which was initiated at this school in September 2010.

Many important insights were revealed from the qualitative and quantitative data which was acquired. The implications of each finding, recommendations for improvements and suggestions for future research are presented hereunder. Clearly there is a need for more research on the benefits of laptop programmes in teaching and learning as was indicated by Penuel (2006). The research has revealed that, without a doubt, there is a great need to study the new learning environments which have been created since laptops were put into classroom.

Implementation of the Programme

There was a measure of urgency by the government and by extension the Ministry of Education to improve the quality of education. This may have resulted in the manner with which

the programme was seemingly tossed into an unprepared school environment. The unpreparedness was observed in the data collection exercise. The qualitative data as well as the research cited herein suggested that the success of the implementation process is directly related to the culture of the individual school and also the level of implementation which might be required. The findings show that the stakeholders of this secondary school wish that the implementation plan would be more tailored to their needs. Livingston (2006) suggested that programmes be created which are relevant to the needs of the school.

The research also clearly revealed that the manner of implementation could be directly linked to the measure of success which can be obtained. Severin & Capota (2011) write that, from an educational perspective, the International Development Bank believes that laptop use may support the development of 21st skills and abilities. Rockman (2003) believes, that effective implementation of the laptop programme, can help students to develop the ability to learn independently, to work together with peers in the classroom, to accomplish tasks and to communicate the finished products, which are the core aspects of 21st century skills. Rockman also asserts that these accomplishments were apparent in his study of laptop programmes and indicates further that a workforce with these competencies will attract new business to a country thereby contributing to its economic well-being.

The process of selecting and implementing is important. A programme that fits the needs of the school and is supported by the teachers and the principal is likely to be better implemented (Slavin & Madden, 1999). There can be barriers to implementation and these should be researched.

Use of the Laptop

The introduction of the laptop programme in school has been an exciting intervention into teaching and learning, but as indicated in Dunleavy et al. (2007) the discussion is now about what the laptops enable in terms of new ways of teaching and learning, and what students actually use the device to do when they have full-time access to this powerful technological tool.

When the programme began in September 2010, four hundred laptops were distributed at the school; one hundred and ten of these are reported to be out of order at this time.

The qualitative data demonstrated that the teachers complain that students do not bring laptops and that students say that there laptops were not working. As well as both groups saying that the laptop is no good. This comment was very common throughout the data collection exercise. It was also quite interesting that to many students "it does not matter "that they do not have a laptop to use. Three fourths of students surveyed were ambivalent about the laptops' use.

These students did not think that owning the device had impacted their learning in any way. These are serious implications which accompany the attitude towards use of the laptop and the perception of its value to students. The data tends to suggest that laptops are infrequently used in the classroom, consequently the development of the 21st century skills can be stymied. The quantitative data also indicated that some students appreciated owning a laptop however they were in the extreme minority. The greater number of them (75%) seemed to be unconvinced of the value of the laptop and how it could enhance their learning.

The findings related to the use of the laptop are significant. The conclusions seem to suggest that the purpose for which the device was distributed was not clearly understood; the goals of the programme as seen by the students differed from those of teachers and the

programme's planners. . Schools should have a clear idea about why they are implementing one-to-one laptops (Clarke et al, 2013). While many individuals are familiar with using technology, (iPads and iPhones etc.) the educators need to deal specifically with how the laptop should be used in schools. Educators and students must have clear instructional goals related to the purpose, value and appropriate use of the laptop as a tool to enhance teaching and learning. All educators and students must be sensitized to the integration of the laptop in teaching and learning to the future of education and the part that it plays in the development of skills which are relevant to the workforce.

It may be important to note that the school started the laptop programme with the Form Ones and each year's entering class have been given a laptop, thus growing the programme from year to year. This technique could have provided time for appropriate development of the programme.

There was an indication through observation, that some students may not have been taking care of the device in addition there are inadequate support and maintenance services. . According to (Gierl, 2012; Clarke et al. (2013), key components for quality implementation includes adequate technological infrastructure and support,

The findings concerning use suggest that future laptop programmes may need to assign time for appropriate technical training to students, teachers and administrators. The break between the SEA exams and entry to secondary school could be used for this kind of groundwork for students. As was suggested by a Form Two student, students could be mandated to bring laptops to school for audit at a particular time. This could be a reasonable way to evaluate its condition and to ensure appropriate use. After ten years of studying laptop

computing in schools, Rockman (2003) has concluded that one of the most important benefits of a laptop program was the increase of 21st century skills. There was one teacher who had used the laptop extensively, but he had commented that many of his students were using their personal laptops and not the ones which were given to students. For the few students who may have had the school laptop they would have benefited from the way the device was implemented in the learning process. Individual responses on the impact of benefits were rarely actual experiences and more of what could be achieved. The data seems to suggest that a culture change is required within the population with regard to the laptop programme.

Most schools internationally have focused on one or more of four outcomes when they implemented one-to-one computing (Penuel, 2006). Those goals include improving academic achievement, increasing equity of access, increasing economic competitiveness of a region, and/or transforming the quality of instruction. Locally we aspire to achieve basically the same goals. (Ministry of Education, 2010)

Stroud's literature review on one-to-one programs found that most studies focus on the first three years of implementation (Drayton, Falk, Stroud, Hobbs, & Hammerman, 2010; Shapley et al., 2010). His review also revealed that 67% of the one-to-one studies focused on the time period between pre-implementation and the first two years of implementation. He thinks that this might be an indication that more significant results could be expected once schools become more experienced and skilled with one-to-one computing and learning paradigms. Since Trinidad and Tobago implemented the programme four years ago, this assumption by Stroud may hold true for our education system. However the literature which was researched revealed that there are still many questions related to the implementation of these

programme and the findings of my data collection are very similar to those which have been reviewed.

Many of the flaws of one-to-one implementation can be seen very easily from the studies. The issues surrounding the presence of laptops in the classroom will inevitably increase even as the numbers of portable devices (e.g., smart phones, tablets) which can also be used in the classroom are used. There are indeed some negative implications but as we learn to incorporate the use of the laptop in the classroom we can create and develop opportunities to improve teaching and learning, and consequently towards the development of skills, the improvement of the workforce and the economic prosperity of Trinidad and Tobago.

Recommendations

The way forward for the Laptop Programme in Trinidad and Tobago

1) A task force should be established with representatives from academia who are known for their involvement in educational research and with a passion for this initiative. These individuals need to leave Trinidad and Tobago. They need to visit schools which exist in environments similar to this country and have successfully implemented the laptop programmes. The members of this team should conduct research in these environments and borrow best practices which may work in Trinidad and Tobago.

2). Laptop programmes should be carefully designed and tailored according to the needs of each school and implemented appropriately with the involvement of the students, teachers and the principal. Back home, the first responsibility of the team should be to create a comprehensive

system to manage the programme and then ensure that all stakeholders are sensitized about the agenda. The operation should be systematically integrated since the programme has already begun. Systems should be put in place to monitor, to manage and to ensure that the standards set by the taskforce are maintained at all educational institutions throughout Trinidad and Tobago.

3) The scope of this research was limited to one school, the West Central Secondary School, in Central Trinidad. To truly acquire a fuller and more comprehensive picture of the programme as it currently stands, similar research must be carried out at all the schools involved. When all the data is compiled, the stakeholders can then fully and accurately assess the programme. Barrios (2004) discuss collecting and sharing related to the implementation of laptop programmes,

(4) There should be further research to ascertain whether the use of laptops has improved academic achievement.

What did the experience of undertaking this research do for me?

This research allowed me to investigate the laptop issue at this school. This was a situation which drew my attention since the programme began in September 2010. At that time I was struck by what seemed to be the lack of a plan as to how the laptops would be incorporated into the curriculum. Undertaking this exercise was certainly an experience which brought to my mind a whole new understanding of the invaluable significance of conducting research before beginning to implement any project. Front end studies are even more critical when this new development impacts the nation's youth and the economic prosperity of the country. There have been many positive experiences but there are three points I wish to highlight.

Doing this research allowed me to work with students at a different level and to gain an even greater respect for them. One thing which stood out was how the students and the teachers

said the same things in different ways. In addition I was empowered with a degree of knowledge and some tools that I can use when I am confronted with teaching and learning difficulties in the classroom.

Conclusion

This study evaluated the state of the e-Connect and Learn Programme (e-CAL) at one secondary school in Central Trinidad, by eliciting the perceptions of the students and teachers four years after the programme's inception. This case study focussed on the use of the computers, the implementation of the programme and the benefits to the students and teachers.

The research discovered that the teachers and students used the laptop computers less than was hoped by the teachers, students and the programme's founders, and when they were used; many times they were used inappropriately or were distracting.

All the teachers and students agree that the programme was implemented poorly. There were no structures put in place whether physical or technological in order to facilitate the proper use of the laptops in the classroom. Because of the lack of such, the benefits realised were few. The students' technological capability did increase to some extent however not as much as would be hoped, especially as regards research skills. Overall the programme is being crippled by the implementation issues, and this must be addressed immediately.

This exercise has helped me to understand why we need serious researchers in this country and that herein may be the solution to many wasted millions of dollars. Trinidad and Tobago is a developing nation, we have been borrowing international "ways of doing things" without conducting adequate research to find out how we may effectively fit these borrowed items into our culture. I will appreciate if the administrators of the laptop in schools programme

will conduct research and in this process have conferences with the relevant stakeholders in the schools. They should then create an effective planning team to ensure that recommendations materialize.

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Appendix A

Principal Interview Schedule

I am conducting a study of the laptop programme at this school. From your participation in the study I hope to learn how the staff and students have been using the laptop, how successful the implementation of the programme has been and the benefits which have been derived from its use. You were selected as the principal to participate in the study because you may have specific knowledge of the programme which might be important to the study. Any information you provide will be held in strict confidence. Your participation is entirely voluntary and you may withdraw at any time.

1. What part do you play in the laptop programme?
2. Can you describe how the classroom environment has been affected by the programme?
3. How are the teachers in your department expected to use the laptops in the classroom?
4. What do you understand to be the purpose of the e-Connect and learn programme?
5. To what extent has the purpose of the programme been achieved in your school?
6. What are some of the major challenges you have encountered with regard to effective implementation of the programme?
7. To what extent was the training which was offered by the Ministry of Education helpful to your teachers?
8. What are some of the challenges which arose for which you were not prepared?
9. What do you think are some of the major benefits that the laptop project has brought to the school?

Appendix B

Teacher Questionnaire

I am conducting a study of the laptop programme at this school. From your participation in the study I hope to learn how the staff and students have been using the laptop, how successful the implementation of the programme has been and the benefits which may be derived from its use. You were selected to participate in the study because you may have specific knowledge of the programme which might be important to the study. Any information you provide will be held in strict confidence. Your participation is entirely voluntary and you may withdraw at any time.

1. On average, how often do YOU perform the undermentioned tasks USING YOUR LAPTOP?	Never	Once a week	Two times a week	Three times a week	Four times a week	Everyday
Conducting research that contributes to lesson plans						
For the development of instructional materials (lesson notes, tests, etc.)						
Using presentation software for instructional purposes (Power point presentations)						
Creating and sustaining website(s) for instructional purposes						
To provide instructions in the classroom						
To give home assignments						
To assist with assessing student work						
To Manage student data						
To communicate with parents and students						
For the preparation of problem solving tasks in your subject area						

What other instructional use do you make of the laptop in teaching?

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In 2. Indicate how much you agree or disagree with each of the following statements about T Barriers to the use of laptops	Strongly Agree	Disagree	Somewhat Disagree	Somewhat agree	Agree	Strongly Agree
I feel excited about the laptop program						
My workload has increased as a result of having the laptop.						
A limited number of projectors in my school makes it difficult for me to use my laptop when teaching a lesson						
It is difficult for me to leave school to attend professional development workshops relating to the laptops						
The presence of the laptops in my classroom disrupts my teaching It is difficult for me to monitor appropriate Internet use in my classroom.						
I would like to have access to more direct technical support for laptops in my classroom during the day.						
I wish that I had more time during the day to explore using the laptops effectively in my classroom.						

1. What are some other hindrances you encounter in having students use the laptops to perform instructional tasks?

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2. What do you think was the purpose of introducing the laptop project in your school?

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3. To what extent do you believe these purposes were achieved?

_____

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3.Indicate how much you agree or disagree with each of the following statements about supports in TECHNOLOGY IMPLEMENTATION	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
The administrator(s) in my school actively encourage teachers to pursue professional development activities geared towards implementing laptops into the curriculum.						
The administrator(s) in my school actively encourages me to integrate the laptops into my curriculum.						
The Ministry of Education has assisted me in locating information and answering my questions regarding the laptop program.						
The HOD's in my school has assisted me in finding ways to integrate the laptops within my curriculum.						
The administrator(s) in my school have provided opportunities for teachers to engage in professional development activities regarding the laptops.						

What are the main difficulties you have encountered in the laptop project?

1._____

_____

_____

2. Do you think that the training which was provided by the Ministry of Education has been effective enough to support you with implementation of the programme in your classroom?_____

_____

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Appendix C

HOD Interview Questionnaire

I am conducting a study of the laptop programme at this school. From your participation in the study I hope to learn how you as a Head of Department have been managing the implementation of the programme, and the use of the laptop in the school. You were selected to participate in the study because you may have specific knowledge of the programme which might be important to the study. Any information you provide will be held in strict confidence. Your participation is entirely voluntary and you may withdraw at any time.

1. What is you role in the laptop programme?
2. What are some of the complaints which you have you been receiving from teachers involved in the programme in your department ?
3. With regard to using the laptops, how has it affected the educational programmes of your department
4. From your point of view, how has its introduction into the classroom environment impacted students attitude towards working in the classroom
5. What are the main difficulties you have encountered as an HOD
6. Can you identify some of the major benefits of the programme to your department?
7. To what extent has the training which was provided by the Ministry of Education been helpful to the teachers in your department?

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Appendix D

Focus Group Schedule

I am conducting a study of the laptop programme at this school. From your participation in the study I hope to learn how you as students have been affected by the implementation of the programme, how you have been using the laptop and may have benefited. You were selected to participate in the study because you may have specific knowledge of the programme which might be important to the study. Any information you provide will be held in strict confidence. Your participation is entirely voluntary and you may withdraw at any time.

1. What do you think was the purpose of the laptop programme?
2. Describe how using the laptop in class sessions has helped you learn in the various subject areas?
3. In what ways has owning a laptop been beneficial to you?
4. What have been some of your major challenges of the laptop programme to you as students?
5. What do you think can be done to make the programme more successful?

Appendix E

Student Questionnaire

1. Do you have a computer at home? _____

2. Do you have Internet access at home? Yes No

3. How often are you able to use your laptop at school? Always Often Rarely Never

4. In section two please rate the following statements

	Strongly Agree	Agree	Neutral	Below Average	Beginner
a. The laptop provided by the Ministry of education works well	1	2	3	4	5
b. My teachers use the internet and the laptop in the classroom	1	2	3	4	5
c. I often use the internet and the laptop at school	1	2	3	4	5
d. At my school the laptop and the internet are used to enrich what I learn	1	2	3	4	5
e. The way my school uses the laptop and the internet is interesting	1	2	3	4	5
f. I am a better student because I use my laptop school	1	2	3	4	5

5.In section three Rate your abilities in these areas

a. Basic computer use	Expert	Advanced	Average	Below Average	Beginner
b. How good are you at using the Internet to communicate with your friends?	Expert	Advanced	Average	Below Average	Beginner
c. How good are you at using Microsoft word to do your assignments?	Expert	Advanced	Average	Below Average	Beginner
d. How good are you at finding websites on the Internet to conduct research?	Expert	Advanced	Average	Below Average	Beginner

6. Why do you think the laptops were given to students in secondary school?_____

_____

_____

_____

In what ways do you prefer to use the laptops in school?

_____
_____
_____
_____