

ICT INTEGRATION IN SECONDARY SCHOOL TEACHING  
AND LEARNING: AN ANALYSIS OF THE  
MAURITIAN CONTEXT

VANDANA R.VEERARAGOO

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## **ABSTRACT**

The integration of Information and Communication Technology (ICT) into the teaching and learning process has become the major focus worldwide. It is clear that students now expect ICT to be part of their learning experience. The purpose of this study was to determine the level of ICT integration in the teaching and learning process among secondary educators in Mauritius and explore their attitudes towards ICT integration. The Diffusion of Innovation theory (Rogers, 1995) served as the main theoretical framework for this study.

A quantitative research design was used in this study. The constructs are namely: usage of ICT in daily lives, perceived competence, ICT integration, attitudes, barriers and early or late adopters. The data were analyzed using both descriptive and inferential statistics for the quantitative data. To complement the findings and for triangulation purposes, semi structured interviews were conducted. A thematic approach was adopted to analyze the data. The findings confirmed those reported in the literature. A majority of educators have adequate knowledge of using ICT. Mauritian secondary educators' attitudes towards ICT integration from highest to lowest in mean scores were: observability, relative advantage, complexity, and compatibility. They had moderate positive computer competence. However, low level of ICT supported teaching due to lack of infrastructure facilities and resources were found. The educators require training on ICT integrated pedagogical approaches. Educators indicated that the lack of time, their uncertainty, the unsuitable curriculum, the problematic access to equipment, the

frequent technical problems and the lack of immediate technical support are some of the most significant factors affecting ICT use. Nevertheless, the study shows that there is a positive ground on which ICT can be successfully and meaningfully integrated in schools if educators have positive ICT attitudes and have quality ICT training. A profile of the Mauritian educators is presented and recommendations based on the research findings are discussed.

The ongoing reform of the educational system provides a great opportunity to set up the right conditions that will facilitate the sound integration of ICT in secondary schools in Mauritius.

## APPROVAL PAGE

I certify that I have supervised /read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, as a thesis for the fulfilment of the requirements for the degree of Doctor of Philosophy.

Prof Dr Nor Aziah Alias  
Director of Academic Development, Academic Affairs  
Universiti Teknologi MARA  
Supervisor

### **Examination Committee:**

Dr Sulaiman Hashim  
Assistant Professor, Kuliyah of Education  
International Islamic University Malaysia  
Examiner

Assoc Prof Dr Johan Eddy Luaran  
Senior Lecturer, Faculty of Education  
Universiti Teknologi MARA  
Examiner

Dr Soon Seng Thah  
Director, Centre for Research and Innovations  
Open University Malaysia  
Examiner

Prof Dr Siow Heng Loke  
Dean, School of Graduate Studies  
Asia e University  
Chairman, Examination Committee

This thesis is submitted to Asia e University and is accepted as fulfilment of the requirements for the degree of Doctor of Philosophy.

Prof Dr John Arul Phillips  
Dean, School of Education & Cognitive Science  
Asia e University

Prof Dr Siow Heng Loke  
Dean, School of Graduate Studies  
Asia e University

## DECLARATION

I hereby declare that the thesis submitted in fulfillment of the PhD degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which may result in my expulsion from the programme and / or exclusion from the award of the degree.

Name of Candidate: VANDANA R. VEERARAGOO

Signature  
Candidate:

of



Date: September 2018



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## **LIST OF ABBREVIATIONS**

ICT	Information and Communication Technology
MOEHR	Ministry of Education and Human Resources
BECTA	British Educational Communications and Technology Agency
DOI	Diffusion of Innovation
EHRSP	Education and Human Resources Strategy Plan
NICTSP	National Information Communication Technology Strategic Plan
UNESCO	United Nations Educational, Scientific and Cultural Organization
OECD	Organization for Economic Co-operation and Development
SPSS	Statistical Package for the Social Sciences

## **CHAPTER 1.0 INTRODUCTION**

### **1.1 Introduction**

This research was about investigating the level of information and communication technology (ICT) integration in Mauritian secondary schools in Mauritius. It is an island found in the Indian Ocean. It is a multi-racial country and English is the official medium of classroom instruction. The research was concerned mainly with investigating issues involved with integrating technology in teaching and learning. The background to the study problem, the objectives and significance of the study are described in this chapter. In addition, it states the research questions, the conceptual framework, methods of research and definition of terms used in this study, and the last part gives an overview of the thesis organization.

### **1.2 Background of the Study**

Information and Communication Technology has brought a robust change in society. It has influenced economic and social sectors and has helped to connect the whole world. ICT has also produced a glittering change in both teaching and learning. According to UNESCO (2013), ICT can be describes as a tool to be used in the education process which can add, enhance and transform the teaching and learning process. ICT can provide access to all kinds of global resources and can facilitate secure collaboration in with modern world education. Parvin (2013) describes ICT as a valuable tool that allows for

sharing of different materials among teachers and students. This helps teachers to discuss their ideas about innovative classroom practices and share their experiences.

Information and Communication Technology has brought about a transformation in society. It has become an important resource for both teaching and learning. UNESCO (2013) describes ICT “as a tool of education which can complement, enrich and transform education for the better”. According to policymakers around the world, integrating ICT in education will enhance both the educational and pedagogical outcomes, which will be of benefit to both the learners and teachers (Jimoyiannis and Komis, 2007; Vieluf et al., 2012).

ICT integration in the classroom provides the learners with the 21<sup>st</sup> century competencies. Kler (2014) identified ICT as an effective medium with ability to improve instructive communication between the teacher and the learner in a classroom equipped with appropriate ICT tools. The advent of the digital age has transformed every aspect of human life. According to Jimoyiannis (2010), true learning in the 21<sup>st</sup> century requires that the learners use ICT both for improving memorization and problem solving in the real world. Technology is constantly evolving and the new technology needs to be introduced and used in the classrooms for instance, encouraging students to access resources and to learn independently so that so that the learning experience for students is improved. (Kelly, McCain and Jukes, 2013). According to Akbulut, Kesim, and Odabaşı (2007), ICT can be used for different purposes, it can be used for research, for

problem-solving, for creative purposes and for teaching and learning. It can improve teaching and learning by enriching the curriculum to be taught, improving delivery of the content and finding new methods of presenting information (Rather and Kuraishy, 2015). According to Wagner (2010), the focus needs to be towards 'learning how to learn', and lifelong learning, as the technological tools used today will rapidly be outdated as technology continues to advance. According to Montaser, Mortada, and Fawzy (2012), teachers need to ensure that ICT tools. This means that ICT is transforming the teaching and learning process. As compared when using the traditional methods, using new technologies in the classroom would transform the classroom from a teacher-centered approach to a learner-centered approach of teaching. This would lead also to more interactive classes.

ICT integration in education is a key component of many educational reform agendas worldwide (Aesaert, Vanderlinde, Tondeur, and van Braak, 2013). A significant number of studies have concluded that using ICT in education can enhance the motivation level of the students, can promote lifelong learning and help learners to communicate creatively (Webb, 2005; Howell 2012). Goffrey (as cited in Sang, Valcke, van Braak and Tondeur, 2011) summarize that using ICT in education provides the opportunity to the learners to have several views on different issues, to develop knowledge and to cater for learners with different abilities. ICT helps learners to solve the complex and real-world problems which helps both the society and the economy of a country (Goswami, 2014).

The use of ICT cannot be avoided as it enhances teaching and learning. It makes students more motivated and take control of their learning (Blackmore, Hardcastle, Bamblett and Owens, 2003) and this will lead to flexible learning (Ali, Haolader and Muhammad, 2013). Moreover, integrating technology in teaching has shown to provide numerous opportunities for both teachers and their learners (Salehi and Salehi, 2012). Moreover, Watson & Watson, (2011) stated that technology has been recognized to be a creative tool of that can be used in the teaching and learning process, which allows for student-centered teaching, which is seen to be beneficial for the learners.

Although there are debates regarding the effectiveness of technology in education, most researchers agree that ICT is an effective educational tool (Moradi and Khalkhali, 2008; Yunis, Koong, Liu, Kwan and Tsang, 2012). There are many benefits in using ICT in the classroom which are highlighted in various schools in Africa and beyond. In a study done in Ghana by Martins, Steil and Todesco (2009), they stated that one of the benefits is that ICT can help scaffold students' concrete learning experiences. Moreover, ICT accelerates active learning and higher order thinking, fosters cooperative learning, and provides individually tailored feedback. Similarly, Olise (2010) revealed that using computers are essential tools in the teaching and learning process as it provides opportunities to a wide range of curriculum activities. Son (2011) is of the opinion that the benefits of integrating ICT tools in education is that it provides learners with information and skills that they desperately need. Similarly, Tinio (2012) reported that for

integration of ICT to be a success, there are several factors including training of the teachers, curriculum development, school readiness to accept the changes, teacher skills and financing of the resources.

For ICT integration in the classroom, teachers need to adapt their teaching practices to suit the new trend in education, from a traditional style to a more interactive method, with the help of technology. In other words, this means that there is an increased need to develop teachers' practices and skills who can integrate ICT in the classroom. Kereluik, Mishra and Koehler (2010) stated that "teachers need to know how to integrate technologies into their teaching in ways that are flexible, tolerate ambiguity and connect to deep subject matter learning" (p. 392). According to Redecker (2009) and Wrenn (2016), a possible explanation for the lack of teachers' ability to integrate ICT fully in the classroom is that there is no system-wide effective and sustainable ICT integration in schools. Teachers are avoiding the use of ICT in classrooms and this is impacting on the pace at which ICT is being integrated in Mauritian schools. And in the cases where ICT is being used, it is either scarcely used or only used to supplement traditional and frontal teaching.

Innovative technology tools are a part of the educational technology landscape. However, according to Gorder (2008), there are many factors involved for the effective integration of technology and the most important is the teachers' competency and ability to devise activities to meet learners' requirements. Further investigation of the literature

shows that different variables impact teachers' abilities to integrate technology. A study conducted by Miranda and Russell (2011) suggested relationships between several factors for teacher-directed technology use in the teaching process. These factors included: technology experience, positive technology beliefs, integration obstacles, pressure relating to technology use, principal's technology use, the availability of technology and technology standards. In the classroom, teachers' beliefs play a role in determining whether s/he will use technology in the classroom.

ICT integration will only be effective if brings about certain benefits in the classroom such as facilitating and supporting the learning process, helping students reach learning outcomes, and motivating them to create, communication and collaboration in ways that were not possible before. The success of ICT integration mainly depends on having precise objectives, timely-framed goals, appropriate infrastructure, curriculum framework, assessment and evaluation systems, political and educational commitment at all levels (Vallance, 2008). For many schools, ICT integration means the distribution of ICT and software; consequently there is no change in the actual practice regarding teaching and learning. ICT integration does not take place effectively.

Integrating ICT in education has now become a requirement. It is no longer considered as an educational practice that can be used once a while in the classroom and as an add-on teaching approach (Pilkington, 2008). ICT has changed many aspects of our lives. Teachers are not focusing anymore on the decision whether to adopt ICT in