TEACHERS' PERCEPTIONS OF THE CONTRIBUTION OF INFORMATION AND COMMUNICATION TECHNOLOGY TO THE TEACHING OF MODERN STUDIES, USING AN INTEGRATED SYSTEM, IN AN URBAN SECONDARY SCHOOL.

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Abstract

Teachers' perceptions of the contribution of Information and Communication Technology to the teaching of Modern Studies, using an integrated system, in an urban secondary school.

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The integration of Information Communication Technology (ICT) into educational practice continues to be lauded as having the potential to dramatically transform the teaching and learning process. This qualitative study sought to explore teachers' perceptions of the contribution of ICT integration to the teaching and learning of Modern Studies at a single-gender urban secondary school. Four teachers, purposefully selected, were interviewed during the month of March 2011. The views expressed by the teachers were summarized and discussed under six themes. The results showed that teachers generally perceive the integration of ICT as having a positive effect on the delivery of Modern Studies. ICT use was associated with enhanced student interest and motivation and increased student engagement. Teachers also reported increased teacher confidence as ICT use added dynamism to their teaching and aroused greater enthusiasm and excitement. Concerns were expressed about negative consequences that ICT use could have for student learning. For more effective use

of ICT in the classroom, it was recommended that teacher training be oriented towards developing skills in pedagogy related to ICT use. In addition, teachers could capitalize on the expertise that exists amongst the digital natives in their classrooms when attempting to integrate technology into their teaching.

Key words: information and communication technology, ICT, embedded ICT, integrated ICT system, enhanced learning, technology-rich learning environments, teaching with technology.

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Chapter 1

Introduction

Background to the Study

The advent of the digital age has dramatically transformed every aspect of human life – the way we work, the way we play, the way we live and the way we learn. The use of Information and Communication Technology (ICT) in and for education is rapidly expanding in many countries and is now seen worldwide as both a necessity and an opportunity for improving and enhancing the education offered to citizens across the globe (UNESCO, 2006). Information and Communication Technology is, in fact, now regarded as "one of the building blocks of modern society" (UNESCO, 2002) and is now considered as one of the indices that should be used to assess a society's development. Many countries globally now regard the acquisition of ICT skills as part of their "core education, alongside reading, writing and numeracy" (UNESCO, 2002).

The Dakar Framework for Action (April 2000) identified the use of ICT as one of the main strategies for achieving the world declaration of *Education for All* adopted at Jomtein in 1990 and called on all nations to harness new information and communication technologies to help achieve these goals. The G8 Heads of State conference concurred and acknowledged the role that ICT can play in supporting educational improvement globally. At the Hwa Chong Education Conference March 2010, it was recognized that developments in ICT have opened

up exciting new possibilities for teaching practices in order to better engage and excite learners.

Grace Fu, Senior Minister of State, Singapore, reiterated that ICT can not only be used to expand our students' learning horizons but could be a powerful aid to learning and stressed that harnessing the power of ICT goes beyond simply investing in infrastructure but in achieving meaningful integration of ICT into educational practices. The International Conference on Teaching and Learning with Technology (March, 2010) stressed the pivotal role that ICT can play in transforming teaching and learning. ICT has the potential to enable teachers and students to construct rich, multi-sensory, interactive environments with an almost unlimited teaching and learning potential (Balanskat, Blamire & Kefala, 2006).

In an attempt to meet the millennium development goals adopted at Jomteim and Dakar, countries worldwide have attempted to implement reform aimed at embedding ICT in educational practice. All countries of the European Economic Union have made the integration of ICT in education a priority and have invested heavily in ICT in schools (Balanskat et al., 2006). However, the degree of e-maturity between and within countries has varied with only a few schools having successfully embedded ICT in the curriculum.

In the Netherlands, government policy has been geared towards the "optimal integration of ICT in innovative learning processes" (Coskun & Kinnisnet, 2010). As a result of this and other initiatives, Dutch schools are making increasing use of digital learning environments. Like the Dutch, the Norwegian government, in its new national curriculum, has identified digital

literacy as one of the five basic skills together with reading, writing, numeracy and oral proficiency and has created an independent agency to implement the government's ICT policy and to oversee the integration of ICT in education. As a result, it has placed a strong emphasis on ICT as an integrated part of the learning activities in all schools (Soby & Egeberg, 2010).

In the United Kingdom, the official view of ICT as potentially transformative of education has placed it at the centre of the national agenda for school reform (Deaney, Ruthven & Hennessy, 2005). As a result, the promotion of ICT in education has been a significant part of the UK government's policy in education since the 1980s with various programmes being implemented over the years. The 1998 *National Grid for Learning* initiative witnessed 'unprecedented levels of government spending' on computer equipment, broadband Internet access and online resources for schools (Department for Education and Skills, 2003). In 2005, the *Division for Children, Schools and Families (DCSF),* launched its "e-strategy" aimed at harnessing technology to transform learning and achieve a more personalized approach within all areas of education. This plan was eventually upgraded to the 2009-12 strategic plan, "*Harnessing Technology for Next Generation Learning*" which was aimed at ensuring that every child develops the skills to use technology effectively and responsibly and which required that the curriculum be restructured to reflect the role of technology in society and the future of work. (Pittard, Brown & Dykes, 2010).

As signatories to the Dakar Framework, Caribbean states have made concerted efforts to establish policies to meet and execute its mandate of

Education for All by 2015. At the 23rd Conference of the Heads of Government of the Caribbean Community it was agreed that the formulation of policy in relation to Information and Communication Technologies (ICTs) should be given attention at the highest level by all member states and that CARICOM states should adopt a coordinated approach to the development of ICT policies (Georgetown Declaration, 2003). Regional governments have all embarked on educational reform aimed at the integration of ICT in educational practice. Most governments of the region have drafted or approved ICT policies in education and some have embarked on extensive efforts to equip schools with the necessary equipment to ensure effective implementation of those policies. However, countries differ in terms of their goals for the introduction of ICT, their available financial resources and the pathways they have chosen to achieve those goals. It is certainly true that some governments and some institutions have invested more, attempted more, and achieved more than others. However, none of the countries have achieved a system-wide adoption of ICT. As a result, student access to ICT for learning in non-IT subjects is limited and support for integration of ICT across the curriculum has not influenced teachers' activities (Gaible, 2009).

In 1997, the government of Barbados launched its *EduTech 2000* initiative which was aimed at reforming primary and secondary education through the integration of ICT in educational practice. This, and subsequent policies, have resulted in the widespread adoption of ICT in schools with the government reporting 100% in secondary schools and more than 30% in primary schools. In addition, Ministry of Education personnel have reported that teachers are

embracing ICT as a teaching tool. However, project evaluations suggest that actual use of technology in the classroom is still very limited (Gaible, 2008).

In Trinidad and Tobago, the education system has a long history experimenting with and using ICT in schools. The government's *SEMP* (1999) initiative and *FastForward: National ICT Strategy* (2003) have lead to a proliferation of ICT equipment in schools at all levels. The extent to which this is effectively being used to enhance the teaching and learning process is still yet to be accessed. The Ministry of Education, in its *Draft Policy for ICT in Education 2005*, acknowledged that the integration of ICT in education has the potential to "enhance human capacity, dynamize the teaching-learning environment, and, by providing equity and access, would create an environment that encourages creativity, critical thinking, and decision-making." (p. 3) By so doing the integration of ICT in education would assist in the development of an individual who is capable of finding his place in a technologically-driven, skills-based world economy.

The most recent *eConnect and Learn (eCAL)* initiative of the Ministry of Education aims to provide additional support for the meaningful use of technology by students in the classroom by issuing laptops to Form One students. This initiative has led to an expansion in the distribution of ICT resources, both hardware and software, in schools. The Ministry's vision is that students could now be actively engaged in using technology in the classroom during the various subject lessons. The expectation is that teachers will now structure their lessons to include the use of ICT in the classroom and would adopt a more student-

centered approach to delivery, actively engaging students in the construction of knowledge. To ensure that these expectations are achieved, the Ministry has embarked on an extensive training programme designed to equip teachers with basic computer literacy skills on the assumption that these skills will enable them to successfully integrate ICT in their practice.

The School Context.

The institution under study is a single-gender secondary school located in the Port-of-Spain and Environs educational district. The school has had a long history of innovation in practice and excellence in performance and demands a high standard of professionalism from its staff. In 2001, the school embarked on a bold initiative to create integrated, interactive learning environments for its students and in 2003, officially launched its multimedia wing, designed to facilitate the integration of ICTs in teaching and learning across the curriculum. This initiative was motivated by the conviction that classroom learning and teacher pedagogic practice should be relevant to the students' experiences and needs and as such the classroom environment should be structured to meet students where they are situated in the digital age. As such the school needed to create technology-rich learning environments that would equip students to function effectively in the world of the future.

To achieve this vision, the decision was taken to create integrated multimedia learning environments that would offer teacher and student access to the full range of ICTs for teaching and learning. At the heart of the system in

each room is a multimedia cart equipped with a personal computer, a visual presenter and a slide presenter which functions as the teacher's workstation. This is supported by a multimedia rack situated at the back of each room which contains a DVD player, a VCR player, a CD/cassette combo player, an amplifier and a synthesizer. Both sets of equipment are connected to an overhead projector and a ceiling-mounted speaker system. An interface panel connects all the equipment in the room making it possible for the teacher to switch seamlessly from one piece of equipment to another during the delivery of a lesson. The entire system is fully networked and supported by five servers. A wireless network also affords access to the system in the classrooms.

In 2005, this vision was expanded to provide access to the services offered in the multimedia rooms to the classrooms. All twenty classrooms from Forms one to five were then equipped with the necessary hardware to ensure the full integration of ICT in the delivery of the curriculum. Laptops were procured for use by teachers so that they would have full access to all the software resources available in the multimedia rooms.

To ensure that maximum use was made of all the resources provided, on-site training was provided in the use of the system to all members of staff over a period of two terms. During the period of training no classes were held in the multimedia rooms so that teachers could use the rooms to practice the skills taught. Teachers were then mandated to include ICT in their lesson planning and to ensure that each class was exposed to lessons involving ICT use in order to enhance the learning experiences of the students. In addition to hardware, a wide

range of educational software, both interactive and non-interactive, was purchased for every subject area in order to facilitate this.

As a result of these initiatives, the use of ICT is now embedded in the pedagogical practice of most teachers at the school. There continues to be a healthy competition for access to the multimedia rooms and teachers continue to make full use of the equipment in the classrooms on a daily basis. However, the effectiveness of this integration of technology in teaching and learning is yet to be assessed.

The Modern Studies department consists of fourteen teachers including the head of department and is responsible for the delivery of the curriculum in the following subject areas – History, Geography, Social Studies, Sociology, Caribbean Studies, and Environmental Studies. With the exception of two teachers, all teachers deliver the curriculum for at least two subjects and at both levels of the school. In addition, all teachers within the department employ the use of ICT in their delivery of curricula though with varying degrees of proficiency and effectiveness.

Justification for the Study

The global trend towards an increasing integration of ICT in education makes it imperative that we continue and expand our ICT policy if we, as a society, wish to remain effective and competitive members of the global community. However, this expansion should be informed by data obtained through rigorous research.

A substantial portion of the public purse has been and is being spent on the integration of ICT in education (Gaible, 2008). In spite of this, there exists very little empirical evidence as to the actual impact or contribution that integration has made to teaching and learning. If that expenditure is to be justified then it is necessary to ascertain what actual or real contribution the integration of ICT makes to enhanced subject teaching and learning.

Statement of the Problem

The school under investigation has made tremendous investments in terms of time, energy, material resources, training and finances to create multimedia learning environments for its students. Little has been done, however, in terms of an assessment of the initiative to determine if that investment yielded the expected returns, that is, an enhancement of the teaching and learning experience. Since the teachers of the Modern Studies department are mandated to incorporate the use of ICTs in the delivery of the curriculum, there is a need to determine if that use is making a meaningful contribution to the teaching and learning of the various subject areas within the department.

Purpose of the Study

This descriptive case study seeks to explore the views of teachers in the Modern Studies department of an urban secondary school to ascertain their perceptions of the contribution of Information and Communication Technology (ICT) to teaching and learning.

Research Questions

Main question.

- What are the contributions of an integrated ICT system to the teaching and learning of Modern Studies?

Sub-questions.

- How has the use of ICT affected the pedagogic practice of the teachers?
- How have students' interest, motivation and engagement in Modern Studies been affected by the integration of ICT?
- How has the use of ICT affected teachers' motivation, interest and practice?

Challenges to the Conduct of the Study

Limitations and risks.

The limited time available may prove to be a challenge to conducting an in-depth and thorough analysis of the data. In addition, maintaining a completely bias-free study may be difficult because of the researcher's intimate involvement with the initiative. However, the researcher acknowledges that because of this close involvement she will be bringing her own values to bear on the study as she interprets the perceptions of the participants. As Creswell (2007) indicates, all researchers bring values to a study and qualitative researchers must acknowledge the value-laden nature of information gathered from the field.

Delimitations.

The study is restricted to the Modern Studies department of a single secondary school in one educational district and as such seeks to examine a single case bounded by time and context. The generalisability of the results, therefore, will be severely limited. However, Erickson (1986) asserts that generalisability of findings is not an appropriate goal for interpretive research (as cited in Merriam, 1998, p. 210). Instead, qualitative researchers should aim for the transferability of findings to similar situations and context.

Significance of the Study

The study will offer invaluable information to the school's administration as well as to policy makers in education as to the nature of the contribution of ICT to the teaching-learning process. Since the attitude and perceptions of immediate stakeholders are critical to how effectively an innovation is implemented, it is important to gauge how teachers perceive this innovation and its efficacy as a tool for enhanced teaching and learning. It is also hoped that this study will contribute to the growing knowledge-base regarding the use of ICT in education in the Caribbean.

Operational Definition of Terms

Information and Communication Technology (ICT) – any technology that allows for the creation, storage and display of information in all its forms or communicate with others over a distance such as computers, computer, networks, television, cell phones, radio, cassette players, DVD and CD players.

e-maturity – when educational institutions make strategic and effective use of ICT to improve educational outcomes

digital learning environments – learning environments that make use of computers and computer related technologies, such as the Internet, interactive whiteboards for teaching and learning.

embedded ICT – when ICT use is incorporated in all or most activities related to teaching and learning – delivery, record keeping, planning, communication, administration, assessment

multimedia rooms – rooms equipped with a full range of information and communication technologies designed to support the delivery of the curriculum using a variety of methods.

Organisation of the Paper

The following is a brief outline of how the subsequent chapters of the paper are organized. A brief synopsis of the current research findings on the effects of ICT integration on teaching and learning as well as a brief examination of the factors that affect technology use in the classroom is presented in Chapter Two. Chapter Three gives a comprehensive outline of the methods that were used to collect and analyse the data. The analysis of the data and the discussion of findings are presented in Chapter Four and the final summary and conclusion are presented in Chapter Five.

Chapter 2

Literature Review

It is generally believed that the use of ICTs in educational practice can 'empower both teachers and learners, promote change and foster the development of 21st century skills' (Trucano, 2005, p. 5). Trucano argued that ICT use has the potential to transform teaching and learning processes from a more teacher-centered to a more student-centered approach and that this transformation will result in increased learning gains for students. Over the past decade several studies have been conducted to examine the effect of the integration of ICT on teaching and learning. The current literature on the contribution of that integration to educational practice will be reviewed and discussed under the following themes: effects on learning and learners; effects on teachers and teaching and challenges associated with technology use.

Effects on Learning and Learners

In recent years, a number of impact studies have been conducted with the expressed aim of assessing the return on investment of ICT in education. Balanskat et al. (2006) conducted a review of seventeen such impact studies carried out in Europe between 2002 and 2006 and aimed at determining the benefits and impact of ICT integration in schools in two major areas: learning outcomes and learners and teaching methodologies and teachers. Six of the

studies reviewed were quantitative in nature while the others followed a qualitative orientation. The quantitative studies attempted to establish causal links between ICT use and learning outcomes. Though the studies revealed some evidence that ICT impacts on learner performance, the general conclusion was that it was difficult to establish a causal relational between computers and educational outcomes (Machin as cited in Balanskat et al., (2006), pp. 11-12). The findings of these studies led to the conclusion that ICT impacts on educational standards most when there is fertile ground in schools for making efficient use of it.

The qualitative studies revealed that teachers, students and, significantly, parents believe that ICT use has a positive impact on students' learning and that students' subject-related performance improves with ICT use. The findings also indicate that teachers believe that the educational achievements of students improve through ICT use and that both strong and weak students benefit from ICT use. Teachers observed that when ICT is used in the classroom pupils work more in cohesion with their own learning styles resulting in a more favorable impact on both academically strong and weak students. In addition, students assume greater responsibility for their own learning working more independently and effectively when using ICT.

All the studies concluded that the integration of ICT has the greatest impact in the affective domain. The studies revealed that 86% of teachers in Europe reported that students are more motivated, engaged and attentive when

computers and the Internet are used in the classroom and that ICT use has positive effects on behavior, communication and process skills.

These conclusions are corroborated by the findings of a three-year study of New Zealand's e-learning initiative conducted by Lai and Pratt between 2001 and 2004. The study aimed at investigating teachers' perceptions of the teaching and learning effects of ICT use in 26 secondary schools. For the purpose of the study both quantitative and qualitative data were collected. Lai and Pratt (2007) concluded that the integration of ICT in educational practice had a number of positive social and motivational effects on the learners including increased interest and engagement and that the social and motivational effects were more frequently observed than cognitive and learning effects. Teachers reported an improvement in the presentation of work, an increased sharing of resources, greater collaboration between students and an increased motivation for learning as student engagement was greater. However, the study also revealed a number of negative consequences such as increased plagiarism and a higher level of distraction.

Sutherland et al. (2004) reported on the findings of the *InterActive Education Project* conducted in the United Kingdom in which teachers and researchers worked together to develop and evaluate initiatives focused on using ICT to enhance learning in curriculum areas that students would normally find difficult. The study was conducted over a two year period and involved 54 teachers from both primary and secondary schools. The project was predicated on the view that ICT in and of itself does not enhance learning but rather how it is

incorporated into learning activities is what makes the difference. The integration of ICTs in several subject areas including Modern Studies, Languages, Science and the Arts were examined.

The data collected revealed that different subject cultures impact differently on how ICT is used in the classroom with History and Geography teachers appearing to be the most technophobic. Sunderland et al. (2004) found that "…for some subject areas and for some teachers, ICT was seen as a Trojan Horse, secretly bringing in new approaches to learning that conflicted with the deep grammar of the subject." (p. 417) However, despite this obvious aversion to technology use in the classroom, the history teachers who participated in the project reported several positive outcomes with regards to ICT integration in the projects implemented. Teachers reported marked improvements in the writing skills of lower ability students, increased levels of interaction among students, greater student enthusiasm and engagement and an increase in confidence for both the teacher and the students.

A similar longitudinal study was conducted in British schools by Deaney, Ruthven and Hennessy (2006) who attempted to examine the contribution of ICT within various subject areas through the execution of ten small-scale projects. They aimed to assist teacher-researchers in developing pedagogic strategies involving the use of computer-based ICTs within several subject areas.

During the initial stages of the project teachers were asked to articulate their ideas about the pedagogical use of ICT in their specific subject areas and to

identify ways in which these ideas could be translated into strategies for incorporating ICT into classroom practice, what the researchers referred to as 'practical theory'. From the initial responses of the teachers, the researchers were able to garner five interconnected themes related to their perceptions as to the possible contribution ICT could make to teaching and learning namely broadening classroom resources and reference; enhancing working processes and products; mediating subject thinking and learning; fostering more independent pupil activity and improving pupil motivation towards learning.

These initial theories were for the most part corroborated by the final results of the study. Teachers reported that the integration of ICTs in their lessons through the use of the Internet had exposed students to not only a wider range of resources but to resources of greater currency. In addition, the use of these internet resources had afforded teachers the opportunity to bring the 'reality of outside into the classroom.' (p. 473) Teachers also indicated that the use of computer tools had enabled students to produce work of a much higher standard and that using technology allowed students to 'home in' on details and to utilise material to support argument in a 'more sophisticated way.' All teachers who participated in the study underscored the 'motivational affordances' of ICT.

> '…the enjoyment pupils derived from using computers was viewed as inherently motivational and sometimes catalytic in promoting engagement with subject material.' (Deaney et al., 2006, p. 476)

In addition, the interactive nature of ICT based tasks encouraged pupils to become 'active, rather than passive, learners'. (p. 456)

While it was believed that the use of internet resources could foster more independent activity in which students could locate their own resources and 'create their own pathways of learning' (p. 475), the study found that Internet use had to be carefully structured and monitored by teachers as it was easy for students to become distracted or get 'lost' during web searches resulting in time wasting and more frequent teacher intervention. It was concluded that while more directive strategies were required to maximize the benefits of Internet research for student learning it was also critically important for teachers to find a balance between providing guidance and stifling creativity.

Effects on Teachers and Teaching

Several researchers have argued that teacher beliefs about teaching and how students acquire knowledge play a critical role in determining not only the degree to which technology is used in the classroom but how technology is used to support teaching and learning. Teachers often view the technology integration as an additional imposition on their already demanding time schedule when they simply want to get on with the business of teaching. In addition to the fact they do not believe that they have the technical competence to effectively use technology in the classroom, they fail to see its utility or relevance for their subject. Research has shown that teachers' perceived usefulness of an innovation

play a pivotal role in determining the extent to which that innovation will be adopted for use in the classroom (Hall & Hord, 2001).

Becker's (2000) nationwide survey of teachers in the United States revealed that, while ICT use enabled a minority of teachers to put into practice a pedagogy that is more constructivist and more in tune with their teaching philosophy, it has not transformed the teaching practices of a majority of teachers, particularly teachers of secondary academic subjects. However, the teachers did acknowledge that under the right conditions computers are becoming a valuable instructional tool and is having an impact not only on students performance in the classroom but on their academic efforts outside the classroom as well.

Similarly, in a survey of 170 secondary school teachers in New Zealand, Lai and Pratt (2004) found that 82% of the teachers considered ICT to be beneficial to their teaching but not in the area of methods of delivery and classroom practice. Significantly, the most obvious effect identified by the teachers was not a change of philosophy or pedagogy but improved efficiency in the administration and management of teaching, including lesson preparation and presentation. Similar findings were reported by Balanskat et al., (2006) in their review of the ICT impact studies conducted in Europe. They found that ICT use enabled teachers to save time and to increase productivity in such activities as preparing and updating daily lessons and maintaining records. In addition, ICT use has fostered greater collaboration between teachers with increased sharing of resources and ideas. However, with respect to pedagogical practice teachers continued to use a more traditional approach to teaching simply viewing ICT as a

tool to support their didactic approach. As such, they concluded that "teachers do not yet exploit the creative potential of ICT and engage students more actively in the production of knowledge." (p. 41)

In a study of ten small-scale projects conducted in English schools where teachers attempted to develop practical 'theories' about the contribution of ICT to teaching and learning, Deaney et al. (2005) found that ICT use led to subtle changes in classroom dynamics and pedagogic practices with teachers adopting a "far less didactic" approach and pupils' attention being "redistributed away from a central position." (p. 477) However, the findings also underscored the teacher's strategic role in structuring tasks and activities as key to effectively harnessing ICT for fruitful and meaningful learning.

Liu (2010) examined the relationship between the pedagogical beliefs of teachers and technology integration in the classroom in a study involving 1139 elementary schools teachers in Taiwan. He argued that technology integration involves perceptions and practices associated with technology use and as such teachers' beliefs about technology can and will influence the teaching methods they employ in the classroom. Studies have shown that teachers' beliefs were critical indictors of classroom technology use and that teachers with strong constructivist pedagogical beliefs were more likely to use technology in the classroom (Becker, 2000; Ertmer & Ottenbreit-Leftwich, 2009). However, Liu (2010) found that while teachers held learner-centered beliefs they did not integrate constructivist teaching with technology use thus revealing clear inconsistencies between teacher pedagogical beliefs and teaching activities. He

found that most teachers, regardless of pedagogical beliefs, were inclined to utilize lecture-based teaching activities when integrating technology into instruction.

Factors Impeding Greater Integration

Several studies have revealed that even teachers who hold constructivists pedagogical beliefs may not necessarily teach actively because of other contextual factors such as teacher technology competence, time constraints and demands of high stakes examinations (Becker, 2000; Deaney et al., 2006; Liu, 2010).

Liu (2010) postulates that current technology use in teaching typically supports the traditional didactic modes, such as lecturing using technology. This, he argues, is due to the fact that teachers have an insufficient understanding of pedagogy associated with technology use. Mishra and Koehler's (2006) TPACK framework corroborates this argument. According to Liu (2010), a lack of knowledge about how to use technology effectively is a likely barrier to technology integration. Tella, Tella, Toyoba, Adika and Adeyinka (2007) in their study of Nigerian secondary schools also found that teachers' lack of expertise in using ICT was a prominent factor hindering teachers' readiness and confidence in using ICTs.

In addition, many teachers report that attempting to incorporate technology into the milieu of classroom activities presents a host of additional problems such as classroom relocation when the required technology is located in

specialist rooms, access to equipment, system unreliability and a lack of technical support (Deaney et al., 2006). As a result, many teachers continue to use lecture-based or demonstrative teaching activities when using technology and teaching modes remain primarily teacher-centered.

Thus, current research indicates that there are several perceived benefits to integrating ICT into educational practice for both teachers and students. The value of ICT as a motivational tool was stressed as well as the affordances it allows for access to a wider range of more current resources. Like the study by Lai and Pratt (2004), this study seeks to ascertain the contribution of ICT use to teaching and learning as perceived by the teachers.

Chapter 3

Methodology

The current study seeks to determine teachers' perceptions of the contribution of ICT integration into educational practice to enhanced pedagogy, student interest and engagement and teacher motivation and practice. The study will adopt a qualitative research design in the form of a case study and its focus will be the Modern Studies department of a single-gender urban secondary school.

Theoretical Framework

This study is informed by the socio-cultural theory of learning postulated by Vygotsky (1978) who argued that all human action is mediated by tools and that effective learning takes place as we interact with the tools and artifacts of our culture. The most pervasive tool of modern society is the computer and associated communication technology. Thus, it is hypothesized that greater interaction with ICT in the classroom environment will enhance the learning experiences of students. Vygotsky also emphasized the social aspect of learning stressing that knowledge is socially constructed as we interact with more knowledgeable others. That "more-knowledgeable-other" could be anyone in the classroom including cultural artifacts like the computer and other forms of technology.

Students and teachers interact in a classroom culture that is heavily influenced by school, local, national and global factors and the manner and frequency with which ICT is used in the classroom would be determined by those factors. In addition, subject cultures impact differently on how ICT is used in the classroom. While certain subject cultures seem to facilitate the integration of ICTs in teaching and learning, others seem to militate against such integration. Research has shown that while Mathematics teachers are able to incorporate ICT more smoothly into teaching and learning, Modern Studies teachers experience greater difficulty when attempting to do so (Sutherland et al., 2004).

Within this context, students and teachers bring their own experiences that relate to previous cultures of learning both inside and outside the classroom. There is a growing body of evidence which seems to suggest that the ways in which students use ICTs at school are heavily influenced by out-of-school cultures of use (Kent & Facer as cited in Sunderland et al., 2004, p. 415). ICT tools are not static and continue to evolve with a rapidity that is nothing short of awe-inspiring. Students are generally more au courant than their teachers with the latest advances in technology. It is important, therefore, for learning environments involving the use of ICTs to be collaborative in nature in order to facilitate the co-construction of knowledge by students.

This study is also informed by Mishra and Koehler's (2006) teaching with technology model. They posit that thoughtful pedagogical uses of technology require the development of a complex situated form of knowledge which they refer to as Technological Pedagogical and Content Knowledge (TPACK).

Building on Shulman's (1986) "pedagogical content knowledge" model, TPACK outlines the essential qualities of teacher knowledge required for effective integration of technology in teaching. According to Mishra & Koehler (2006), TPACK is an emergent knowledge that goes beyond the three individual components of content, pedagogy and technology and represents a class of knowledge that is central to teachers' work with technology.

Early initiatives in technology in education focused simply on the supply of hardware to schools under the misguided assumption that the mere presence of computer hardware would magically transform the teaching-learning process. Even in those cases where educational software was provided along with the hardware, there was the belief that knowledge was somehow embedded in the software and the technology, therefore, would do the teaching (Sutherland, et al., 2004). The painful lesson that has been derived from that initial experience is that introducing technology to the educational process is not enough. Of greater importance to the successful integration of ICTs in the educational process is what teachers must know in order to effectively integrate technology into their teaching (Mishra & Koehler, 2006).

The argument is that what is required is not simply knowledge of content, pedagogy and technology but more importantly an understanding of the interrelationship between the three types of knowledge such as what pedagogy is suitable for which content, how technology and content are related and how pedagogical strategies can be applied to the use of technology. According to Mishra & Koehler (2006), there is a dynamic equilibrium between the three and

productive technology integration requires an appreciation of that complex relationship. Viewing any of these components in isolation represents a disservice to good teaching. They argue that quality teaching requires developing an understanding of the complex relationship between these components and using this understanding to develop appropriate context-specific strategies.

Most teacher-training courses with respect to technology integration in education focus on teaching basic computer literacy skills. The underlying belief being that teachers simply have to be trained to use the basic application packages in order to successfully incorporate technology in their classrooms. Most scholars however, agree that these traditional methods of technology training for teachers are ill-suited for preparing teachers to be intelligent users of technology for pedagogy (Mishra & Koehler, 2006). Merely knowing how to use technology is not the same as knowing how to teach with it.

Rationale for Qualitative Approach

Rooted in the interpretive paradigm of social constructivism, this study is posited on the assumption that knowledge is socially constructed as individuals seek to make meaning of the world in which they work and live (Creswell, 2007). The study is, therefore, informed by the epistemological position that individuals construct knowledge and understanding through their experiences and the meanings they derive from and bring to those experiences. As such, those meanings will be multiple and varied. The researcher believes that the teachers

and students experiencing this phenomenon will have different and varied experiences and as such there will be multiple realities. Thus, the study is conducted with the intent of understanding and reporting these multiple realties. To achieve this, data can best be gathered by engaging participants in face to face, open-ended dialogue since this will afford them the opportunity to give a more comprehensive description of their experiences.

The focus of the study is simply to explore the phenomenon of the integration of ICT in an urban secondary school from the perspective of those who are expected to carry through the initiative. The researcher is herself a member of the institution under investigation and was intimately involved in the implementation of the initiative to create integrated multimedia learning environments for its students. Since the researcher is an active member of the institution experiencing the phenomenon and the research seeks to understand the meanings teachers derive from their experience then a qualitative approach is best suited for this study.

Using the qualitative method, knowledge will be constructed from the meanings and responses obtained from in-depth interviews with the participants. It is expected that the resulting data will be richly descriptive and faithful to the participants' perspective. Thus, it is believed that a qualitative approach will provide the thick description that will allow for a deeper understanding of teachers' perceptions on how this innovation has impacted on the teaching and learning of Modern Studies at this particular institution.

Data Collection Strategy

Research design.

This is a descriptive case study which seeks to understand the meanings teachers of the Modern Studies department derive from their experience of this innovation. Merriam (1998) asserts that a descriptive case study is one that presents a detailed account of the phenomenon under study and is useful for investigating innovative programs and practices. Since this study seeks to garner teachers' perspectives on their experience with this innovation a descriptive case study is the most appropriate research design. The study will employ a descriptive survey method using face-to-face semi-structured interviews. It is believed that this method will allow for a more rich description of the teachers' experience of the phenomenon and their views on the contribution of ICT to the teaching and learning of Modern Studies.

Data collection instrument.

The researcher will be the main instrument of data collection. An interview protocol will be constructed and independently reviewed before administration. The protocol will be pilot-tested with one teacher from the school under study who will not be a member of the final sample selected for participation with a view to identifying and correcting any anomalies that may surface. Interviews will be conducted over a period of two weeks and the proposed length for each interview is 15-20 minutes. Each interview will be audio-taped and transcribed.

Sampling Design and Procedure

Purposeful sampling will be used to select participants for the study. The sample will consist of four teachers from the Modern Studies department who will be selected based on the criteria that they teach more than one subject, deliver the curriculum at both the upper and lower levels of the school and have been using ICT in their delivery for more than two years. It is believed that participants with these characteristics will be able to purposefully inform an understanding of the research problem and central phenomenon in the study (Creswell, 2007).

Of the 13 teachers in the Modern Studies department of the selected institution, two teach only one subject, one teacher is currently on maternity leave and four are recent university graduates with less that one year teaching experience. This leaves a population of six teachers from which a sample could be chosen. The final sample will be chosen from amongst those who deliver the curriculum in two of the following subjects - History, Social Studies, Sociology, Geography and Caribbean Studies as these subjects are taught at both levels of the school.

Procedure for Data Analysis

The techniques of the grounded theory methodology, as proposed by Strauss and Corbin (1990), will be employed to analyse the data as it allows for analysis of emerging data. After the interviews are transcribed, the data will be colour-coded by participants, segmented and re-grouped by questions. Initial or open coding will be done by examining the data sentence by sentence and

defining the actions, events or ideas explicit within the data. This will allow the researcher to build ideas inductively while deterring her from imposing extant theories or her own beliefs on the data (Chamaz, 2000) and will allow for a rigorous review of the data as well as provide a structure for analysis and interpretation.

Once the initial codes have been identified, axial coding along with the constant comparative method will be employed to identify patterns as well as paradoxes in the data (Glaser & Strauss as cited in Wellington, 2000, p. 136). These patterns or categories will be constantly reviewed and refined as data analysis proceeds. Finally the categories will be examined and reassembled in order to identify emerging patterns and construct a coherent description of the phenomenon under study (LeCompte, 2000). Findings will be interpreted and discussed using emerging themes and categories supported by the narratives of the participants.

Procedure for Ensuring Validity and Reliability

To ensure the credibility of the study, permission will be sought from the administration of the school and initial contact will be made with the possible participants to apprise them of the nature of the study. Dates for the conduct of the interviews will be agreed upon and all interviews will be conducted over a two-week period. Follow-up interviews will be conducted for verification and confirmation of the data obtained during the initial interviews as well as for clarification of any issues identified during the transcription and initial analysis of

the data. Peers at the School of Education will also be engaged to review the transcripts and initial analysis of the data to ensure that interpretations remain true to the stated views of the participants. Thus, member-checking and peer review will be employed to enhance the credibility of the process. It is believed these would facilitate objectivity, ethical diligence and rigor (Jackson, Drummond & Camara, 2007).

Chapter 4

Data Analysis and Interpretation

Method of Data Collection

This study sought to investigate the perceptions of teachers of the Modern Studies department of a single-gender urban secondary school as to the contribution of ICT to subject teaching and learning by drawing on data collected from interviews with participating teachers. Data was collected over a two week period during the month of March 2011and data collection took the form of semi-structured, face-to-face interviews each lasting approximately 25 minutes. Participants were again apprised of the nature and purpose of the study and offered the option to withdraw. The interview questions were framed to elicit data on teachers' perceptions of the effects of ICT use on teacher's pedagogy, effects on the learners and learning, effects on the teachers' motivation and engagement and to explore those factors that support or hinder ICT use. All interviews were audio-taped and were transcribed verbatim as it is believed that this method of transcription provides the best database for analysis (Merriam, 1998). Preliminary analysis of the data began during transcription with the researcher making brief memos and anecdotes as the data was being transcribed.

Each participant was given the opportunity to review the transcript of her interview in order to verify the accuracy of the content to ensure that it was reflective of what she intended to say. Follow-up interviews, each lasting approximately five minutes, were conducted during the last week of April 2010 in

order to seek verification of the data obtained in the first interview as well as to give participants the opportunity to modify or add to that data if they so desired. The second interview was also used to seek clarification and deeper explanations of issues that emerged during the transcription and preliminary analysis.

The Participants

The sample for this study consisted of four members of the Modern Studies department of the selected institution. Two of the participants are DipEd [1] trained teachers each with over ten years teaching experience at the institution under study while the other two teachers are yet to receive post graduate teacher training and together have been teaching at the school an average of four years. All four teachers received their secondary education at the institution under study and as such have internalized the culture of the school. All teachers have had at least three years experience using ICT in the delivery of the curriculum for their various subject areas with one teacher reporting ten years of use. The following is a brief description of the teachers who participated in the study.

Lisbeth has been a teacher at the institution for eleven years and has been using ICT in her teaching for approximately ten years. She teaches History to both lower and upper school and Caribbean Studies to the Upper six class. She makes use of a variety of technologies in her teaching ranging from the computer to audio and video material including the students' blackberry cell phones which

[1] Diploma in Education

she sometimes have them use to access information on the Internet. She also uses facebook and email to communicate with her students and to give feedback on assignments. She tends, however, to use technology more with the upper school than with the lower school and conducts about 50% of her classes using ICT.

Joelle has been at the institution for seventeen years and delivers the curriculum in Social Studies to the lower school and Caribbean Studies to the Upper six class. She also teaches at times Principles of Business and Principles of Accounts. Joelle has been using ICT in her delivery for the past eight years and conducts about 40% of her classes using ICT. Like Lisbeth, she uses it more with the upper school than with the lower school and makes use of a variety of technologies in her classes including PowerPoint, videos, the computer and the Internet.

Victoria has been a teacher at the institution for three years and has been using ICT in her delivery since she started teaching. She teaches Geography at both levels of the school and Caribbean Studies to the upper six class and reports that close to "97% to 100%" of her upper school classes are conducted with the use of some form of technology. She also uses a variety of technology in her delivery including PowerPoint, live video streams from the internet and like Lisbeth, encourages her students to use their blackberries during class to access information on the Internet.

Myriam delivers the curriculum for Caribbean Studies and History to the Upper six student body and English language to the Lower School. She has been

teaching at the institution for five years and has been using ICT in her teaching since she started teaching. She currently conducts about 10% of her classes using ICT but expresses a desire to use it more. She uses a variety of ICTs in her teaching including the computers, the internet, audio and video as well as email to give feedback on assignments to her students.

All the teachers in this study reported a high level of skills in basic computer use such as productivity tools and the Internet and all make extensive use of word-processing software, spreadsheet software, presentation software, file management tools as well as email, social networking sites and the world wide web. In addition, all teachers had received basic training in the use of the equipment installed in the multimedia rooms and in the classrooms and a short but intensive exposure to the educational software available for supporting the delivery of the subjects in Modern Studies. The level of skills reported, however, is not an indicator of ICT use in their teaching.

Ethical Considerations

Written informed consent was obtained from both the administration of the institution and the selected participants prior to the collection of data (see Appendix A). Both the participants and the administration were briefed as to the nature and purpose of the study. Participants were assured that the identities of both the institution and the teachers will be held in the strictest confidence and that the data obtained from the study will be used solely for the stated purpose. Dates and times were agreed on for the conduct of the interviews ensuring

minimal disruption of the teachers' scheduled classes. Participants were assured of confidentiality and anonymity and were offered the option of withdrawing from the study at any time. Permission to use the actual words of participants in the presentation of the findings was also sought.

Strategies to Ensure the Trustworthiness of the Data

Although the trustworthiness of qualitative research is often questioned by positivist researchers, a number of strategies can be adopted to ensure the credibility and dependability of the findings (Shenton, 2004). The researcher adopted some of the strategies proposed by Creswell (2007) to ensure the trustworthiness of the data collected. As suggested by Lincoln and Guba (as cited in Shenton, p. 65), the development of an early familiarity with the culture of the participating organization through "prolonged engagement" in the field is key to ensuring the credibility of qualitative research. Since the researcher has been a member of the institution for the past sixteen years and is the head of the Modern Studies department she is familiar with both the culture of the school and the department and thus satisfies the criteria of "prolonged engagement" in the field.

Iterative questioning as proposed by Shenton (2004) was also employed as a means of verify the information being provided by participants. Questions were rephrased and re-presented so that answers could be compared for consistency. For the most part, the researcher relied on the actual words of the participants when analysing and coding the data in order to ensure that the meanings derived remained true to the voice of the participants. Taylor-Powell and Renner (2003)

posit that this allows the themes and categories to emerge from the data rather than having the researcher impose preconceived notions on the data.

Member checking of interview transcripts, emergent codes and preliminary findings was employed as a means of ensuring the credibility of the findings. Lincoln and Guba (as cited in Creswell, 2007, p. 208) argues that this is "the most critical technique for establishing credibility". Peer review, which provides an external check on the research process (Merriam, 1998), was also used to ensure the credibility of and trustworthiness of the findings. The codes and categories derived during the analysis as well as the preliminary interpretations were critiqued by peers from the School of Education. External audits were also employed as the assistance of two individuals who were not associated with the study was sought to critically review the findings and conclusions to ensure that they were reflective of the data (Creswell, 2007).

Data Analysis Strategy

The transcription of data began with the first interview and the transcripts were then taken back to the participants for review and confirmation of the accuracy of the content. Participants were afforded the opportunity to make changes to the transcripts if they felt what was recorded did not accurately reflect their thoughts. The data was then colour-coded by participants and merged and organized question by question into one document (Appendix D). It was felt that this approach would give the researcher the opportunity to examine the data

across all respondents and thereby identify consistencies and differences that may exist within the data and across participants (Taylor-Powell & Renner, 2003).

Content analysis of the combined interviews was then carried out sentence by sentence in order to determine what the data was saying and to identify themes and patterns in the data. During the initial stage of analysis *in vivo* coding was used, as far as was possible, to code the data (Strauss & Corbin, 1990; Creswell, 2007). These initial codes were constantly reviewed and refined. The emergent codes were then organized and grouped by research questions.

During the second phase of analysis, axial coding was carried out by constantly comparing and contrasting the initial codes and grouping those that were similar in nature to form categories (Strauss & Corbin, 1990). The emergent data was then aggregated into sixteen categories and later collapsed into six over-arching themes (Creswell, 2007). Category names were either derived from the words of the participants themselves or created by the researcher to reflect what was seen in the data. As data analysis progressed, themes were revised and categories restructured to better represent the emerging patterns. The findings will be presented and discussed based on the themes and categories identified.

Presentation and Discussion of Findings

As indicated in the World Bank report on ICT in Education, it is difficult to measure the actual impact of ICT on teaching and learning (Trucano, 2006). As Mishra and Koehler (2007) point out, teaching is a complex and ill-structured

problem to which there is no single, perfect solution. Teaching and learning takes place in environments that are fluid and ever-evolving and a multiplicity of factors converge and interact to determine how effectively teaching has taken place and learning effected. As such, this study did not intend to assess the impact of ICT use on teaching and learning but rather to investigate teachers' perceptions of its contribution to the teaching and learning process. The analysis of the interview data, therefore, focused on what the four teachers had to say about the contribution of ICT to the teaching and learning of Modern Studies. The themes emerging from that data were grouped into the following six major categories (Appendix C) each of which will be discussed in turn:

- Effects on Pedagogy
- Management of Teaching
- Effects on Learning and Learners
- Motivational Effects
- Emotive Value
- Impediments to Use

Presentation of findings.

Effects of ICT use on teachers' pedagogy.

This theme centered on the contribution of ICT use to the pedagogical practices of the teachers and sought to determine the types of ICTs being used by the teachers, how they were being used, what effect that use was having on the delivery of the content and if the use of ICT had effected a change in the methods

of delivery adopted by teachers. The teachers responses were grouped into five sub-categories all of which speak to the pedagogic practice of the teachers namely manner of use, content delivery improved, use of resources broadened, pedagogical practice affected and negatives outcomes.

Manner of use.

All teachers reported making use of a variety of ICTs in the delivery of their lessons as well as using it for a variety of purposes. ICTs such as PowerPoint presentations, audio clips, live video streams, wikis and still pictures were used as visual aids and auditory stimulation to get students thinking and as a stimulus to initiate discussions:

> I also use videos where it's appropriate…like …for the Japan earthquake we used a live stream of the news to discuss the actual hazards and disasters…

Teachers also reported that ICT made it easier to review and recap the main points of what was taught in a lesson and saw it as an excellent tool for repetition and reinforcement of content and skills taught.

> …as a review of the last lesson… I would put the questions up on the board and I basically ask who wanted to do questions one, two, three or four. So that they could see the questions, I would not have to call them out…

The use of ICT was also incorporated in all areas of the lesson from set induction and lesson summary to being used for the main activity during the lesson.

> Sometimes [I use it for] induction if I want to present them with a scenario that would launch the discussion. Sometimes it might just be to give them content during the lesson…

Teachers, therefore, incorporated ICTs in all areas of their lessons and made use of the technology in several different ways.

Content delivery improved.

Most teachers reported that the integration of ICT into the teaching of Modern Studies has facilitated a more expeditious delivery of the content of the various subjects.

> Yes it is in terms of getting content across quickly it helps with that…

The view was also expressed that ICT has helped the teachers to maximize content delivery and has made it possible for the teachers to get more done in the allotted class time thus enabling faster completion of the syllabus.

> …and I find I get more done actually. Instead of talking and talking, I find I get more done...you cover a greater part of the syllabus.

In addition, most teachers reported that the use of ICT not only facilitates the easier delivery of the more difficult and complex topics in the syllabus but that it is more beneficial to the students when ICT is used.

> In looking at the topics I have to teach there are some things I realize is easier or it's better more beneficial to students if I do it using ICT…

However, one teacher expressed the view that ICT cannot be used effectively to teach all topics and that it was extremely difficult to teach abstract, highly theoretical topics using ICT. She reiterated that how effectively ICT is used can be determined by the content to be delivered.

> …there are some things that...it makes no sense using ICT…especially when you have to teach a theory… So in those cases when you teach the theory you don't really need the ICT. It depends on the content.

While some teachers alluded to the fact that lessons can be completed faster because both students and teachers were so immersed in the lesson when ICT is used, one teacher expressed the view that the use of ICT could, in fact, slow down the lesson making it difficult to complete the syllabus in a timely manner.

> …students like to write down everything you have on the slides …so it takes some time to actually go through and because they all write at different rates it takes longer. It slows down the lesson. Yes, syllabus completion would take longer.

All teachers agreed, however, that the use of ICT demanded greater creativity in delivery from the teacher. As one teacher pointed out, even with the use of ICT the teacher had to devise ways of making the lesson interesting for the students.

> …when you have to include ICT you, therefore, have to think of what resources what ideas would be relevant and put it in a way that the students would willingly listen whether it's the video or even just the PowerPoint, you must make that also interesting.

Use of aids and resources broadened.

The integration of ICT into education has broadened the range of resources available to teachers. All teachers indicated that they are now able to make use of a wider range of resources both in the preparation and delivery of their lessons.

> I find that they have a lot of things online so what I do sometimes I take it, I tweek it a bit and then I use it. Whenever I plan a lesson I always usually consult the internet.

In addition, some teachers alluded to the edutainment value of ICT use which brought otherwise "dead" subjects alive for the students and helped to make subjects like History and Caribbean Studies more interesting and appealing to students. The use of a wider range of resources has transformed and enriched the learning experiences of their students. One teacher reported that a new phenomenon is emerging where students who are more inclined to do the Sciences at the Forms Four and Five level are now expressing a desire to continue their studies in History not necessarily as a career choice but simply for the educational value.

> …there was this term I learnt in DipEd... it was edutainment. Well…that is what I'm planning to do because History unfortunately is one of the subjects that everyone thinks is a dead subject. So I'm hoping to… a combination of entertain and intrigue and interest... So to win their interest, to let them know that history isn't that dead.

The integration of ICTs has made possible the use of concrete, real-world examples in the delivery of the curriculum which brings the 'reality of outside' into the classroom.

> I'll give you an example from Caribbean studies. Sometimes I pull out videos from Human Rights Watch and other human rights organisations like Amnesty International and we show them the videos. I showed them one on Guantanamo bay and I showed one on the health care system in India and how women are normally treated. So I use it that way to really show them how the Human Rights on the paper are applied in real life.

That exposure to real life events in vivid, moving colour that ICT affords enhances the delivery of content and brings the curriculum to life for the students.

Pedagogical practice affected.

The use of ICT in the delivery of their lessons has afforded the teachers greater opportunity to vary their approach in order to cater for the different types of learners in their class. As a result, teachers feel that they are able to reach more students when ICT is used.

> It reaches more of the children those who normally get bored with just the book and the talk… it helps where a child is not too much into the talk and she can't … listen and write at the same time. It helps with those who are visually stimulated...

> I'm able to reach more students, I think, through the use of ICT.

The teachers also indicated that the integration of ICT in classroom practice is especially useful for the more introverted, less confident child and helps to draw her into the class. In addition, it also helps to create a less intimidating environment for the weaker student.

> …you know long time ago Ms. Curtin told me when I was a student about the different types of learners... I know in some of my classes some of the students are a bit weaker so I use ICT to hopefully grab them and help them understand where they wouldn't have before if I was just calling out notes.

However, one teacher expressed the view that the way ICT is being used still involves a lot of "brain work" and, as such, does not really cater for the more artistic and tactile learner. Even with the use of ICT, classes would have to be purposefully structured to meet the needs of those students. With respect to the degree to which ICT impacts the teaching style adopted by teachers, the responses varied with three teachers indicating a subtle shift to a more learner-centered approach while one maintained a more teacher-centered approach.

> For now it's more teacher-centered but I'm trying to get it to shift towards the student-centered.

> In terms of teaching in the classroom, I have been able to shift from teacher-centered to learner-centered…ICT has helped with this because then I can get them to do things.

Those teachers who are shifting to a more student-centered approach have attempted to use more collaborative learning strategies and include more project-based learning and group work in their delivery.

> I think it's more a student-centered because I really try to use [methods] from collaborative learning so I like get them in smaller groups… So I go around and…find out what's going on. 'Cause I find that they work better in groups.

The teachers reported that with that shift their role in the classroom has changed from that of the "sage on the stage" to being more of a guide and a facilitator. They found that the use of ICT facilitates less teacher-talk and greater student involvement.

> I get to talk less. That is a big thing. I used to go home with a sore throat…because I've been talking for the entire day. So I get to talk less. As I said, they are more involved.

One of the positive impacts of ICT identified by the teachers is the extension of the classroom into the digital environment of the internet. The use of ICTs facilitates increased communication between teacher and student as teachers are opting to continue their dialogue with their students over the internet. The teachers reported making use of wikis and social networking sites such as Facebook to keep classroom discussions going as well as to give assignments.

> I use a wiki with my Form Fours and I find they are more interested. They like to comment on each other's post. They have to do journal entries and they comment on each other's post and keeps the discussion going…

> …with my History students … we use to communicate on Facebook. I would send them a message saying what I wanted…they could actually go up on the internet do different chats about it, do different blogs about it… so learning is moving outside of the classroom

All four teachers reported using email facilities for the submission of assignments and for giving feedback to their students on assignments submitted.

> I also use email to give feedback to students. I also use it to correct essays using Microsoft word and review tab.

The teachers also indicated that the use of ICT facilitates better classroom management and control. Students tend to be more focused and less disruptive when ICT is used.

> It definitely helps the teacher in terms of class control and class management.

Negative outcomes.

In addition to all the benefits, teachers also identified some negative consequences of ICT use for classroom teaching. The most commonly cited problem with respect to ICT use was technical problems with the equipment which can at times significantly reduce teaching time.

> It is a valuable tool but also it can distract from delivering your class because if you don't know how to set it up or if you have problems then that is going to take away from your teaching time.

Time required for setting up the equipment for the lesson also impacts on teaching time and can also be a source of distraction for the students.

> If we are not using the multimedia rooms the time it takes to set up in the classroom …it would take about 5 or more minutes and that's 5 minutes of class time that is going.

In addition, one teacher felt that she had a tendency to depend too much on the technology for the delivery of some topics especially when the delivery of those topics are not necessarily enhanced by ICT use.

> …some of the topics I may depend too much on the ICT…and that would not bring across the lesson as clearly as it should.

Management of teaching.

This theme sought to understand what contributions teachers felt ICT made to administrative and management tasks associated with teaching. The responses of teachers were organized into two sub-categories – planning and preparation and organization and management.

Planning and Preparation.

Teachers noted that though ICTs are useful for preparing assignments and exams and makes lesson planning easier, it does require a more thoughtful and critical approach to lesson planning.

> It really requires much more planning than just your run of the mill lesson.

While preparation is not as tedious and demanding and the amount of work to prepare is reduced, much more time is required for planning.

> Yes, you have to devote more time planning but it does not feel like more time. But it does require more planning and more time planning.

With ICT use, teachers report that, in terms of preparation, they are more focused and more methodical in their approach.

> I'm a little more focused when I use ICT…You must be prepared…So I have to do more planning.

All teachers stressed the importance of having a back-up plan when delivering lessons using ICT commenting that ICT use demands greater flexibility and creativity in planning from the teacher.

> …oh that's another thing…always have a back-up plan…so you're not caught off guard when the computer doesn't work

ICT also offers teachers access to a wider range of resources and different perspectives via the internet and, as a result, gives the teachers an avenue to be more creative in her lessons.

> For me it's easier for me to deliver my lesson. It gives me access to a wider range of information.

> It's a different way to deliver the content to students. It gives me an avenue to create because I really have to think about how I'm going to do it… not the run-of-the-mill PowerPoint presentation all of the time, can I do something different?

One teacher reported that she is always on the lookout for new and interesting material online to incorporate in her lessons. All teachers generally felt that ICT had impacted positively on all areas of teaching.

Organization and management.

All teachers view ICT as an excellent tool for managing information and improved record keeping. ICT use allows for better management of tasks associated with teaching and helps the teacher to be more organized.

> A little more organised when I have it... Yeah I think that's a major thing…because if you are more organised as a teacher you feel more confident when you teach.

In addition, ICT allows for more efficient management of teaching resources. Teachers report that ICT makes it easier to build resource banks of both teaching materials and lesson plans which, in turn, makes future planning less demanding.

> It helps me be more organised as a teacher... what I have now is a bank of lessons.

> So it makes it a lot easier for me to in terms of keeping all my information in one place. It also helps with the preparation of my papers…it's easier for me to put together end of terms exams to draw from different what you may call it banks of past papers and so forth.

ICT use, therefore, affords better time management and greater organization for the teacher.

Effects of ICT use on learning.

This theme sought to examine teachers' perceptions of the contribution of ICT use to the learning experiences of the students. Teachers' responses were grouped into four sub-categories namely facilitates concept building, improves recall and understanding, provides more meaningful learning experiences and negative consequences for student learning.

Facilitates concept building.

Teachers reported that the use of ICT in their teaching makes it easier for students to visual and understand concepts.

> …what I do is use pictures or if I can get a video so it's easier for students to visual… it is easier for them to understand it if they can actually see it.

They also expressed the belief that the use of ICT not only brings subject content to life for the students but also allows them to see the practical, everyday application of concepts and helps them to put things into context.

Improves recall and comprehension.

All teachers were of the opinion that the use of ICT facilitates better student understanding of concepts being taught as it makes it easier for students to follow what is being delivered.

> ...so it's easier for some students to visualise something, it is easier for them to understand it if they can actually see it. I tend to like… to use it to help them to understand better.

In addition, ICT makes possible the use of concrete, real world examples which facilitates better recall of content taught.

> I think they can better recall examples I give because whenever … I'm talking about a right they remember I showed them something on Tiananmen Square and censorship and they can relate…

Teachers also expressed the view that the use of ICTs fosters a spirit of enquiry in students as it gets them thinking and encourages them to ask questions. As a result, students are more motivated to explore and do independent research.

> I have children sometimes coming in and saying 'Miss I have this song from home…' So they actually volunteer to bring in stuff and they actually become more a part of their learning.

More meaningful learning experiences.

Teachers felt that the use of ICT affords experiences that make learning more relevant and real for the students. Subjects come alive as students are exposed to

real world examples to which they can relate. ICT use also helps to bring sensitive issues to life for the student. Instead of simply hearing the teacher talk about issues they can see visual representations of what is being discussed.

> I teach mass media and you talking about the news and how sometimes they invade people's privacy or things that are not appropriate. And usually I just tell them about it but I found the picture last night when I was looking through and I was like I definitely want to use that to show them…

Teachers also report that with the use of ICT students take responsibility for their learning and that there is greater ownership of learning.

> I actually have situations where children actually ask me miss what's the next topic if they could prepare something related
>
> When they have to create something I think it's because they own it they learn more from it.

As such, learning is no longer seen as something that is done only in the classroom.

Negative consequences for students' learning.

Though teachers believe that for the most part the integration of ICT had positive outcomes for students learning, they also expressed the concern that ICT use could have several negative consequences for students' learning. Because of pervasive use of ICT in the school, students are developing a growing dependency

on ICT. The expectation is that all lessons will be delivered with it and when it is not present student lose focus and interest.

> So when you actually have a different type of lesson or a lesson where you don't use the ICT they get bored…Sometimes if you don't use it enough they will become even disruptive because they don't have that focus that they are used to.

In addition, ICT use can be a source of distraction for some students. Unless carefully monitored they can get caught up in the technology and lose sight of the purpose of the exercise. In addition, they can become too excited and unsettled when technology is used.

> Your lower school would tend to get excited with the technology and it could become more entertainment than education and you spend a lot of time trying to zone them back in.

One teacher expressed the view that using ICT to enhance learning does not necessarily work for all students. Some students still indicate a lack of understanding even when technology is used.

> There are students even if I use the ICT they would still come after the class or outside a class and say Miss I really didn't understand…

In addition, teachers noted with concern a tendency by students to view only what is presented to them on the screen as important. Though they participate in class discussion, they tend to dismiss this as unimportant and, therefore, there is little recall of what was discussed after class.

> They just pay attention to the PowerPoint. They don't take notes in class but they're focussed on what's happening in the PowerPoint and what's being discussed in class. But after class if you go to question them on something that was said in class that wasn't in the PowerPoint they're not going to remember.

All teachers expressed the concern that ICT use was resulting in a loss of interest in reading. Students generally express the desire to look at the DVD rather than read a book.

> They don't know how to read…even for literature in forms four and five they rent the movie on DVD… so they have lost the art of reading the book which is still very important for their tertiary learning.

In addition, critical skills that are required in higher education, such as research skills, formal writing skills and skills of analysis and synthesis are being lost.

> The fact that they would be losing more of their writing skills… So even in writing presentations they would type and expect the computer to identify spelling errors… So they are not learning as well the technique of writing an expanded essay or writing an expanded response.

The issue of plagiarism was also identified by teachers as an area of particular concern especially with respect to internet use. Teachers commented that students were beginning to develop a 'cut and paste' mentality.

> We have issues with plagiarism all the time. They love to cut and paste. They still don't know how to summarise.

The problem, however, was more common with the lower school.

Motivational effects of ICT use.

This theme explored the motivational effects of ICT use on both the teachers and the students. All teachers reported enhanced interest and greater engagement for both teacher and student. This theme was collapsed into two sub-categories: interest captured and engagement increased.

Interest captured.

Teachers report that ICT use helps to grab students' attention and capture their interest. Its use engenders genuine interest in the subject and motivates students to learn. As a result, students tend to be more attentive.

> They tend to remember, they get excited, they want to learn, they want to participate, so they pay more attention than if you just go and sit down and talk…

ICT use excites and intrigues learners and that excitement usually translates into increased participation and involvement.

> …when you have ICT they seem to be more intrigued, they seem more interested, their whole posture is different and generally speaking they seem to be more well-behaved.

ICT use helps to make subjects more appealing to students and increases their enthusiasm for learning.

> …it just gets them interested in what you are teaching.

As with the students, teachers reported that ICT use increases and holds their interest and adds dynamism to their teaching.

> …I guess for me it makes the lessons more interesting to teach

> I find for teaching it is very good. It adds dynamism for me... keeps me interested.

Like the students, teachers are enthused and excited about teaching when they use ICT and that enthusiasm and excitement is usually transmitted to their students. As a result, teachers are motivated to do more.

> I enjoy it more I think when I use ICT. I'm very computer-oriented so when I get to use it I am myself more excited by it. And that excitement is often transferred to the students.

> …I am very excited so I go early to set up…

Engagement increased.

Teachers reported that when ICT is being used students are less distracted and there is less disruptive behavior. It helps to keep students focused and helps them to stay on task.

> They tend to be less disruptive with something with ICT going on that they can focus on... like they are more attentive… Definitely a greater level of interest.

> It keeps them a little more on task than just the talk and chalk... They focus a little more.

With ICT use students are much more engaged and are more willing to participate in class activities. Teachers also report that, with ICT use, they too are more engaged and derive greater enjoyment from their craft. This leads to an increase in teacher confidence.

> So it excites me. It makes me, I think, a better teacher when I use it.

Emotive value of ICT use.

The integration of ICTs into their practice helps the teacher to create less intimidating learning environments for the weaker student and helps the teacher to reach those students who would normally withdraw and draw them into active participation in the class.

> ...like there is this one weak student in my class she's very, very weak but she really tries hard but she likes the wiki because she can go back and edit, you know... So it's a way of reaching those students, pulling them into your class.

Through ICT use, teachers are able to give their student vicarious experiences that evoke an emotional response and helps them to develop greater empathy for others.

> I think pictures really evoke emotions in persons and pupils would be affected more than if I just said okay this is what happened.

In addition, visual stimuli often evoke different responses from different students thus offering the class as well as the teacher a variety of perspectives.

> When you show a DVD or play a song to a Form 3 and they give you a response... play that same song with another Form 3 and you get a different response.

Impediments to use.

While the teachers all acknowledged the positive contributions that ICT use makes to their teaching, they all identified deterrents that would make them less inclined to use ICT. These include technical problems associated with ICT, access to equipment, availability of multimedia rooms, time constraints and teacher technical competence. The most commented on problem was technical problems with the equipment which proved to be a source of frustration for most teachers.

> Definitely computer glitches… no matter how much you prepare I think as far as using computers you know that they are going to have problems. You have to be realistic.

The view was expressed that teachers must be prepared for these problems and plan accordingly.

Time constraints was another issue identified by teachers that militates against greater ICT use. Most teachers felt that a forty minute period made it difficult for them to use ICT adequately.

> …so time constraints as well. I find it's difficult to use ICT in a 35 minute period

Teachers also noted that pressure to complete the syllabus on time, especially when the number of periods per week is limited, discourages ICT use. In addition, time lost as a result of start up and shut down meant that teaching time could be significantly reduced.

> Set up time…it takes to set up in the classroom…then of course you have to shut down before the other teacher gets there. So you really just get 30 minutes of your lesson

Preparing lessons that involves the use of ICT could also be time consuming.

Decisions to incorporate ICT in their lessons are also affected not only by the nature of content but also by the nature of the class. Teachers are discouraged from using ICT when it becomes more entertainment than edutainment for the students and when content is too theoretical.

> Your lower school would tend to get excited with the technology and it could become more entertainment than education and you spend a lot of time trying to zone them back in.

Students' over-enthusiasm when ICT is used can also create classroom management issues which make the teacher less inclined to use it.

Most teachers identified a lack of technical knowledge as a major deterrent to ICT use. Teachers reported that initial use of ICT was extremely

traumatic with two teachers admitting to being resentful of having to use it initially.

> It was a horror…I couldn't get things to work.

> I hated it. I was very, very, very much against it…and that is when the technical stuff used to be a big glitch cause I was a dinosaur where computers were concerned, you know

Even with basic literary training, ICT use could still be quite unnerving as it puts the teacher out of her comfort zone.

> Well there were problems you know I didn't know how to set it up properly so that kind of took away from my class time. I was like maybe I shouldn't use it you know it's shortening my teaching time.

The view was also expressed that teachers are not adequately prepared to make effective use ICT in the classroom since they are not really trained in how to teach with technology.

> …they would need training but again…not just in ICT… but actually training in …how to use the tools to facilitate better learning and delivery of the curriculum.

What is required is training in pedagogy related to technology use and not simply training in ICT skills. All teachers, however, now see the value of using ICT in their teaching and report that confidence and proficiency develops with practice.

Discussion of Findings.

The findings of this study offered a comprehensive picture of the perceived contribution that the integration of ICT in the educative process makes to the teaching and learning of Modern Studies. It is clear that ICT use is having an impact on how teachers work and how they structure learning experiences for their students.

The findings revealed that while teachers were making use of ICT in all areas of the lesson, the focus of use tend to be for the speedy delivery of content and syllabus completion rather than the construction of knowledge as reported in the studies by Becker (2002), Balanskat et al., (2006) and Liu (2010). Teachers revealed that one of the major benefits derived from ICT use was the more efficient delivery of content that it facilitated. Tella et al. (2007) also found that a clear distinction could be made between teachers who critically select ICT resources to fit a topic and those who simply use it to present work.

With respect to teachers' pedagogic practice, the findings indicate that teachers are beginning to review their role in the classroom when using ICTs in their teaching. Like the teachers in the study conducted by Deaney et al., (2005), some are making a subtle shift in their delivery to a less 'didactic' approach. However, others continued to utilize a more lecture-based approach to delivery (Liu, 2010). In their study, Deaney et al. (2005) stressed the teacher's strategic role in structuring tasks and activities requiring the use of ICT. The teachers under study also underscored the importance of the teacher in carefully managing

activities involving ICT use so that intended outcomes could be achieved. Teachers felt that while ICT facilitated the achievement of lesson objectives its use must be well-planned and teachers must retain control of the class. Similar to the findings of Deaney et al. (2005), teachers stressed the benefits of access to a wider range of resources and more meaningful learning experiences that ICT use affords.

Consistent with the findings of Lai and Pratt (2007), this study revealed that the integration of ICT in teachers' practice had the greatest effect on the administration and management of teaching. Teachers were of the opinion that ICT use introduces a greater level of efficiency in the administration of their craft and demands the adoption of a more critical approach to planning. All teachers reported that ICT use demanded greater creativity in lesson planning and as such much more time had to be invested in planning and preparation. As reported in the study by Deaney et al. (2005), all teachers in this study stressed the importance of having a back-up plan when using ICT in classroom delivery.

With respect to its effect on student engagement and interest, the findings revealed that teachers believe that ICT use helped to create learning environments that were more conducive to student learning as it served to capture their interest and lead to greater student involvement and engagement. Teachers reported that student were better able to recall content when ICT was used since it afforded the use of concrete, real world examples with which students identified. These findings are corroborated by the work of Lai and Pratt (2007), Deaney et al. (2006) and Balanskat et al. (2006). Teachers also indicated that ICT use was

especially beneficial to the academically weaker and more introverted child as it helped to draw these students into the class. However, teachers also identified several negative consequences of ICT use for student learning such as a loss an interest in reading and poor research skills. Teachers also indicated an increased problem with plagiarism with the use of the internet (Lai & Pratt, 2007).

As reported in other studies (Balanskat et al., 2006; Lai & Pratt, 2007), the findings revealed that the integration of ICT had positive motivational benefits for both teachers and students. Both teachers and students were excited and intrigued by the use of ICT in the classroom with students demonstrating increased enthusiasm for learning. ICT use had the effect of creating greater subject appeal thus arousing in students a desire to know more and encouraging independent study and ownership of learning. Teachers experience greater enjoyment from their craft and are motivated to do more.

Though all teachers indicated a desire to make more meaningful use of technology in their classrooms, they identified several impediments to use which made greater integration of ICT difficult. The most pervasive of these barriers were technical problems with the equipment, time constraints and the availability of equipment. Teacher technical competence was also identified by the teachers as a factor hindering greater use. As Mishra and Koehler (2007) point out teachers often have inadequate experience with using digital technologies for teaching and learning and as such do not consider themselves sufficiently prepared to do so. Significantly, teachers also stressed the importance of training in pedagogy related to technology use and not simply the acquisition of ICT skills

as an essential prerequisite for effective ICT use. Mishra and Koehler's (2007) argument that effective teaching with technology requires an understanding of pedagogical techniques that use technologies in constructive ways to teach content corroborates this position.

Despite the difficulties associated with ICT use, teachers were generally of the opinion that ICTs offered excellent tools to both the teacher and the learner and its use contributed positively to both teaching and learning.

Chapter 5

Conclusion and Recommendations

The integration of ICT into educational practice continues to be viewed as having the potential to transform teaching and learning. Several studies have shown that when utilized effectively ICT enhances the teaching-learning process in several ways. This study sought to ascertain the perceptions of teachers of the Modern Studies department of a single-gender secondary school as to the contribution of ICT to teaching and learning in three specific areas – pedagogy, students' interest and engagement and teachers' motivation and interest. As a result, qualitative research design was adopted in the form a descriptive case study and data was collected using semi-structured interviews with four members of the department who were purposefully selected. The ground theory methodology as proposed by Strauss and Corbin (1990) was used to analyse the data.

The findings of the study revealed that teachers did perceive several positive benefits to the integration of ICT in the teaching of Modern Studies for both the teacher and the students. Generally, teachers viewed ICT as a "fantastic tool" for engaging learners and capturing their interest. ICT use exposed students to richer, less intimidating learning environments and encouraged them to take ownership of their learning. In addition, ICT was also seen as important motivational tool for teachers, engaging and exciting them about their craft and

encouraging them to be more creative in their approach to their work. ICT use exposes both teacher and students to a wider range of resources of greater currency and made possible real world experiences that aroused students' empathy and made learning more meaningful. However, its use still needs to be carefully monitored as it could easily become a source of distraction and a deterrent to learning. The essential role of the teacher in adaptively managing its use is key to the effective integration of ICT in educational practice. Technology cannot do the teaching in lieu of the teacher so it is imperative that its use in the classroom be carefully planned and managed.

It is undeniable that ICT has great potential to transform the learning environment and when utilized well can enhance the learning process. However, teachers must be competent and confident in technical, pedagogical and content knowledge for technology to be used effectively in the classroom. It is imperative, therefore, for teachers to be afforded opportunities to develop their skills not only in technology but in pedagogy associated with technology use. That is, they must be assisted in developing technological pedagogical content knowledge (Mishra and Koehler, 2007). Since many teachers lack both competence and confidence in using ICT and students, as digital natives, bring with them an array of ICT skills to the classroom, teachers could enlist the assistance of technically skilled students both as peer tutors and teaching assistants when using technology in the classroom.

Few would disagree that ICT offers a range of powerful tools which proficient users can employ to achieve an array of outcomes in the classroom

(Deaney et al., 2006). It is critical, therefore, that educators acquire the skills and competences necessary to fully exploit the potential that ICT has to offer for teaching and learning as they prepare their charges to meet the challenges of the 21st century.

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Appendices

Appendix A

Letters to the Principal and Participants

The Principal,

[redacted]

[redacted]

[redacted]

March 8th, 2011.

Dear Madam,

In partial fulfillment of the requirements for the completion of the Masters in Education degree at the University of the West Indies, I am conducting a qualitative study on the contribution of the Information and Communication Technology (ICT) to the teaching and learning of Modern Studies. To this end, I am inviting teachers who have been using ICT in their teaching for more than two years to participate in face-to-face interviews on the issue.

I am, therefore, seeking your permission to conduct this study with four teachers from the Modern Studies department of your school. I assure you that the information obtained in this interview will be kept in the strictest confidence and will only be used for the stated purpose. The identity of the school as well as the teachers involved in the study will be kept in the strictest confidence.

It is hoped that this study will contribute to the growing body of knowledge in the Caribbean which speaks to the contribution of ICT to educational practice.

Thank you for your kind consideration.

Respectfully yours,

_____

Caty-Ann Rampersad

March 8th, 2011.

Dear Participant,

In partial fulfillment of the requirements for the completion of the Masters in Education degree at the University of the West Indies, I am conducting a qualitative study on the contribution of the Information and Communication Technology (ICT) to the teaching and learning of Modern Studies. To this end, I am inviting teachers who have been using ICT in their teaching for more than two years to participate in a face-to-face interview on the issue. The interview will be done in two parts. The first will be conducted in the third week of March, and a follow-up interview for verification of the information collected will be done in April.

I assure you that the information obtained in this interview will be kept in the strictest confidence and will only be used for the stated purpose. No personal data about you is required and as such your anonymity is assured.

It is hoped that this study will contribute to the growing body of knowledge in the Caribbean which speaks to the use and contribution of ICT to educational practice.

Please be assured that you are free to withdraw your participation in this study at any time. Thank you for your willingness to participate.

Respectfully yours,

_____

Caty-Ann Rampersad

Appendix B

Interview Protocol

1. How long have you been using ICT in your teaching?
2. What percentage of your classes is conducted using ICT?
3. What type of ICT do you use in your teaching?
4. How do you use ICT in your teaching? (In what areas of the lesson?)
5. When planning to use ICT in your in teaching, what are your objectives or intentions?
6. What are some of the constraints to using ICT in your teaching that you experience?
7. In your opinion, is there a benefit to using ICT in the teaching of Modern studies?
8. How valuable a tool do you think ICT is for teaching and learning?
9. How has the use of ICT affected the way you deliver the curriculum?
10. How has the use of ICT helped you to cater for the different types of learners?
11. How has the use of ICT impacted on students' engagement in the classroom?
12. How has the use of ICT affected the behaviour of your students in the classroom?
13. How has the use of ICT affected your students' attitude to learning?
14. Has the integration of ICT facilitated an improvement in learning?
15. What difference, if any, has the use of ICT made to your students' performance?
16. What are some of the positives/negatives for the students?
17. What do you think are some of the positive/negative outcomes for you as a teacher?
18. How would you describe your initial experience with using ICT?
19. How has your initial experience affected the way you use it now?
20. Has the use of ICT impacted on your approach to your work?
21. What advice would you give to a novice teacher about the use of ICT in teaching?

Appendix C

Analysis Stage 2 – Emergent Themes by Research Questions

Research Question	Category	**Emergent Themes**
1. How has the use of ICT affected the pedagogical practice of the teachers?	Manner of Use	Visual stimulation/aids Stimulus to initiate discussion Recapping/review Reinforcement/repetition Lesson wrap-up/summary Set Induction Reinforce main points
	Content Delivery	Maximize content delivery Deliver content more expeditiously Facilitates faster completion of content – can get more done in single period Class time seems to go faster as teacher and students so engaged Can slow down lesson – takes longer to complete syllabus Makes delivery of some topics easier and more beneficial for students Demands greater creativity in delivery Difficult to teach abstract concepts/theory topics using ICT
	Use of aids and resources	Makes use of wider range of resources Edutainment – to bring subject alive Helps to make subject more interesting Use concrete, real world examples - use of real life examples enhances lessons
	Negative consequences	Loss of teaching time due to technical problems, set up time Tendency to depend too much on ICT for delivery of some topics
	Teaching Style	Caters for different types of learners especially introverted child/one lacking in confidence Style still more teacher-centered Style more student-centered

Research Question	Category	**Emergent Themes**
		Less teacher talk; greater student involvement Use more collaborative learning – small group activity Teacher more of guide/facilitator Helps to create learning environment less intimidating to weaker child Takes teaching and learning out of classroom to digital environment Better class management & control Able to reach more students
2. How have students' interest, motivation and engagement in Modern Studies been affected by the integration of ICT? Over-arching Theme Learning Effects	Learning Effects - Facilitates Concept building Learning Effects - Improves recall and comprehension Learning Effects – Relevance of learning Interest captured	Easier to visual concepts Allows them to see practical, everyday application of concepts Brings content to life for students Facilitates better student understanding Easier for students to follow Better recall of information, concrete examples Gets them thinking; facilitates enquiry Improves academic performance Encourages independent research Learn more from collaborative work involving use of ICTs Apply knowledge to real world situations, experiences Makes learning more relevant, real – subject comes alive Brings sensitive issues to life – instead of hearing teacher talk, can see visual Ownership of learning Generates genuine interest in subject Generates greater student interest Captures students' interest, grabs attention Excites learners Increased participation/involvement More attentive Increased enthusiasm Appeals to/reaches more students Intrigues them, more appealing to them

Research Question	Category	**Emergent Themes**
	Student engagement	Less distracted, less disruptive behaviour Keeps students focused Keeps them on task More willing to participate Much more engaged
	Emotive value	Less intimidating environment for weaker students Helps to reach those students who would normally withdraw Helps weaker students – draws them into class Able to evoke emotional response - empathy in students Evokes different response from different students – different perspectives
	Negative consequences	Tendency to think only what's on screen important-ignores class discussion Can become too excited, unsettled Can be source of distraction Can lose students' attention/interest if technology isn't working Loss of interest in reading Loss of research skills, formal writing skills, skills of analysis and synthesis Dependency on technology – loss of focus if not present Does not work for all students Plagiarism – copy and paste mentality
3. How has the use of ICT affected teachers' motivation, interest and practice?	Planning and Preparation	More preparation time needed - takes more time to prepare lesson Requires a more thoughtful, critical approach to lesson planning Demands flexibility, creativity Gives teacher avenue to be creative Back-up plan in case of technical glitches More focused in terms of preparation - more methodical in approach Useful for preparing assignments, exams Easier lesson planning Always on look out for new interesting events online to incorporate in lesson Access to wider range of resources

Research Question	Category	**Emergent Themes**
3. How has the use of ICT affected teachers' motivation, interest and practice?		Access to different perspectives via net Has impacted positively on all areas of teaching
	Organisation	Requires better time management Requires greater organization Good for managing information Better management Better organised Improved record keeping Easier to build a resource bank Build a resource bank of lessons – makes future prep easier
	Teacher interest, engagement	Increases and holds teacher interest – adds dynamism Increases teacher enthusiasm and excitement Teacher enthusiasm and excitement transferred to students Makes teacher more engaged Improves teacher confidence Greater teacher interest and motivation Greater enjoyment for teacher
	Technical competence	Initially resented having to use it now sees value of it Lack of technical know-how created problems Can be unnerving; puts teacher out of comfort zone Confidence develops with practice and proficiency

Appendix D

Axial Coding – Grouping of themes and identification of categories

Category	Sub-Category	Emergent Themes
Pedagogical Effects	Manner of Use	Visual stimulation/aids Stimulus to initiate discussion Recapping/review Reinforcement/repetition Lesson wrap-up/summary Set Induction Reinforce main points
	Content Delivery	Maximize content delivery Deliver content more expeditiously Facilitates faster completion of content – can get more done in single period Class time seems to go faster as teacher and students so engaged Can slow down lesson – takes longer to complete syllabus Makes delivery of some topics easier and more beneficial for students Demands greater creativity in delivery Difficult to teach abstract concepts/theory topics using ICT
	Use of aids and resources	Makes use of wider range of resources Edutainment – to bring subject alive Helps to make subject more interesting Use concrete, real world examples - use of real life examples enhances lessons
	Teaching Style	Caters for different types of learners especially introverted child/one lacking in confidence Style still more teacher-centered Style more student-centered Less teacher talk; greater student involvement Use more collaborative learning – small group activity Teacher more of guide/facilitator Better class management & control Helps to create learning environment less intimidating to weaker child Takes teaching and learning out of classroom to digital environment Able to reach more students

Category	Sub-Category	Emergent Themes
	Negative consequences	Loss of teaching time due to technical problems, set up time Tendency to depend too much on ICT for delivery of some topics
Learning Effects	Facilitates Concept building	Easier to visual concepts Allows them to see practical, everyday application of concepts Brings content to life for students
	Improves recall and comprehension	Facilitates better student understanding Easier for students to follow Better recall of information, concrete examples Gets them thinking; facilitates enquiry Improves academic performance Encourages independent research Learn more from collaborative work involving use of ICTs
	More meaningful learning experiences	Apply knowledge to real world situations, experiences Makes learning more relevant, real – subject comes alive Brings sensitive issues to life – instead of hearing teacher talk, can see visual Ownership of learning
	Negative consequences for student learning	Tendency to think only what's on screen important- ignores class discussion Can become too excited, unsettled Can be source of distraction Can lose students' attention/interest if technology isn't working Loss of interest in reading Loss of research skills, formal writing skills, skills of analysis and synthesis Dependency on ICT – loss of focus/interest when not present Does not work for all students Plagiarism – copy and paste mentality
Motivational Effects	Interest captured	Generates genuine interest in subject Generates greater student interest Captures students' interest, grabs attention Excites learners Increased participation/involvement

Category	Sub-Category	Emergent Themes
	Student engagement	More attentive Increased enthusiasm Appeals to/reaches more students Intrigues them, more appealing to them Less distracted, less disruptive behaviour Keeps students focused Keeps them on task More willing to participate Much more engaged
Emotional Effects	Emotive value	Less intimidating environment for weaker students Helps to reach those students who would normally withdraw Helps weaker students – draws them into class Able to evoke emotional response -empathy in students Evokes different response from different students – different perspectives
Management of teaching	Planning and Preparation	More preparation time needed - takes more time to prepare lesson Requires a more thoughtful, critical approach to lesson planning Preparation not as tedious and demanding Reduces amount of work to prepare Demands flexibility, creativity Gives teacher avenue to be creative – have to put more thought into planning Back-up plan in case of technical glitches More focused in terms of preparation - more methodical in approach Useful for preparing assignments, exams Easier lesson planning Always on look out for new interesting events online to incorporate in lesson Access to wider range of resources Access to different perspectives via net Has impacted positively on all areas of teaching
	Organisation	Requires better time management Requires greater organization Good for managing information Better management Better organised

Category	Sub-Category	Emergent Themes
		Improved record keeping Easier to build a resource bank Build a resource bank of lessons – makes future preparation easier
Motivational effects	Teacher interest, engagement	Increases and holds teacher interest – adds dynamism Increases teacher enthusiasm and excitement Teacher enthusiasm and excitement transferred to students Makes teacher more engaged Improves teacher confidence Greater teacher interest and motivation Greater enjoyment for teacher
	Technical competence	Initially resented having to use it; now sees value of it Lack of technical know-how created problems Can be unnerving; puts teacher out of comfort zone Confidence develops with practice and proficiency
	Impediments to use	Technical glitches Time constraints Length of period No. of periods per week Set up time reduces teaching time Loss of class time due to set up or technical problems time to prepare lesson using ICT Slows down lesson Nature of content – too theoretical Access to equipment; availability of rooms Over-enthusiasm can create classroom management issues When it becomes more entertainment than edutainment Can be a distraction

Appendix E
Analysis of Data Stage 1 – Initial/Open Coding