ROLE OF SOCIOCULTURAL CONTEXT IN TEACHERS' INFORMATION AND COMMUNICATION TECHNOLOGY INTEGRATION IN SELECTED PUBLIC PRIMARY SCHOOLS IN MALAYSIA

NOR ASIAH BINTI MOHAMAD@RAZAK

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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June 2019

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A tremendous capital expense for Information and Communication Technology (ICT) integration programmes including to train teachers does not guarantee that teachers integrate ICT in teaching in schools. According to a reports by the Malaysia's Ministry of Education (MOE), approximately 80% of teachers spent less than one hour a week integrating ICT in teaching. Similarly, United Nations Educational, Scientific and Cultural Organisation (UNESCO) reports revealed that teachers' ICT integration in Malaysian schools has not gone much further than the use of word-processing application as an instructional tool in teaching. Recent studies in Malaysia indicate that there was a minimal ICT integration in schools. Therefore, there is a need to understand why teachers' ICT integration in teaching in Malaysia is minimal despite pockets of promising practices on ICT integration programmes.

This study explores the role of sociocultural context on teachers' ICT integration in Malaysian public primary schools on the success of ICT integration. To understand the different sociocultural contexts, this study employs the Cultural-Historical Activity Theory (CHAT) to explore the 'mediators' of different sociocultural contexts that influence teachers' ICT integration in teaching. This study also sought to explain how the 'contradictions' and the causes of the 'contradictions' in different sociocultural contexts that hinder teachers' ICT integration in teaching. Lastly, this study explains how 'contradictions' within the different sociocultural contexts that influence teachers' ICT integration in teaching are resolved.

This study utilised a qualitative methodology with a multiple-case study approach. A research paradigm employed was social constructivism. CHAT was employed as an analytic lens which incorporates Activity Systems Analysis (ASA) to analyse three intertwined contexts (classroom, department, school) of ICT integration activities related to teachers in three activity settings. Three levels of in-depth-interviews were used for primary data collection to acquire the participants' experiences in the school's

social environments. A within-case analysis, utilising qualitative content analysis incorporates the 'inductive category formation technique' to navigate each case study data in order to construct the categories. For constructing the themes, a cross-case analysis utilised the constant comparative technique to observe similarities and differences, and typicality and diversity between both cases. This study also discussed the trustworthiness of the data to ensure the rigor and robustness of the study is ensured. One of the strategies for trustworthiness that used in this study was triangulation. One of the triangulation techniques to validate the primary data collection that used in this study were non-participant observations, field notes, and document analysis.

The findings of the study revealed three 'mediators' within different activity systems in a school's sociocultural context that influenced teachers' ICT integration in teaching: 1) types of tools in the school, 2) rules and regulations in the school that shape the ICT culture, and 3) division of labour in a collective context of the school community. The findings also uncovered three themes for existing 'tensions' and resolving 'tensions'. Three themes for 'contradictions' and causes of 'contradictions' categories involve the inadequate schools' ICT facilities due to financial constraints, failure to commit to the schools' regulations due to time constraints, and failure to comply with the schools' regulations due to resistance to change. The three themes for the resolutions of 'contradictions' category is assisted performance, sharing ideas, and distributed leadership style.

In conclusion, school stakeholders should work hand-in-hand to resolve uprising tensions and reckon their respective roles in working to ensure the success amidst teachers to integrate ICT in teaching. The most influential role reflects the leadership styles that place focus on distributed leadership, which serves as a catalyst in influencing the teachers to integrate ICT. This study points to several relevant implications for policymakers, school administrators, and teachers in shared ownership to address the 'contradictions', as well as the causes of 'contradictions', in varied sociocultural contexts that affect teachers to integrate ICT towards successful ICT integration across schools. Integrating ICT in teaching is not without its own set of drawbacks, wherever and whenever issues arise, efforts from the school community, including alumni and local business owners, which offer strong social and financial support. Leadership quality in distributed leadership style adopted by both headmasters and ICT coordinators in transferring their duties to their subordinates to manage ICT integration activities has also led the teachers to succeed in integrating ICT across schools. Despite the scarcity of this particular subject matter, this study has put forward crucially sought lessons for successful implementation of ICT integration, from which other schools that share similar characteristics and contexts may benefit.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

PERANAN KONTEKS SOSIAL DAN BUDAYA DALAM INTEGRASI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI GURU DI SEKOLAH RENDAH AWAM TERPILIH DI MALAYSIA

Oleh

NOR ASIAH BINTI MOHAMAD@RAZAK

Jun 2019

Pengerusi: Profesor Madya Habibah binti Ab Jalil, PhD
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Perbelanjaan modal yang begitu besar untuk program integrasi teknologi maklumat dan komunikasi (TMK) termasuk untuk melatih guru tidak menjamin bahawa guru akan mengintegrasikan TMK dalam pengajaran di sekolah. Menurut laporan oleh Kementerian Pelajaran Malaysia (KPM), kira-kira 80% guru menghabiskan kurang dari satu jam seminggu untuk mengintegrasikan TMK dalam pengajaran. Begitu juga laporan Pertubuhan Pendidikan, Saintifik dan Kebudayaan Pertubuhan Bangsa-bangsa Bersatu yang mendedahkan bahawa integrasi TMK dalam kalangan guru di sekolah-sekolah di Malaysia tidak lebih daripada penggunaan aplikasi pemprosesan perkataan sebagai alat pengajaran dalam mengajar. Kajian terkini di Malaysia menunjukkan bahawa terdapat integrasi TMK yang minimum di sekolah. Oleh itu, terdapat keperluan untuk memahami mengapa integrasi TMK guru dalam pengajaran di Malaysia adalah minimum walaupun terdapat banyak amalan yang dapat terjana daripada program integrasi TMK.

Kajian ini meneroka peranan konteks sosial dan budaya terhadap kejayaan integrasi TMK guru di sekolah rendah awam Malaysia. Bagi memahami peranan konteks sosial dan budaya, kajian ini menggunakan Teori Aktiviti Budaya dan Sejarah (TABS) untuk meneroka peranan 'pengantara' dalam konteks sosial dan budaya berbeza yang mempengaruhi integrasi TMK guru dalam pengajaran. Kajian ini juga cuba untuk menjelaskan bagaimana 'percanggahan' dan punca-punca 'percanggahan' dalam konteks sosial dan budaya yang berbeza menghalang integrasi TMK guru dalam pengajaran. Akhir sekali, kajian ini menerangkan bagaimana 'percanggahan' dalam konteks sosial dan budaya yang berbeza yang mempengaruhi integrasi TMK guru dapat diselesaikan.

Kajian ini menggunakan metodologi kualitatif berserta pendekatan kajian kes kolektif. Paradigma kajian yang digunakan ialah konstruktivisme sosial. TABS digunakan sebagai lensa analitik yang menggabungkan Analisis Sistem Aktiviti (ASA) untuk

menganalisis tiga konteks yang terjalin (bilik darjah, jabatan, sekolah) dalam aktiviti integrasi TMK yang berkaitan dengan guru dalam tiga penetapan aktiviti. Tiga seisi temuduga mendalam digunakan untuk pengumpulan data utama bagi memperolehi maklumat berkenaan pengalaman peserta dalam persekitaran sosial sekolah yang sedia ada. Bagi analisis data, analisis kandungan kualitatif digunakan yang menggabungkan 'teknik pembentukan kategori secara induktif' untuk menelusuri data setiap kajian kes bagi pembinaan kategori. Untuk pembinaan tema, analisis silang kes menggunakan teknik perbandingan tetap bagi mencerap persamaan dan perbezaan, serta kelaziman dan kepelbagaian antara kedua-dua kes. Kajian ini juga membincangkan kebolehpercayaan data bagi memastikan ketepatan dan keteguhan kajian. Salah satu strategi untuk memastikan kebolehpercayaan kajian ialah melalui triangulasi. Teknik triangulasi yang digunakan untuk mengesahkan pengumpulan data utama dalam kajian ini adalah dengan membuat pemerhatian tanpa serta, nota lapangan, dan analisis dokumen.

Dapatan kajian ini mendedahkan tiga 'pengantara' dalam sistem aktiviti yang berbeza bagi konteks sosial dan budaya sekolah yang mempengaruhi integrasi TMK guru dalam pengajaran: 1) jenis alat yang ada di sekolah, 2) peraturan di sekolah yang membentuk budaya TMK, dan 3) pembahagian kerja dalam konteks yang kolektif untuk komuniti sekolah. Dapatan juga menemui tiga tema untuk 'percanggahan' sedia ada dan penyelesaian 'percanggahan'. Tiga tema bagi kategori 'percanggahan' dan punca-punca 'percanggahan' melibatkan kekurangan kemudahan TMK sekolah disebabkan oleh kekangan kewangan, kegagalan untuk mematuhi peraturan sekolah disebabkan oleh kekangan masa, dan kegagalan untuk mematuhi peraturan sekolah disebabkan oleh keengganan seseorang untuk berubah. Tiga tema untuk kategori resolusi 'percanggahan' ialah prestasi berbantu, pengkongsian idea, dan gaya kepemimpinan teragih.

Kesimpulannya, pihak berkepentingan sekolah perlu bekerjasama untuk menyelesaikan 'ketegangan' dan tahu peranan mereka dalam bekerja untuk memastikan integrasi TMK guru dalam pengajaran berjaya. Peranan yang paling berpengaruh adalah gaya kepemimpinan yang memberi tumpuan kepada kepimpinan yang diagih-agihkan, yang bertindak sebagai pemangkin dalam mempengaruhi integrasi TMK guru. Kajian ini memberi implikasi yang relevan kepada pihak-pihak pembuat dasar, pentadbir sekolah, dan guru sebagai pemilikan bersama bagi menangani 'percanggahan' dan punca-punca 'percanggahan', dalam konteks sosial dan budaya yang berbeza yang mempengaruhi kejayaan integrasi TMK guru di sekolah. Integrasi TMK guru dalam pengajaran bukanlah bebas daripada ketegangan kerana di mana-mana dan bila-bila masa sahaja timbulnya isu. Usaha daripada komuniti sekolah, termasuk alumni dan pemilik perniagaan tempatan, boleh memberi bantuan sosial dan kewangan yang mantap. Gaya kepemimpinan teragih yang diamalkan oleh guru besar dan penyelaras TMK adalah dengan memindahkan tugas kepada pihak bawahan mereka dalam mengurus kegiatan integrasi TMK telah menyebabkan guru-guru mencapai kejayaan dalam mengintegrasikan TMK di sekolah-sekolah. Walaupun skop kajian ini adalah terhad, ia memberi pengajaran penting untuk kejayaan pelaksanaan integrasi TMK yang dapat dikongsi oleh sekolah-sekolah lain yang mempunyai ciri-ciri dan konteks yang sama.

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Declaration by graduate student

I hereby confirm that:

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Signature: _____
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LIST OF ABBREVIATIONS

ADSL	Asymmetric Digital Subscriber Line
ASA	Activity Systems Analysis
AT	Activity Theory
CEC	Commission of the European Communities
CHAT	Cultural-Historical Activity Theory
EPRD	Educational Planning and Research Division
ETD	Educational Technology Division
GEG	Google Educator Group
GT	Grounded Theory
ICT	Information and Communication Technology
IWB	Interactive Whiteboard
LINUS	Literacy and Numeracy Screening
LMS	Learning Management System
MDEC	Malaysia Digital Economy Corporation
MOE	Ministry of Education
MSC	Multimedia Super Corridor
OECD	Organisation for Economic Cooperation and Development
PAK21	*Pembelajaran Abad Ke-21* / 21st-century learning
PTA	Parent Teacher Association
SSQS	Smart School Qualification Standards
TABS	Teori Aktiviti Budaya dan Sejarah
TICKIT	Teacher Institute for Curriculum Knowledge about Integration of Technology
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VCL	Virtual Chemistry Laboratory
VLE	Virtual Learning Environment
VSAT	Very Small Aperture Terminal technology

CHAPTER 1

INTRODUCTION

1.1 Introduction

Malaysia is one of the countries in Southeast Asia with the highest expenditure on education. The capital expenses for Information and Communication Technology (ICT) programmes including to train teachers for ICT integration in teaching are approximately RM6 billion (Ministry of Education [MOE], 2013, 2018). These expenses have been put to use through many phases in ICT integration programmes since the 1980's, will be discussed in Section 1.2.1. Despite a tremendous amount of capital spent on the programmes, it is pertinent to investigate why there has been minimal teachers' ICT integration in their teaching. The Malaysia's MOE reported that approximately 80% of teachers spent less than one hour a week integrating ICT in teaching (Educational Technology Division of Malaysia [ETD], 2017; MOE, 2013, 2018). It added that Malaysia's ETD endorsed a list of schools with different levels of ICT integration, ranging from 1-star (lowest) to 5-star (highest) to portray the implementation of ICT integration in each school based on Smart School Qualification Standards (SSQS). In 2016, thirteen out of 212 primary schools from the federal territory of peninsular Malaysia were awarded with 5-star. As only few primary schools received the 5-star recognition, it is imperative to explore why that certain schools are more prominent than others for ICT integration in teaching. Thus, the researcher seeks to investigate how the social environment within selected schools influences teachers in integrating ICT as of how it leads to the schools to be successful ICT integration. It is hoped from this study the researcher be able to address the concern on minimal teachers' ICT integration in teaching.

1.2 Background of the Study

The globalisation in the 21st-century has brought about changes in the education system. Generally, for human beings, changes take place in working conditions, handling and exchanging of information, scientific research and accessing and creating of knowledge. The globalisation changes increase mediated by technology, especially ICT that is emerging (Mikre, 2011). As such, ICT can be seen as 'tool mediation' for human to communicate and collaborate in a globalising technological world. From a sociocultural perspective, Luria (1928, p. 493) claims that "man differs from animals in that he can make use of tools" and Vygotsky (1978) claims the 'tool mediation' is human beings' use of 'tools' to mediate their action within their social environments. For example, the Internet mediates millions of people all over the world via web technology for any purpose such as to share and access knowledge (Clements & Sarama, 2007). The great role of the Internet is mediating everyone to search for

information at any time, anywhere with a finger click for sharing and creating knowledge, and for obtaining immediate responses.

ICT integration involves the utilisation of technological tools that can facilitate teachers to be innovative and effective in teaching while allowing students to learn at their own pace in creating knowledge. Various studies have documented the impact of global ICT integration on every level of the school community, including students, teachers, peers, and experts, in the process of acquiring, creating, and sharing knowledge (Donnelly, McGarr & O'Reilly, 2011; Nishant, 2016; Sultan, Woods & Koo, 2011). New learning environments can support knowledge sharing and learning collaboration through the use of computers (Anderson, 2008). ICT integration in schools does not just occur within the school walls, but beyond the classroom due to the availability of technologies that connect students with teachers, peers, and experts across vast distances at any time. Students can access educational resources, such as interactive subject contents with multimedia, communicate through social media platforms like Facebook and Twitter, and participate in active and collaborative learning through applications like ZohoWriter and Google Hangout messenger (Nishant Gunjan, 2016; Parycek, Sachs, & Schossböck, 2011; Tay, Lim, Lim, & Koh, 2012).

There are two types of policy implementation barriers for ICT integration in education in the developed and developing countries: first-order and second-order barriers. These barriers hinder teachers' ICT integration resulting in minimal ICT integration implementation in schools (for first-order barriers, see Divaharan & Lim, 2010; Laferrire et al., 2013; Lim, 2007; Rabah, 2015) and (for second-order barriers, see Al-zaidiyeen & Mei, 2010; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012; Giavrimis, Giossi, & Papastamatis, 2011; Teo, 2011). According to Ertmer et al. (2012), first-order barriers are "external to the teacher" such as technology resources, training, and support, while second-order barriers are "internal to the teacher" such as "teachers' confidence, beliefs about how students learned, as well as the perceived value of technology to the teaching and learning process" (p. 423). In conjunction with the sociocultural perspective, this study focuses on first-order barriers that hinder or influence teachers' ICT integration in teaching in Malaysia in order to gain an in-depth understanding of the existing schools' stakeholders and the environment in teachers' ICT integration in teaching.

1.2.1 ICT Integration in Malaysia

The Malaysia's MOE began spent in technological facilities in the 1980's for infra and infostructure. The first ICT programme was the formation of the Malaysia's MOE-MIMOS Joint Committee in 1986, which marked the initiation of broad-based computer usage in Malaysian schools. From 1999 to 2010, the Malaysia's MOE spent more than RM6 billion on ICT in educational programmes. Majority of the investment was to build computer lab in every school, with the cost of approximately RM 5.1 billion (MOE, 2013). The Smart School, also known in Malaysia as *Sekolah Bestari*,

has cost approximately RM 2.1 billion which ends in 2005 (Ali, Nor, Hamzah, & Alwi, 2009). These spendings were some of the most capital-intensive investments in Malaysia.

The Malaysia's MOE encouraged schools to participate in the Smart School project by developing an instrument to benchmark the ICT utilisation of the Smart School. This instrument is known as the SSQS. The 'star ranking' system was used to appraise each school based on four variables: utilisation (40%), human capital (40%), applications (10%), and technology infrastructure (10%). Approximately 10,000 schools were encouraged to achieve the minimum requirements of 3-star for each Key Performance Indicator (KPI) of the four variables, in order to qualify the title of a 'Smart School'. The performance indicators were used to reflect how ICT have been used, that is, not only as a basic operational tool, but also as 'tool mediation' for educational sectors. ICT mediate educational institution in the development of creativity, interactivity, collaborative learning, critical thinking, and problem-solving (Frost & Sullivan, 2010; Multimedia Super Corridor [MSC], 2009). However, the Smart School project was not driving transformation sustainability due to the time factor, course contents, and technical malfunctions during the process of implementation of ICT integration in the curriculum (Zah, Ali, & Nor, 2010).

In 1998, the Malaysia's MOE launched SchoolNet project, a website or portal containing teaching and learning materials for easy access to all teachers and students. Teachers and students used the Internet as a medium in the classroom activities. However, the Malaysia's MOE terminated the SchoolNet project in 2012 due to low Internet access. Then, in 2013 1BestariNet took over the goal of the SchoolNet project to sustain classroom activities with quality Internet access.

As discussed early in this section, the Malaysia's MOE has invested a huge capital in various ICT integration programmes in schools to improve the quality of education. Although some projects succeeded, most of the projects were suspended, terminated, appealed or failed, caused by schools' infrastructure, ICT facilities, Internet connection, and human factor. These histories indicate a need to understand teachers' activities related to ICT integration in teaching as Lim et al. (2013) argue that the effectiveness of ICT integration depends on the people, processes, culture, and structure of the environment in which the ICT integration is situated. However, understanding teachers' activities solely will not give an in-depth understanding, as teachers are not considered independent but situated within their social environment (Vygotsky, 1978). Thus, it is vital to explore how the social environment in an entire school may influence or hinder teachers' ICT integration leading to the success or failure of the ICT integration in the school.

1.2.1.1 Leveraging ICT to Scale Up Quality Teaching Across Malaysia

In 2011, the Malaysia's MOE took a serious action by undertaking a comprehensive review of its education system and introducing Education Blueprint 2013-2025, which

incorporates the plan to raise the ICT integration in the entire education system. This blueprint also mentions ICT integration as one of the main focuses, which is leveraging ICT to scale up quality learning across Malaysia. Figure 1.1 depicts the roadmap in leveraging ICT for teaching and learning, which consists of three waves. Wave One (2013-2015) is enhancing the foundation, Wave Two (2016-2020) is introducing ICT innovations, and Wave Three (2021-2025) is maintaining innovative, system-wide usage (MOE, 2013).

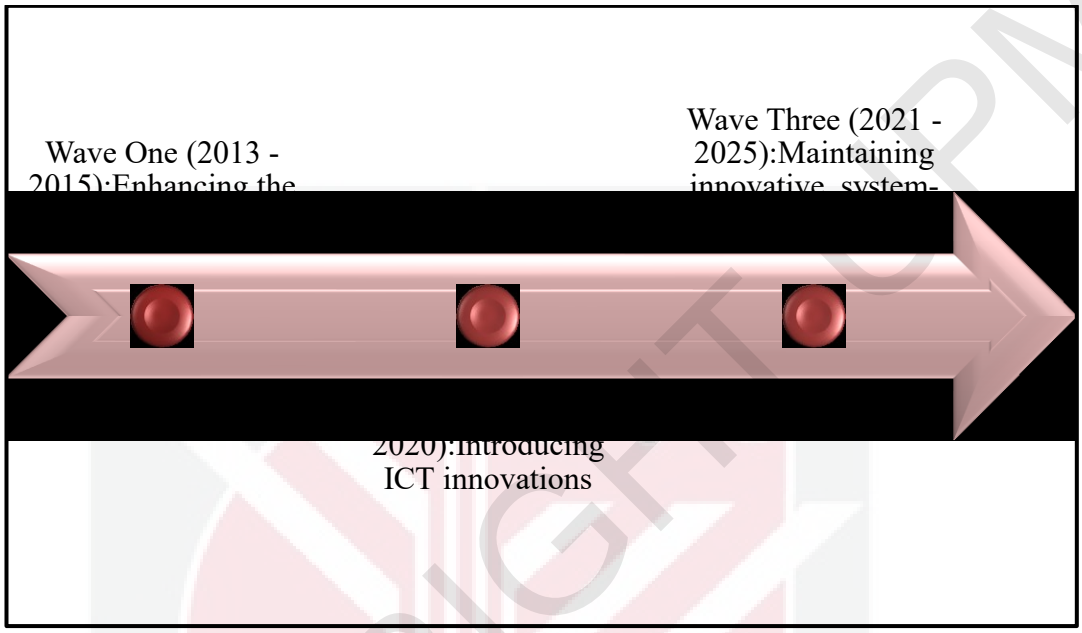

Figure 1.1: The roadmap for Leveraging ICT for Teaching and Learning

In 2013, the Malaysia's MOE instructed all schools to officially qualify as "Smart Schools" by achieving minimum standards in ICT utilisation, capability, availability of infrastructure, and applications in integrating ICT into the teaching and learning process (MOE, 2013). The MOE introduced 1BestariNet under Wave One of the Malaysian Education Blueprint 2013-2025, aiming to equip all public schools, encompassing approximately 10,000 primary and secondary schools across Malaysia with high-speed 4G Internet access and a Frog Virtual Learning Environment (VLE) called Frog VLE (Xchanging, 2014).

By the end of Wave One in 2015, a total of 8,940 schools nationwide were connected to 1BestariNet (MOE, 2015). According to the Malaysia's MOE (2016), a total of 6,695 (67%) schools were connected to high-speed Internet access while 2,245 (23%) schools were connected using Asymmetric Digital Subscriber Line (ADSL) or Very Small Aperture Terminal technology (VSAT). For ensuring the users able to enjoy a better experience with Frog VLE that connected through the ADSL or VSAT in schools, Phase 2 of the 1BestariNet introduced a Frog Appliance device. The device provided access to its content within the intranet environment without having to access the Frog VLE via the Internet. This connectivity helps to improve the delivery of

quality education to a wider reach especially under-served groups such as in rural and remote areas, and under-enrolled schools.

1.2.1.2 ICT Integration in Teaching in Malaysia

ICT integration in teaching in Malaysia can be manifests through the implementation of 21st-century learning programme, also known in Malaysia as *Pembelajaran Abad Ke*-21 (PAK21) (MOE, 2013). The PAK21 emphasis on student-centred learning based on the four skills comprising communication, collaborative, critical thinking, and creativity. These skills can be achieved with the help of ICT to support teachers in their teaching. Malaysia's MOE has been launched the pilot of PAK21 programme in 2014. In 2015, the successful PAK21 scaled up nationwide. For implementing the PAK21, the first effort by Malaysia's ETD is providing the material for EduWebTV in 2008. To date, there are 865 programmes TV has been produced for teaching purposes, consist of 440 for secondary school and 425 for primary school. According to Malaysia's ETD, programme producers total up to about 50 comprising 20 from Malaysia's MOE; 15 from Astro Tutor Channel; and 15 from other freelance production houses namely World Summit on Media for Children Foundation (ETD, 2017). Learning management system (LMS) was also introduced to schools in 2008. LMS is a web-based application to support teachers in their teaching. In 2013, there are 120 schools ware used digitised material in LMS for integrating into teaching (Keling, Madar, & Salam, 2013).

In 2013, the Malaysia's MOE had provided Frog VLE through the 1BestariNet initiative. Frog VLE is an online learning platform which is flexible and mobile, benefits 5.5 million students, 500,000 teachers, and 4.5 million parents. Frog VLE enables teachers to share educational materials, online assignments, learning sites, and digital textbooks with their students (Xchanging, 2014). Frog VLE also allows accessing free content from well-known providers such as YouTube and Discovery Channel for use in lessons and homework at any location within Malaysia (Xchanging, 2014). In 2015, more than 30,000 content materials were uploaded onto the Frog VLE and as of year-end, the total number of first time logins onto the Frog VLE was over 2.7 million. The percentage of students and teachers that logged onto the Frog VLE was very encouraging at 91.3%. Teachers and students were able to experience various activities via Frog VLE for teaching and learning purposes (Xchanging, 2014). For example, teachers used Frog VLE to build engaging lessons, download and share resources with other teachers. Meanwhile, students used Frog VLE to access learning materials and gain the latest information from teachers (ETD, 2017).

1.2.2 Different Sociocultural Contexts Influencing Teachers' ICT Integration in Teaching

Teachers need be the central focus in this study as they are the implementers who can claim a large stake in the success of the ICT integration process in schools. As explained in Martin (2000), teachers play an important role in successful ICT

integration in schools in that “without the input and acceptance of teachers, the developments of useful educational technology projects are hindered”. Martin also mentioned that “not only teachers are the gatekeepers of the classroom, but they are also the greatest source of information about curriculum design and educational content” (p.8). However, studies of the interaction between teachers and ICT integration are not sufficient. Salomon, Perkins, and Globerson (1991) claim that studies of ICT integration must explain the interaction of the “whole cloud of correlated variables – technology, activity, goal, setting, teacher’s role, culture – exerting the combined effect” (p8). Thus, there is a need to study teachers’ ICT integration within their social environment which is a study of ICT integration activities related to teachers in the entire school’s environment. Vygotsky's (1978, 1997) sociocultural theory emphasises the interrelatedness between an individual and the social environment to mediate his/her action. Thus the stance in a sociocultural perspective is appropriate in studying teachers’ ICT integration.

The present study is conceptualised based on the assumption that sociocultural factors may influence or hinder teachers’ ICT integration as teachers are not independent but share within the social environment in implementing ICT integration in teaching. In this study, the social environment is the school as an organisation in which the teachers function. The environment in the school with regard to ICT integration includes ICT facilities provisions, department culture, support structure from the management and stakeholders. For influencing teachers’ ICT integration in teaching, the 'tools' are needed to mediate the ICT integration process. This is because, as claimed by Luria (1928, p. 493), from a sociocultural perspective, "man differs from animals in that he can make use of tools”. The ‘tools’ represent mediators (see Michael Cole, 1996; Jonassen, 2000; Vygotsky, 1978) that mediate the process of ICT integration in schools. The roles of the mediators cannot be ignored. As Nardi (1996) points it out, "an activity cannot be understood without understanding the role of mediators in everyday existence, especially the way that mediators are integrated into social practice” (p.14). Adopting the sociocultural third-generation of Activity Theory (AT) or Cultural-Historical Activity Theory (CHAT) perspectives, mediators are conceptualised as three components of an activity system that mediate the activity within the ‘community’, ‘subject’ and ‘object’, namely the ‘tools’, ‘rules’, and ‘division of labour’ (Engeström & Miettinen, 1999; Jonassen, 2000; Kuutti, 1996; Vygotsky, 1997; Yamagata-Lynch, 2002). For example, the school provides regulations (mediator: rules) to govern the ICT facilities (mediator: tools) for teaching purposes. Nevertheless, the rules hinder teachers' ICT integration when teachers could not comply and be responsible for the regulations (rules) that the school has established. In order to influence the teachers’ ICT integration, the headmaster himself monitored all the management procedures (rules) to ICT facilities (tools). This explanation reflects the headmaster duties (division of labour) act as a mediator to achieve the goal of the school.

Teachers' ICT integration in teaching is hindered if a ‘contradiction’ exists, which can demotivate their enthusiasm. According to Lim et al. (2011), contradictions exist in the form of ‘tensions’ to achieve the object and transform it into desired outcomes, and

also as emerging dilemmas, disturbances, and conflicts (Engeström, 2001). If the resolutions of contradictions do not occur, the teachers are hindered to integrate ICT as the tension inhibit them to implement ICT integration in teaching (Al-zaidiyeen & Mei, 2010; Ertmer, 1999; Hamzah, Embi & Ismail, 2010; Mukti, 2000).

Sociocultural scholars emphasise the need to study the whole intertwined play of events that take place in the context where ICT integration takes place (Cole & Engestrom, 1993; Lim, 2002). Adopting the CHAT perspective, the present study is conceptualised based on the assumption that different sociocultural contexts influence or hinder teachers' ICT integration in teaching. Using the CHAT as a theoretical framework and Activity Systems Analysis (ASA) as a methodology, the study explores multiple stakeholders and multi-layered activities of ICT integration that are related to teachers' ICT integration in teaching.

1.3 The Statement of Problem

A tremendous capital expense for ICT integration programmes including to train teachers does not guarantee that teachers integrate ICT in teaching in schools. These expenses have been put to use through many phases in ICT integration programmes since the 1980's, as discussed in Section 1.2.1. According to a reports by the Malaysia's MOE, approximately 80% of teachers spent less than one hour a week integrating ICT in teaching. Similarly, United Nations Educational, Scientific and Cultural Organisation (UNESCO) reports revealed that teachers' ICT integration in Malaysian schools has not gone much further than the use of word-processing application as an instructional tool in teaching (ETD, 2017). Recent studies in Malaysia indicate that there was a minimal teachers' ICT integration in teaching (Umar & Hassan, 2015). Therefore, there is a need to understand why teachers' ICT integration in teaching in Malaysia is minimal despite pockets of promising practices on ICT integration programmes.

The existing literature on ICT integration demonstrates that a sociocultural context is a key to influencing teachers' ICT integration in teaching (Laferrire et al., 2013; Tearle, 2004). Previous study conducted mainly in advanced economies of Canada focuses on activity system in schools portrays how roles, rules, and activities within sociocultural context reflect how the school must change for successful ICT integration which influence ICT integration among teachers (Laferrire et al., 2013). Therefore, the purpose of this study is to explore the role of sociocultural context on teachers' ICT integration in Malaysian public primary schools with the highest level of ICT integration. In 2016, thirteen out of 212 primary schools from the federal territory of peninsular Malaysia were awarded with 5-star. Malaysia's ETD has endorsed a list of schools with different levels of ICT integration, ranging from 1-star (lowest) to 5-star (highest) to portray the implementation level of ICT integration in each school based on the SSQS (MSC, 2009). In conjunction with the sociocultural perspective, missing from Malaysian education system is an exploring of the 'mediators', namely tools, rules, and division of labour within a school's

environments, influence teachers' ICT integration in teaching. As only few primary schools received the 5-star recognition, it is imperative to explore why that certain schools are more prominent than others for ICT integration in teaching.

Previous studies show that a sociocultural context does not always bring the success to the school if the school's stakeholders fail to understand the root causes of the problems and resolve the problems for achieving the school's objective (Tay & Lim, 2016; Yamagata-Lynch, 2010). If the listed successful ICT integration conditions are neglected, contradictions that exist in the form of tensions may eventually prevent teachers from integrating ICT into their teaching. Based on the evolution of the prominent sociocultural theory, as elaborated in Section 2.5, the CHAT was adopted in this study to address the shortcomings noted in the first and second generations of AT. This is imminent to comprehend the aspect of cultural diversity with a strong emphasis on the contradicting notions that are intertwined in the varying sociocultural context, which are bound to affect teachers' ICT integration in teaching. This study also uses contradictions notion to explain the how school stakeholders' resolved the problems which can lead to the successful ICT integration in schools. Thus, the study seeks to understand the sociocultural context in the highest level of ICT integration schools that influence their teachers in integrating ICT. The findings could offer an answer to the minimal teachers' ICT integration in teaching.

1.4 Research Questions

As the research purpose is to explore the role of sociocultural context on teachers' ICT integration in Malaysian public primary schools with the highest level of ICT integration, the researcher was guided by three research questions and employed the CHAT to frame the research analysis. The research questions of the study are as follows:

1 What are the mediators within the different sociocultural contexts that influence teachers' ICT integration in teaching?
2 What are the contradictions and the causes of contradictions within the different sociocultural contexts that hinder teachers' ICT integration in teaching?
3 What are the resolutions of contradictions within the different sociocultural contexts that influence teachers' ICT integration in teaching?

1.5 Purpose of the Study

The purpose of present study is to explore the role of sociocultural context on teachers' ICT integration in Malaysian public primary schools with the highest level of ICT integration. To understand the role of sociocultural context, this study employs the CHAT to explore the mediators of different sociocultural contexts that influence teachers' ICT integration in teaching. This study also seeks to explain how the

contradictions and the cause of the contradictions in different sociocultural contexts that hinder teachers' ICT integration in teaching. Lastly, this study explains how contradictions within the different sociocultural contexts that influence teachers' ICT integration in teaching are resolved. The study employs qualitative case study methodology as it is concerned with a group of existing schools' stakeholders who are involved in the process of selected ICT integration in the highest level of ICT integration schools.

1.6 Significance of the Study

This research is thought to be significant for providing both theoretical and practical implications. This study may address the gap in the literature and adds value to the existing body of knowledge concerning the mediators and the resolutions of contradictions that influence teachers' ICT integration, and the contradictions and the causes of contradictions that hinder teachers' ICT integration in schools with the highest level of ICT integration. Using the CHAT as a theoretical framework and ASA as a methodology, the study explores multiple stakeholders and multi-layered activities of ICT integration that are related to teachers' ICT integration in teaching. As most of the studies that employ CHAT and ASA have been conducted in Western countries, this qualitative case study certainly contributes to the body of knowledge in the field of teachers' ICT integration and sociocultural factors that support the success of ICT integration in Malaysian public primary schools as an Eastern country. Studies utilising ASA as a research methodology is still lacking either in developed or developing countries (Yamagata-Lynch, 2010). Therefore, the current study, which focuses on three different sociocultural contexts (classroom, department and school), would add value to the existing body of knowledge pertaining education stakeholders in understanding how existing school stakeholders' diverse roles influence teachers' ICT integration leading to successful ICT integration in schools. For instance, the top management, namely headmasters and ICT coordinators who should demonstrate strong leadership skills, may serve as a role model to their subordinates in functioning as a catalyst for teachers to integrate ICT in their teaching. Other significant school stakeholders, including ICT teachers, technicians, and student IT representatives, should work as a team so as to enable fixture of technical failures that may occur before, during and after the integration of ICT into teaching.

From a practical point of view, this study would help schools' policymakers to reflect on their ICT integration strategies. They would understand what kind of support they should plan for their teachers as well as key personnel to make it possible for schools to have a successful ICT integration. The study aoffers insights into the strength of every school's stakeholders in achieving the school's success in ICT integration which they did not realise. Thus, this study would provide documentation for other schools to explore the strategies for helping teachers' ICT integration that can lead to successful ICT integration. This study also offers the strategies pertaining to how schools can manage 'tensions', problems, and failures in order to improve ICT integration activities to achieve the nation's goals. This study hopes to shed some light on enhancing future self and staff development in order to increase and improve the

level of ICT integration in teaching in Malaysia. At the same time, investments in technology can be spent wisely. Moreover, the Malaysia's MOE could continuously refine and revise the current practice for successful ICT integration as reflected in this study. Therefore, this study would be beneficial for a large number of education stakeholders who intend to change the Malaysian education system to be aligned with the international level.

1.7 Delimitations of the Study

The participants in this study are delimited to those from public primary schools in urban districts (i.e. federal territory) in Peninsular Malaysia. Only two types of Malaysian schools were selected based on the schools' achievement of being given a 5-star ranking (as reported by SSQS) in November 2016. The selection of schools was also based on the schools' willingness to cooperate and the ability to schedule the three sessions of in-depth individual interviews and observations. The participants selected were those equipped with the sought information.

The participants in this study are also delimited to teachers who teach Standard Two, Four, and Five, ICT teachers, head of units, ICT coordinators/media coordinators and headmasters from public primary schools. Standard Six teachers were excluded as they would be busy preparing and managing examination for their students. Standard One teachers were excluded as they may not have sufficient experience to reflect on ICT integration. As for Standard Three teachers, they are in the transition phase from the lower level to the second level. These groups of teachers might have uncertain information that may affect the researcher's investigation. In addition, this study focusses on ICT as 'tools' in supporting teaching process, rather than in supporting learning how to learn.

1.8 Limitations of the Study

This study is a qualitative case study that explores the process of ICT integration in Malaysian public primary schools that have been considered as successful. The purpose of this study and similar type is not to generalise the findings. The finding does not represent the Malaysian public primary schools as a whole. Qualitative researchers emphasise on in-depth understanding in a small number of schools and participants. Accordingly, the researcher makes no claims that the data from this study would reflect the experience of all schools in Malaysian public primary schools. However, the findings can offer an exemplar of the highest level of ICT integration for other schools to emulate as this area of study is still lacking (Lim et al., 2013). The schools can consider how the different sociocultural contexts may influence teachers' ICT integration in terms of support, challenges, and strategies.

In conjunction with other studies (e.g., Divaharan & Lim, 2010; Lim et al., 2013; Tondeur et al., 2008), the findings obtained from this study provide empirical data that support how ICT integration in schools can be successfully implemented and several insights for future research. Nevertheless, limitations exist that require further considerations. One limitation is the use of in-depth interviews, document analysis, and non-participant observation. The study could have benefitted from more prolonged observations or participant observations at each school to better understand the schools' culture and activities concerning ICT integration (Angrosino & Perez, 2003). However, the utilised methods of data collection were considered adequate for achieving the study purpose. The researcher did not focus on the interaction between students and teachers in the classroom, but rather the interaction within and between the different sociocultural contexts.

The ICT integration activities involve various stakeholders direct and indirectly. For instance, involvement by the headmaster, the ICT coordinator, and the ICT teachers in ICT integration activities can potentially influence teachers' ICT integration into teaching both direct and indirectly as MOE has an integral role in ascertaining that schools do adhere to the stipulated education policies. As such, this study drew upon the CHAT as an analytic lens by employing the Activity Systems Analysis (ASA) to assess the roles of school stakeholders in three activity settings that project their direct involvement.

1.9 Definitions of Terms

Information and communication technology (ICT) – The term ICT represents the "technological tools used to manipulate and communicate information, such as recording media (e.g., CDs/DVDs), broadcasting systems (e.g., radio, television), computing hardware and software (e.g., Personel Computer, World Wide Web, Web 2.0, email), and mobile networks devices (e.g., cell phones, smartphones)" (Aucoin, 2011, p.2).

For the purpose of this study, ICT is operationalised as the communication tools and web-based system especially the latest ICT integration system launched in 2013 namely 1BestariNet and Frog VLE to support teachers in the teaching process by acquiring, sharing, and creating knowledge.

ICT integration - ICT integration referred to the use of technology to facilitate students' learning, challenge students with authentic and multifaceted tasks for meaningful learning experiences as ICT provides students with information to support their curiosity process in a collaborative environment (Nishant Gunjan, 2016; Tay et al., 2012).

For the purpose of this study, ICT integration is operationalised as the use of technology to facilitate the connection between modern technologies and teachers, students, peers, educational resources, and also experts inside or outside classrooms for acquiring, sharing, and creating knowledge.

Different sociocultural contexts – In CHAT perspectives, the context of sociocultural had been constituted by multiple stakeholders and multi-layered activities which the analysis of "historical relationships among multiple activities" can explain "a past activity affects new activities." (Divaharan & Lim, 2010; Engestrom, 2001; Yamagata-Lynch, 2010, p. 2).

In this study, different sociocultural contexts are operationalised as the multiple stakeholders and multi-layered activities in the classroom, department, and school as each activity affects one another which bounded with ICT integration activities that are related to teachers in Malaysian public primary schools.

Mediators - Adopting the sociocultural third-generation of AT or CHAT perspectives, mediators are conceptualised as three components of an activity system that mediate the activity within the 'community', 'subject' and 'object', namely the 'tools', 'rules', and 'division of labour' (Engeström & Miettinen, 1999; Jonassen, 2000; Kuutti, 1996; Vygotsky, 1997; Yamagata-Lynch, 2002).

For the purpose of this study, mediators are operationalised as three components of an activity system that mediate the ICT integration activities related to teachers within the 'community', 'subject' and 'object' namely the 'tools', 'rules', and 'division of labour'.

Contradictions – According to Lim et al. (2011), contradictions exist in the form of 'tensions' to achieve the object and transform it into desired outcomes, and also as emerging dilemmas, disturbances, and conflicts (Engeström, 2001).

For this study, contradictions are operationalised as 'tensions' that exist in ICT integration activities related to teachers to achieve the object and transform it into desired outcomes.

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