THE INFLUENCE OF LITERACY SUPPORT ON READING, SCIENCE, MATHEMATICS AND ICT LITERACY PERFORMANCE AMONG FORM FOUR STUDENTS IN PENINSULAR MALAYSIA

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UNIVERSITI SAINS MALAYSIA
2018

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by

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Thesis submitted in fulfillment of the requirements
for the degree of
Doctor of Philosophy

February 2018

ACKNOWLEDGEMENT

I would like to express my deepest appreciation to Dr. Thomas Chow Voon Foo for his unending support and encouragement throughout my research studies. I would also like to thank the team of Malaysian Literacy Index in harnessing my research experience. This journey is not made possible without the unwavering support of the following individuals: My heartfelt thanks to Professor Nordin Razak for being such an insightful mentor. I would also like to extend my appreciation to Prof. Dr. Shameem, Assoc. Prof. Dr. Munir Shuib and Dr. Parameswari for contributing their expertise to this body of work.

Much love and gratitude to both my parents, Mr. and Mrs. Ganasan who have always been a source of inspiration in my academic pursuits – I am ever thankful. My sincere thanks to Prophet Moses, Corry Lincoln, Kumar, Stella, Dr. Marlina Jamal, Renu and Saraya Yakubu for making this arduous journey bearable.

Above all, to Almighty God, the Author of All Knowledge and Wisdom,

for His Strength – I am gratefully humbled

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LIST OF ABBREVIATIONS

AEC	ASEAN Economic Community
ALP	Adult Literacy Performance
BRLT	Blooms Revised Learning Taxonomy
CRT	Criterion Referenced Test
EPI	English Proficiency Index
FL	Functional Literacy
FGI	Focus Group Interview
IALS	International Adult Literacy Survey
ICT	Information and Communication Technology
MOE	Ministry of Education
MES	Malaysian Examination Syndicate
MOHE	Ministry Of Higher Education
NAAL	National Assessment for Adult Literacy
NALS	National Adult Literacy Survey
NAEP	National Assessment of Educational Progress
NAPLAN	The National Assessment Program Literacy and Numeracy
NCES	National Centre for Education Statistics
NLS	New Literacy Studies
NRT	Norm Referenced Test
OECD	Organization for Economic Co-operation and Development
PISA	Program for International Student Assessment
PLD	Performance Level Descriptors
PIRLS	Progress in International Reading Literacy Study
SPM	Sijil Pelajaran Malaysia
TTR	Text -Task Respondent
TIMMS	Trends in International Mathematics and Science Study
UNESCO	United Nations Educational, Scientific and Cultural Organization

SATU KAJIAN TENTANG PENGARUH SOKONGAN LITERASI TERHADAP PRESTASI LITERASI DALAM MEMBACA, SAINS, MATEMATIK DAN ICT DALAM KALANGAN PELAJAR TINGKATAN EMPAT DI SEMENANJUNG MALAYSIA

ABSTRAK

Kajian ini bertujuan untuk mengkaji tahap prestasi literasi, kemahiran pemprosesan kognitif dan perbezaan prestasi pelajar di negeri Pulau Pinang, Perak, Perlis, Kedah, Selangor, Kelantan, Terengganu dan Johor. Lapan negeri yang menyertai kajian ini bertujuan untuk mewakili zon Utara (Pulau Pinang, Perak, Perlis, dan Kedah), zon Selatan (Johor), zon tengah (Selangor), dan zon Timur (Kelantan dan Terengganu) di Malaysia. Domain membaca, sains, matematik, dan ICT disepadukan sebagai subjek yang memberikan suatu disiplin yang menyeluruh untuk meneroka tahap keupayaan dan literasi pelajar bagi negeri-negeri tersebut. Kajian ini juga bertujuan untuk mengkaji pengaruh indikator bagi individu, rumah, sekolah, dan komuniti terhadap pretasi literasi pelajar dalam membaca, sains, matematik, dan ICT. Kajian ini menggunakan pendekatan kaedah bercampur yang menggabungkan kedua-dua pendekatan kualitatif dan kuantitatif. Soal selidik kuantitatif memperlihatkan data yang berhubung dengan prestasi pelajar dalam setiap domain literasi dan juga menguji faktor-faktor yang menyumbang kepada prestasi literasi. Pendekatan kualitatif pula melibatkan temu bual dalam kumpulan fokus yang bertujuan untuk memperlihatkan tanggapan pelajar terhadap nilai dan praktis literasi untuk tujuan triangulasi. Sampel kuantitatif melibatkan 813 orang pelajar manakala sampel kualitatif melibatkan 160 orang pelajar. Secara keseluruhan, hasil dapatan kajian dalam prestasi literasi telah menunjukkan bahawa pelajar di seluruh negeri mencapai tahap 3 (Asas) dalam membaca, tahap 4 (Cekap) dalam literasi sains, dan tahap 3 (Asas) dalam literasi

matematik dan ICT. Hasil dapatan ini menunjukkan bahawa pelajar yang berumur 16 tahun mencapai literasi asas dalam tiga domain literasi yakni literasi membaca, literasi matematik dan ICT, dan mencapai tahap cekap dalam literasi sains. Hasil dapatan kajian juga menunjukkan bahawa terdapatnya perbezaan dalam prestasi literasi di seluruh negara. Berdasarkan data keseluruhan, penemuan yang mengenai pengaruh sokongan telah menunjukkan bahawa terdapatnya persamaan di seluruh negara, apabila kedua-dua indikator personal dan rumah didapati memperlihatkan pengaruh yang kuat dalam prestasi literasi. Keadaan ini juga memperlihatkan bahawa negeri-negeri dari Semenanjung utara Malaysia (seperti Perlis dan Kedah), Semenanjung timur Malaysia (seperti Kelantan dan Terengganu) dan negeri pusat (Selangor) telah menunjukkan tahap literasi yang kurang daripada sederhana. Berdasarkan hasil dapatan, kajian ini boleh disimpulkan bahawa faktor-faktor literasi sokongan boleh menjadi pemangkin untuk meningkatkan prestasi literasi. Kedua-dua domain kognitif dan bukan kognitif adalah penting untuk menggalakkan literasi fungsian dalam kalangan pelajar. Oleh hal yang demikian, terdapatnya keperluan untuk meningkatkan kerjasama dalam kalangan agen literasi bagi mewujudkan suatu persekitaran literasi sokongan dan begitu juga untuk mencapai tahap yang lebih baik bagi kesaksamaan dan keadilan dalam literasi.

THE INFLUENCE OF LITERACY SUPPORT ON READING, SCIENCE, MATHEMATICS AND ICT LITERACY PERFORMANCE AMONG FORM FOUR STUDENTS IN PENINSULAR MALAYSIA

ABSTRACT

The study aims to examine students' literacy performance levels, knowledge and cognitive skills and performance differences in the states of Penang, Perak, Perlis, Kedah, Selangor, Kelantan, Terengganu and Johor. The eight states that participated in this study represent the North zone (Penang, Perak, Perlis and Kedah), South zone (Johor), Central zone (Selangor) and the East zone (Kelantan and Terengganu) of Malaysia. The domains of reading, science, mathematics and ICT are integrated as subjects that provide a holistic discipline to explore students' abilities and literacy levels across the states. The study also investigates the influence of personal, home, school and community predictors on students' literacy performance in reading, science, mathematics and ICT. This study employs a mixed methods approach incorporating both quantitative and qualitative approaches. The quantitative surveys attempt to draw data in relation to students' performance in each literacy domain as well as examine factors that contribute to literacy performance. The qualitative approach involved focus group interviews that endeavor to draw insights regarding students' values and literacy practices for the purpose of triangulation. The quantitative sample consisted of 813 students while the qualitative samples comprised 160 participants. The findings on the overall literacy performance showed that students across states attained Band 3 (Basic) in reading, Band 4 (Proficient) in science literacy, Band 3 (Basic) in mathematics and ICT literacy. The findings revealed that sixteen year old students attained basic level in three literacy domains namely, reading, mathematics and ICT literacy and attained proficient level in science literacy. Results

also showed that there are differences in literacy performance across states. Based on the overall data, the findings on the influence of literacy support revealed that there are similarities across states as both personal and home predictors were found to have had strong influences on literacy performance. It also revealed that states from the north Peninsular Malaysia (such as Perlis and Kedah and East peninsular Malaysia (such as Kelantan and Terengganu) and central state (Selangor) of Peninsular Malaysia performed below an average literacy. Based on the findings, it is inferred that supportive literacy factors can be a catalyst in enhancing literacy performance. Both cognitive and non-cognitive domains are integral in influencing functional literacy among students. Thus, there is a need to intensify co-operation among literacy agents in order to create a supportive literacy environment as well as achieve improved levels of equality and equity in literacy.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The 21st century has shaped our everyday lives in distinctive ways, creating new opportunities and causing fundamental changes in all aspects of life namely education, workforce, training and leisure (Morrell et al., 2012; Kalantzis & Cope, 2005; Salpeter, 2003). Accelerated transformation in Information and Communication Technology (ICT) has led to the rise of new types of occupations that require new skill sets necessitating an amalgamation of a new set of skills and knowledge. In that stance, the role of education cannot be belittled as it plays a key function in contributing to knowledge economy and preparing students for the challenges of the 21st century.

The emergence of knowledge societies has made literacy even more critical in today's global world as new knowledge and current skills pave students' success**es** in the 21st century (Wan Nor Fadhilah et al., 2016; Kivunja, 2015; Murnane et al. 2012; Rotherham & Willingham, 2012; Schleicher, 2007; Gilbert, 2005). In addition, it is equally important to equip students with knowledge and skills necessary to enable to survive in this age of information and advancement in ICT which has propelled Malaysia to attain the status of a fully developed nation by 2020 (Kek Yih et al. 2007).

Literacy skills are undeniably needed for effective and functional purposes and participation in society particularly in preparing young adults with a strong working knowledge and skills base essential for the future workforce. Literacy topics that are much publicized since the beginning of the millennium delve in the areas related to adolescent literacy and designing assessments that closely align to international standards. The scenario above concludes that none can escape from the responsibility of deciding what students should do in the 21st century (Allvin, 2016; Cassidy & Ortlieb, 2012; Bellanca & Brandt, 2010).

The Department of Statistics (2009) states that 47.7% of the labour force in Malaysia is between 15 to 24 years old and a total of 64% of these workers have completed 11 years of formal schooling. This shows that the majority of workers possess a basic diploma and a secondary school certificate. At the workplace, employers report that novice workers lag in employment opportunities due deficits in employability skills and mismatching of skills that do not suit the job specifications and requirements (Heidi Yeen & Mai Neo, 2016; Dania et al, 2014; Nooraini & Khairul, 2014). Consequently, this results in an increased level of the unemployment rate (Abdullah et al. 2012; Ananda, 2010; Jelas & Azman 2005). This trend cuts across the globe as youth unemployment is reported as three times higher than unemployment rate of adults (Government of Malaysia, 2010).

To prevent the youth unemployment rate from rising, researchers concur that students should be equipped with the requisite skills to qualify for the job market (Mahmood et al., 2014; Mason et al. 2009). Students will not only need basic knowledge, but also need to develop a range of skills known as 'common knowledge' of the new age (Trilling & Fadel, 2009; Havnes & McDowell, 2008). Education systems should then embrace the realities which concern knowledge and skill acquisition or risk a mismatch between what is taught in schools and what is required in the real world (Gonzales & Ruiz, 2014; O'Hara, 2007). Houser et al. (2005) stressed that deficits in literacy skills pose irreversible impact between the citizens and the actual needs of the economy.

Also, the ability to perform at the optimal level in the workplace largely depends on the effective application of transferrable knowledge and skills attained through education. Youths need to be equipped with transferrable skills that meet the real world's needs. This would minimize risks and ensure potential career prospects in new times emphasizing the importance and needs of transferrable skills to curb

unemployment rates among school leavers that largely stems from their inability to transfer knowledge in new environments (Healey, 2016; Hilton, 2015; Pellegrino, 2014; Smith & Cumming, 2009).

1.2 The Role of Critical Literacy in the 21st Century Education

Education is seen as a catalyst in producing skilled and capable human capital to ensure continued maintenance of a nation's competitive edge in challenging era. In critical times, many have turned to schools for answers to sustain competitiveness in the changing global era as schools are often held responsible for nation's economic concerns (Christensen et al. 2008). Education in the 20th century was designed to meet the needs of the industrialization era creating docile workers that fit a model of factory education. Therefore, knowledge acquired in the 20th century has lost its relevancy in the 21st century (Yong Zhao, 2014). It is timely that students are prepared with knowledge and skills essential in developing lifelong learning.

The abilities to solve problems and think innovatively across all content areas involving multiple levels of Blooms Taxonomy in the 21st century education is currently widely researched (Yong Zhao, 2014; The Partnership for 21st Century Skills, 2008; enGauge 21st Century Skills, 2003; Pillay & Elliott, 2001; Prensky, 2001; Hurd, 1998). As such, 21st century skills focus on the ability to search, analyze, innovate and make informed decisions. These skills take precedence particularly in jobs that entail analytic, non-routine tasks that do not involve machines and interactive communication.

According to enGauge (2003) and Wagner (2008), education that is concomitant with 21st century needs, focuses less on academic content knowledge and prioritizes cognitive processing as a key skill. Numerous studies have indicated that having proficiency in the 3R's is rendered insufficient when employees are not able to

think critically in various situations (Morell, 2015; Keane et al., 2016; Crockett et. al, 2012; Schwarz, 2001). Such an insufficiency severely compromises employees' competitiveness in securing a job despite completing formal education. It was found that although students generally move into the workforce with varying amounts of knowledge, they do not have sufficient understanding in applying cognitive skills in the real world (Mkandawire & Walubita, 2015). This reveals that although students possessed knowledge, they lacked critical literacy skills notably the ability to analyze and solve problems. The U.S Bureau of Labour Statistics reported that individuals who were born between after the age bracket of 1964 between the ages of 18 and 44 held 11 different occupations on average (as cited by Dohm, 2000). However, with the current workplace demands, employees need to think critically to respond to new situations as well as be part of the knowledge pool workers in the 21st century.

Roberts et al. (2008) state that the primary purpose of education is to equip school leavers with the necessary skills for good careers. He posits that critical thinking, problem solving, reasoning, analysis, interpretation and synthesizing of information are the traits that corroborate with the current needs of education. Universally, schools act as a focal agent in preparing students for the associated traits in which students' abilities are mustered developmentally (OECD, 2009).

As concerns have been raised by relevant authorities in measuring students' abilities and their work readiness as explained above, literacy assessments such as international assessments are interested in measuring students' functional skills and benchmarking students in literacy education programmes such as the Programme for International Student Assessment (PISA), National Assessment for Adult Literacy (NAAL), Trends in International Mathematics and Science Study (TIMMS) and as well as addressing methodical approaches and performance outcomes (Rolf & Monica, 2016; Broadfoot & Black, 2004).

These assessments reflect an increased effort to raise literacy rates across the globe as data generated act as a basis for countries with relatively low literacy attainments. The aim of these surveys is to provide a common denominator for improving achievement rates and providing valuable insights for policy interventions and identifying abilities along a band scale of competencies in determining individuals' literacy attainment (Esposito et al. 2011). Also, data obtained from these assessments responsively serve as a system-level monitoring record to mark the strengths and weaknesses of achievement so that the needs of the global education in the 21st century can be addressed (PIRLS, 2016).

Thinking skills which involve the ability to identify, reason, evaluate and provide solutions take precedence in one's learning as they equip students with a strong skills set which will surely assist then in securing employment. Studies indicate that graduates are not as adept in tackling higher level knowledge wherein there is a need to instill these skills as they are the forefront of today's education (Cavanagh et al. 2006; Baron & Henry, 2006; Mitchell, 2005).The core skills include competencies in analyzing problems, solving problems as well as thinking critically which are developed through constant practice and exposure to a range of cognitive processes achieved through various literacy interactions. The Partnership for 21st century proposed that the development of these skills will enable students to transfer their thinking abilities into various contexts.

Researchers argue that a major educational challenge lies in increasing the amount of 'thinking in the curriculum' to foster cognitive proficiency among all students as the basic goal of education is to improve the ability of students to think critically (Resnick, 2010). The demands of the 21st of century necessitate the usage of higher order thinking skills as an important component raising students' achievement standards in order to thrive in the global workforce (Zandi, 2016; Singh et al. 2012).

Pink (2008) states that "we've moved on from an economy built on people's backs to an economy built on people's right brains" (p.50). The proposition shows that the current workforce clearly requires employees who are able to assimilate data and facts leveraging on thinking capacity.

A standard based expectation for all students is likely to be met when teaching methods benefits the mind, particularly when the thinking faculty is enhanced through the introduction of thinking skills (Protheroe, 2007). When teaching and learning emphasize higher order thinking**,** it focuses on consequential learning that centres on deeper learning and discounts rote memorization (Tufekci & Demirel, 2009). Moreover, with deliberate effort and support, critical literacy skills can be further developed and learnt. In the attempt to propagate critical literacy, the roles of literacy support such as individuals, home, school and community cannot be dismissed as they are essential in providing a conducive environment in nurturing a supportive literacy environment skills as well as providing an improved quality of education (Zalizan et al., 2016; Partnership of 21st Century Skills, 2008 & Bronfenbrenner, 1979). The provision of an overview on the current education system and learning practices is needed to best meet the requirements of the 21st challenges in line with the workforce needs. The following section provides a cursory glance into the teaching and learning environment in Malaysia.

1.3 The Malaysian Learning Environment

In 2011, findings from a research by the Higher Education Leadership Academy (AKEPT) conducted on 41 schools indicated that 50% of the lessons delivered did not sufficiently engage students and relied on a more passive lecture format of content delivery. The focus was more to prepare students for summative assessment purposes, instead of cultivating higher-order thinking skills. The Ministry of Education has put in much effort and has carried out initiatives in improving the

current education system. The Blueprint was implemented to respond to the languishing state of students' critical thinking skills as reported in the international assessments results such as PISA and TIMSS. The Malaysia Education Blueprint (2013-2025) was found to be a manifestation of government transformation in getting the best returns in human capital. The aim is to drive all national development aspirations in transforming the national education system by introducing the different waves periodically.

The First Wave (2013-2015) focuses on improving teacher quality and students' literacy, the Second Wave (2016-2020) focuses on accelerating the improvement of the education delivery system and the Third Wave (2021-2025) is focused on enhancing operational flexibility to cultivate a peer-led culture that leads to professionalism. In addition, higher order thinking skills system (HOTS) was introduced into the teaching and learning process through which students are required to employ thinking skills to solve problems. The Ministry of Education has also proposed a change in the exam dominated system that was highly centralized in the direction of the school based assessment (SBA) in 2012. The SBA is a combination of centralized examinations with school based assessments; the teachers are given more autonomy in tailoring classroom learning and teaching instructions. Teachers' roles change to facilitate and monitor students' learning activities prompting students to engage in tasks that involve thinking skills while classroom activities are being carried out.

In 2013, The Ministry of Education implemented the i-Think programme in developing students' thinking capacities particularly in nurturing thinking skills among primary and secondary school students with the aim of cultivating lifelong learning covering more than 1000 schools in Malaysia (Tenth Malaysia Plan 2011).

Nevertheless, the Ministry of Education has taken prompt steps to improve the current learning and teaching situation among students and educators. However, the challenge persists in forging partnerships among stake holders in developing a smart culture with quality of thought progression. Therefore, there is a need to pay close attention to support system and its interactions as the influence of support system impacts students' performance outcomes directly (Reschly & Christenson 2006; Roeser et al. 2000).

Many raised concerns that the current education system in Malaysia is examination oriented as securing a good grade in public examinations has become the main priority (Lee et al. 2010; Yu Cheng et al. 2009; Fook & Sidhu, 2006). Students learn based on the kinds of questions, content and selected skills that will be tested in public examinations due to the tedious process of preparing students for public examinations. This is a common teaching and learning culture in the Malaysian classroom.

Studies conducted by Semry et al. (2015), Che Musa et al. (2012) and Harrison (2010) found that English language learners are heavily exposed to grammar based teaching and learning. Students are taught in a mechanistic manner whereby much priority is given to literal comprehension skills at the word and sentence recognition. Studies conducted in the past also suggested a similar finding asserting that English language learners are taught to focus on discrete and singular skills (Koo, 2001). Students learn language skills that are transferred into examinations which leave them uncritical readers when evaluating texts (Norbaiyah et al. 2014). Shafie and Nayan (2011) posited that current reading instruction adopted in Malaysian classrooms have produced surface readers who depend on memorization and facts making no connection to the text. This shows that the school system has left a majority of students without the basic skills and strategies that are required to read effectively.

Hussin (2006) states that science teachers tailor questions aligned with those similar to the SPM examination (Malaysian Certificate of Education) resulting in the design of more factual oriented questions that dwell recall as opposed to comprehending a large passage of text. He also stated that science learning lessons in classrooms were devoid of problems that tap thinking skills. A study conducted by Lay Yoon (2009) found that students' logical abilities were lower than the average mean in most of the science competencies examined. Meng et al. (2014) reported that secondary school students lagged in science achievement in Trends in International Mathematics and Science Study (TIMSS) for three consecutive years scoring 510 in 2003 to 471 in 2007 and 426 in 2011. This shows there is a need to foster proper initiatives for better educational outcomes (IEA, 2008; 2012 & MOE, 2012). In fact, Hurd (1998) observed that science textbooks in Malaysia often did not stress on practical knowledge that could be applied in everyday life. It is argued that 21st century science students should master critical thinking skills to better equip themselves in meeting the challenges of the global world.

Also, drilling and practice are the most common teaching approaches adopted by Malaysian mathematics teachers as indicated by local studies (Lim & Chew, 2007). Traditional teaching approaches emphasize memorization and rote learning as opposed to analytical thinking and reasoning skills. According Noor Azina (2008), more than 70% of mathematics teachers reported using textbooks as the primary basis of their lessons as curriculum and textbooks are regulated by the Ministry of Education (MOE). Classroom instruction that is teacher-oriented is less likely to engage students in mathematical reasoning (Jing Jing et al. 2016; Tan & Saw Lan, 2011).

Sam et al. (2009) found that students who had problems in solving non-routine mathematical problems were also weak in statistical reasoning even though they passed their mathematics examinations. It was also pointed out that although the MOE

had introduced teaching courseware, it lacked activities that enhanced cognitive abilities that involved mathematical reasoning and problem solving skills. The net effect shows that the general inability of learners in making effective linkages between the information acquired and its application in problem solving tasks invariably stunt the development of creativity and innovation resulting in a generation that lacks thinking skills (Tambychik & Meerah, 2010; Nordin, 2009).

Many countries regard the understanding of ICT literacy and mastering its basic skills and concepts as being an important core component of holistic education besides reading, writing and numeracy. In step with prevailing international trends, the Ministry of Education in Malaysia embarked on a programme in 2007 to expose learners to ICT skills and concepts through the introduction of ICT literacy classes in Malaysian secondary schools (Ministry of Education, 2003). Essentially, the ICT syllabus in Malaysian classrooms revolves around the acquisition of terminologies, concepts and facts about ICT. Nevertheless, ICT policy in schools remains a contentious issue among researchers with regard to learning achievement (Hamzah et al. 2010). Thus, learners are not required to acquire information literacy skills in order to achieve top results in exams as information literacy does not constitute part of the examination framework as ICT skills are not tested in examinations.

Given this backdrop, it is obvious that the culture of memorization and regurgitation of information as model answers is highly prevalent in excelling in examinations despite the changes in the education system. The pressure is also felt by teachers and students to perform well in an examination dominated culture. The conundrum has led to a surge of incompetent learners who lack thinking skills. This is partly because learning has become mechanical and the true essence of learning is ill captured. This is worrisome as the 21st century calls for an infusion of learning contexts that leverage on students' thinking abilities. Similarly, the Partnership of the

21st century (2008) concurs that, the 21st century learning environment act as a support system in which students learn best when they are placed in a conducive environment. This is because different types of inputs that students receive within the environment will influence students' performance outcomes. Therefore, the inclusion of a support system that comprises the environments of home, school and community plays an integral part in nurturing learners' literacy skills. Hence, it can be surmised that a similar thread runs across the four subjects- reading, science, mathematics and ICT literacy which call for the integration of support that infuses pertinent skills in line with 21st century learning. The following section discusses the statement of problem of this study.

1.4 Statement of Problem

The Malaysian education context suggests that the national curriculum specifications (2003) aspire to develop citizens who are able to think, reason and solve problems effectively. However, heavy emphasis on examinations distorts the intended aspirations of the curriculum as noted by the local researchers (Chap Sam & Cheng Meng, 2010; Yu Cheng et al. 2009; Nambiar, 2007; Hussin, 2006). Past studies have also indicated the effects of rote learning and exam drills have hampered students' thinking skills. Rosnani & Suhailah (2003), in their book the 'Teaching of Thinking in Malaysia', claimed that "many studies have begun to reveal symptoms of the decline in students' ability to think well, especially when schools begin to focus on the mastery of subject content more than the process of deriving products" (p.1). The overemphasis on examinations has caused educators to use strategies such as rote learning and 'spoon feeding' that produce mediocre educational outcomes as students are trained to answer questions aligned to national examinations (Hussin, 2006; Anandha, 2006 & Adi Badiozaman Tuah (2006). This showed that much emphasis is

placed on preparing students for public examinations than equipping students with the actual skills of learning.

The researchers posited that the students' habit of practicing with the forecasting of questions and memorization of answers as being two of the reasons that they are unable to apply thinking skills when solving problems (Tan & Arshad, 2011 & Nurfaradilla, et al. 2010). The findings from international assessments such as the Programme for International Student Assessment (2009) showed that Malaysian students performed below the bar and were ranked in the bottom third out of 74 and 65 participating countries in reading, science and mathematics literacies. PISA results suggest that Malaysia was 100 score points below Singapore, Japan, South Korea and Hong Kong in these three subjects (PISA, 2009). TIMSS also showed a drop in rank for mathematics and science attainments from the 16th (1999) to 10th (2003) and 20th (2011) in Mathematics. Science rankings dropped from 22nd (1999), to 20th (2003), then to 21st (2007) and dropped drastically to 32nd (2011).

The aforementioned issues do not provide a realistic estimate of students' overall achievement and raises concerns about the roles of literacy agents in relation to critical literacy performance. It is critical to provide a strong support system to achieve a balanced collaboration and active engagement which stems from a number of sources for effective impetus of change (Malaysia Education Blueprint 2013-2025). This is primarily because literacy agents such as parents, schools, teachers and the larger community members play crucial roles in developing critical literacy skills. In other words, it is also how the support system enables students to grow by providing a stimulating literacy environment. From this perspective, the learning context is composed of critical systems that affect students' literacy performance as both internal and external enablers share a common mutual goal aiming to develop and nurture critical thinkers prepared to step into the global world.

It is no surprise that findings from the past research correspond that education is slanted towards producing individuals who score well in examinations but are derailed in their ability to think critically which affects their overall functionality. In effect, students are blamed for being inept as critical thinkers and are unable to fully function effectively in the workforce. Only very few research projects have focused on the importance of social support in facilitating students' literacy and as a result, limited research has been done to address the influence of literacy support in nurturing critical literacy skills (Lee & Shute, 2009). Also, not much attention has been paid to the roles of social agents in preparing students for the 21st century workforce.

Malaysia is working towards improving achievement test scores and education outcomes among the school going population (Ministry of Education, 2013). However, the extent of the influence of the support system is not really known in the Malaysian context; there is an abundance of research done pertaining to the relationship between parental, teacher and community engagement and achievement in the Western contexts and in developed countries. Previous studies indicate that an individual's development is nurtured within the social contexts as supported by the theory of human development. The foundation of their learning environments is influenced by the interactions and social engagements that primarily occur within the layers of environments such as home, school and the larger community (Smith, 2013; Allen & Fraser 2007).

Having mentioned that, collaborative efforts of literacy support system empowers students by capitalizing and fostering literacy skills particularly in the area of critical literacy skills. Studies show that the roles of social context factors cannot be dismissed in accounting for students' literacy development (Peralta & Galaviz, 2013). This issue warrants attention as there seems to be little interest in investigating the roles of internal and external social environments encompassing critical literacy

skills in gauging students' performance. In order to be equipped with cognitive skills such as the ability to think critically and to solve problems that allow individuals to contribute successfully in society, it is important to consider the roles of supportive literacy agents in cultivating a conducive literacy climate. This is because to produce dynamic and successful knowledge contributors, it is vital to first create a literacy-rich environment that promotes literacy in order to hone students' literacy skills. This will better prepare them for the future workforce which involves collaboration between support systems to raise performance literacy standards.

This study investigates the extent to which the components of the support system simultaneously influence students' literacy performance as a collection of both internal and external factors that contribute to performance levels in reading, science, mathematics and ICT literacy. This is because the support systems are the sources responsible for spurring and meeting educational goals and improving students' academic achievements. This study attempts to shed some light on the relevant factors affecting students' literacy performance levels to draw implications for policy implementations and better equip students for a challenging future workforce.

1.5 Research Objectives

The objectives of the study are to:

1. determine Form Four students' literacy performance in a) reading literacy b) science literacy c) mathematics literacy and d) ICT literacy in Peninsular Malaysia
2. determine Form Four students' performance in the domains of knowledge and cognitive skills in a) reading literacy b) science literacy c) mathematics literacy d) ICT literacy in Peninsular Malaysia
3. determine Form Four students' performance differences in a) reading literacy b) science literacy c) mathematics literacy and d) ICT literacy in Peninsular

Malaysia

4. examine the influence of literacy support (personal, home, school and community) on a) reading literacy b) science literacy c) mathematics literacy and d) ICT literacy performance in Peninsular Malaysia

1.6 Research Questions

The research questions of this study are as the follows:

1. How have Form Four students performed in a) reading literacy, b) science literacy c) mathematics literacy and d) ICT literacy in Peninsular Malaysia?
2. How have Form Four students performed in the domains of knowledge and cognitive skills in a) reading literacy b) science literacy c) mathematics literacy d) ICT literacy in Peninsular Malaysia?
3. To what extent does Form Four students' performance differ in a) reading literacy b) science literacy c) mathematics literacy and d) ICT literacy in Peninsular Malaysia?
4. To what extent does support system (personal, home, school and community) influence Form Four students' a) reading literacy b) science literacy c) mathematics literacy and d) ICT literacy performance in Peninsular Malaysia?

1.7 Research Hypothesis

Based on the research questions advanced previously, several hypotheses were drawn for research questions 3 and 4 as shown below:

3(a) $H0_1$: There is no difference in reading literacy performance among states in Peninsular Malaysia?

(b) $H0_2$: There is no difference in science literacy performance among states in Peninsular Malaysia?

(c) $H0_3$: There is no difference in mathematics literacy performance among states in Peninsular Malaysia?

(d) $H0_4$: There is no difference in ICT literacy performance among states in Peninsular Malaysia?

4(a) $H0_1$: Support system (personal, home, school, community) does not influence reading literacy performance in Peninsular Malaysia?

(b) $H0_2$: Support system (personal, home, school, community) does not influence science literacy performance in Peninsular Malaysia?

(c) $H0_3$: Support system (personal, home, school, community) does not influence mathematics literacy performance in Peninsular Malaysia?

(d) $H0_4$: Support system (personal, home, school, community) does not influence ICT literacy performance in Peninsular Malaysia?

1.8 Significance of the Study

This study attempts to examine the influence of the support system such as individuals, the home, the school and the community on students' literacy performance in reading, science, mathematics and ICT literacy in Peninsular Malaysia. This study investigates learners' overall performance in four important areas namely reading, science, mathematics and ICT literacy.

Assessing students' literacy performance is an important task as it can empower policy makers, educationists and employers to make data-driven decisions aimed at determining students' performance for a variety of purposes. Firstly, such an attempt will benefit policy makers, education practitioners, curriculum designers and even employers as it will help them identify the general literacy skills that underscore students' abilities. This is because the findings regarding the relative strengths and weaknesses of learners can serve as useful inputs in guiding policy formulation,

implementation and evaluation at the curriculum level. This will enable policy makers and curriculum designers to make necessary changes to realign syllabi integrating thinking skills with students' valued practices.

Secondly, important baseline information can also be obtained pertaining to respective performances in reading, science, mathematics and ICT literacy as the study measures the abilities of sixteen year olds in applying knowledge and skills in each literacy domain. The study will provide empirical evidence about the representation of literacy performance trends across states analyzed in this study, in monitoring students' literacy performance outcomes that will assist policy makers and curriculum designers in planning as well as implementing collaborative literacy activities among home, school and community literacy support agents.

Also, remedial assistance and immediate attention could be provided to students from the states selected for this study, where literacy performance is found to be at a critical level or below the average literacy baseline from the performance levels. In addition, the roles of literacy agents could be monitored so that these literacy trends are observed and profiled in order to serve as a useful input for improved collaborative planning and policy-making. This is in line with the Malaysian Education Blueprint (2013-2025) plan that aims to provide access to quality education that emphasizes critical thinking skills.

Finally, the information and data generated is useful in guiding educational practitioners, parents, educational planners, employers, policy makers and communities in preparing students' transitional process from school to the work force. This study will aid literacy support agents, educational practitioners and policy makers in developing students' critical literacy skill in setting up mutual partnerships among key literacy enablers within the environment. Since employers lament that graduates are not ready for work as they lack certain skills deemed crucial by the partnership of

the 21st century skills Such a move will empower students to become dynamic learners and thinkers thereby preparing them for the future workplace in a much better way.

1.9 Limitations of the Study

This study is limited within the scope of literacy performance that focuses on fourth form students and benchmarking sixteen year old students. The literacy survey focuses on four core subjects namely reading, science, mathematics and ICT literacy and assesses only selected knowledge and cognitive processing skills of students' literacy performance. In addition, the number of items in the literacy achievement test is limited in each section due to the constraints of time.

The study only focuses on the influence of the literacy support system in the provisional aspect of literacy. The study does not include other non-cognitive variables such as motivation, self-perception of ability, or social-emotional skills in relation to literacy performance. The study aims to provide a general representation of 16 year old literacy skills in the selected schools from eight states. Hence, matters pertaining to teaching techniques, classroom instruction or strategies are not included in this study.

1.10 Definitions of Key Terms

1. Literacy Support

Literacy support refers to personal, home, school and community support that influence students' literacy performance. It is a support system that creates an engaging literacy environment in developing students' literacy skills leveraging on provisional support such as availability of facilities and resources such as materials and tools (Bronfenbrenner, 1979).

2. Reading Literacy

Reading literacy refers to understanding, interpreting, comprehending as well as engaging in informational texts in order to function and participate effectively in society (PISA, 2009).

3. Science Literacy

Science literacy refers to the ability to use scientific knowledge to understand, identify, explain and draw evidence-based conclusions based on scientific reasoning to function and participate effectively in society (PISA, 2009).

4. Literacy ability

Literacy ability refers to the learner's capability in performing tasks that utilizes the operation of the knowledge domain and cognitive processing skills that involve the ability to remember, understand, analyse, apply and evaluate in reading, science, mathematics and ICT literacy related tasks.

5. Literacy Practice

Literacy practice refers to literacy activities that are regulated as acts of 'doing' for everyday practical purposes related to reading, science, mathematics and ICT literacy (Baynham, 1985).

6. Value

Values refers to affective association towards literacy practices that causes one to place positive or negative values based on benefits and practical usage (Street, 1984).

7. Literacy Performance

Literacy performance refers to the varying levels of the students' performance measured using bands scores such as Band 1(scores: 0-20), Band 2(scores: 21-40%), Band 3(scores: 41-60%), Band 4(scores: 61-80%) and Band 5(scores: 81-100%) (PISA, 2009). It is an attempt to link literacy with levels of skills that one needs in order be attain functionality in the investigated areas related to the study.

8. Functional Literacy

Functional literacy refers to one's ability in carrying out the demands of tasks successfully as well as possessing the required knowledge and skills in order to function effectively in a society (White, 2011).

1.11 Plan of the Study

This study consists of five chapters. Chapter 1 is an introductory chapter which describes the background of the study and the statement of the problem. This chapter also sets out the research objectives and the research questions of the study. Other components of the chapter include the significance of the study, the definition of key terms and the limitations of the study.

Chapter 2 which is allocated to the review of literature elaborates on issues that ground the study. This chapter reviews areas related to literacy such as functional literacy, literacy performance and literacy support. The chapter reviews theories related to the study and provides a theoretical framework of the study.

Chapter 3 elaborates on the methodology employed in this study focusing on data collection and analysis. It centres on target population selection, research techniques utilized and procedures adhered to, in conducting this study. Chapter 4 presents the empirical findings and results of the study.

Chapter 5 summarizes the entire study and contains a discussion on the findings in line with the research questions of this study. It also details the conclusions, contributions and implications of the findings and recommendations for future work.

1.12 Conclusion

This chapter provides a discussion on the expansion of literacy to literacies as the notion of a 'literate' society is more than a society with high literacy rates. Literate societies should enable individuals to acquire, develop, sustain and use relevant literacy skills through basic schooling through good quality youth and adult literacy programmes and environments. Therefore, the influence of literacy support is vital in creating a functionally literate society. This chapter emphasizes the importance of

preparing students to meet the challenges of the 21st century which calls for core skills that are relevant in today's new learning environment. Also, the influence of the support system is valuable in improving and nurturing literacy for better performance outcomes. In the following chapter, a review of the related literature will be discussed pertaining to the current study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Global education focuses on balancing knowledge transmission with explicit emphasis on 21st century skills aimed at equipping young adolescence for future employment. This is because the core of a quality education focuses on instilling students with the required knowledge and skills to succeed in a competitive global market. As initiatives are being undertaken to infuse critical skills in learning, it is timely to connect and leverage a supportive network because relevant issues, concerns and interests have been raised by key international league players such as UNESCO and international assessments in setting a standard benchmark in the 21st century. This chapter specifically reviews the theoretical underpinnings related to the present study and offers relevant discussion to unravel various perspectives stemming from the issues addressed to shape concrete initiatives.

2.2 The Development of Literacy

The conventional understanding of literacy which focuses on one's ability to read and write is currently unsuitable to fit in reality of the millennium that involves more than making sense of "page bound, official, standard forms of the national language" (Cope and Kalantzis, 2000, p. 9; Fong & Peng, 2016). Radical changes in the political, economic, technological and social platforms require immediate responses in addressing fundamental changes in today's global society (Ntiri, 2009; Jacobs 2009). The Education for All Global Monitoring Report (2006), also posits that academic research, national policies and agendas have influenced the augmentation of the concept of literacy in its scope and meanings. These changes have compelled the

need for re-visioning novel perspectives on literacy resulting in growth and expansion of definitions of literacy as there is a need to accommodate these literacies in the current literacy climate (Cope & Kalantzis, 2000; Ahmed, 2011; Stordy, 2015).

Literacy research has assimilated many areas and includes a wide range of disciplines, deriving application perspectives from education, psychology, sociology, anthropology and history thus paving the way for different kinds of literacy such as information literacy, media literacy, health literacy, financial literacy, cultural literacy and metaliteracy. The term literacy was introduced in the nineteenth century that basically entails one's ability to decode and encode texts (Gurak, 2001). In the 1980's, literacy gained paramount importance as it takes on various forms of literacies (Lankshear & Knobel, 2003). The concept of literacy has been reconceptualized to absorb characteristics from various fields creating new literacy branches (Caroll, 2011). It shows the diversity and multi-faceted roles that literacy has taken on over the years and is ever expanding to co-exist with time (Joint Task Force, 2010; Koo, 2001). To put it succinctly, literacy is described:

> "Like sand, without intrinsic shape, defined and redefined over time"
> Venezky, Wagner &Ciliberti, 1990: IX)

In addition over the last century, theorists and practitioners have looked at literacy which can be summed as three major tenets of quantitative, qualitative and pluralist literacy approaches. The quantitative definition primarily refers to quantifiable numbers that are used in understanding literacy for instrumental, pragmatic and political reasons. The qualitative definition refers to descriptions of literacy characteristics and traits and the pluralist defines literacy as the acquisition and application of literacy and its dimensions in multiple social contexts (Roberts, 1995).