CHILDREN'S PRACTICES AND ENGAGEMENT IN E-READING FOR PLEASURE: A CASE STUDY OF A MALAYSIAN PRIMARY SCHOOL

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CHILDREN'S PRACTICES AND ENGAGEMENT IN E-READING FOR PLEASURE:
A CASE STUDY OF PRIMARY SCHOOL

ABSTRACT

Children nowadays have been exposed to on-screen reading or e-reading since the development of mobile application and devices to support reading and learning activities. The reading for pleasure declines as children grow older. Studies highlighted the reduces children's time and motivation for voluntary reading because of competing interests and other leisure activities. It is believed that recent technological advancements are also contributing to the decline in reading for pleasure. This study employed a case study approach to understanding children's practices and engagement in e-reading for pleasure context. The following research questions were put forward in the investigation: a) how do children demonstrate their e-reading experience when using touch screen device? b) What drives children emotional engagement in e-reading exercise when using touch screen device? c) What drives children behavioral engagement in e-reading exercise when using touch screen device? d) How do children demonstrate their understanding of the e-reading exercise when using touch screen device? The study was conducted based on the engagement model of reading development as the theoretical underpinning to guide the study as well as self-determination theory. Engagement model includes three engagement components namely emotional, behavioral, and cognitive, and self-determination theory comprises autonomy, competence, and relatedness. Participants in the study include ten multilingual children aged between seven to eight years old from a primary school and their parents. The study adopted observation and interview as data collection techniques. Data collections were conducted at the library and computer room inside the school compound where the children were given iPad that was installed with several

reading applications for e-reading sessions. Each e-reading session took around 10 to 15 minutes, a total of eight reading activities were conducted in individual and shared settings. Thematic analysis was used as an inductive analysis through coding strategies to generate relevant themes or concepts from the data. The findings from the study reveal that children exhibited passive and active reading behaviors in individual and shared settings. They experienced enthusiasm and enjoyment as well as boredom to complete or continue the reading activities through their interaction with interface and peer interaction. Several motivation and engagement constructs are discovered to influence the emergent themes from the data. Children demonstrated RECEIVE construct through attentiveness and taking an interest in the genre, topics, and context of reading apps as well as RESPONSE through the excitement and amusement towards interaction with the interface and peer interaction. The PHYSICAL EFFORT revolved around applying sensory skills and touched-based gestures to operate the device or get lost in their favorite topic to read such as navigating the app interface and manipulating the screen. The MENTAL EFFORT corresponded with commenting about the app and the content, asking questions, and showing more interest in visual and audition features of reading apps. Moreover, it was evident that children's PERCEIVED VALUE of reading was influenced by verbal information they receive from parents or guardians highlighting the importance of reading and learning in English. Thus, not only the reading from the iPad itself was enjoyable, but also valuable and supported. In addition, SELF-EFFICACY was regarded to their ability to interact with iPad and read in English; as reported by parents on children' home literacy practices SCAFFOLDING. Children used several cognitive strategies to engage with text such as GUESSING the meaning of unfamiliar words, making ASSOCIATIONS between visual and verbal information, providing SYNONYMS, and SUMMARIZING the key events in proper sequences. However, the design of reading apps made it difficult for children to fully

understand the text and recall the key events in the correct sequence. It maintains that assisted cognitive tools should be embedded for the scaffolding and supporting children's information retrieval process. No empirical study could be located in the form of case study to explore children’s e-reading experiences and engagement when the intention is reading for pleasure using storybooks and educational apps in the second language, particularly for those who are in the stage of learning to read (grade 1 and 2). Children’s reading motivation and engagement will encourage a satisfactory experience, improved reading performance (comprehension), and persistent in reading habits.

Keywords: E-reading Engagement; Reading in the second language; Reading for pleasure; Reading apps, iPad.

AMALAN DAN PENGLIBATAN DALAM KESERONOKAN E-BACA: KAJIAN KES KANAK-KANAK SEKOLAH RENDAH

ABSTRAK

Kanak-kanak kini lebih banyak terdedah kepada aktiviti pembacaan atas skrin atau e-baca semenjak peranti dan aplikasi-aplikasi mudah alih dibangunkan bagi membantu aktiviti pembacaan dan pembelajaran. Keseronokan membaca dalam diri kanak-kanak pula semakin hari semakin pudar tatkala usia mereka terus menginjak dewasa. Kajian menunjukkan, kemerosotan penggunaan masa dan motivasi yang ada dalam diri kanak-kanak dalam menjalankan aktiviti pembacaan adalah disebabkan oleh pesaingan minat dan aktiviti santai yang lain. Selain itu, kemajuan teknologi juga dipercayai menjadi salah satu punca utama yang membunuh keseronokan membaca dalam kalangan kanak-kanak. Kajian ini mengguna pakai pendekatan kajian kes untuk memahami amalan dan penglibatan kanak-kanak dalam e-baca dalam konteks keseronokan. Soalan-soalan kajian berikut telah dikemukakan dalam penyiasatan: a) Bagaimanakah kanak-kanak menunjukkan pengalaman e-baca mereka? b) Apakah yang memupuk penglibatan emosi kanak-kanak terhadap latihan e-baca? c) Apakah yang memupuk penglibatan tingkah laku kanak-kanak terhadap latihan e-baca? d) Bagaimanakah kanak-kanak menunjukkan kefahaman mereka terhadap latihan e-baca? Kajian ini dikendalikan berdasarkan model penglibatan dalam perkembangan pembacaan sebagai sokongan teoritikal untuk menggerakkan kajian ini sendiri serta teori penentuan diri. Model penglibatan tersebut merangkumi tiga komponen penglibatan iaitu emosi, tingkah laku dan kognitif, dan teori penentuan diri pula terdiri daripada autonomi, kecekapan dan keterkaitan. Sampel yang digunakan untuk kajian ini termasuklah sepuluh orang kanak-kanak sekolah rendah yang mampu bertutur dalam pelbagai bahasa, berusia dalam lingkungan tujuh hingga lapan tahun, dan ibu bapa mereka. Pemerhatian dan temuduga telah digunakan sebagai kaedah untuk mengumpul data. Pengumpulan data

dikendalikan di dalam perpustakaan dan bilik komputer dalam kawasan sekolah, di mana kanak-kanak telah diberikan sebuah iPad yang telah dilengkapi dengan beberapa perisian pembacaan untuk sesi e-baca. Setiap sesi e-baca yang berlangsung mengambil masa sekitar 10 hingga 15 minit, dengan jumlah lapan aktiviti e-baca secara keseluruhan yang dijalankan dalam situasi berindividu dan beramai-ramai. Analisis tematik telah digunakan sebagai sebuah analisis yang induktif menerusi strategi pengekodan untuk menjana tema-tema atau konsep-konsep yang relevan daripada data. Penemuan-penemuan yang didedahkan daripada kajian tersebut mendapati kanak-kanak menunjukkan tingkah laku pembacaan yang pasif dan aktif dalam situasi berindividu dan beramai-ramai. Mereka mempamerkan minat dan keseronokan, begitu juga kebosanan dalam menghabiskan atau meneruskan aktiviti-aktiviti pembacaan menerusi interaksi mereka dengan antaramuka peranti dan interaksi rakan sebaya. Beberapa binaan motivasi dan penglibatan yang mampu mempengaruhi tema-tema yang sedia ada juga telah ditemui. Kanak-kanak menunjukkan binaan penerimaan (RECEIVE) melalui perhatian penuh yang diberikan dan memiliki minat dalam genre, topik dan konteks dalam aplikasi pembacaan, begitu juga dengan tindak balas (RESPONSE) melalui keterujaan mereka terhadap interaksi dengan antaramuka peranti dan interaksi rakan sebaya. Usaha fizikal (PHYSICAL EFFORT) mengaplikasikan penggunaan deria dan gerakan berdasarkan sentuhan untuk mengendalikan alat peranti serta mengemudi antaramuka aplikasi dan skrin peranti tersebut. Usaha mental (MENTAL EFFORT) pula berkaitan dengan komen-komen yang diberikan mengenai sesebuah aplikasi dan isi kandungannya, bertanyakan soalan, dan menunjukkan minat yang lebih mendalam terhadap ciri-ciri visual dan uji bakat aplikasi pembacaan tersebut. Selain itu, bukti menunjukkan bahawa nilai taksir (PERCEIVED VALUE) pembacaan dipengaruhi oleh maklumat lisan yang mereka terima daripada ibu bapa atau penjaga yang menitikberatkan kepentingan pembacaan dan pembelajaran dalam Bahasa Inggeris.

Oleh yang demikian, pembacaan menerusi iPad bukan sahaja menyeronokkan, tetapi aktiviti tersebut juga sangat bernilai dan amat disokong. Tambahan pula, keberkesanan diri (SELF-EFFICACY) mempunyai perkaitan dengan kemampuan mereka untuk mengendalikan iPad dan membaca dalam Bahasa Inggeris; seperti yang telah dilaporkan oleh ibu bapa mereka mengenai amalan literasi perancah (SCAFFOLDING) di rumah. Kanak-kanak menggunakan beberapa strategi kognitif untuk melibatkan pembacaan teks seperti meneka (GUESSING) makna perkataan yang asing bagi mereka, membuat perkaitan (ASSOCIATIONS) antara maklumat visual dengan lisan, memberi kata seerti (SYNONYMS), dan meringkaskan (SUMMARIZING) peristiwa-peristiwa penting dalam urutan yang betul. Namun begitu, pemahaman kanak-kanak terhadap pembacaan teks dan proses mengingati kembali peristiwa penting dalam urutan yang betul menjadi sukar disebabkan oleh reka bentuk aplikasi pembacaan yang dibina. Alat kognitif berbantu perlu disertakan dalam aplikasi untuk menyokong kanak-kanak dalam proses penerimaan maklumat. Tiada kajian empirikal yang dapat dikenal pasti dalam bentuk kajian kes bagi meneroka dengan lebih luas berkenaan pengalaman dan penglibatan kanak-kanak dalam e-baca apabila perkara itu adalah bertujuan untuk menimbulkan keseronokan dalam pembacaan dengan menggunakan buku-buku cerita dan aplikasi pendidikan dalam Bahasa Inggeris, terutamanya bagi mereka yang masih berada dalam peringkat untuk belajar membaca (gred 1 dan 2). Motivasi dan penglibatan kanak-kanak dalam aktiviti membaca akan memberikan pengalaman yang memuaskan, selain prestasi membaca (pemahaman) yang ditambahbaik dan tabiat pembaca yang berterusan.

Kata kunci: Penglibatan e-baca; Membaca dalam bahasa kedua; Keseronokan membaca; Aplikasi pembacaan; iPad.

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CHAPTER 1: INTRODUCTION

1.1 Overview

This chapter discusses the context and problem statement of this study. It attempts to clarify the focus of this study by discussing the purpose, the objectives, and the research questions of the study. The goal of this study is to understand children's experience and engagement with reading app using touch screen device like iPad in their leisure time. This chapter is going to cover the conceptions of technoliteracy, development of digital literacy, development of digital literacy among children, development of reading engagement viewed from motivational learning theory. This chapter then proceeds with discussions on the delimiters and the organization of the whole thesis.

1.2 Background of Study

Humans have been relying on artifacts and technologies (abacus, calculator, typewriter, and the computer) to supplement and expand limited cognitive capacity (Mangen & Velay, 2014). The current generation of young children is growing up in a digital media-saturated environment in which they receive daily exposure to a variety of technologies (Hisrich & Blanchard, 2009). Young children spend several hours a day with electronic entertainment, about as much time as they usually spend playing outside. New media including smartphones, tablets, and social media are a predominant drive in children's lives. Although television is still the dominant medium for children and adolescents, new technologies are increasingly popular (Strasburger, 2015). Nowadays most of the young children's leisure time activities include watching and learning from their parents and siblings in their home, with more personalized media use. They likely watch their parents model media use in a range of scenarios throughout the day and with multiple devices (Lauricella, Wartella, & Rideout, 2015).

1.2.1 New Literacy

The children's literacy acquisition refers to the acquisition of reading and writing skills with the emphasis on the link between cognitive skills and reading skills (decoding and comprehension) (Hall, Cremin, Comber, & Moll, 2013). There is also the related idea that adopted new media drive out the traditional literacy practices. Literacy is seen as replacing oral communication, or electronic media overruling the practice of reading and writing (Finnegan, 2014). Literacy is deeply connected in any consideration of technology and childhood, particularly since the rapid adoption of new practices in everyday life is closely tied up with meaning-making and communication, predominantly, although by no means exclusively, through the use of textual representation (Burnett & Merchant, 2013). The new literacy refers to different skills needed to use digital technologies, and along with traditional skills, they are required so that children can read and navigate ebooks, apps, and other programs available on mobile devices like tablets (Bayles & Knoke-Staggs, 2013). New literacies change regularly as technology opens new possibilities for communication and information. This study use the term new literacy as the objective of study is to investigate children's engagement with new technologies (iPad) and reading for pleasure (Leu, Kinzer, Coiro, & Cammack, 2004).

The "Emergent Literacy" was introduced first by Marie Clay in 1966 for early childhood literacy development. Since then studies have been conducted to a richer understanding of the way in which children's engagement in print and electronic literacies from birth and affordance of ebooks on their emergent literacy with the regards to formal reading and writing as well as reading electronic storybooks (Bus, Takacs, & Kegel, 2015; Hisrich & Blanchard, 2009; Korat & Shamir, 2007; Neumann, 2016; Salmon, 2013; Shamir, Korat, & Barbi, 2008). Some emergent literacy skills are code-related which means abilities to acquire the alphabetic principle successfully and

become accurate and fluent decoders of text, and other emergent literacy skills are meaning-related which means abilities to comprehend text once it is decoded; language related (Lonigan, Purpura, Wilson, Walker, & Clancy-Menchetti, 2013). Different terms correspond to explain and define the strategic capabilities of a literate person in the digital age in the academic literature and mass media. A review by Tour (2012) cited several studies developing this context: technoliteracy (Lankshear et al. 2000), electronic literacy (Warschauer 1999), digital literacy (Gilster 1997), silicon literacy (Snyder 2002), and multiliteracies (New London Group 1996). The terms vary and argue that the concept of literacy is no longer implied with linguistic symbols only and also that literacy associated with the use of ICT is more than an ability to decode and encode with the help of technological devices.

The concept of "Multiliteracies" has served to push the boundaries of what it means to be engaged in encoding and decoding text and the importance of visual, aural and corporeal ways of meaning-making have become recognized within the literacy field (Kress, 2003). Cope & Kalantzis (2000) defined the term 'Multiliteracies' which describes the multiplicity of communications channels and media as well as increasing salience of cultural and linguistic diversity. It is referring to multimodal channels of meaning that is important to communication. Multiliteracies entail multiple ways of meaning-making and communicating using visual, audio, spatial, behavioral, and gestural settings. Multimodal texts are considered as sign generating devices that improve communication (Leander & Boldt, 2013). The multiliteracies distinguish digital technologies and other types as practical tools to aid children's knowledge development and meaning-making (Rowsell, 2013). In Wong (2015) work the term "multiliteracy practices" identifies children's reading and writing using printed and digital texts, viewing images, presenting ideas visually and orally, and the cultural ways children interact with literacy. Wong believes this practice makes it possible for

children to read and understand texts that are facilitated by multimodal and multimedia communicational tools. The new digital technologies with touch screen sensitivity and various literacy-related apps affect how children engage with multiliteracy activities at home (Hesterman, 2013). Young children choose these innovative digital devices to communicate, learn, and to be involved in and understand the world they live in (Marsh, 2011).

Digital literacy development offers a requirement created by the extensive development and application of new technologies for communication and representation (Churchill, 2016). The rationale for using technology in the early years is examined along with the changes that have occurred in written texts and textual practices (Shuker & Terreni, 2013). The term "Technoliteracy" has been used most often by researchers about children's everyday technology engagement. In 2002, technologies were referring to DVD players, stereos, mobile phones, computer games (Spink, Danby, Mallan, & Butler, 2010). Lankshear and Knobel (2003) defined the concept of technoliteracy capabilities as ‘being able to decode and encode fluently; find the relevant information from text; taking notes of the text; browsing the text, and collecting information in a selective way. Marsh referred technoliteracy as a notion of a "technically literate generation" (Marsh, 2004, 2005). In 2005, Kahn and Kellner also defined it as computer-related literacy and referred to it as a set of skills to use computer technologies (Kahn & Kellner, 2005). Also, Jewitt (2005) coined the term “Techno-literacy" to pertain to literacy activities that employ the use of technology such as television, computers, and mobile phones.

1.2.2 Digital Devices

Electronic devices are growing in numbers, become more affordable. This rise is along with the increased access to broadband internet which has led to quick rise ownership of such novel devices. According to Picton (2014) between 2012 and 2013,

the number of children who owned electronic reading devices rose from 20% to 30%. This rise followed by an increase in tablet ownership from 38% to 65% and smartphone ownership from 38% to 70% (Picton, 2014).

E-books are print books that have been transformed into a digital format or books that originated in a digital format. E-book readers and tablet computers implemented with an electronic reader (e-reader) based software are handheld electronic devices that store a variety of e-books and other print materials (Hyman, Moser, & Segala, 2014). An e-reader is a mobile electronic device that is designed primarily to read digital e-books and periodicals. The Rocket ebook was one the first electronic reader released in1998. Since then companies like Amazon, Sony, and Apple releasing an upgraded version of e-readers. Favorite digital readers are as follows: Kindle(Amazon), Nook (Barens & Noble), Sony Reader(Sony), Cybook OPUS (Bookeen), iLaid (IREX), and iPad (Apple) (Richardson & Mahmood, 2012).

These are remodeling the ways that which children read, write, engage with and create stories. The touch- screen devices like the iPad, can be used to begin to bridge the gap between emerging home literacies and the techno-literacy practices of the early years' classroom, and through this to assist new types of cultural contribution and learner uniqueness (Lynch & Redpath, 2014). The ASDF (2012) , Autism Spectrum Disorder Foundation organization, recognized characteristics of touch screen devices as follows: a) touch screen devices offer much flexibility than laptops or desktop computers, b) touch screen makes the iPad more accessible, c)tapping and sliding motions are much easier than typing, d) the device can also go wherever the child goes, which means they have ways to calm, focus, and learn while on-the-go, e) the devices support aesthetic experience due to their functional utility for entertainment and education as well as development of their discovery skills. Moreover, since the students'

access to tablets has increased, it becomes an excellent opportunity for educators to connect home and schools the learning activities (Northrop & Killeen, 2013).

1.2.3 Second Language Reading

Research on second language reading has become more visible and expanded (Bernhardt & Kamil, 2010) including Teaching children to read, National Reading Panel Report (NICHD, 2000); Abadiano and Turner (2003); August and Shanahan (2010); Handbook of reading research, volume II (Barr et al., 2016). Scholars Kern (2000) and Pennycook (2001) also expanded their visions about second language (L2) literacy, exploring the implications of a global technology that afforded immediate and essentially cost-free access to billions of written pages, as well as of the politics and social force of literacy. One of the expanded areas of interest was on the concept of transfer between the first language (L1) and second (L2) when the reader attempts to understand the second language. The concept of positive transfer indicates that readers in L1 have an easier time learning to read in L2, and if they find it difficult to learn to read it is negative transfer.

In regards to the potential of computer technology for reading and writing in the second/foreign language, there are many software programs were created in several languages. However, English was the most common language in second and foreign language research. One of the main aspects of reading that received most attention was the acquisition of vocabulary for supporting reading comprehension (Liu, Moore, Graham, & Lee, 2002). One of the first models has been developed on second language readings by Coady in 1979, in psycholinguistics field of research where variables included conceptual abilities, background knowledge, and process strategies (word-level processes and high-level process) (Morales, 2010).

1.3 Problem Statement

Today, reading and more broadly conceived notions of literacy has changed in a way that new technologies require new literacies to exploit their potentials effectively. Children's leisure reading is defined as the reading children choose to engage in, as supposed reading that is assigned to (Mellon, 1990; Hughes-Hassell, & Rodge, 2007; Hughes-Hassell, 2008). Many studies conclude that reading declines in print and on screen as children grow older. Although on-screen reading was reported encouraging the reading but other studies reported reading is still in decline (Clark & Rumbold, 2006; Dickenson, 2014; Huysmans, Kleijnen, Broekhof, & Dalen, 2013; Kavi, Tackie, & Bugyei, 2015; Mansor, Rasul, Rauf, & Koh, 2013; Merga, 2014; Nippold, Duthie, & Larsen, 2005; Sullivan & Brown, 2015; Taylor, 2013; Wollscheid, 2014). Studies highlighted the reduces in children's time and motivation for voluntary reading because of competing interests and other leisure activities. Similarly, in Malaysia the average reading rate is only 2 books per year (Kamarudin, Hussain, Applegate, & Yasin, 2018; Rosli, Zamil, Mohd Noor, and Baharuddin, 2017). Malaysians are not reading enough and they tend to read newspaper and magazine (80%) rather than books (3%) ("Malaysians still not reading enough", 2019). According to study by Chew (2012) 7.7 percent of primary schools' students couldn't master reading and writing. Moreover, Husaini and Noordin (2015) stated that reading interest and habits of Malaysian are still considered very low, as they read for information rather than to seek knowledge. However, government aimed to promote and encourage literacy practices through increasing the number of libraries and the memberships with the aim of Vision 2020 (Kaur & Jawaid , 2018).

It is believed that recent technological advancements are also contributing to the decline in reading for pleasure. Therefore, this study was conducted to investigate this issue by gathering a deeper understanding of children's interaction and reading

engagement with reading apps through handheld touch screen devices, using a qualitative approach. Concerning technology supported multimodal learning environments (technoliteracy); however, research focusing on learners' willingness to read is limited (Jiang & Luk, 2016). By evaluating children's engagement, a study by Ronimus, Kujala, Tolvanen, and Lyytinen (2014) from Finalnd reported that children enjoyed using game-based learning of reading but then tend to use it less frequently. However, the reward system encouraged them to play in longer sessions. They suggest a need to investigate game-features' in children's reading engagement. So, it is important to understand children's reading practices and engagement in e-reading settings where it can be an individual or joint reading.

Similarly, Dickenson (2014) from Australia indicated that reading for pleasure declines in frequency and intensity as well as enjoyment and importance as children approach adolescence. There is a positive association between reading frequency and self-perceived reading ability (Clark, 2012). On the other hand, the study by Taylor (2013) from UK claims that declines in reading frequency and comprehension have social, cultural, and economic implications in reading for pleasure context. The study identified a sharp decline in families with less-educated parents.

In the same context, study by Iyengar (2007) from US concluded that reading ability and the habit of regular reading are in decline and have demonstrable social, economic, cultural, and civic implications. Their findings indicated that reading for pleasure correlates strongly with academic achievement. The study concluded that young children who choose to read in their leisure time are exposed to significantly to more new words and a greater opportunity to develop literacy skills than children denied early reading experiences. Nonetheless, children will lose their focus and become demotivated or frustrated if the multimedia element of e-books is distracting or provided task is too complicated; consequently, giving up on the interaction with the e-book. On-

screen reading differs from reading from mouse and keyboards devices, and findings from these studies may not apply.

From another perspective, a study by Sullivan and Brown (2015) from UK stated that the reading trend is dropping due to limited suitable books for children as well as less-educated parents. Moreover, the decline can be in regards to an increase in competing demands on young people's time, including homework, organized activities, and internet.

Similarly, a study by Wollscheid (2014) from Norway indicated that decline in reading amount and reading interests corresponds to increasing age and cultural participation which is referred to involvement in a range of intellectual, cultural activities (for example, exploring museums or reading classical texts). In addition, the influence of parent perception and practices on children's cultural participation is relatively stable over time. The decline is also associated with competing interests and other leisure activities. Furthermore, a study by Huysmans et al. (2013) from Norway defined reading attitude tends to decline in younger generations compared with the older generation who grew up in a time where few other media were available. According to Massimi, Campigotto, Attarwala, and Baecker (2013) the goals of e-reading for pleasure more generally, remained underexplored when children read with their parents or loved one as a way to pass the time. In addition, it was stated by Eden and Eshet-Alkalai (2013) that knowledge on the nature of digital reading is very limited.

On the other hand, the development of e-book was not tailored to children's e-reading behavior and experience mainly looking at their engagement with reading apps (Bus, Takacs, & Kegel 2014). According to Rahman et al. (2013) in regards to natural interaction, there is a need to explore more characteristics of such interaction and user's perception. Most of the studies have paid attention to the issues of performance and task efficiency rather than the user's attitudes and experience on the naturalness of the tools

and devices. It is also important to involve children and parents to understand better the children e-reading experience or technoliteracy practices at home. With this understanding, the researcher can better define the typology of children's engagement (emotional, behavioral, and cognitive) with and e-reading skills competence. The application designer can develop more sophisticated and more child appealing apps in mobile devices. The teacher at the school may profit using such well-designed apps as learning tools for children at school. Parents also can support and cultivate children's e-reading for pleasure. Therefore, there is a need to understand different aspect of bilingual children's engagement with reading apps for early readers in English.

1.4 Purpose and Objectives

This research aims to understand children' e-reading experience and engagement using touch screen device such as iPad, in which, reading for pleasure is the main focus. The result of this study will inform planners, application designers, policy makers, and parents; those who are trying to understand the specified problem. The objective of the study are as follows:

a) To understand children e-reading practices when reading for pleasure using touch screen device
b) To understand children's engagement in e-reading when reading for pleasure using touch screen device

1.5 Research Questions

The research questions for this study put forward as:

1. How do children demonstrate their e-reading experience The literature review revealed screen device?
2. What drives children emotional engagement in e-reading exercise when using touch screen device?

3. What drives children behavioral engagement in e-reading exercise when using touch screen device?
4. How do children demonstrate their understanding of the e-reading exercise when using touch screen device?

1.6 Significance of the Study

The significance of the research is discussed concerning method, context, and subject. Firstly, with the advent of technology, technoliteracy or emergent literacy become a popular area of study among researchers in several field and domain such as in education (Fernandez, 2015; Friedrich, Teichert, & Devadas, 2017; Goodfellow, 2011; Jetnikoff, 2016; Lynch & Redpath, 2014), human-computer interaction (Fails, 2012; Ismail, Ismail, & Abdz.Razak, 2014; Thies, 2017; Wang, Kota, Reddy, Baran, & Bhatia, 2018; Zhao & Unsworth, 2017), science (Karuppiah, 2014; Lopatovska, 2016) , linguistics (Chanier & Lamy, 2017; Tour, 2010; Wohlwend, 2017). According to (Richard Kahn & Kellner, 2005), the concepts of technological literacy has been written since 1992, and the term technoliteracy has begun to emerge since 1995. Many studies have explored this field to identify the advantages and a need this topic. However, there is no empirical study with case study approach to examine children's e-reading experiences and engagement when the intention, here, is reading for pleasure using storybooks and educational apps in the second language. Several studies recognized a knowledge gap in reading for pleasure in second language (Chanier & Lamy, 2017; Massimi et al., 2013; Verhallen & Bus, 2011; Kucirkova & Littleton, 2016). Study by Chanier and Lamy (2017) discussed how second language learners arrange various resources such as spoken words, images, colors, movements, and sounds for online communication. The study highlights the multimodal meaning-making for language learning; linguistic mode (written language) and visual mode (choice of fonts and spaces on the screen). They categorized the tools into screens, recording and screen

capture tools, hot buttons, messaging channels, and web conferencing. Study by Massimi et al, (2013) discussed the term “edu-tainment” and designed a study were asked to read using e-reader in joint reading aloud setting with their mother in English (their second language). The scope of the study was reading for pleasure, however, reading materials included educational component. The findings highlight that participants used e-reader to learn English through entertainment. Moreover, study by Verhallen and Bus (2011) examined young children’s second language learning using a digital picture storybook. The study used eye movements tracking system to see how children understand a story. They focused on visual and verbal elements in digital storybooks. The findings discussed how children’s visual behavior can add to vocabulary development and story comprehension. In addition, survey by Kucirkova and Littleton (2016) was conducted on reading for pleasure with print and digital books for children from 0-8-year old. The study investigated children’s engagement with digital technologies at home, general reading practices with children, and parent parent perceptions. The findings highlighted parents cencern on children’s digital media exposure.

Secondly, in the concept of emergent literacy and literacy development, many studies have shown the importance of children's literacy development in the early stage of reading to learn and learning to read. It is clear that studies have shifted to explore the affordance and hindrance of handheld touch screen devices for reading and writing. However, a significant gap identifies that there is limited exploratory studies on a form of the qualitative case study that employs engagement model of reading development and self-determination theory on reading apps to probe children's experience and engagement in reading for pleasure context in depth. This study aims to explore the e-reading experience when children engaging with reading apps iPad for pleasure in English. Many education stakeholders often consider promoting reading and developing

lifelong reading habits amongst children a priority (Colombo, 2013). This study aims to create greater technoliteracy awareness among children and families, especially those bilingual/multilingual families where learning English is important. This awareness is addressed by highlighting the significance of the skills to promote new literacy skills for bi/multilingual children.

1.7 Limitation

Careful considerations were made in planning and designing this study to stay in focus with the research objectives. While all necessary efforts have been taken to ensure efficient and credible research, the researcher was faced with several challenges which might have interrupted or changed the initial research plan of the study. The challenges include the followings:

Firstly, data collection, particularly finding a school that permits to conduct the study there was difficult and time-consuming. In some cases, school permission was obtained but could not get parents' permission. In addition, school routine and examination time caused a longer data collection period. The improved version of information sheets with more detailed process of data collection as well as study's objectives and aims captured more parent's attention and led to obtaining permission easier. In addition, facilitator (English teacher) helped the researcher to remind and talk to parents during their school visits to explain the data collection process in person.

Secondly, fieldwork observation initially was conducted in the computer lab, and seminar room at the school where there were other students involved some school activities or the windows were designed that way the student's loud sounds during the break time or recess was disturbing. So, therefore, the reading session was scheduled on days with less traffic on the school library and computer lap with the help of a facilitator. The ideal setting might be at home. However, conducting the study at home is very difficult and ethically challenging.

Thirdly, some parents were reluctant to take part in an interview. Researcher managed to communicate more with parents through email or short SMS to briefly go through the interview questions. However, 7 out of 10 parents agreed to participate in interview through phone; parents' preferred way of participation. Ideally, if researcher could have other three parents, it would provide more information about informal home literacy practices. Moreover, some students were not willing to answer questions. In some occasion, children should leave school earlier than the scheduled time due to change in the school shuttle bus timeline. Thus, the researcher had to set another reading session later.

Fourthly, data analysis software, the license was expired for the first round and took longer to repurchase new package, and it was available on dedicated University' laptop; not available for the half of data analysis.

Fifthly, recording devices, some functionality disoperation happened with a voice recorder for some of the sessions that resulted in longer transcriptions of part of interviews through matching and checking the audio and video.

Last but not least, since researcher is foreigner in Malaysia, it was necessary to pick children with better English language proficiency to be able to communicate and collect rich data without any assistant. In addition, all the reading apps used in this study were in English. Moreover, for future work, it is better to conduct the study with paid version apps if possible, as developer improve the app interface very quickly.

1.8 Definition of Terms

Technoliteracy refers to literacy activities that employ the use of technology such as computers, mobiles, and tablets (Jewitt, 2005).

Reading engagement is defined as the integration of motivation and cognitive strategies during literacy activities" (Baker, Dreher, & Guthrie, 2000, p. 9). Moreover, it

has three dimensions as the enjoyment of reading, time spent reading for enjoyment, and diversity of text read (Brozo et al., 2014).

E-reading refers to reading and interacting with reading materials using an electronic/digital device such as personal computer, tablets, or e-readers such as the Kindle.

Reading for Pleasure has comprises several forms including play pleasure (relating to characters, participate in making meaning), intellectual pleasure (figuring out the message, meaning, and effects of the text), social pleasure (capacity to experience world from other perspectives) (Wilhelm, Smith, & Fransen, 2014).

Cognitive strategies refer to as a way to processes verbal and visual information for learning purpose; the aim of these strategies is to obtain, store, retrieve, or use of information such as repetition, organizing, summarizing, guessing, imagery, and associations (Ma, 2014).

1.9 Organization of the Thesis

The structure of this thesis is designed into six chapters. Chapter one explains the background to the study, the context of the study that discusses the research problems, the objectives and the research questions, the research paradigm and theoretical framework, as well as the significance of the study to the research area. Chapter two examines the literature about the topic of the study. Chapter three describes the research design and methods employed in conducting the study. It discusses all the steps taken to investigate how e-reading engagement, as well as e-reading experience and behaviors, are conceptualized when children were reading from an iPad so-called on-screen reading (storybooks and educational reading apps). Chapter four reports the analysis and results of e-reading activities observations and interviews. Chapter five discusses the findings from children' reading activities observation, children's, parents interview and relates the findings of the study to the engagement model of reading development,

finally concludes the study by discussing the implications of the findings and recommendations for further research.

CHAPTER 2: LITERATURE REVIEW

2.1 Overview

The research in children's technoliteracy originates from both research and practical perspectives with a background in children's online interaction. Technoliteracy has been used most often by researchers about children's everyday technology engagement. The steps to obtain literature includes deciding on area of research (technoliteracy), conducting exhaustive search on online databases such as Web of Science and Science Direct by looking at the recent studies in human-computer interaction, educations, and library and information science domain. The main keywords search includes children, engagement and motivation, emergent literacy, tablet, iPad, e-readers, e-readings, and ebooks.

This chapter uncover the review of existing research related to this study. It includes: a) Technoliteracy and digital reading, b) E-reading practices, c) Theories and applications, d) Theoretical lenses.

2.2 Technoliteracy and Digital Reading

Today's children are growing up in rich digital environment. They are exposed to many opportunities to explore and interact with electronic devices. As we know, children's literacy experiences can impact the development of their emergent literacy skills. The children's literacy acquisition refers to the acquisition of reading and writing skills with the emphasis on the link between cognitive skills and reading skills (decoding and comprehension) (Hall et al., 2013). This section discusses about children's technoliteracy experiences and mediums.

2.2.1 Children and Reading

Children obtain verbal and nonverbal behavior by informal observation and impression of others (Skinner, Kindermann, & Furrer, 2008). In individual reading

context, children look up to their caregivers in life, for example, if they witness parents on home literacy practices, most probably will engage more in reading. Also, the access to reading materials at home or school (formal or informal) will influence their reading engagements (Jewel, Phelps, & Kuhnen, 1998). Most young children (4-year old) read or are read to daily for approximately 30 minutes per day (Lauricella, Barr, & Calvert, 2014). Literacy-related benefits of informal reading include reading achievement and writing skill, text comprehension and grammar, breadth of vocabulary, positive reading attitudes, greater self-efficacy as a reader, enjoyment of reading in later life, as well as acquisition of general knowledge, a better understanding of other cultures, community participation, a greater insight into human nature and decision-making (Mistry, Biesanz, Chien, Howes, & Benner, 2008). First- and second-grade students are in the 'learning to read' stage, and if they can gain a rich variety of reading experiences at this time, it will be helpful in the development of their reading development stage (Huang, Hsu, Su, & Liu, 2014). On the other hand, children with less exposure to informal reading activities do not have the advantages come with reading. When children are struggling to read, they lose their motivation and opportunities to learn to decrease significantly (Clark, Osborne, & Akerman, 2008).

2.2.2 Children and Digital Devices

There has been a visible increase in the ownership of smartphone and use of mobile devices among young adults in Malaysia (Song, Murphy, & Farely, 2013). Smart mobile devices are notably becoming more accessible, available, and widely used. The Statista Research Department (2019) reported that approximately 6.3 million people in 2018 and 6.7 million people in 2019 were using tablets in Malaysia. The Digital Influence Lab (2019), reported the Malaysian access their smartphone 96% , Laptop, notebook, and netbook 41%, Tablets 18%, TV 90%, and e-reader devices 12 %.

The mobile learning or m-learning , learning process through mobile devices such as tablets and smartphones, is in increase in Malaysia (Masrom, Nadzari, Mahmood, Zakaria, & Mohd Ali, (2016). Study by Wahab, Osman, & Ismail (2010) stated that in primary education most of learning apps was about the science. According to Elyazgi, Mahrin, Rahim, and Imtiaz (2014), tablet usage at school in Malaysia includes teaching material, ebook, digital knowledge, weekly reports, exercise, toolbox, and contact book. The western Malaysia peninsular (Terengganu) has started to use ebooks in the primary schools (Rahim & Abu Bakar, 2014). Rahim and Abu Bakar identified the tablet usage among primary school children includes answer to exercise, finding material from internet, as well as dictionary use and playing computer games. On the other hand, study by Yin (2013) stated the tendency for parents, teachers and students to view the tablet PC as a tool for entertainment, not education. However, according to Gang, Zainudin, Ibrahim, and Chun (2017), in Malasysia many of reading apps (interactive storybooks) were not tailored for children whose first language is Bahasa Malaysia.

2.2.3 New Literacies and E-reading

The term ‘New literacies' revolves around the concept of employing new skills to use digital technology besides traditional literacy skills to read and navigate digital reading devices and materials. Children learn the navigational skills when interacting with digital devices by practicing own self or through the discussion about the mechanic of the devices (Lauricella et al., 2014) such as clicking and moving the mouse with their parents. These new interfaces welcome children into the technological environment. The cultural anthropology, sociolinguistic, cognitive science, and information science were able to identify literacy evolution. The impacts were recognized through the result of teaching the students who struggle with the printed version using new literacies in a different medium. Digital literacy development has become a requirement created by the extensive development and application of new technologies for communication and

representation (Churchill, 2016). These digital devices become their medium of preference. Children learn to discipline themselves with devices. So, the new technology gives teachers another opportunity to help children work on self-control (Donohue, 2014). Cope & Kalantzis (2000) defined the term ‘Multiliteracies' which describes the multiplicity of communications channels and media as well as increasing salience of cultural and linguistic diversity. It is referring to multimodal channels of meaning that is important to communication. The term "technoliteracy" has been used most often by researchers about children's everyday technology engagement. Marsh referred technoliteracy as a notion of a "technically literate generation" (Marsh, 2004, 2005).

The rationale for using technology in the early years is examined along with the changes that have occurred in written texts and textual practices (Shuker & Terreni, 2013). The “Digital books” is a general term corresponds to a wide range of digital texts available such as e-books, iBook, and LeapReader books (Kucirkova, Littleton, & Cremin, 2015). The digital technology has changed the notion of reading and writing. The touch-screen devices, such as the iPad, can integrate the learning platforms at home and school to support cultural participation and learner identity (Lynch & Redpath, 2014). In the course of the time, with the growth of tablet computers and development of the variety of apps, they can provide unprecedented opportunities for children to create their contents and participate in rich and dynamic learning contexts (Kucirkova, 2014). For example, in 2012, ‘Apple in Education' has been developed with the focus on developing digital textbooks for low budget schools and educational apps to facilitate learning, promoting iTunes for the creation of instructional podcasts, and offering special pricing for students and educational institutions (Bayles & Knoke-Staggs, 2013).

Literacy learning using tablets occurs in two contexts; at home or school when integrating it to the curriculum. With the emergent of technology and literacy, educators can employed these interfaces in reading acquisition and instruction as early as the primary school (De Jong & Bus, 2002). It is evident that for students in the beginning reading stages, using developmentally appropriate information and communication technologies can support and facilitate communication their learning in language. Besides, a well-designed application offers enormous potential for young children (5-year old) to learn fine motor skills, verbal skills, recall, and recognition (Bayles & Knoke-Staggs, 2013). Features on tablet-based e-books such as on-screen display, interactive elements, built-in dictionaries, automatic page turning, and hotspots can influence children's literacy skills (Wang & Huang, 2015).

Moreover, automatically read the text aloud feature (pronunciation of text by a narrator) provides opportunities for learners to hear the spoken words which a way to enhance letter-sound awareness by highlighting the text at the same time. This spoken words can be entertaining for children as well. This feature works best for struggling readers when the pronunciation of new words is made easy by listening to the narrator (Massimi et al., 2013). A reader with a larger vocabulary is better able to understand a sophisticated text. Use of such e-books including auditory features improved children's vocabulary (Korat & Shamir, 2007; Segers & Verhoeven, 2002). Similarly, some ebooks have audio-recording features that have the ability to records the parent's voice reading the text. Children can play a recorded voice to re-live the parent-child reading session (Attarwala, Munteanu, & Baecker, 2013).

2.3 E-reading Practices

Research has shown that emergent literacy and digital devices can facilitate engagement in ways which are difficult to achieve otherwise. Studies argue that technoliteracy is best done using natural and intuitive gesture-based touch screen

devices through encouraging children's motivation and engagement with informal reading and reading for pleasure literacy practices. The current literature on children's e-reading falls into four areas of interest: reading for pleasure, reading engagement and motivation, e-reading before and after tablet, and reading in the second language.

2.3.1 Reading for Pleasure

The leisure reading is referred to as 'reading for pleasure', 'recreational reading', voluntary reading', and 'reading outside of the school' (Hughes-Hassell, 2008; Hughes-Hassell, & Rodge, 2007; Taylor, 2011). The emergent of e-books influences entirely the young children's (ages 9 to 10) literacy development (Miller & Warschauer, 2014). Reading for pleasure has comprises several forms including play pleasure (relating to characters, participate in making meaning), intellectual pleasure (figuring out the message, meaning, and effects of the text), social pleasure (capacity to experience world from other perspectives), work pleasure (learning strategies for getting something functional done) (Wilhelm et al., 2014). Recently, scholars have emphasized the importance of reading for pleasure for both educational as well as personal development (Clark & Rumbold, 2006).

A literature review work by Wilkinson (2015) categorized the impact and outcomes of reading for pleasure for children and young people into personal outcomes (emotional intelligence, relaxation, knowledge of self-identity, creativity, and enjoyment), social outcomes (relatedness, social and cultural capital, and communication), and external outcomes (attainment, knowledge of services, knowledge of other cultures). Success in reading for pleasure exercises can also develop social skills in children. Children need knowledge and understanding of their world in order to make sense of what they read. Reading for pleasure in children is the dominant factor in cognitive progress and social mobility over time (Sullivan & Brown, 2013). It is also

crucial to understand the factors that may influence children's literary lives at home or in school.

In the book of Psychology of Reading for Pleasure, Victor Nell distinguishes reading for pleasure from reading for practical knowledge or instrumental knowledge. In reading for pleasure context, it identified the reader as being enchanted and transported as well as fully attained on reading. The reading for pleasure was defined as a form of play that allows the reader to experience other worlds and roles in their imagination (Nell, 1988). The component process of reading for pleasure was defined base on reading skills, choice of reading material, and cognitive demands of reading. According to The National Literacy Trust, a leading authority on literacy based in the UK, reading for pleasure is one way to advance literacy attainment in children (Clark & Rumbold, 2006). There is a positive relationship between reading frequency, reading enjoyment and attainment. Reading for enjoyment is characterized by concentration and high emotional involvement with the text (O'Hara & Sellen, 1997).

A report by (*Research evidence on reading for pleasure*, 2012) summarizes benefits of reading for pleasure on children's educational success, reading achievements, and personal development. Similarly, a study by Mikulecky and Jeffries (1996) provides guidelines on how to choose a book for pleasure, and to improve reading for pleasure habits. They identified reading comprehension skills such as (scanning, skimming, summarizing, previewing and predicting), the review states the benefits of reading for pleasure regularly as improving vocabulary, reading speed, reading comprehension, writing, gaining more knowledge, and improve language learning like English. On the other hand, Krashen (1994) argues that when children read for pleasure, they acquire involuntarily and without conscious effort which leads to acquiring a large vocabulary, developing comprehension skills, and become a good speller. However, based on the pleasure hypothesis by Asimov and Asimov (2002), " If an activity promotes language

acquisition, it is enjoyable. However, enjoyment does not guarantee language acquisition". Nevertheless, developing children's interest and pleasure in reading must be as much a focus as developing their reading skills (Learning First Alliance, 1998). In regards to reading for pleasure context, it is important to motivate readers and promote creatively engaging environments where early readers encounter with literature and other texts and allow them to choose, volunteer reading and share their preferences (Cremin, 2007). Furthermore, a review by Douglas and Hargadon (2000) on reading for pleasure principle through the scope of engagement, immersion, and interactivity. They defined that reading for the pleasure of interactive text coming from immersion and engagement. The pleasure of immersion occurs when the reader is absorbed within the ebb and flow of a familiar narrative schema. The pleasure of engagement tends to come from the ability to guess about the direction of the plot. The affective pleasure of reading text comes from paging through and different navigation genre of literature of interactive narrative. So, pleasure principles indicate that texts are either engaging or immersive. For example, characters, plots, and feeling of being an oblivious immerse reader. In the immersive type of texts, the ability to the familiar schema can bring reader pleasure. On the other hand, challenging schema engages the reader. Nonetheless, the pleasure stems from following the story or ideas being presented by the author and is distinguished from the required act of memorizing the material (Mikulecky & Jeffries, 1996).

This section summaries the benefits of reading for pleasure when the reader chooses to engage in reading acts (voluntarily) in order to get practical or instrumental knowledge as well as the enjoyment of going through events in the story and estimation of what will happen next. The literature identified the impact of reading for pleasure in literacy attainment, educational success, reading achievement, and language learning as it can promote children’s reading attitudes. It reveals the connection between reading

for pleasure (enjoyment) and sustained attention to reading material and motivation to reading after a pleasant reading experience.

2.3.2 Reading Engagement and Motivation

Engagement is presumed to be malleable, responsive to contextual features, and amenable to environmental change. Researchers describe behavioral, emotional, and cognitive engagement and recommend studying engagement as a multifaceted/ multidimensional construct (Fredricks, Blumenfeld, & Paris, 2004). The fusion of behavior, emotion, and cognition under the idea of engagement is valuable because it may provide a richer characterization of children than is possible in research on single components. In reality, these factors are dynamically interrelated within the individual; they are not isolated processes (Fredricks et al., 2004).

A conceptual framework by O'Brien & Toms (2008) indicates that engagement builds upon the foundation of a usable system that is effective, efficient, and satisfying. Engagement integrates system attributes (i.e., feedback, challenge, sensory appeal) with the affective propensities of the user. They claimed engagement is conceptually a holistic framework for understanding the integration of user and system variables, and how they combine to push the boundaries of user experience from merely perfunctory to pleasurable and memorable.

It is recommended that children who are in the early stage of reading should engage with reading material and learning process. In brain the affective system control the engagement behaviour of a learner (Guthrie, 2000). If children enjoy reading activities and use advanced strategies in their literacy practices become more engaged in reading (Jones & Brown, 2011).

Engagement for school achievements – several studies investigated learning engagement in the learning achievement context. A study by Stern and Shalev (2013) investigated the impact of sustained attention on the performance of students' reading

comprehension, and the results showed that students with more sustained attention had significantly better outcomes. Mayer (2010) explained that engaging in active processing within the verbal or visual channels facilitate s meaningful learning. It occurs through the selection and organization of words and pictures into a proper visual and verbal model and then integration with prior knowledge. These active learning processes occur when corresponding verbal and pictorial representations are in working memory simultaneously. In literacy practices, engagement is an essential factor for the development of and learning and reading skills. Reading engagement is an excellent indicator of reading achievement, comprehension, vocabulary acquisition, and fluency for children at the age between second and fifth grade. (Guthrie, 2000). According to Kelley and Clausen-Grace (2009), proficient engaged readers attempt to deeply understand what they are reading which can bring them enjoyment and pleasure and often actively to share their experience with others. Reading skills such as word decoding, sentence integration, and situation model formation will impact performance in reading the digital text (Naumann, 2015). It is clear that low-skilled readers might have difficulty on comprehending, decoding words, and lack of interest towards improving required skills. Based on Wigfield & Guthrie (1997) work on low-skilled readers, reading may become a painful experience; thus they may decline opportunities for practice. On the other hand, motivated readers read more and drawn upon independent reading.

Reading engagement can predict a child's ultimate literacy development. One of the leading indicators of reading engagement is motivation for independent reading (Jones & Brown, 2011). Characteristics of engaged readers are as follow:

- Intrinsically motivated factors such as curiosity, interest, and enjoyment are great drivers of why people want to achieve their intellectual or personal goals.

- Demonstrating the behaviors of concentration, investment, enthusiasm, and effort (Jablon & Wilkinson, 2006).
- Enjoy literacy activities and able to use sophisticated strategies (Jablon & Wilkinson, 2006).
- Enjoy literacy activities and able to use sophisticated strategies (Jones & Brown, 2011).
- Actively attempt to read appropriate books and become enthusiastic about learning new topics and contents (Lutz, Guthrie, & Davis, 2006).

Furthermore, Guthrie (2000) suggested the characteristics of an engaging software for children's reading to be challenging and supportive, appealing feature along with reward system, encouraging the pleasure of reading, fostering the reader's creativity, providing real-life context and variety of text. On the other hand, Schlechty (2001) recognized the differences between being engaged and being on task. Task engagement requires students to be attentive as well as committed to the task and believe in some inherent value to complete a task. The engaged student finishes the task with enthusiasm and persistence. Research shows a significant relationship between high levels of engagement and improved attendance and achievement. (Jablon & Wilkinson, 2006). In addition, several studies compare boy and girl reading engagement. For example, a study by Kirsch et al. (2003) compared the reading engagement of 15-year-olds (boy and girls). The results show that, girls recorded higher scores in the level of reading engagement and the variety of reading topics to read compared to boys.

Motivation is crucial to engagement because motivation is what activates behavior (Guthrie & Wigfield, 2000, p.406). Engagement associates with both intrinsic (curiosity, aesthetic involvement, challenge, feelings of competence, and enjoyment) and extrinsic motivation (compliance, recognition, and grades) (Guthrie, McGough, Bennett, & Rice, 1996). The characteristic of intrinsically motivated learners is to

persistence, make more effort, proactive on applying strategies, and retaining information consistently (Guthrie, McGough, et al., 1996; Malone, 1981).

Flowerday, Schraw, and Stevens (2004) reported that children's reading engagement is positively affected if a wide range of favorite reading materials is available for them. The availability of reading materials indicates how engaged children are in reading (Jones & Brown, 2011). Moreover, the wide selection of titles possible through online ebook websites is motivational for children. This resemblance to the freedom of choosing any book from the library. The reader is afforded a choice of what to read.

According to Malloy, Marinak, and Gambrell (2010), motivation theorist coming from (Eccles, Wigfield, & Schiefele, in press; Pintrich & Schunk, 1996; Weiner, 1992) try to understand the choices individual make about which activity to do, degree of persistence at chosen activity, and amount of effort they exert as they do the activity. On the other hand, Skinner (1959) and Watson (1913) believed that choices are based on what happened in the environment. If the response to our behavior is pleasant, we are likely to choose to engage in the same behavior again.

Three theories such as ‘expectancy-value' , ‘attribution' theory and ‘self-efficacy' theory focus on the expectation of doing desired activities; outcome expectation or efficacy expectation. The values are defined base on usefulness or interest, an outcome of doing activities (achievement motivation). For text reading, it can be an indicator of reading achievement. For example, a study by Schoor (2015) examined reading motivational constructs and utility of reading. Motivational factors on reading achievements were mediated by reading behavior. Besides, a study by Wigfield and Eccles (2000) investigated the reader's motivation to read through the lens of expectancy-value theory. They indicated that those activates that have high intrinsic value are inherently enjoyable in which help the learner to achieve more goals. Being persistence on activities or giving up because of the lack of interest can define success

or failure on doing activates. Therefore, motivation refers to the function of the value one places on a task, one's expectations about the task, and the perceived cost of the task (Leacock & Nesbit, 2007). It identifies as learners' effort to preserve the perception of high ability among themselves and others (Schunk, 2012). According to Bandura (1971) the intention of getting engaged more readily in activities where one feels competent in the task or lacking in skills. For example, game-based applications have been related to heightened enjoyment, and perceived enjoyment is having a positive effect on self-efficacy (Weniger & Loebbecke, 2011). Similarly, those features on digital reading interfaces that offer the ability to select words and help for that word increases the feeling of self-efficacy within the beginning and struggling readers (Pearman & Lefever-Davis, 2006). In regards to children's reading self-efficacy beliefs are how well they have done on similar tasks or activities and the feedback that they receive from others (Das, Schokman-Gates & Murphy, 1985).

Cognitive constructs correspond to motivational constructs. Proficient readers exhibit higher level of engagement in reading, and therefore attain more skills and knowledge. On the other hand, poor readers have lower tendency to read (Allington, 1984) and exhibit a negative attitude towards reading (Oka & Paris, 1986). Hence, they experience less exposure to promotion of their comprehension skills.

Reading attitudes have long been considered an important psychological construct because of their essential role in moderating motivation to read and intention to read and in mediating the relationship between individual beliefs and reading activity (Petscher, 2010). Intrinsically motivated students read for enjoyment and pleasure as well as knowledge (Wigfield & Guthrie, 1997).

Personal interest of reader on reading material enhances the cognitive performance. Reader's preference and interest impact the selection of reading material which can lead the improvement of reading engagement. Familiarity with the domain or prior

knowledge improve further interest and offers a support for new learning. The reader grows familiarity with content, structure, characters, and vocabulary — and word activities based on story content (Guthrie, 2000). Cognitive and linguistic support during parent-child interaction such as that which occurs during joint reading is important to children's cognitive development (Krcmar & Cingel, 2014). One method of improving reading ability and motivation is to make texts more engaging and connected to the real world (Miller, 2009). Cognitive scaffolding, which happens in shared or joint reading, develops the understanding of concepts through questioning, modeling encouraging collaboration with peers (Neuman, 1996).

This section mapped the motivational construct of engagement with defined engagement components and its benefit on literacy practices, school achievements, performance and comprehension. The section highlighted the role of multimedia elements, visual and verbal modes, on in meaningful learning. Moreover, it stated the role of children's reading interest and preferences on their sustained attention and eventually on understanding of what they read. It showed the relationship of favourite reading material with self-efficacy generated from enjoyment and perceived enjoyment.

2.3.3 E-Reading before the Tablet

In 2000, technology included Compact Disc Read Only Memory (CD-ROMs), DVD, and mobile phones, and computer games. The CD-ROMS were popular and used to distribute software and data for computers and video game consoles. A book by Unsworth, Thomas, Simpson, and Asha (2005) explored children's literature on CD-ROM and identified most common categories of literature for children as traditional tales such as classic children stories were published around 1955 in print format. Also, the authors mentioned about some contemporary literary texts for children had also been published on CD-ROMs. The interactive features include hotspots, highlighted text, hyperlinks, narration over the text, and animations. The mouse, mostly through clicks

controlled the animations inside the CD. So, the navigation was significant issues on that, for example, Chen et al. (2008) reported complains from ebook reader users including difficult navigation, eyestrain, and preference for print. The difficulty of how to quite the story and return on the current page. Also, the most frequent problems in computer use are keyboard ergonomics, since keyboards are the most used part of computers. Keyboards are to blame for the majority of disorders related to computer use including puts strain on hand wrists or an unsuitable chair or armchair, poor lighting, not suitable position of the monitor (Anđelić, Čekerevac, & Dragović, 2014).

There are several studies investigating children's reading or listening to storybook using CD-ROMs (Doty, Popplewell, & Byers, 2001; Labbo & Kuhn, 2000; Lefever-Davis & Pearman, 2005; Miller, Blackstock, & Miller, 1994; Pearman & Lefever-davis, 2006; Shamir, 2006; Shamir et al., 2008). For example, a study by Miller et al. (1994) is an exploratory research on the use of CD-ROM storybooks. They examined children's reading behavior by comparing their behavior in two settings including CD-ROM reading and paper book reading. Their findings highlight the role of on-demand features on CD-ROMs that enhanced children's reading improvements. In terms of learning language, Eun and Lim (2009) explored mother-child interactions with traditional book and electronic book in CD-ROM. The study suggests that second-language learners who live in an environment that continually reinforces the use of the language that they are learning will already know the value and importance of the target language. Therefore, it brings attention to the significance of technoliteracy competence across the informal and leisure time literacy practices as well for better literacy development of bilingual children in English.

Lefever-Davis and Pearman (2005) investigated the impact of CD-ROM storybook features on children's reading behavior. They explored the benefits and drawbacks of the features in CD-ROM storybooks. For example, they highlighted that those features

could support struggling children to read when they encounter new or unfamiliar words. Besides, they indicated that games embedded in storybooks might encourage children to view reading as a collection of playful activities rather than as a meaning-making event. However, at the same time features can promote passive reading and they do not get actively involved in reading. The passive reading refers to when reader becomes spectator stance and activates the narrative and have computer read the entire page instead of reading it aloud.

Rich multimedia features and interactive elements are often appealing for children and enjoy spending time for more interaction (Guthrie, 2000). It is recommended that use of technology should be coupled with effective instruction to ensure that children are learning, not just playing with the computer assisted features (Northrop & Killeen, 2013). In terms of children's comprehension levels at school, Pearman (2008) explored the affordance of CD-ROM storybooks on struggling children with reading comprehension. He believed that embedded features in CD-ROM provide support for children's understanding by adding the context of illustration and ready availability of definitions for vocabulary acquisition.

Navigation of digital text is a challenge, entail a cognitive cost that causes a cognitive overload for the reader (Mangen & Velay, 2014). In contrast, Larson (2009) explored the benefits of features and functions in e-readers such as highlighting and bookmarking which help readers to leave personal notes and comments. She identified these functionalities as the most valuable reason to use e-readers. The interface of ebook encompasses different features such as hotspots, dictionary, replay button with spoken words, game-like features to facilitate the reader’s understanding. These features dramatize the details of the reading content and provide an interactive environment. They target specific comprehension events which can improve children's understanding of that realm. Moreover, the design of interface facilitate reading activities and provide

an opportunity for learners to read independently with support (Guthrie, 2000). Nevertheless, a study by Green (2005) asserted that given a choice between reading e-books or print books, children prefer e-books, and Greenfield (2012) observed that children (5th and 6th grade) preferred reading an e-book to a print book and that the comprehension between the two formats was the same. Children would choose electronic book over paper books at the presence of interactive elements of ebook which it can enhance listening comprehension skills (Chera & Wood, 2003; Korat & Shamir, 2006; Segers, Takke, & Verhoeven, 2004) and children's early reading development (Ciampa, 2012).

This section discussed the early advancement of digital devices such as CD-ROM and personal computers on cognitive component of reading engagement (reading comprehension). The studies identified that the interactive features and navigation tool of digital text influence the language learning and reading behaviour. The studies highlighted the enjoyable multimedia features (enjoyment) and improvement on reading comprehension (literacy development) as they have potential to promote the listening comprehension skills. However, some studies pointed the difficulties of navigating such digital devices.

2.3.4 E-Reading after the Tablet

Nowadays, one of the innovative and increasingly popular mediums for delivering text is the portable digital reading devices such as Amazon Kindle, Sony Reader, Apple iPhone, iPod and iPad, Barnes and Noble Nook, Netbook designed initially been for reading e-books in which children and adult have started to use e-readers for informal and formal reading.. Kindle, for example, allows readers to download a considerable number of books, magazines, and newspapers in a short amount of time. Generally, e-readers allow users to have access to more significant numbers of reading selections and

download them. It enables them to sift through books and providing them to others in a preferred format.

With the advent of handheld devices in 2010, such as tablet technology, like iPad, offered bare handed touch-form interaction. The natural interactions refer to mutual or reciprocal actions that the user operates through intuitive actions that are related to or are as close as possible to natural everyday human behavior. By ‘intuitive' it means a device or an interactive system that is not just easy to use but is used based on what one feels to be true even without conscious reasoning (Rahman, Ali, & Mohd., 2013). There are several studies on understanding tablet use and apps. For example, a study by Cohen (2011) identified three types of tablets apps for young children (2-year old) ; a) gaming apps (interactive, easy to learn, and compelling to master), b) creating apps which are tools for drawing or building, c) reading apps. The gaming apps typically have a goal (e.g., to score points) and progressively increase in difficulty to maintain the child's interest. The creating apps are based on children's preferences as they involve building activities in an environment with a range of possible ends. The system provides immediate feed and facilitates learning by doing. The reading apps consist of verbal and visual rich multimedia information and interactive elements that also provide 'read to me' or 'read it myself' reading modes.

Similarly, a study by Miranda, Williams-Rossi, Johnson, and McKenzie (2011) listed assistant features in the apps assisted dictionary, adjusting font size, listening to music, and using the text-to-voice function to improve writing and engagement with text as benefits. Tablets have the potential to improve children's emergent literacy skills. However, the optimal use of tablets for early literacy learning may be reliant on the type of supports children received to interact with digital devices (Neumann & Neumann, 2013). A study by Müller, Gove, and Webb (2012) focused on when, where, why, and how people interact with the content of their tablets. They identified most frequent

tablet activities such as checking emails, playing games, social networking. Moreover, the study recognized that most locations of use are couch, bed, and table. Moreover, the setup of tablet use includes watching TV, eating, and cooking.

Moreover, a study by Huang, Liang, Su, and Chen (2012) investigated elementary school student's e-book reading rate using tablets for mobile personalized learning context. The personalized functions such as annotation, content searching, and learning process tracks were embedded in the ebook learning system. This study employed a mixed method (qualitative and quantitative) and was divided into three phases based on human-cantered design processes. Situational elements and interactive interface as well as novelty of device can improve children reading engagement. These assistant design encourage readers to read "like an expert" by supporting decoding, background knowledge, and vocabulary skills (Guthrie, 2000). For example, study by Hutchison, Beschorner, and Schmidt-Crawford (2012) explored the viability of using iPad to support and enhance literacy instruction, findings show that having the visual images to go with the text helped students to understand better what they read. They reported three new literacy skills that children used during the experiment; a) using doodle buddy to create the image of what they understand from the story, b) using sticky notes (virtually) to communicate with other students, c) a linear diagram to describe the written text. Authors believed students were highly engaged and able to demonstrate unique and creative ways of responding to text using a technology tool.

Furthermore, Study by Fernandez (2015) employed a qualitative research design using phenomenology to explore the techno-literacy practices of nine emergent readers and how they engaged with technologies and digital devices or with screens. It is evident that emergent readers become active meaning-maker as they expose to rich multimedia content which offers an opportunity to ask questions and talk about what they are always watching. Rahman et al. (2013) Investigated the natural elements of

gesture-based interaction in terms of how they influence the behavior of children using gesture-based technology devices, and to what extent the children benefit from their use. The results suggest natural gesture interaction which refers to mutual or reciprocal actions that the user operates through intuitive actions (i.e., easy to use, based on one feels to be true even without conscious reasoning) that are related to or are as close as possible to natural everyday human behavior. These type of interaction enable children to control devices. Findings show that natural gestures helped the children engage in gesture interaction by speeding up the interaction; they required less effort to call-back, and eliminated engagement issues such as hesitation and fear when gesturing; the greater benefit for children. Comparing touch-screen usage and pen, a study by Arif and Sylla (2013) investigated these two inputs gestures on iPads. The results showed that in terms of speed and accuracy, pens were more effective than fingers. However, children disliked using the pen for their interactions.

Early studies of electronic books and e-readers had reported mixed reviews, tablets as a medium of reading were not user-friendly as it would seem. The studies identified the challenges of a reliable delivery systems and accessibility (Coleman, 2004), as well as issues of purchasing, app installation (Bell, McCoy, & Peters, 2002), gave both e-books and e-readers low marks. The identified problems were about the flexibility, slow navigation, and poor materials management which made them return to print version in the school context. Further investigation was conducted by Mohd Shukri and Howes (2014) on children's difficulties when interacting with tablets. They highlighted some errors such as multi-touch when single touch actions are required, maintaining contacts with the screen, and making unintentional touches with trailing finger and thumb. As conclusion, the result showed that children with less developed fine motor skills had those difficulties as mentioned above. It was in line with the study by Mcknight, and Fitton (2010) which indicated that six-year-old children could be comfortable with

touch-screen technology and distinguish between a range of common on-screen gestures. So, the exposure to imagery in electronic technologies contributes to the children's literacy development. As Vygotsky (1978) discusses in his theory the role of tools on children development. It means if the device or tools are interactive and responsive to the child's input and need, the child can be influenced and supported and this can mediate the cultural knowledge acquisition (Lauricella, Barr, & Calvert, 2009).

In a joint reading context, parent-child shared reading activity when the aim is learning to read can be recognized as a social process as they read together (Raffle et al., 2010). A study by Massimi et al. (2013) explored shared reading in the context of reading for pleasure. They defined reading for pleasure as a social act and is often performed in the home with family and friends. It is evident that ebooks and tablets are increasingly available in this social context and reading together can be a fun activity in leisure time for people of any age. It is believed that e-readers can support partnered e-reading for pleasure.

Nonetheless, children who read for the outcomes of reading are less likely to get enjoyment from books (Clark & Rumbold, 2006). E-reading for pleasure establishes its form of education and entertainment but competes against growing set of favorite leisure activities (e.g., games and videos) available on tablet computers (Massimi et al., 2013). However, for children with reading problems, the digitized pronunciation of words and oral renderings of larger textual units can stimulate their comprehension and read for pleasure (Bus & Neuman, 2009).

In regards to parent-child interaction during reading activities, Chiong, Ree, Takeuchi, and Erickson (2012) explored parent-child reading interactions and examined child comprehension in both print and e-books. The findings show a decrease in comprehension among children in the e-book reading. Lauricella et al. (2014) examined how parents and children interact during traditional and computer storybook reading in

their home. The results show insignificant differences in comprehension scores between traditional and computer storybooks. In addition, the study of Krcmar and Cingel (2014) reported that parents make more conversation about the book format and environment (Mechanic Utterance) in e-book reading setting than in the print book setting, where they made more evaluative comments about content. The authors believed that electronic reading could be distracting. However, it will get less distracted by course of the time and frequency of parent-child reading sessions; getting more familiar with the e-reader and its function.

Tablets offer potential for successful manipulation by even young children since they do not require separate input devices. Since the first appearance of the iPad in 2010, iPads and other comparable tablets have been heralded for their potential to revolutionize education. Moreover, the natural and interactive on-screen manipulation provide an great opportunity for children to be able to interact even at very young age (Jones & Brown, 2011). Tablets are flexible and versatile. One clear advantage of tablet devices is the natural interaction which requires almost no assistant and children at an early age can interact with it (Geist, 2012). In terms of tablets interface, study by Frank, Sugarman, Horowitz, Lewis, and Yurovsky (2016) defined tablets as being reactive (responding contingently to the child's actions), interactive (eliciting responses from the child based on his or her actions), tailorable (modifiable according to age or preference), progressive (can increase in difficulty or complexity with experience), highly portable, and able to promote joint attention (a child and caregiver can interact with the program together). The interactivity characteristics of tables benefits over passively viewed screen alternatives.

On the other hand, interactive such as hotspots can either enhance learning when they are congruent and central to the story (Chera & Wood, 2003; De Jong & Bus, 2004; Korat & Shamir, 2007) or can hinder learning when they are distracting (Labbo &

Kuhn, 2000; Ricci & Beal, 2002; Trushell & Maitland, 2005). For example, a study by De Jong and Bus (2002) on children's comprehension when reading from the traditional book and electronic books indicate that children learn more from traditional books. However, in 2011, in a similar context, the study of Jones & Brown (2011) found no significant improvements in children's comprehension comparing traditional and electronic books. On the other hand, findings from Zucker, Moody, and McKenna, (2009) examined the efficacy of ebooks on children's literacy skills in the classroom. The findings indicate that some interactive e-book features support comprehension, whereas other incongruent features may hinder comprehension. The study also recommends that any future interactive enhancement should not be implemented just for the sake of interactivity. Meaningful interactive enhancements may also support reading comprehension.

Young children , for example 7 and 8-year old , with poor comprehension skill experience specific difficulties with making two types of inference necessary to construct coherent and integrated text representations (Cain & Oakhill, 1999). They have a poor ability at integrating information given in the text (literal) as well as incorporating information outside of the text (general knowledge) (Cain & Oakhill, 1999). Furthermore, a study by Wolfram and Ortlieb (2012) compares the two reading modes (listening mode and silent reading mode) for proficient and struggling readers between 3rd and 5th-grade student. The results show that children's comprehension improved significantly in reading while listening mode. They believe reading while listening to scaffolds readers, particularly poor comprehender, and help them to improve phonemic awareness (knowledge about sounds in spoken language). The children found listening more enjoyable than reading in silence. Moreover, a study by (Chen & Chen, 2014) compared reading comprehension using paper and screen. The results show

readers reading from paper outperformed readers reading from the screen in literal and inferential comprehension and use of reading strategy.

This section discussed the e-readers and tablets when on-screen reading become more intuitive because of the natural interaction of reader (particularly children) with such hand held devices. Some studies summarized the children's navigation problems in on-screen reading using tablets. Many studies investigated cognitive component of reading engagement by looking at the children's comprehension score when using print and ebooks on shared (parent-child) and individual readings on tablets. Some studies found the assistant features in reading apps or ebooks do not improve the children's comprehension score. However, study on comparing poor and proficient reader shows the significant difference of children's comprehension score when reading from apps and using assistant features. The features enhanced the literacy instructions.

2.3.5 Reading Comprehension

According to the available cognitive models of multimedia learning (Mayer, 2005; Schnotz, 2005) processing of related text and pictures involves the selection of the relevant elements of visual and auditory information, their organization, activation of prior knowledge, and the integration of this knowledge with the organized verbal and pictorial information resulting in a coherent unified representation. Most of these processes occur in working memory as a conscious information processor in which learners build or modify their knowledge structures. Subsequently, these knowledge structures are stored in long-term memory as a knowledge base.

Comprehension of verbal information is often reflected in being able to restate the information in own words or to explain it to someone else (Alessi & Trollip, 2001). Comprehension strategies refer to deliberate efforts by a reader to better understand or remember what is being read (Duke & Block, 2012). Text comprehension is a complex task that draws on many different cognitive skills and processes (Cain, Oakhill, &

Bryant, 2004). According to Jones and Brown (2011) cognitive skills include the ability to preview the text, activate prior knowledge, identify main ideas, the sequence of events, make predictions, make an inference and draw conclusions. Children with reading comprehension difficulties are poor at detecting internal inconsistencies in the text (Cain et al., 2004). Comprehension requires readers to use a variety of skills and strategies to extract meaning from a text. Building background knowledge, story schema and, metacognition. Story schema, defined as the child's prior knowledge of particular story types such as fairy tales (Pearman & Lefever-Davis, 2006). Cain et al. (2004) defined two categories as reading comprehension skills including word recognition skills (low-level processing) and inference making (high-level processing).

According to Oakhill (1982, 1984) children's reading comprehension skill is associated with their ability to make an inference. However, poor inferences could not be attributed to a lack of relevant general knowledge. Instead, the pattern of errors indicated that differences in reading strategy were the most likely source of these group differences. Furthermore, Cain and Oakhill (1999) identified several reasons behind poor comprehension as having a poor memory for the text, failing to instantiate the most contextually appropriate meaning of the category nouns, and making inappropriate inferences. On the other hand, Lauricella et al. (2014) found that attention, language, parent engagement (interaction during the reading sessions) are significant predictors of story comprehension.

Comparing print book and electronic book, a study by Krcmar and Cingel (2014) conclude that children obtained higher comprehension score reading from the print book than in the e-book reading. They believed parent-child conversation over e-book resulted in lower comprehension score. This result echoes the findings from the capacity model by Fisch (2000) indicating that distraction talk draws parent-child focus to an external context which is not associated with story comprehension, providing a limited

capacity for drawing the inference, time ordering, and plot points. However, Krcmar and Cingel (2014) indicated that as children master the learning medium, the capacity of narrative and educational elements of visual and verbal information also grows. Similarly, if children master reading from an e-book, then, it is likely that experience with touch screen technology may enhance the understanding of the narrative. In contrast, Mangen (2008) stated that intangibility of the digital text has caused the reader having shallower and less focused reading experience, also Korat, Shamir, and Heibal, (2013) highlighted that children recall fewer details, too busy with the additional features such as games and hotspots, distract children from the story and disrupt their memory of narrative details.

The nature of reading comprehension has changed with the advent of digital text. E-book interactivity, sound effects, and animation have commonly improved children's reading comprehension skills (Chau, 2008; Maynard and Cheyne, 2005; Ertem, 2010; Grimshaw et al., 2007; and Larson, 2010). Read aloud – spoken words or read it myself mode - it is assumed that by listening to stories children's listening comprehension and their knowledge about story structures are enhanced (Duursmaet al., 2008; Leseman et al., 2007; Mol & Bus, 2011; Sénéchalet al., 1998; Zuckerman & Khandekar, 2010). According to modality effect of verbal and visual information (Mayer & Moreno, 1998) when pictures or animations are represented along with spoken words, working memory capacity increases by using both visual and auditory channel instead of visual channel alone which can be lead to more efficient use of available cognitive resources. For example, a study by Kalyug (2012) reported some findings on the use of spoken words besides written words and pictures. They categorized represented information in two contexts; a) words and pictures, b) words only. In regards to the context of words and pictures, when pictures are incomprehensible without words, they suggested using

spoken words instead of written words. Moreover, spoken words should not be used with written words concurrently when the information is complex, and text is lengthy.

In the same context, when pictures are comprehensible without words, they suggest words should not be used when information is complex. On the other hand, in words only context, spoken words should not be used when information is complex, and text is lengthy. Moreover, spoken and written words should not be used concurrently when information is complex, and text is lengthy, or information is in the second/foreign language. Metacognition can be defined as the reader's self-awareness of their reading strategies and comprehension. E-readers with the assistant features for reading such as pronunciations and auditory reading of the story can promote the reader's metacognition (Pearman & Lefever-Davis, 2006).

This section discussed the previous studies on what influenced the comprehension level of children when reading from digital text. The studies highlighted the strategies Cho and skills to read from reading material when includes multimedia elements. The findings shows how children's brain handle cognitive load when reading from a screen with animation, sound, music and background noises.

2.3.6 Reading in the Second Language

There is growing attention on power of reading on language acquisition. Reading for pleasure can influence literacy development. It is evident that first and second language development, with the context of selected reading (reading for pleasure), can impact reading and writing skills, as engage in more reading activities (Cho & Krashen, 2019). In the context of second language acquisition, reading for pleasure has positive impact on children's reading habits and better language acquisition (Renandya, Jacobs, Krashen, & Hui Min, 2019). Moreover, and Krashen (2016) identified the contributors of reading for pleasure in second language as a) initial pleasant reading experience, b) access to interesting reading materials, c) time and place to read regularly, d) freedom to

select own reading, e) no rewards for reading. Furthermore, in second language reading, Weissheimer et al., (2018) pointed out that reading apps can develop reading skills by increasing focus and reading pace, as words are shown one by one on screen. Several studies investigated children's reading in second language using digital text as follows:

A study by Ping (2014) examined immigrant preschool children's reading from a picture book in Germany as an opportunity to learn the language. Process strategies such as promoting, commenting, and giving feedbacks can help children's language acquisition. He found that by adult support on story reading setting, children enhance interaction among each other and become a storyteller and develop language learning. There are a growing number of multimedia software development for foreign language reading activities since multimedia is considered a promising technology to promote second language learning and teaching (Chiquito et al. 1997; Kramsch and Andersen 1999). However, their focus mostly was on glossary and annotation which can be lead to incidental vocabulary learning.

There are some concerns on cognitive overload caused by multimedia learning applications. A study by Plass, Chun, Mayer, and Leutner (2003) examined English-speaking students reading stories in the German language. In the context of the foreign language or second language learning, presenting too many elements/information to be processed in visual and verbal working memory can lead to cognitive overload. The findings indicated that students' comprehension scores were significantly lower when visual annotations had to be processed than when no annotations, verbal annotations or verbal and visual annotations had to be processed. These findings are in contrast with theory by Mayer, Heiser, and Lonn (2001) indicates that the presentation of word and picture simultaneously and eliminating extraneous media modes lead to better learning outcomes.

On the other hand, a study by Leowr, Ahmad, and Yatmry (2014) is an exploratory study aimed to develop a conceptual framework on mobile-assisted second language learning. The study reviewed several learning theories includinbusg a) second language learning acquisition (learning theory), b) working memory, c) dual coding theory, d) cognitive theory of multimedia learning and e) mobile learning model. The outcome of this mobile-assisted second language learning suggests an improvement on second language learners' oral communicative, and comprehensive intake environment and communication strategies. Moreover, the study concludes the important role of second language acquisition for future work and job as well as academic progress.

A review by Bus et al. (2015) explains the effects of visual and verbal elements of rich multimedia apps on children's emergent literacy. They discuss children's emergent literacy upon whether materials are consistent with the way that the human information processing system works. Not all children would benefit from multimedia stories that use a broader range of symbolic elements to carry meaning; because of the ability to create a mental image of story events.

This section discussed the impact of multimedia elements of digital text and reading apps on children’s cognitive overload and their cognitive engagement. Studies highlighted that processing of such features on visual and verbal working memory can lead to cognitive overload in children. However, some studies have praised the mobile assisted feature for second language learning.

2.4 Theories and Applications in Literacy Development and Reading

An overview of the children's technoliteracy practices studies reveals many theories and models being employed in the learning and literacy development (Csikszentmihalyi, 1990; Deci & Ryan, 1985; Dresang, 2008; Gregory, 1970; Malone & Lepper, 1987). The *Top-Down Information Processing* theory identifies the way reader process the visual and verbal information in multimedia environment (i.e. ebooks) and comprehend

them. The *Flow* theory highlights the concept of engagement and studies in digital environment and design of ebooks. The *Motivation* Theory define intrinsic and extrinsic motivation indicators in fun learning context such as reading or learning from mobile apps. The *Radical Change* theory revolves around the changes in form and format of traditional text into digital text. The theoretical lenses adopted for this study are engagement model of reading development and self-determination theory which are discussed in more details in section 2.5. The following section discusses some use cased of these studies.

2.4.1 Learning Theories

Some of leaning theories have been emerged through the acquisition of learned skills such as reading; providing active processing of knowledge during the reading and afterward (Ortlieb, 2014).

2.4.1.1 Top-down Information Processing

The top-down theory perception or visual perception theory is concerned with receiving information from the environment through a sensory system and transmit it to the brain (Gregory, 1970). Carrell and Eisterhold (1983) defined top-down information processing in reading context as conceptually-driven processing when this mode of processing facilitates the reader's conceptual expectations, so that enables the reader to select between the possible alternative interpretation of the incoming information. They highlighted the fact that when we read a sentence, we try to relate it to something familiar (effect of background knowledge). Factors such as prior knowledge, the ability to engage in top-down processing and identifying central information in narrative affect the comprehending narrative and educational content (Fisch, 2000). According to Chun and Plass (1997) vocabulary knowledge and acquisition is a bottom-up process, and text comprehension is a top-down process. In top-down processing model, learner actively selects relevant information.

On the other hand, Motivational states also are essential in the processing of information (Schunk, 2012). We perceive reality as of how we want it. The concept of constructively responsive reading also embraces the key principles of top-down processing (Mokhtari & Reichard, 2002). Skilled readers build a mental representation of the context while reading and expect certain words and phrases in the text which depends on extensive prior knowledge as well (Resnick, 1985).

A study by Chun and Plass (1996) on language learning through multimedia applications focused on comprehension development using interactive approaches like top-down reading processing. The results highlighted the affordance of multimedia systems for language learning through the use of a dual mode of information (visual and verbal). They indicated that multimedia software facilitates reading comprehension when helps the reader to make referential connections between verbal and visual channels.

Similarly, Plass, Homer, and Hayward (2009) work on design factors on effective learning highlighted the use of top-down theory in design educational animations and simulations. They stated that top-down processing is intentional and voluntary. It is "based on perceiver's knowledge, goals, and expectations" (page 4). They believed that top-down processes could be used to guide learners' attention to the essential parts of the visual information where it allows more cognitive resources to be available for visual learning. Furthermore, this theory has been used in the design of literacy-related apps. So, children can benefit from a top-down reading process when reading from apps. For example, Malzkuhn, and Herzig (2013) work on the design of storybooks for bilingual children who have hearing impairment utilized the top-down theory to support bi-literacy development. Children with hearing difficulties can watch complete ASL translation in *watch mode* and view illustrations in *read*ing *mode*.

2.4.1.2 Flow Theory

The term 'Flow' refers to an optimal engagement state in an activity that is challenging enough to often resulting in immersion and concentrated focus on a task. (Csikszentmihalyi, 1990) called the flow as a positive aspect of human experience including joy and creativity. He developed the theory of optimal experience based on this concept. This theory has been used by scholars who work on "happiness, life satisfaction, and intrinsic motivation", (page 14). Flow experience is directly linked to intrinsic motivation (Longa & Mich, 2013). The fun of play is highly correlated with experiences of flow, enhancing the enjoyment of media consumption (Vorderer, Klimmt, & Ritterfeld, 2004).

Several studies were based upon flow theory in the digital environment. For example, Woszczynski, Roth, and Segars (2002) worked on integrated playful behavior and flow state in human-computer interactions field. The results identified user satisfaction, computer proficiency, and personal innovativeness in information technology as consequences of playfulness in computer interactions. A study by Garzotto (2007) employed this theory as one of the other approaches to identify enjoyment elements in learning online games for children. They believed gaming activities are concerned with motivation factors for engaging in a game. The results indicated that educational games should sustain children's "concentration through an appropriate work-load and proper stimuli" (page, 2).

Additionally Lawson and Lawson (2013) review paper on student acts of engagement identified several states of flow experience where engagement conditions and dispositions and drivers for engagement define the act of engagements, and therefore it manifests benefits of competencies of engagement. On the other hand, Colombo and Landoni (2011) investigated children’s level of engagement using flow theory as a foundation to assess eBooks’ design. Moreover, Colombo (2013) and

Colombo and Landoni (2014) utilized flow theory as a framework to understand the context of children's leisure reading experience. This framework helped them to evaluate user experience (UX).

2.4.1.3 Taxonomy of Intrinsic and Extrinsic Motivation

Malone and Lepper (1987) developed a motivation taxonomy and explained fun and motivating learning activities. The taxonomy of intrinsic motivation identified individual and interpersonal motivational factors. They believed the impact of fun activities over intrinsic motivation through the challenge, curiosity, control, and fantasy. In reading studies motivation is often discussed in terms of intrinsic motivation (motivated from within; e.g., curiosity to read, enjoyment of the experience) and extrinsic (motivated by external factors; e.g., to get a good grade) (Hall, Gee, & Mills, 2016).

This framework has recently been employed for game design and learning. It also has been applied to online applications that offer opportunities for exploration, collaboration, and challenge. Such applications foster motivations and serve as the organizational framework for the interactive environment (Dickey, 2007; Ronimus et al., 2014). It is believed that motivation is central to understanding engagement (Appleton, Christenson, Kim, & Reschly, 2006). A study by Ciampa (2014) investigated student and teacher use of tablets for instructions through the motivation context. The findings were in line with the taxonomy of intrinsic motivation. The mobile app features foster challenge, curiosity, control, recognition, competition, and cooperation and encourage students' learning motivation. *Intrinsic motivation* is viewed as integral to self-determination (Ryan & Deci, 2000) and refers to inherent enjoyment and interest in reading (Klauda & Guthrie, 2015). A study by Baker et al. (2011) explored children's motivation to read and achievements based on intrinsic motivation (interest) and extrinsic motivation (recognition) as well as competence and relatedness.

2.4.2 Literacy and Reading Development Theories

Reading is one of the four pillars of language besides listening, speaking, and writing. Generally, literacy theories intentionally start with how children learn to read. However, the concept of literacy development has changed as emergent literacy have been evolving (Hearn, 1993). This section discusses literacy development theories.

2.4.2.1 Radical Change Theory

Eliza T. Dresang introduced radical change theory in a book entitled "Radical Change: Books for Youth in a Digital Age" and published in 1999. Additionally, she published a revised version in 2008, where the theory was used to examine youth literature changing in forms, formats, and perspective in the digital age. She identified changes including interactivity (dynamic, nonlinear, non-sequential, complex books and other resources and associated learning and information behaviors) , connectivity (connections of hypertext-like links in resources) , and accessibility (the removing of restricted flow of information, opening opportunities for the acceptance of a variety of previously unavailable opinion and advancement in books and other resources and related opportunities in society) (Dresang, 2008). This theory is used to predict future changes in books for digital age children. A study by Pantaleo (2014) used this theory as a foundation to investigate children's responses to and interpretations of radical change characteristics in picture books. The result identified characteristics as multiple visual/verbal narratives, nonlinear stories, the spatial arrangement of test where engaged children cognitively and affectively. The digital design governing how children interact with these digital materials should consider emergent of new literacies, "Children see and experience the world differently than adults. Their ability to use technology differs widely because each child develops skills and abilities at a different rate" (Houston, 2011).

2.4.2.2 Engagement Model of Reading the Development

According to Chall and Jacobs (2003) changes in reading development starts from the prereading stage to the most mature reading stage (stage 0 to 6). The ‘learning to read' and ‘reading to learn' are defined as follow:

- Stage 1 and 2: Learning to read – grade one to three (they read simple and familiar texts through alphabetic principle)
- Stage 3 to 5: Reading to learn – grade four to eight (they read more complex and challenging text linguistically and cognitively)

The ability of children to transition from stage 2 to 3 impact their academic success. The Guthrie and Wigfield engagement model of reading development (Guthrie & Wigfield, 2000) was developed based on engagement components. This model corresponds to cognitive and motivational characteristics of the reader. The proposed model includes emotional (feeling, attitudes, and values), behavioral (attention, efforts, self-regulation, relevance), and cognitive engagements (cognitive curiosity and processing represented information). These elements are defined through reader’s cognitive effort, perseverance, and self-direction reading (Guthrie & Wigfield, 2000). The engagement model of reading can be employed to examine the affordance of electronic books on children's engagement and listening comprehension (Ciampa, 2012). A study by Guthrie and Davis (2003) explored struggling readers and their reading engagement and achievements at school based on the engagement model of reading development. A study by O’Farrell and Morrison (2003) explored student engagement, attachment, and connectedness to understand student outcomes. A study by Unrau, Ragusa, and Bowers (2015) investigated student-teacher relationships using the engagement model of reading development. They were looking at teachers' beliefs on students' reading motivation in the classroom.

2.5 Theoretical Lenses

Previous studies in children's e-reading practices and engagement use experimental and empirical approaches in classrooms and reading for leisure time. There is a need to have a framework that could be used to study e-reading experiences and engagement among children who are in the early stage of learning to read, particularly in another language, and to explore their motivation to read for pleasure when using touch screen devices. Understanding the nature of on-screen reading for pleasure will lead to fostering and developing children's desire to read for pleasure as a key priority for the primary profession if a further decline is to be avoided. In this section, two adopted theoretical lenses are discussed in details.

The engagement model of reading development was first introduced by Guthrie and Wigfield (2000) as an approach to understanding readers' engagement and its consequences with a particular focus on how children's motivation contributes to engagement. Self-determination theory (SDT) postulates that with more self-determined motivation, more positive behavioral and psychological consequences will ensue. Research has indeed shown that self-determined motivation results in better performance, health, and well-being (Deci & Ryan, 2002; La Guardia, 2009; Weinstein & Ryan, 2011).

2.5.1 Engagement Model of Reading Development

The Guthrie and Wigfield engagement model of reading development (Guthrie & Wigfield, 2000) is mainly related to this study as it was developed based on engagement components. The model of reading engagement process is based on motivational and cognitive characteristics of the reader. The proposed model based on engagement perspective includes emotional (feeling, attitudes, and values), behavioral (attention, efforts, self-regulation, relevance), and cognitive engagements (cognitive curiosity and processing represented information). A well-developed personal reading interest may

accentuate the reading engagement perspective by increasing motivations to read, strategy use, conceptual understandings, and positive social interactions around reading (Guthrie & Anderson, 1999).

According Guthrie and Wigfield (2000), these attributes can be identified in the reader's cognitive effort, perseverance, and self-direction reading. Figure 2.1 represents the development of reading engagement through the motivation and cognition components.

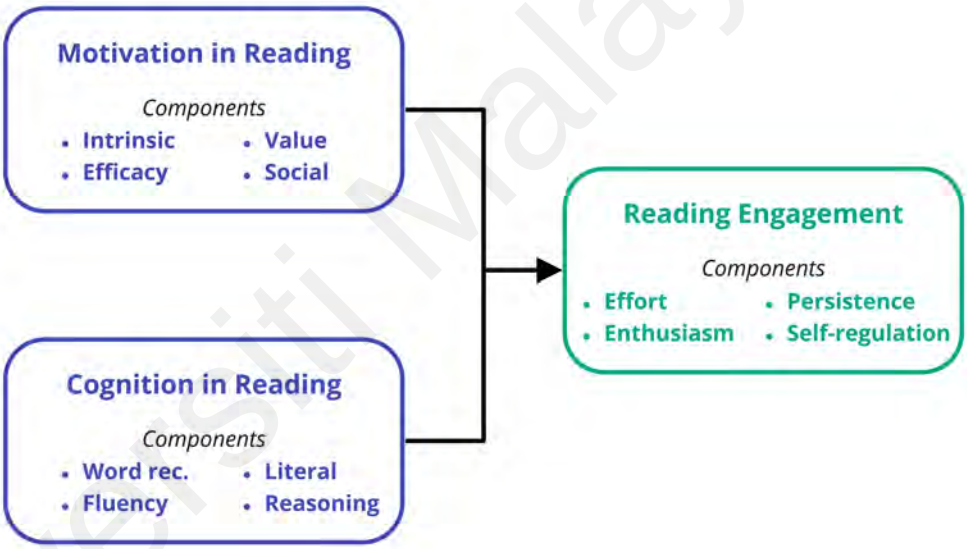


Figure 2.1: Engagement Model of Reading Development Adopted from (Guthrie & Wigfield, 2000)

2.5.1.1 Emotional Engagement

Various meanings have been associated with the term engagement such as emotional engagement, behavioral engagement, and cognitive engagement. For emotional engagement, it signifies the interest in contrast to boredom, happiness in contrast to sadness, anxiety, anger (Furrer & Skinner, 2003). According to Skinner and Belmont (1993), emotional engagement in learning context refers to the learner's affective

reactions when they face an academic task. In a similar context, O'Farrell and Morrison (2003) define emotional engagement as affect, interest, identification with school, and belonging. In reading for pleasure when the objective is to make connections, engage emotionally and feel deeply, the emotional engagement refers to the desire to read, indicate a degree of delight in reading itself and the need to share one's affective engagement (Cremin, 2007).

2.5.1.2 Behavioral Engagement

According to Bangert-Drowns and Pyke (2002) behavioral engagement characteristics are effort, attention, and persistence during the initiation and execution of learning/reading activities. In regards to persistence and commitment behavior, Deci and Ryan (1985) defined the identified regulation (perceived benefits) as the extrinsic motivation of behavioral goal. Also, they considered self-efficacy, from the motivational construct, as developing the ability to learn. As Jablon and Wilkinson (2006) stated, psychologically, engaged learners are intrinsically motivated by curiosity, interest, and enjoyment, and are likely to want to achieve their own intellectual or personal goals. On the other hand, engagement and motivation, or disaffection and boredom affect learners' wills and skills in acquiring new knowledge (Derbali & Frasson, 2012). Hence, an interactive educational e-book which benefits from eye-catching features can cultivate children's emergent literacy growth using principles of enjoyment while achieving educational goals (Korat & Shamir, 2008).

The notion of involvement in reading refers to obtained enjoyment from and the willingness to get lost in reading a storybook or educational book on a topic one finds interesting. Children experience parents' supports and active involvement in shared reading and learning activities at home. A study by Meyer, Rose, and Chall (1998) shows that providing a nurturing environment for children to engage with reading materials (either print or digital) can be considered as scaffolding which can be led to

literacy development. Children have access to books, magazine at home and look up to their caregiver on their home-literacy practices. Parents become a great influencer for their children to cultivate the benefits of activities such as reading literature (Wollscheid, 2014). Child's interaction with the physical environment does not deter her from engaging with the physical environment or from activities centered on creativity and interpersonal engagement. Supported by parents, the child is able to move seamlessly between the digital and physical environments showing how and why using and engaging with digital devices and physical objects (Bilal & Beheshti, 2014).

2.5.1.3 Cognitive Engagement

Cognitive engagement refers to a desire to employ required cognition strategies to understand challenging content and the use of self-regulatory and other strategies to guide one's cognitive efforts (Guthrie, Wigfield, & You, 2012). The cognition in reading includes word recognition (recognizing written and spoken words), fluency (to read a text accurately, quickly, and with expression), literal (what text says explicitly), and reasoning (making connection between concepts) (Guthrie, 2014). Moreover, reading comprehension is the ability to process the represented information of reading materials and to understand its meaning. The three levels of understanding include literal, inferential and evaluative (Basaraba, Yovanoff, Alonzo, & Tindal, 2013). Literal meaning refers to an understanding of information explicitly been stated, outlining and summarizing, following sequence of events, and identifying the main idea. Inferential meaning refers to an understanding of the indirect information retrieved from the text; not explicitly mentioned. It also refers to thinking about the text and the ability to conclude what has been indirectly stated. The evaluative meaning refers to the ability to formulate the responses to questions based on their own opinion. Learning a second language / foreign language can secure a better future in life (Araújo & Dinis Da Costa, 2013). In English as a second language (L2) or English as Foreign Language

(EFL) context, Ma (2014) identifies cognitive strategies including repetition, organizing, summarizing, guessing, imagery, and associations. Language learner using strategy-driven processes such as discovering the new word, obtaining word meaning, and mapping the word meaning with form, consolidating the use of the word in a language-rich environment. The cognitive process includes constructing meaningful learning outcomes from words and pictures (Mayer, 2002).

A study by Yang and Yin (2018) examined the effectiveness of leaning everyday language using mobile technology (mobile phones). They believed that using digital devices can increase the possibility of incidental vocabulary learning. However, the findings revealed this literacy practices only facilitate to recall from short term memory. The study also concluded that mobile learning provides great potential to engage learners in learning activities to process new information via both audio and visual sensory channels. Cognitive engagement also is determined based on intrinsic interest, curiosity, focused attention, concentration, and absorption in a task (Scott & Walczak, 2009). It is evident that motivated readers choose to spend time and make an effort in the reading process for information gathering, knowledge building, or personal enjoyment (Guthrie et al., 2012). Moreover, Pellas (2014) defined cognitive engagement as learning goals, self-regulation (self-directed actions), and abilities to implement strategies, in order to elucidate the new knowledge.

Based on the Cognitive Theory of Multimedia Learning (CTML) by Mayer (2002, 2005) cognitive process includes selecting, organizing, and integrating (selecting words, selecting images, organizing work, organizing images, and integrating new knowledge with prior knowledge). The processing of illustrations and animations occur mainly in the visual/pictorial channel, and processing of narrator voice or reader's voice occur mainly in the auditory/verbal channel. However, processing of on-screen text takes place first in the visual channel and then moves to the auditory channel. Several reading

apps' on-screen texts would become highlighted as the narrator was reading them or become activated and represented in another color if the reader was tapping on them.

2.5.2 Self-Determination Theory

Motivation is associated with greater persistence, performance, social functioning, and physical and psychological wellness (Ryan & Deci, 2000). Reading motivation refers to beliefs, attitudes, and values that individuals hold specific to reading activities. Self-determination refers to underlying conditions that are relied on the process of self-motivation (Ryan & Deci, 2000). The basic needs include competence, autonomy, and relatedness. When these needs are addressed (satisfied), a more in-depth form of motivation emerges (intrinsic motivation). Intrinsic motivation refers to the self-reported level of interest and enjoyment (Malone & Lepper, 1987). The intrinsic motivation related to reading refers to an individual's enthusiasm or enjoyment of reading activities in free time and based on personal interest (Wigfiled, 1997; Wigfield & Guthrie, 1997). In contrast, extrinsic reading motivation involves an individual's participation in reading activities based on external demands and values such as obtaining grades, rewards, or any other incentive, meeting requirements of the school or expectations of teachers and parents, as well as the desire to avoid punishment (Guthrie & Wigfield, 1999, 2000; Wigfield & Guthrie,1997). Three self-determination components are discussed as follow:

2.5.2.1 Competence

Competent learners tend to create their opportunities for autonomy when seeking knowledge beyond that required of them (Guthrie & Wigfield, 2000). This need refers to learner's desire to feel capable of learning and developing talents (Shuank & Bursuck, 2016).

2.5.2.2 Autonomy

Autonomy can be regarded as learner's choice (Deci, Vallerand, Pelletier, & Ryan, 1991). The choices can extend to the material, read, the purpose of reading, or the method of evaluation (Guthrie & Wigfield, 2000). It reflects 'the belief that one has control over one's actions and that these actions reflect one's desire' (Shuank & Bursuck, 2016). Autonomous reading motivation is associated with enhanced reading engagement and improved reading comprehension (De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012). It highlights engaging in a reading activity for their enjoyment like pleasure, interest or because of their perceived personal significance and meaning like personal value, importance (Naeghela, Keera, & Vanderlindea, 2014).

2.5.2.3 Relatedness

The need for relatedness refers to wanting to feel attached or connected with others (Shuank & Bursuck, 2016). People attempt to reach a minimum level of social connection and relatedness searching for interpersonal contacts and develop possible relationships (Leversen, Danielsen, Wold, & Samdal, 2012).

When needs for autonomy, competence and relatedness are met, autonomous motivation is fostered, which promotes more joy in learning, enhanced persistence in the face of difficulty, and richer levels engagement (Deci & Ryan, 2008). Perceived autonomy, competence, and relatedness also play a major role in the process of interaction with games (Przybylski, Rigby, & Ryan, 2010). This active participation can be regarded as intrinsic motivation. For example, a study by Reeve and Deci (1996) examined the effects of competition within a controlling versus noncontrolling setting on participants' intrinsic motivation for puzzle solving. The result shows that in noncontrolled group participants perceived autonomous mediated their intrinsic motivation.

Similarly, a study by De Naeghel et al. (2012) examined children's reading motivation based on self-determination perspective; comparing recreational reading and academic reading. The findings show that recreational autonomous reading motivation is associated with more positive reading behavior and better performance. Furthermore, a study by McGeown, Osborne, Warhurst, Norgate, and Duncan (2016) explore children's reading activities and found that although intrinsic reading motivation was a good predictor of recreational book reading, age was a stronger predictor of engagement with digital texts. Furthermore, specific dimensions of motivation predicted engagement in different reading activities; being motivated to read challenging texts predicted recreational book reading. Another study by Dhanapala and Hirakawa (2016) examined factors influencing second language reading motivation. They identified factors predicting students' intrinsic reading motivation as the value of reading, curiosity and involvement, positive behavior of reading, and challenge for reading. In addition, extrinsic motivation predictors include attitude toward grades, social sharing, recognition, and compliance. They also concluded that reading motivation contributes to reading comprehension.

As a summary, Table 2.1 shows previous studies using engagement model of reading development or self-determination theory in different reading context.

Table 2.1: Previous Studies using Engagement Model and Self-Determination Theory in Different Reading Context

Reading Context	**Engagement and Motivational components**
Reading engagement and literacy instructions in high school (Cantrell et al., 2016)	Social Influence: - Teacher and Peer interaction Behavioral motivation: - Self-efficacy with valued tasks Reading strategies: - Navigate the complexities of a range of content-focused texts and technologies - Cognitive strategies for comprehension

(Table 2.1, continued)

Reading Context	**Engagement and Motivational components**
Reading intervention and seventh-grade students' motivation, engagement, and comprehension – seventh (Rosenzweig, Wigfield, Gaspard, & Guthrie, 2018)	Motivation - Task values - Perceptions of competence support - Perceptions of importance support - Competence-Related beliefs Behavioral Engagement - Engagement with reading information texts - Dedication to reading Information text comprehension - Understanding of words, phrases, concepts and meaning of the words
A Case Study Exploring the Reading Engagement seventh and eighth grade students (Protacio, 2017)	Motivation Strategies: - Intrinsic motivation, - self-efficacy - value - prosocial goals Engagement Strategies: - effort - purpose - intention to learn Cognitive Strategies: - organizing - rehearsing - elaborating meaning
Student Engagement in Science (Sinatra et al., 2015)	Emotional engagement - emotional reactions to subject - attention - task values Behavioral engagement - positive conduct - involvement in task Cognitive engagement - cognitive effort to understand and problem solving - self-regulation
Reading experience in gamified context of primary school children (Chen, Yi, & Lee, 2018)	Autonomy - experience of behavior as volitional and reflectively self-endorsed Competence - experience of behavior as effectively enacted Relatedness - the experience of interacting or being connected with others

(Table 2.1, continued)

Reading Context	Engagement and Motivational components
Motivational pull of teaching proficiency through reading and storytelling secondary school children (Printer, 2018)	Autonomy - choice - opportunities for self-direction - student's ownership of learnings Relatedness - sense of belonging and inclusion in the classroom Competence - capacity to achieve success

2.6 Methodological Approach

The literature reveals that library and information science (LIS) scholars are considering dominant research methods such as questionnaire survey and historical method with more qualitative approaches. There is a growing number of qualitative research methods within LIS to collect perception of participants (Connaway & Radford, 2016). A study by Chu (2015) evaluated research methods in LIS and concluded that qualitative methods such as content analysis, interview, and theoretical approach are among the top five research methods in major LIS journals. The LIS desires to be integrated and recognized as a scientific discipline and encourages professional practices through empirical strategies where descriptive methodologies (observational, case study and surveys) have been used increasingly (Risso, 2016). This strategy significantly contributes to an in-depth understanding of a phenomenon, within the unique context of the study.

In 1970, studies started investigating the relationships between literacy, technology and learning began. The early 'computer-writing' studies were most often quantitative, experimental in conception and design. In 1980, qualitative methods increased with the emphasis on social behaviors, and the special relationship between the researcher and what is studied, and the situational constraints that shape inquiry (Snyder, 1999).

A review of the literature displays the various qualitative research methodologies adopted in the technoliteracy research area, such as phenomenology, case study, ethnomethodology, ethnographic. Table 2.2 shows some of the technoliteracy related studies using different research methods. The qualitative study by Fernandez (2015) defined technoliteracy practices at home as multi-literacy practices using digital devices or with the screen, a source of textual pleasure. The study explored the reader's engagement with technology through phenomenology. A case study by Plowman, Stephen, and Mcpake (2010) refers to children's technoliteracy as learning with technology such as knowledge contribution, obtaining operational competence, and fostering dispositions to learn. Similarly, Kimber, Pillay, and Richard (2007) case study approach referred technoliteracy in learning and communication with new technologies context when developing technical and intellectual skills such as functional literacy practices and basic technological operations. Moreover, the qualitative study by Kiran and Hasliza (2010) investigated pre-school children's techno-literacy practices with information and communication technology tools for teaching and learning.

A study by Davidson (2009) defined the techno-literacy practices at home when children engage with digital text (surfing the internet) using a computer to learn English. The study adopted the ethnomethodology approach to understanding participants' ordinary actions. On the other hand, an ethnographic approach by Spink et al. (2010) defined children's technoliteracy practices when web searching for their school project. The study aimed to understand participants searching behaviors.

Table 2.2: Qualitative Research in Technoliteracy Studies

Research Method	Researchers	Objective of study
Phenomenology	(Fernandez, 2015)	To explore the technoliteracy practice of young children (2 to 4 years old) using screen-based technology/devices

(Table 3.5, continued)

Research Method	Researchers	Objective of study
Case study	(Jetnikoff, 2016)	To explore the technoliteracy in classroom using laptop.
Ethnographic	(Friedrich et al., 2017)	Investigate techno-literacy practices within the homes of pre-school aged children

The e-reading practices and involvement with reading material goes beyond the borders of classrooms and reading achievements for young readers. Therefore, it makes reasonable sense to adopt case study approach to probe the concepts deeper into the more delicate details of literacy practices and informal reading in English boundaries targeting storybooks and educational reading apps when reading for pleasure. In this study the engagement model of reading development as well as self-determination theory has been chosen as the theoretical lens with the aim of understanding children's technoliteracy practices and to see how children experience and e-reading engagement using iPad.

2.7 Summary

This chapter discussed the research context in e-reading devices, reading for pleasure, engagement and motivation, comprehension, and reading in second language. It outlined the theories have been used in learning and literacy and reading development as well as their applications in literacy development. In addition, theoretical lenses were discussed in detail for both engagement model of reading development and self-determination theory. The literature review revealed that there is little research has been done on children's e-reading engagement with reading apps in second language in the context of reading for pleasure. Previous studies mostly focused on children's literacy engagement, achievement and development in school context or home formal literacy practices. There is gap on understanding of how children interact with touch screen

devices such as iPad and how these devices can sustain children's attention on what they read as well as their understanding when they read for pleasure in their leisure time. Next chapter discusses about the research design and methodology.

CHAPTER 3: RESEARCH AND METHODOLOGY

3.1 Overview

This chapter describes the research and methodology employed in this study. It corroborates the choice of employing a qualitative case study to collect data to be examined in order to answer the research questions. This chapter starts with justification of the chosen methodological approach followed by an explanation of the data analysis processes. The research methodology describes the population and sample selection, the data collection procedure and instrument. The subsequent section incorporates the trustworthiness of data collection and analysis. The purpose of this qualitative study is to answer following research questions: How children demonstrate their e-reading experience when using touch screen device?, what drives children emotional engagement in e-reading exercise when using touch screen device?, what drives children behavioral engagement in e-reading exercise when using touch screen device?, how do children demonstrate their understanding of the e-reading exercise when using touch screen device?.

3.2 Research Paradigm

Since the focus of this study is to look at children's experience when involve in e-reading activities for fun and their engagement with reading apps in iPad, the researcher's philosophical assumptions inspiring this study was derived from the constructivist perspective. A researcher's disciplinary orientation often determines how a problem is defined (Merriam, 2009). This constructivist perspective views children's e-reading through their interpretation of the reading for pleasure base on their experiences and interaction with handheld devices and reading apps. The goal of instruction in this approach is to engage readers in the actual use of the iPad and reading apps (storybooks and educational) in a real-world situation; reading in leisure time. Therefore, the researcher spends prolonged periods interviewing participants and

observing them in their natural settings to build the constructions participants use to make sense of their worlds, as suggested by (Hatch, 2002b).

The constructivists perspective assumes a world in which universal, absolute realities are unknowable, and the objects of inquiry are individual perspectives or constructions of reality (Hatch, 2002). In this study researcher and the participants in are joined together in the process of construction of e-reading experience. Constructivist theories correspond to a multiplicity of ways to think about learning and development (Kroll, 2004). The constructivist paradigm is typically associated with qualitative research designs that are described as contextual, inclusive, involved, and emergent where research questions are allowed to emerge from the data as the study progresses (Mertens, 2010). As such, Foster (2002) recommended using a constructivist approach in case of study research when addressing issues of integrating technology and education for children. In addition, Baxter and Jack (2008) indicated that the foundation of the case study is established in the constructivist approach as human's meaning-making processes worth researching. Furthermore, Yin (2009) defined case study approach as a means to establish "the holistic and meaningful characteristics of real-life events" where case study practitioner collects stories from respondents that indicate their subjective realities. Therefore, this can contribute to our knowledge of the individual, group, social and related phenomena.

The constructive approach in this study highlights that children take responsibility for their willingness to read for pleasure and engage in a meaningful situation by reading storybooks or educational apps in English. Digital devices utilize two main factors of motivational strategies including scaffolding the learner and providing effective, enjoyable learning process through the sound, video, music, and pictures (Derbali & Frasson, 2012). Most storybooks in this study are interactive and are

embedded with features such as highlighted texts, read aloud modes, music and background noises, sound effects, animations, and narrations.

As Gasparini (2011) work on children's interaction with iPad, "*Touch, learn, play*", recognized the shift of many educators towards a more constructivist approach to learning. He listed several studies were conducted on evaluating the use of iPad in the classroom. Their works mainly were concerned about how and when learners engage with learning activities using the iPad. In this study, data shows that using the iPad for playing and reading context emphasizes the interactive experience that reflects natural constructivist learning.

It is believed that storytelling is an essential aspect of human communication and sense-making. Electronic reading materials, such as apps, can be used to support skills in communication, cognition, social skills (Bonsignore, Quinn, & Druin, 2013), and play (More & Travers, 2012).

In respects to constructivist educational goal, both individual and shared reading activities in this study allowed children to practice and build structures in the second language as the storybooks and educational apps challenged them creatively and narratively. The apps were promising for literacy purposes by providing some instructions to the children to navigate and interact with elements and objects on the screen or answer some questions about the topic. On children's second language learning through technology-enhanced instructions stated that a rich vocabulary is the main component of reading accuracy and promotes reading fluency (Leacox & Jackson, 2014). When children encounter a familiar word, they can read it more easily. The repeated reading feature of electronic books increases vocabulary learning. Children's engagement with the supportive learning environment of electronic reading apps offered them with digital learning opportunities.

3.3 Research Design

To achieve the research objectives, a qualitative methodology with case study approaches were chosen to postulate inclusive outcomes and to tackle knowledge gap in case of lake of existing studies to discover the Malaysian children's e-reading experience and engagement with the regards to reading in English for pleasure using iPad. According to a literature review study by Burnett (2010), still limited research has been done on to understand children's digital lives within and outside educational setting or considering the process and possibilities associated with new literacies. Burnett suggested that there is a need for more qualitative research to investigate children's sustained engagement with digital texts through meaning-making processes when forged in more informal context.

The aim of conducting a qualitative study is to gain an understanding of underlying reasons, opinions, and motivation. According to Hatch (2002) the data collection in qualitative research is carried out in a natural setting to explore human behavior (real people in real settings), so that participants' perspective is concerned (perception of realities), and researcher's role as a research instrument focus on gathering data and making sense of participants' actions and intentions. As such this study aims to examine children's engagement and experience with reading apps and develop an understanding based on their interactions and behaviors. After the extensive review of existing literature on relevant methodologies (empirical studies in technoliteracy and theoretical research), researchers identified the best approach and theoretical lens for this study. Thus, reading sessions observations and interviews were used to illustrate a holistic view for this qualitative research. Figure 3.1 shows the relationship of theoretical lenses (engagement model of reading development and self-determination theory) with research objectives and research questions.

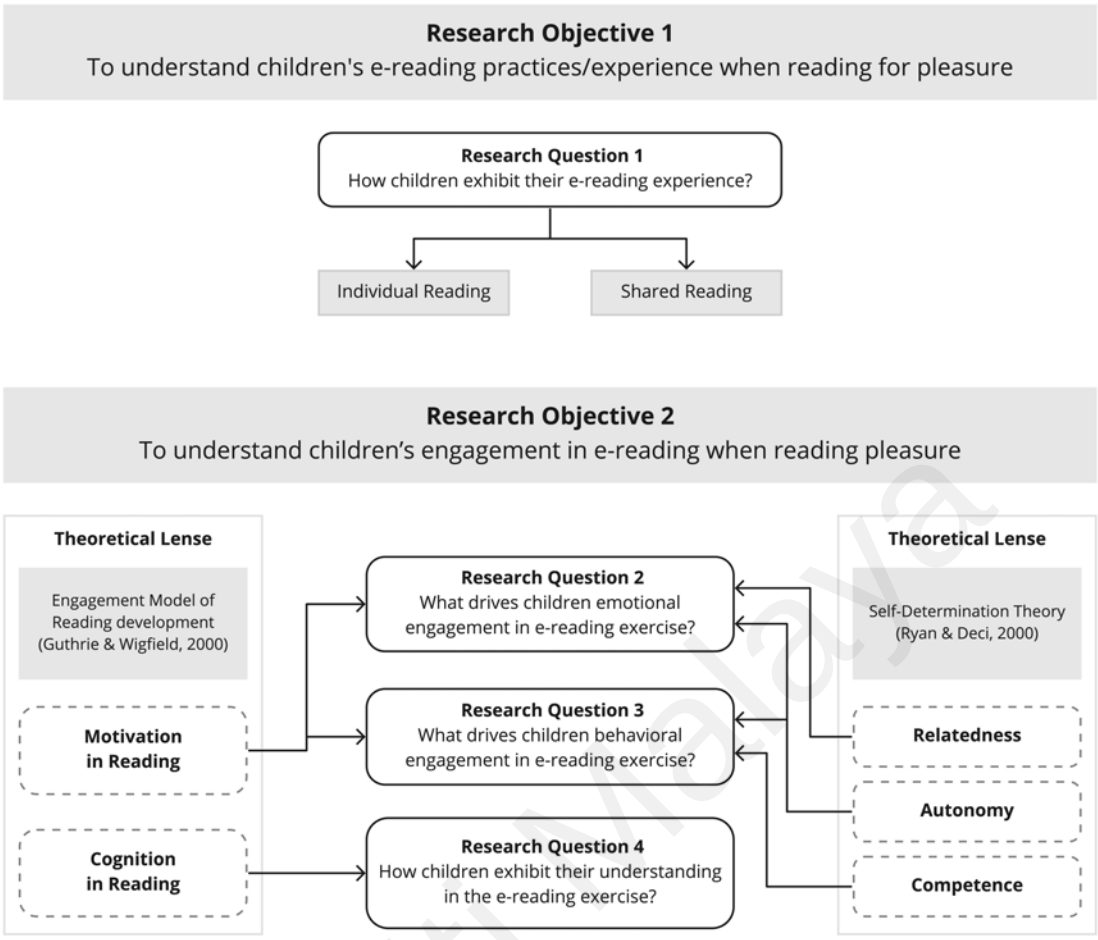


Figure 3.1: Relationship between Theoretical Lenses and Research Objectives and Questions.

The engagement model of reading development helped to identify the motivational constructs and cognition indicators from the observational data by looking at their interaction and engagement with reading apps. On the other hand, self-determination theory helped to look at the quality of children's interactions with reading apps and more importantly how children perceived reading for pleasure and their reading ability to read in second language when they choose to engage in reading acts for pleasure.

The research design facilitates the structure of research, to show how all the major parts of the research project and are designed to address the central research questions (Hancock & Algozzine, 2016). It is structured based on function, characteristics, or disciplinary by how well it allows full investigation of a particular research question. A good research design, a good review of the literature, proper storage of data, all

contribute to saying how and what you have to say about how a thing works (Stake, 2010). This is exploratory research because it attempts to explore children's e-reading experience/practices and engagement with reading apps for pleasure using the iPad. The result will help to identify the quality of such experiences and interactions in the on-screen reading context in the second language. This study seeks to answer the 'how' and 'what' questions, which are a primary part of qualitative research. Qualitative research is defined through the emphasized subjective experiences and the meanings they have for an individual (Starman, 2013). It is designed to understand the human elements of a given topic, where specific methods are applied to explore how individuals see and experience the world (Given, 2008). The research examined the phenomenon in-depth, with the underlying assumption of that all of the concepts about a given phenomenon have not yet been identified, at least not in this population and place (Strauss & Corbin, 2010).

The study was carried out under several empirical stages: first review of existing literature to find the knowledge gap and finding the best approach to address that gap. Second, running the preliminary studies with a) preschool children at University Malaya kindergarten and b) two international student at the age of 8 (male and female). Third, choosing the school and participants and obtaining consent letter and providing information sheets to the school principal and parents. Fourth, interviewing with ten children and conducting eight reading session observations (five individual and three shared sessions). Sixth, transcribing and analyzing data after each reading session. Seventh, facilitating member checking with another research assistant and supervisor. Eighth, interviews with children and parents, and finally, organizing the analyzed data. Figure 3.2 shows the research process of the research in this study. Later we will discuss the data collection procedures in section 3.6.

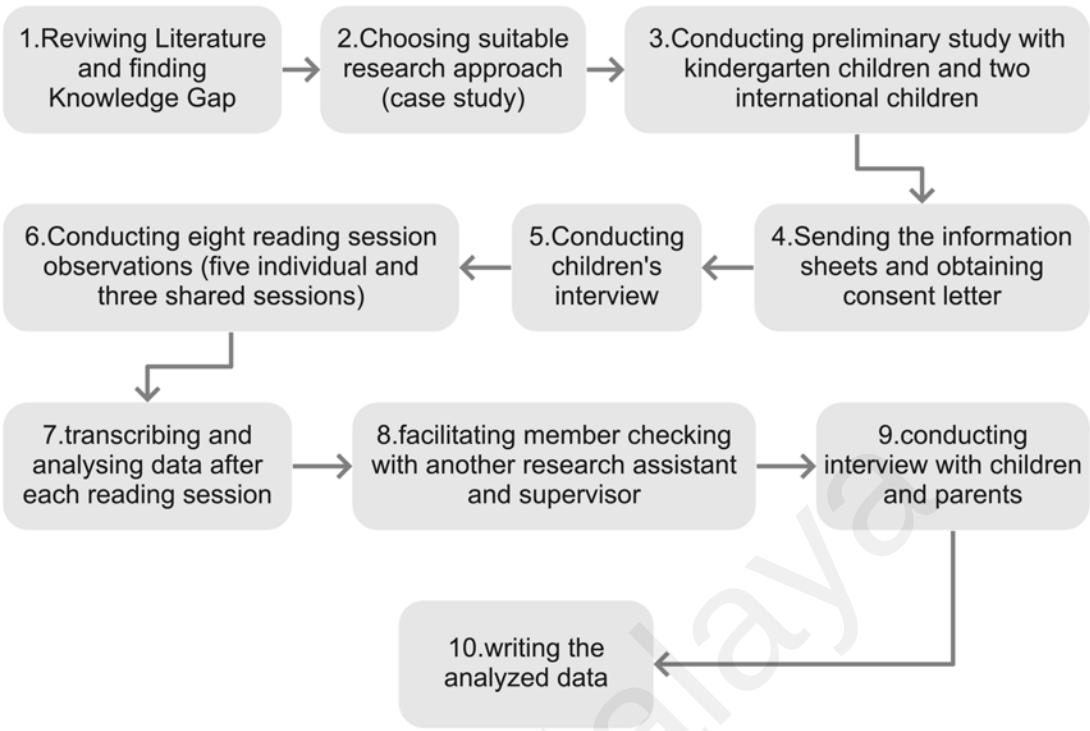


Figure 3.2: Research Process

3.3.1 Case Study

The qualitative case study method is served to "encapsulate complex meanings" into an accurate research report where cases are expected to represent some population of the cases (Stake, 2005). This study uses a case study approach to demonstrate behavior of participants, parents, and related phenomena (Yin, 2015). Yin identifies characteristics of a case study approach as being significant, complete, display sufficient evidence, and composed engagingly. Therefore, in this research, children's e-reading practices and experiences, as well as e-reading engagement with reading apps for pleasure using iPad, are indicated as single in order to ensure more rounded discovery of the setting of reading for pleasure for first and second grade. Children and their parents were identified as credible enough to provide the information required for the study. The on-screen reading for pleasure has been attracted the scholar attention recently, and there are few kinds of literature covering e-reading practices and

engagement of first and second-grade children when are motivated to read in the second language for pleasure using iPad.

This qualitative case study is interpretive as it sought to understand interactions, experiences, and to mean constructed by first and second-grade children as they engaged with reading apps within a reading for pleasure context. There are many well-known case study researchers, the most prominent of whom include Yin, Stake, and Merriam, all of whom have written extensively about case study research and have suggested techniques for organizing and conducting such research successfully. This thesis research relies primarily on definitions offered by modern case study methodologists Stake (2000), and Yin (2009).

The case study has been regarded as a design, a methodology, a particular data collection procedure, and as a research strategy (Brown, 2008). Yin (2009) describes a case study as the preferred method when research contains a "focus on a contemporary phenomenon within some real-life context" (p. 4)". A case study is an empirical inquiry when the boundaries between phenomenon and context are not evident (Yin, 1994, p.13). This approach can be helpful when the aim is to answer the questions of "how" and "why," when the researcher cannot influence the behavior of those involved in a study (Yin, 2015). This research employs a case study design in which was established based on engagement model of reading development by Guthrie and Wigfield (2000) and self-determination theory by Ryan and Deci (2000) to explore first and second-grade children e-reading experience and deep involvement with iPad when reading pleasure.

The study employed a case study approach based on several aspects. For example, when there are multiple instances as a result of description and contextual analysis, and questions are addressing how these instances occur and what is important in this situation (Corcoran, Walker, & Wals, 2004). The purpose of case study research is to

characterize something as it is; there is no manipulation of treatments (Golightly, 2006). It explores the in-depth program, event, activity, process of one or more individuals. As Bryman (2008) cited Pettigrew(1997) that defined a process as a sequence of individual and collective events, actions, and activities unfolding over time in context. This is so as this study requires in-depth investigation on e-reading experience in its natural setting when children read for fun from the screen without having any impact on the event in the study. Questions about the process (why and how something happens) commonly guide qualitative research, as do questions of understanding (what happened, what does it mean for those involved) (Merriam, 1998).

3.3.2 Case Study Procedures

Stake (2000) points out that "case studies are useful in the study of human affairs because they are down-to-earth and attention-holding" (p. 19). He highlighted that a research design develops well when the aims of the study are understanding and extension of experience. Therefore, in this study, the case study approach serves to explore e-reading experience when reading storybooks or educational reading apps for fun.

In addition, Stake (2005) recognizes case study research by the object of study instead of a specific methodology. Rationalization of a case study determined by a specific, unique and bounded system of the particular instance/cases. Defining the boundaries, or specifying the *unit of analysis* is the key decision point in case study design (Hatch, 2002). In this situation, unique translate into a tiny geographical area or numbers of subjects of interest are examined in detail (Zainal, 2007). Yin defines a case as the exciting topic of the study empirically, and unit of analysis as the actual source of information (Yin, 2015). In this study, the case is bi/multilingual children's e-reading practices and engagement with reading apps in leisure time, and unit of analysis are children (aged 7 to 8 years old), parents' perception in e-reading and home literacy

practices, and storybook and educational reading apps. In sum, the case is e-reading exercise of children in for pleasure.

Nonetheless, Hancock and Algozzine (2016) identified the role of the researcher in the case of study method as immersed in the settings and activities, rather than maintaining distance from their work. Therefore, the method subjects to the researcher's biases. Case studies can be a very effective way of presenting profiles of different groups within the study population. Therefore there can be value in describing how the typology of the study context distributes across the study sample in terms of other essential characteristics (Ritchie, Lewis, Nicholls, & Ormston, 2013). Thus, it concluded that case studies and surveys could inform us about different issues and provide different perspectives on children's use of technology.

When the aim is to investigate a technology or industrial-education in depth to, the case-study analysis is often an appropriate choice for researchers. The case studies can focus upon actual instances of attempts at technology intervention in children's literacy development context. There are several good examples of the application of case-study models in research of technology and literacy. For example, in England, the government has published case studies exemplifying the use of new technologies in early childhood settings (Burnett, 2010). Grzeschik, Kruppa, Marti, and Donner (2011) examined children's reading behaviors when using digital reading devices in an experimental case study approach. Reading devices in the study include Sony ebook reader, LCD of a personal computer, laptops, and smartphones. Also, Moyer and Thiele (2012) adopted a case study to provide an overview of current research on the use of eBooks and eBook readers like Kindle. More, Thomas (2012) conducted a case study of one student from primary school to investigate the effectiveness of multimedia learning in teaching and learning using apps. Ibharim, Borhan, and Yatim (2013) conducted a case study method to identify children's knowledge, skills, and interaction with a touch screen device when

using the iPad. Friedlander (2013) explored ebook app production for children and provided insights into the design and development of storybook apps using the case study method. The study focused on technology, storyboard development, and pricing. Agarwal (2014) conducted single-case study to explore toddlers and preschoolers' touch-based interactions from a user engagement perspective (physical and digital environment) when using the iPad and iPhone. Lee (2015) adopted case study research to investigate how children (age 3-5) could use iPad more effectively for learning purposes in preschools.

Therefore, according to abovementioned facts, a qualitative method with case study approach suites this study to understand the phenomenon under investigation, children's e-reading experience and behavior that impacted e-reading engagement when children read for fun using iPad. The unit of analysis is directly tied to the research questions developed by the researcher; *children (aged 7-8 years old), parent's perception in e-reading and home literacy practices, and storybook and educational reading apps.* The e-reading experience as a holistic unit of analysis or bilingual/multilingual children. The research design is based on the single case and participants were selected from local, first and second grade, students who attend the primary school in Kuala Lumpur, Malaysia. The investigation was conducted during school time and started from June 2015 until October 2015 at one school.

The aim here was to establish the logic linking the data to the purpose of the study (purpose statement). Observational data including children's e-reading experience in individual and shared reading setting, and interview from children and parents illuminated the understanding of on-screen reading practices and engagement components when reading is perceived as a fun activity during leisure time. The criteria of interpretation of the findings include looking at children' e-reading experiences and practices, children' topics of interest to read, interactions with embedded multimedia

elements on the page, and engagement components. Also, considering the type of settings (individual and shared reading), as well as types of reading apps (educational and storybooks). In addition, the role of parent determined children's motivation toward selecting a reading activity in their free time. Moreover, parent's attitudes/perceptions towards e-reading activities and family's ownership of digital reading devices help to provide rich data for interpretation of results.

Investigation in this study is based on interpretive orientation where understanding the meaning of the process or experience constitutes the knowledge to be gained from the inductive mode of inquiry (Merriam, 1998). From an interpretive perspective, the purpose of this qualitative study is to understand children's e-reading experience and engagement for pleasure using reading apps on the iPad. The objectives are defined to discover children's on-screen experience and what drives children to engage emotionally, behaviorally, and cognitively with multimodal reading apps English language for fun. The researcher, hence, needs to employ a research strategy that allows her to consider the children's on-screen reading practices and behaviors and their engagement and understanding in the context of the reading or pleasure. The aim is to gain insight into the nature of e-reading experience and the important and sometimes subtle ways it might vary across contexts. Therefore, the case study strategy seems to be an appropriate and feasible methodology for this study.

While this research used many participants from first and second-grade students in different reading settings, it employs a single case study design. The study aims to examine the general phenomenon of interest, where data from all respondents will be combined, rather than to be isolated and compared against each other. The choice of using respondent from different grades and genders, rather than using multiple respondents from same grade and gender, is the research strategy to address maximum variation among samples, an effort to get more rich data that will further enhance the

study. The disciplinary orientation of this study is constructed to investigate the problem based on theories and techniques; human behavior, motivation and engagement, self-efficacy.

3.4 Population and Sample

While the generalizing of the findings is not considered, selecting single case that is considered to be a case of reading events tend to lead us closer to the real picture of the e-reading situation, which draws us closer to understanding the phenomenon. The single case of e-reading activities is thought to fairly represent the reading activities in English for fun using reading apps in iPad of first and second-grade children population in the country.

The rationale to use school with an acceptable level of English skills as the criterion and the boundary for the case lies in the assumption. First, since researcher is a foreigner in Malaysia, it is crucial to conduct the study in a school that students and staffs that are better in English are assumed to be better able at handling required communications and for student's better interaction with reading content provided in this study. Second, bilingual students are more comfortable in reading another language. These criteria are in return, could provide richer data for this study. With regards to the study design, the school was chosen based on these criteria:

1. The school is willing to participate in the study
2. The school's staff and students were able to communicate in English properly and encourage reading activities in free time.
3. Local upper-class primary school (socio-economic wise), assumed to have better English language proficiency.(family monthly income above RM7,000)
4. The capability of the researcher to visit the school frequently as required by the research design
5. Appropriate reading location

Having decided on the potential school, the researcher visited the school in May 2015 to seek the consent to conduct research from the principals, and produce application letter and permission letter from University of Malaya. The school was selected for the study as they met the criterion of the study and was willing to participate. The school is located in the state of Kuala Lumpur. It is situated in the generally upper-class area of Kuala Lumpur, with multi-race populations. Most of the students are picked up by parents or use the school bus for transportation after school. The school represented all the races in the country; a mixture of Malay, Chinese, Indian, and International.

3.4.1 Participants

The participants were selected through purposive sampling to select appropriate participants, as most qualitative studies. In the qualitative investigation, with purposive sampling, the number of people participated is less important than the criteria used to select them (Wilmot, 2005). The characteristics of individuals are used to reflect the diversity and breadth of the sample population.

Labbo (2009) indicated that a case selection involves identifying a participant who possesses attributes of a typical person from within the culture or phenomenon being studied, as in this study for bi/multilingual students. Participants were selected from first and second-grade students, age 7-8 years old, male and female.

The school principal helped us to identify relevant teacher to facilitate the data collection. The researcher took the opportunity to have a meeting with the selected teacher and ask some basic questions regarding the school and students in general. Questions such as how many first and second grade classes are available, where is the common of teachers, how many students are in each class (first and second grade), potential and available location to conduct the study, her experience in teaching English

subject, and her preferred way of communications with the researcher. After, first meeting consent letters were granted for the student to be involved in the study.

The discussion with an English teacher who accepted to take the role of facilitator in the school confirmed a few things about the location and procedures of data collection: (a) only those students who are excellent in English subjects are given the consent form to obtain their parents' agreement, (b) computer room, part of the school library, and meeting room were available for conducting data collection, and (c) student are allowed to attend in reading activities when they are completed with their school works.

Sample selection was carried out when it reached saturation. As Stake (2005) reported that sample size in qualitative research could be "very limited and ad hoc". The aim is to select cases and respondents that provide the best possible explanations of phenomena. According to Yin (2002) each case must be carefully selected so that it predicts similar (a literal replication) or contrasting results but for anticipatable reasons (a theoretical replication). The researcher needs to establish a rationale for the sampling strategy for selecting the case and for gathering information about the case (Creswell, 2007). Sampling selection is conducted in a way to get conclusive findings. The number of people in the sample depends on the study's research objectives and the characteristics of the study population (Mack, Woodsong, McQueen, Guest, & Namey, 2005). There are two levels of sampling inherent in the design including a) selection of the case to be studied, b) the sampling of the people within the case (Brown, 2008). In this study the case is e-reading exercise of children in reading for pleasure (single case study).

In single case study, the case is consist of people (children) or events (e-reading exercise) in a specific place and a specific time (Mills, Eurepos, & Wiebe, 2010). Single case is employed when there are no other cases to be replicated (Zainal, 2007). Here, in this study Malaysian multilingual children at the primary school at the age of 6 to 7-

year-old were selected as a sampling people within the case. In addition, reading exercises were limited to the reading apps for pleasure in English. The selection process of the school, participants, and reading apps are summarized in Figure 3.3:

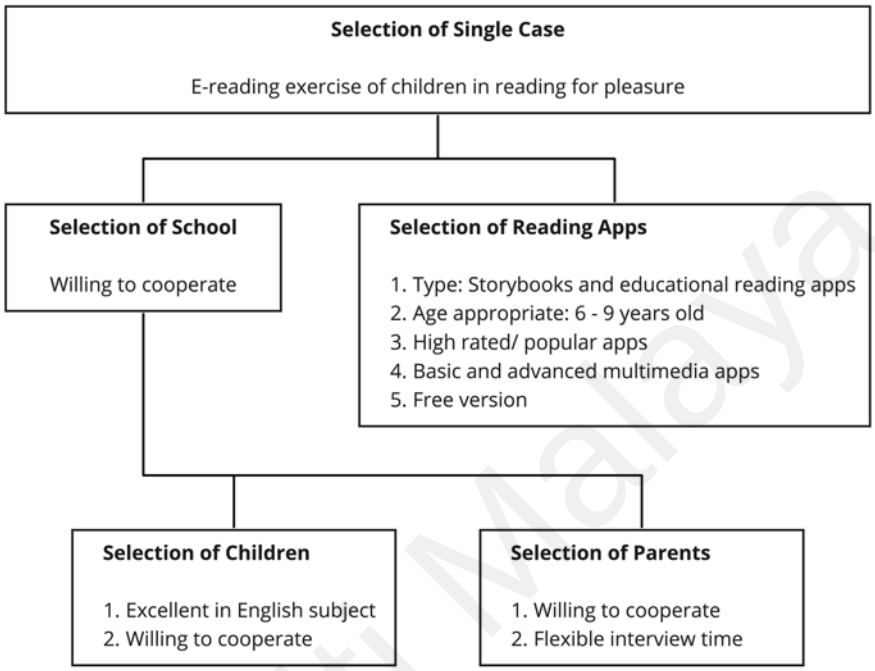


Figure 3.3: Selection of Participants and Reading Apps

In order to get a rich description of the situation compared to a single one, several children from both gender and all races, as well as various settings, were contributed to the study. The participants were selected through teacher on two grounds: a) the researcher was not allowed to interrupt the children before their examinations and recession time, b) the teachers knew the children and their abilities better, therefore, were in better position to select the most appropriate children for the study. The researcher communicated her intention to involve children of each class for the study to the teacher. She also explained what was expected from the children in participating in the study to the teacher, such as the ability to communicated and read properly in English, be able to work with apps and iPad interface, be able to express themselves in

English. Hence, the researcher requested that the teacher selects children who they think could provide rich data. The children were selected based on the following criteria:

1) Proactive and willing to cooperate
2) Able to provide rich information
3) Able to interact with reading apps in English and iPad interface

Most of the children were excited about the reading sessions and would always ask about the next reading session and the next topic to read. Children exhibited their willingness to share about their home reading experiences and usage of tablets like iPad. All the ten children involved were selected from grade 1 and 2, aged 7 to 8 years old. Three female and two males were from grade 1, and three female and two males from grade 2. This variety offered the researcher the opportunity to make wider selections of the appropriate respondents. Thus, the single case study design helped to develop the study's reliability and trustworthiness further and provided an opportunity to collect richer data at the same time. Table 3.1 shows children demographic information. A pseudonym identified each participant in this study.

Table 3.1: Demographic Information of the Children

Children Pseudonym	Age	Gender	Grade	Ethnicity	Number Siblings
Eisha	7	Female	1	Malay	3
Najwa	7	Female	1	Malay	3
Naveesha	7	Female	1	Indian	2
Hiba	8	Female	2	Malay	1
Nadia	8	Female	2	Malay	2
Aina	8	Female	2	Malay	3
Irfan	7	Male	1	Malay	2
Farish	7	Male	1	Malay	2
Kyrie	8	Male	2	Malay	3

(Table 3.1, continued)

Children Pseudonym	Age	Gender	Grade	Ethnicity	Number Siblings
Maneesh	8	Male	2	Chinees	2

The seven parents involved in this study through a telephone interview. Table 3.2 shows parents demographic information.

Table 3.2: Demographic Information of the Parents

Children Pseudonym	Parent Educational background	Parent Work Category	Family Income - RM	Area of Living
Eisha	Postgraduate Degree	Accounting/ Finance	above 11000.00	Taman Kuching
Naveesha	Professional Degree	Banking	above 11000.00	Taman Kuching
Hiba	Professional Degree	Legal	above 11000.00	Mont Kiara
Nadia	Undergraduate Degree	Healthcare	5000 - 8000	Kuala Lumpur
Irfan	Undergraduate Degree	Computer/IT	2000 - 5000	Lumpur
Farish	Postgraduate Degree	Accounting/ Finance	above 11000.00	Taman Kuching
Maneesh	Postgraduate Degree	Education/ training	Below 2000	Solaris

3.4.2 Reading Apps Selection

Children today are more exposed to technology since their parents are often given the opportunity to use their tablet and smartphone. They can manipulate and interact with the display screen on their own (Ibharim et al., 2013). In regards to on-screen reading, children must gain the capacity to successfully and effortlessly navigate and interact with this technology (Vanderschantz & Timpany, 2012). Reading is an interactive process for children, as they may develop their storyline. Learning to read and reading to learn for children can provide a highly interactive, engaging and intellectually stimulating experience. An increase in the inclusion of interactivity, tactility, and exploration through playful reading and learning could be attributed to

increased use of digital technologies for children's reading (Timpany & Vanderschantz, 2012). Here, the reading app selection criteria are discussed.

It is crucial to develop a reading interface in a way that offers challenging and exciting content to early readers. The criteria of selecting content and app for children as follows: 1) socially appropriate language, 2) not promoting the act of violence, 3) free of cultural stereotypes (More & Travers, 2012). Moreover, Study by Lee (2015) listed sets of criteria for iPad app selection for children at the preschool age. The study defined five major domains to be considered for app selection as follows:

1. Interactivity: offering child participation actively, promote critical and creative thinking, and problem-solving
2. Digital literacy: providing a means that child can make sense of the world, explore and discovery safely
3. Appropriateness: offering child multiple domains to experience, challenging the content, positive virtual universe
4. Results: offering a connection between the child's actions and learning responses, child performance, feedback interpretation
5. Participation: involving parents, teacher, and caregivers to be part of children’s experience

Following the suggestion from abovementioned studies, in this study, app selections included navigating through the favorite Apple store and compiling a list of 50 storybook apps recommended by such sources. Moreover, researcher gathered information about children’s favorite topics and their preferences from the preliminary study and introductory interview sessions. There are some stories adopted from popular TV or animation programs by the time of conducting this study.

Nevertheless, the diversity of content and app feature design were considered beneficial for the study. These apps are being read for fun and education and received

higher rate review in Apple Store. The 50 pre-selected apps were then filtered to twenty apps. In the end, eight reading apps were used during the study. All apps had embedded smooth navigation features and offered easy to moderate interactivity level. The variety of age-appropriate topics were included.

Moreover, some familiar and popular topics also were selected according to children preferences. Criteria to select apps in this study are as follows:

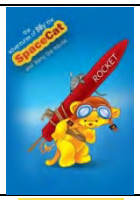
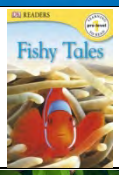
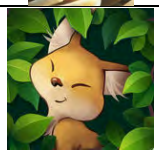
1. They should contain information or a story (fiction and non-fiction). For this study, those being considered are texts that have narrative and embedded rich multimedia elements. The objective is to maintain consistency of interface design that have similar characteristics. Both Storybooks and educational apps were selected.
2. All selected apps were age appropriate, free, chosen from educational and storybook categories in the apple store.
3. Some apps were selected mainly for their motivational value. Priority was given to those apps that can be categorized as being converted from print book to digital/electronic version. Also, those apps that were sought to meet children interest as adopted from favorite movie/animation or character from TV programs.

As discussed before, according to objective of the study the following elements were considered as indicators of app playfulness, as suggested by Frederico (2014): a) the process of decoding the audio visual information through contrast and counterpoints, b) the multimedia features such as narratives, background noises and sound effects, c) the game-like interactions with the interactive elements on the screen.

The list of selected apps is included in Table 3.3. The reading apps were revised according to review and comments. The apps were finalized based on price (free version) and review rates. The researcher filtered all the apps for the age of six to nine

in English. The free version of apps was installed. According to interview data, the installation of the free apps was popular among children and their parents.

Table 3.3: Reading Apps for Reading Observation

No	Thumbnail image of app	Title	Type of content	Mode of reading	Interface design
1		'The Three Little Pig	Storybooks	Read to me Read it myself	Highlighted text Single narration Background noises animation Interactive elements
2		Little Red Riding Hood	Storybooks	Read to me Read myself	Highlighted text Single narration Background noises Illustration Interactive elements
3		Billy the Space cat	Storybooks	Read to me Read myself	Static text Single narration Background noises
4		Fishy Tales	Educational app	Read to me Read it myself	Static text Illustration Image
5		How Fennec Fox Built a Home	Storybooks	Read to me Read it myself	Highlighted text Multiple narration Illustration Interactive elements Background noises
6		The Jungle Book	Storybooks	Read to me Read it myself	Highlighted text Single narration Background noises Illustration Interactive elements
7	-	What is in my garden?	Educational app	Read to me Read it myself	Static text Single narration Animation Background noise
8	-	Tiny world - Heaviest, Smallest, and Great Jump	Educational App	Read it myself	Static text Animation Background noises Interactive elements

The reading modes that are part of reading apps' multimodal text are writing, image (including illustration, typography, and layout), narration, sound (including background noises and sound effects), movement (animation) and gesture (interactivity). Frederico (2014) indicated that meaning only happens through the inter animation between modes. Each of these reading modes helped the study to understand how children interanimate with the other modes in generating the playful aspects of such texts. The technical aspects of the apps were not considered in this study, although they might be mentioned in cases where they interfere in the understanding of the narrative. See Figure 3.3 for a summary of the reading app selection process.

3.5 Data Collection Procedure

The data in this study is obtained from various data sources that overlap and intertwine throughout the study. Employing multiple data collection method has allowed the researcher to gain insights into the topic from various angles. By putting all the pieces of evidence together, the researcher was able to assemble a better picture of the phenomenon. The data were collected through extensive observations of reading activities in individual and shared reading settings, individual children's interviews, and field notes. In addition to that, interview sessions with children and parents were conducted to supplement data from the main data collection technique as well as triangulate data. Interview with parent illuminated a lot of information about the children' home literacy practices and confirmed some interview question that has been asked in interview with children. In other words, the most appropriate way to find out what children think, want or need is to seek 'proxy information' from significant adults such as parents and professionals (Darbyshire, MacDougall, & Schiller, 2005). In summary, the data sources and the scope of investigation are as follows:

1) Observation of e-reading activities in individual and shared settings: to provide a rich description of children's e-reading experience and practices, and

their engagement through interacting with storybooks and educational apps using iPad.

2) Interview: a) individual children's interview: to discover children's perceptions towards using iPad in free time and perceived benefits and challenges of reading for pleasure using iPad; b) parents' interview: to discover parents' perceived benefits of using digital devices and reading activities and home informal literacy practices.

However, it is necessary to acknowledge that the study is inevitably limited and can be justified why other alternate approaches were not chosen. For example, parent children joint reading for pleasure at home could be another potential source of data.

A case study protocol is a formal document capturing the entire set of procedures involved in the collection of data for a case study (Mills et al., 2010). Given (2008) defined the term "protocol" or "data collection sheet" as plans for qualitative research, in a sense that it refers to a measurement that is not subject to interpretation. She identified steps to be taken to develop a data collection protocol as a) identifying the problem to be investigated, b) understanding the process and context of data sources, c) selecting unit of analysis, d) listing the items and categories to guide data and drafting a data collection protocol, e) reviewing and revising the protocol and selecting several additional cases to further refine the protocol.

In this study, several data collection protocols were created prior implementing the data collection, as the source of data differed (children and parents); grouping based on age and gender for both individual and shared settings.

All qualitative studies depend on the unique characteristics of people, locations, and cultures. It means that two qualitative studies never will be identical. The integration of all research process using a data collection protocol called replication. Denzin and Lincoln (2005) describe that in qualitative study researcher plays a more important role

than instruments so that this approach is more concerning how a human is conducting all of the research. Self-designed protocols are used to record data as the study proceeds and help to organize information reported by participants; for example, observation protocol (notes about the behavior of participants) and interview protocol (4 to 5 questions), as suggested by Creswell (2010). The advantage of establishing data collection protocols is that the researcher constructs a clear and usable case study database from a different perspective rather than record its view perception.

3.5.1 Multiple Data Collection Techniques

The structured and overlapping employment of multiple data sources is referred to as triangulation (Foster, 2002). Using the aforementioned multiple data sources (children and parents) to dig up additional data as well as to be used for triangulation purposes as the data from the various sources can be compared against one another to check for consistencies or flaws, which could further establish "verification and authenticity" of the study (Creswell, 2010) and confirmation of findings. In addition, field notes which referred to children and their interaction with apps and peers, temporal elements, and interpretations evolved during data collections and shaped better pictures of events during data collection in fieldwork. Figure 3.4 shows the data collection techniques.

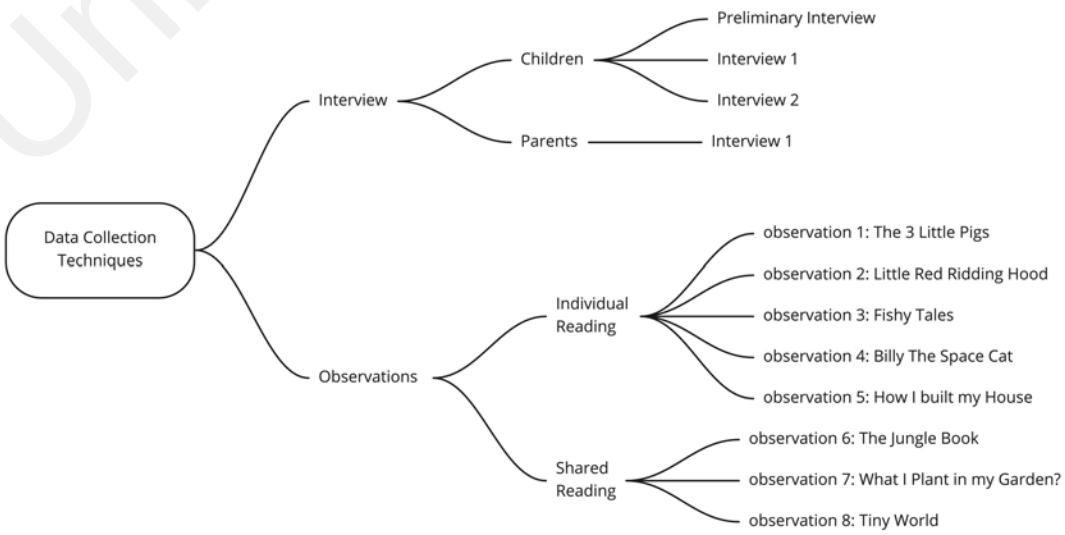


Figure 3.4: Data Collection Techniques

The data collection period ran from June 2015 through the whole semester which ended in October 2015. The data were collected during multiple interactions with the participants in the three settings which included: 1) eight reading observations; 2) interview with children 3) interview with parents. All the interview and observation sessions supported by field notes. The summary of the data collection techniques and the scope of the investigation is presented in table 3.4:

Table 3.4: Data Collection Techniques

Research Questions	Scope investigated	Data collection techniques
1. How do children demonstrate their e-reading experience when using touch screen device?	• Children's e-reading experience and practices • Children's perceived benefits of reading	• Observation of children's reading activities • Children's interview • Parents' interview
2. What drives children emotional engagement in e-reading exercise when using touch screen device? 3. What drives children behavioral engagement in e-reading exercise when using touch screen device?	• Children's interaction with interactive elements of reading apps • Children's motivation towards reading for fun • Children's perceived benefits of reading and using digital reading devices and encouragement of reading activities	• Observation of children's reading activities • Children's interview
4. How do children demonstrate their understanding in the e-reading exercise when using touch screen device?	• The answers children provide to recall and understand the comprehension questions after reading activities • Children's e-reading behaviors in individual and shared setting • How children establish connection with events and character of the reading apps	• Observation of children's reading activities

Four research questions were linked to the sets of data collection methods. Figure 3.5 illustrates the research questions and data collection techniques.

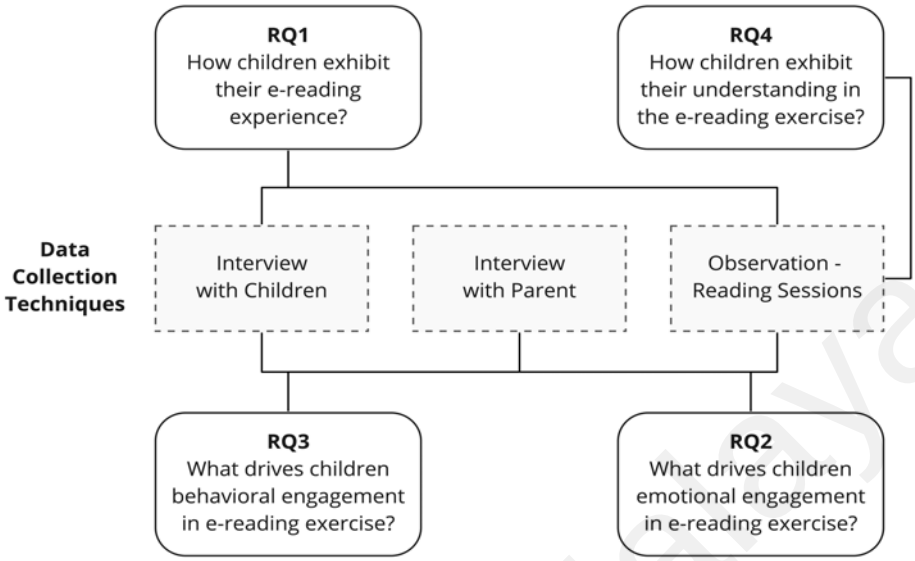


Figure 3.5: Mapping Research Questions and Data Collection Techniques.

Engagement model of reading development and self-determination theory was linked to data collection methods. Figure 3.6 illustrates the adopted theories and data collection techniques.

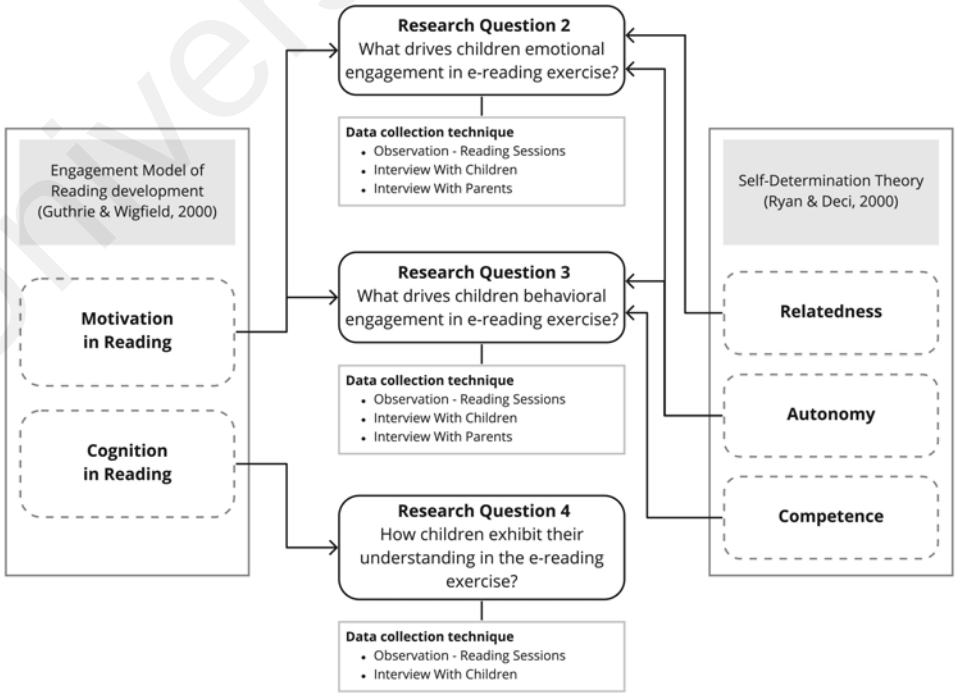


Figure 3.6: Mapping of Adopted Theories and Data Collection Techniques.

Children and parents were fully debriefed about the nature of the study. Summary of data collection settings are displayed in Table 3.5 as below:

Table 3.5: Data Collection Sessions (N=10)

Source of Data	Description	Duration
Introductory Interview Session	Researcher conducted briefing, explained about the study and reading sessions, then children were asked • to draw a picture and colour it • to brows and explore as many given apps in the device	15- 20 min
Observation 1	Individual Reading Children were asked to explore as many as apps they like from given folders	20 min
Observation 2	Individual Reading Reading app: 1) The Three Little Pig 2) Little Red Riding Hood	10 min each
Observation 3	Individual Reading Reading app: Billy Space Cat	20 min
Observation 4	Individual Reading Reading app: Fishy Tales	20 min
Observation 5	Individual Reading Reading app: how I build my house?	20 min
Observation 6	Shared Reading Reading App: The Jungle Book Involves 4 groups with 2 or 3 children in each group.	10 min Each group
Observation 7	Shared Reading Reading App: What I Plant in My Garden Involves 4 groups with 2 or 3 children in each group	10 min Each group
Observation 8	Shared Reading Reading App: Tiny world - Heaviest, smallest and jump Involves 4 groups with 2 or 3 children in each group	10 min Each group
Children Interview 1	Children were asked • about reading experience with electronic device (Reading, Books, Reading time at Home) • about digital reading devices (i.e. iPad and Apps) to answer questions regarding high working memory load (numbers, words, following instruction)	15- 20 min

(Table 3.5, continued)

Source of Data	Description	Duration
Children Interview 1	Children were asked • about reading experience with electronic device (Reading, Books, Reading time at Home) • about digital reading devices (i.e. iPad and Apps) to answer questions regarding high working memory load (numbers, words, following instruction)	15- 20 min
Children Interview 2	Children were asked about • Tablet Usage • Reading Activity • Parents' attitudes towards reading activities Children's perspective on Reading Previous Reading Experience	15 min
Parents' Interview	Parents were asked about: • Parent and children literacy practices at home Perception of e-reading from iPad	20 min

3.5.1.1 Reading Observation of Children

The study employed an observational protocol to record information during all eight observation sessions. The protocol includes children reading activities; verbal and non-verbal behaviors (Appendix A). The researcher recorded a chronology of events, a map of the setting, and verbatim quotes of individuals as suggested by Creswell (2010). The observational protocol includes two sections; descriptive and reflective notes. The descriptive notes contain a description of on-screen reading activities, a flow of activities, and chronological summary, and reflective notes contain notes about the process reflection of activities, remarks for theme development. This is to ensure that all elements and area of on-screen reading practices were covered in the observations. The observation settings were pilot tested on two participants (Mujtaba and Dania) from an international school who were involved in the preliminary study only. The observation settings and protocols then refined according to the preliminary study experiences and discussion with the supervisor.

Reading observation was conducted for each reading apps in individual and shared reading settings. The advantage of observation is that it provides a way for researcher "to watch the child as he or she reads and writes and what he or she thinks" which is difficult progress to document. This source of data provides qualitative information concerning the child's strategic operations on print (Clay, 2013).

In this study, observations seek to understand how children interact and explore reading apps, how motor skills shape the interactions with the touch screen device, and how children perceived app interface. Observations were conducted from June to October 2015 after the researcher had studied the introductory session interview. Video and audio tapes were utilized to recode all information. Observation sessions were conducted in both reading settings, and "read to me" or "read it myself" modes, and by storybooks and educational reading apps. At the end, children were given multiple comprehension questions in individual and shared reading sessions. The comprehension questions at end of each reading session was designed to understand and capture the cognitive indicator of e-reading engagement. How or what do they understand from reading apps in individual and shared reading sessions.

As shown in Table 3.5, observation one to five were conducted in individual reading context. In the first observation setting, the researcher provided a reading activity for exploring and getting familiar with the reading type of readings and the interface without assigning any specific app to read. Children were asked to select as many reading apps as they like from given folders and free to explore reading apps. This allowed the researcher to probe on e-reading behaviors during exploration of apps to better understand the e-reading experience through the interaction with several reading apps.

In the second setting, children were given two similar reading apps ("The Three Little Pig" and "Little Red Riding Hood") in terms of type and interface design in "read

to me" and "read it myself" mode. In third and fourth setting, children were given two different reading apps ("Billy Space Cat" long storybook and "Fishy Tales" an educational reading app); in term of content and interface design. Children could decide to read or listen to the spoken words. In the fifth observation, children were asked to listen to long interactive storybooks ("How I built my house") read by the narrator.

Observation six to eight were conducted in shared reading context. Every two or three children from the same gender were placed in a group to read in a shared context. They were given one app at each session ("The Jungle Book" - a storybook; "What I Plant in My Garden" – storybook; "tiny world - Heaviest, smallest and jump" – educational reading app) and asked to choose to take turn and read it one by one or to listen to the narrator together.

To end, either in individual or shared reading sessions, children were asked to answer some comprehension questions at the end of each reading session. The researcher would ask them literal or inferential questions. They were given some time to think about the questions. Children should get response orally for storybooks; however, for educational reading apps, participants were given multiple comprehension questions at the end of each reading session.

Young children are developing as readers when they are able to understand, interpret and critique what they read (Duke & Pearson, 2001). Reading literacy involves understanding, using and reflecting on written information for a variety of purposes (Kirsch et al., 2003). The Guthrie and Wigfield (2000) engagement model of reading development, which posited that reading comprehension is the consequence of an extended amount of engaged reading. They identified comprehension components as a) word recognition, b) fluency, c) literal, and d) reasoning. Basic literacy skills are word recognition and literal comprehension. Two main comprehension questions fell under literal and inferential questions. Literal means the question/answer is clearly stated;

versus inferential, that means question/answer is not explicitly stated. Literal comprehension questions were often adopted in order to examine the literal meaning of the story (Ciampa, 2010). They can target characters, pace/time, and the setting of the story. However, inferential questions requires the reader has to identify the literal cues and evaluate the text through critical thinking (Kirsch et al., 2003).

In this study, the reading comprehension questions were implemented in the following formats:

a) Literal**:** questions were clearly and explicitly stated in the passage. Also, this targeted some vocabularies and required the child to understand the meaning of a word or phrase were depicted and mentioned in illustrations.

b) Cause and Effect (evaluative): questions generally began with the word "Why". Children had to read the passage clearly to find either the cause or the effect of events and express their opinion as well.

c) Inferential: questions that were generally more challenging for most students. The answers were not clearly stated in the passage but were usually implied. Children needed to learn to conclude from what they have read in the passage in order to answer such questions.

d) Retelling: It requires children to retell the story as they remember it in the open ended format without being asked explicitly about any event or characters.

Details of comprehension questions for each reading sessions are available in Appendix B. Table 3.6 summarizes details about the comprehension questions.

Table 3.6: Summary of Comprehension Questions

No.	Reading Apps	No of Pages	Content Representation	Reading Setting	Type of Comprehension Questions
1	The Three Little Pigs	4	- Text - Animation -Narration	Individual	Literal (oral)

(Table 3.6, continued)

No.	Reading Apps	No of Pages	Content Representation	Reading Setting	Type of Comprehension Questions
2	Little Red Riding Hood	3	- Text - Animation -Narrtion	Individual	Literal and Inferential (oral)
3	Billy The Space Cat	17	- Text - Illustration	Individual	Literal (oral)
4	Fishy tale	14	- Text - Illustration - Narration	Individual	Literal (textual)
5	How do Ibuild a house?	39	- Text - Animation - Narration	Individual	Literal , Inferential, Evaluative (oral)
6	The Jungle Book	3	- Text - Animation - Narration	Shared	Retelling (oral)
7	How I plant my seed?	3	- Text - Animation - Narration	Shared	Retelling (oral)
8	Tiny world - Heaviest, Smallest, and Great Jump	3	- Text - Illustration - Narration	Shared	Literal (textual)

3.5.1.2 Interview Session with Children

The first interview was an introductory interview (informal) session with children (Appendix C). Informal interview known as a conversational interview or discovery interview is considered as an unstructured interview and can be determined as a guided conversation rather than strict structure interview (McLeod, 2014). In this study, informal interview with children was carried out at the school, at the computer room, started the end of June 2015. The purpose of this interview was to debriefing the future activities and procedures of the study as well as offering an icebreaking session with children, so that allows them to ask any questions from the researcher. It, notably, aimed to enhance the level of comfort for children. Children also were given time to explore iPad and reading apps. In addition, as a form of play, they were given drawing tools and paper to paint/draw; to create a fun environment for children.

The session started with fun activities. At the end of sessions, children were called one by one to answer some informal questions by a researcher in the same location as the rest of the participants were playing around. The interview protocol contained information about the time and location, the name of children, age, and pseudonyms as they had selected for own. After explained the study, children were asked about their reading activities at home, reading from a paper book or electronic books, and their touch screen device ownership.

According to Riley et al. (2000: p. 129), interview 'represent(s) the qualitative approach' as it provides a 'richness' of data. They argue that 'the case for interviewing rests on two conditions': 'First, that the researcher is seeking, at the level of "meaning", "feeling" and "value", insight into how individuals or groups think about their world and how they construct the "reality" of that world. Second, if the researcher is uncertain regarding how the target population actually thinks about the topic under examination – if it is not known how they conceptualize the area, how sure they are of it, or how much they actually know about it, then the interview serves its purpose of giving explanatory insights' (Riley et al., 2000). One of the crucial elements during the interview is to have a structure and taking notes, as it ensures continuity across interviews. In this study, the interview protocol served the purpose of reminding the researcher of the questions to be asked, and it provides a means for recording notes, as suggested by Creswell (2010).

Children are active in the construction and determination of their social lives can provide valuable insights into their daily lives (Irwin, 2005; Kellett, 2011). When constructing an interview protocol for children' interview, it is important that the questions be appropriate for the developmental level of the child. Children at the age 7-12 are considered concrete operational which means they are aware of external events and able to recognize one's unique thoughts and feelings (Piaget, 1956). In this study, the main individual interview with children contained semi-structured questions and

was designed to take less than 20 minutes each and teacher or guardian were not present at the time of the data collection sessions. The interview protocol was a form that contained questions to be asked in separate sections to cover all each area under investigation and space for taking notes of children's responses and indicating date and time. The form addressed three areas: technology usage, reading activities, and experiences, and their perspective towards technology and reading. The protocol included children reading habits, beliefs and preferences; children interview 1 and 2 (Appendix D and E). Generally, good interview questions solicit participant perspectives and stories (Saldaña, 2011).

Interviews were documented using audio/voice-recorder. The interviews were conducted after several observation sessions to be able to build connections and enhance their level of comfort by the time. At the initial part of the interview, the researcher explained to the child why the interview is taking place. During the interview, researcher avoids trying to follow every answer from the child, instead, if needed, commented, asked the child to elaborate, or acknowledged the child's response, as suggested by Vasquez (2000).

The open-ended questions encouraged participants to explain their "unique perspectives on the issues at hand" (Hatch, 2002). However, a preliminary study revealed that, in the interview session, it is better to be specific about the subject in a way it is possible to ask them to be more elaborative. It was suggested by several researchers such as Ciampa (2012), Fargas-Malet, McSherry, Larkin, and Robinson (2010), Irwin (2005) and Pitcher et al. (2007) to use "Tell me about…" when interviewing with children. Questions were designed in a way to be simple, intuitive, and understandable for children. According to Partington (2001) if questions are too sophisticated for them to understand, they may pretend to understand and provide answers that seem to satisfy the interviewer. Partington suggested that interviewer

should “listen carefully, respond appropriately and follow up on areas requiring clarification”. Similarly, Fargas-Malet et al. (2010) advised the researcher to start the interview by asking about things the child already knows or sees like daily events and routines, or feelings.

3.5.1.3 Interview Session with Parents

Docherty & Sandelowski (1999) cited Faux, Walsh, & Deatrick (1988) highlighting the role of parents or caregiver as informants in research focused on children due to children’s “lack of the verbal skills, conceptual abilities, recall, and overall narrative competence to convey those experiences”. In this study, before starting the data collection process, four attached forms were distributed to families through the children where they included 1) information sheets: describing the goals and procedures, 2) questionnaire: ten socio-demographic questions about the family and backgrounds, 3) Child consent letter: agreement on allowing children to take part in this study, and 4) Parental consent letter: agreement to take part in an interview. In parental consent letter, they were asked to provide their preferred means of communication (face to face, phone, email), potential location (if face to face), and the date they are free for an interview. All of the interviews conducted through phones.

Parent interview protocol (Appendix F) designed and contained three sections including questions about 1) technology usage and ownership of touch screen devices for reading, 2) shared activities with participants and home literacy practices, 3) parent’s literacy activities. The interview sessions were conducted around 15 to 20 minutes and recorded by voice-recorder. All of the interviews were conducted through phone and respondent were informed that their voice would be recorded. The phone interview was parent’s preferred way to attend in the interview. The Interview with parent illuminated a lot of information about the children’ home literacy practices and recognized as a way

to confirm children' answer to some interview questions The interview with parents was mainly used to support other data and for triangulation purpose.

3.6 Research Trustworthiness

The quality of the work and consistent credibility of the methods and trustworthiness of the findings are crucial concerns in qualitative research. As Willis (2007) defined trustworthiness as believability of qualitative inquiry, Lincoln and Guba (1985) identified following unique terms such as credibility", authenticity, transferability, dependability, and confirmability to establish trustworthiness in rigorous research. Strategies that enhance each component of trustworthiness are as follows:

- Credibility: prolonged engagement, triangulation
- Transferability: enriched data and thick description
- Dependability: replication of the research process (describing the changes that occur in the setting and how these changes affected the way the research approached the study)
- Confirmability: documentation of whole research procedures

In this study, the researcher addressed the trustworthiness issue of research procedures to ensure a well-established research design through these efforts: a) the preliminary study b) triangulation c) persistent observation d) member checking and peer debriefing.

3.6.1 Credibility

Credibility refers to the accuracy of representation. Creswell (2007) defined "Rigor" research as utilizing/employing "member checking", "triangulating sources of data", or "using peer or external auditors" of the research process to validate the accuracy of the findings.

3.6.1.1 The Preliminary Study

The two preliminary studies were conducted; first, at the University of Malaya kindergarten several months before of main data collection, and second, at Wisma R&D, University of Malaya one month before the main study. In the first preliminary study, ten children from kindergarten at the University of Malaya were involved in the study. It employed children's reading observation and individual children interviews. The outcome of the study was published at Computers and Education Journal (Noorhidawati, Ghalebandi, & Siti Hajar, 2015). The second preliminary study was conducted at Wisma R&D, University Malaya, with two children aged eight years old, male and female. They were researcher's colleague children at Wisma R&D and joined from an international primary school. They were involved in reading activity observation, children's interview, and also one of the parents (researcher's colleagues) also took place in an interview.

Both studies were important as they provided insights which otherwise could not be anticipated towards designing a more robust main study. These preliminary studies have contributed to the main study in many ways which includes:

1) Providing useful information on the field observation to plan for data gathering schedule. It is crucial that the researcher goes to the field work at the appropriate time. Data collection activities, like children's reading activities, need to be conducted in an allocated location as the video recording equipment and position of camera, the position of children as well as touch screen device should be planned ahead in a way to capture verbal and non-verbal behaviors as much as possible
2) to identify information on the number of required sources of data, ideal respondent, and sample size, and

3) to provide the opportunities for novice qualitative researcher on qualitative data collection activities, data handling, and qualitative analysis.

These experiences from preliminary study informed that it is not adequate to capture only reading observation on individual setting and only interview from children. This suggests that the need for additional interview from parents on this scope of the investigation. Teacher interview and multiple reading settings were added as another data collection technique.

3.6.1.2 Triangulation

The descriptor of triangulation is identified as terms such integrating, mixing, and combining wherein empirical inquiry it refers to knowing more about phenomena when the multiple methods are utilized to generate data (Moran-Ellis et al., 2006). In the qualitative investigation, triangulation minimizes the biases in conclusion of findings and allows the researcher to achieve a better evaluation of the "validity" and "generality" of the explanations that have been developed (Maxwell, 1998). In order to offer triangulation and trustworthiness to validate the results of this study, following triangulation techniques were employed:

a) Data collection techniques: interview with children and parents, and children's reading observation
b) Respondents: children and parents
c) Source of data: observation video/sessions, interview transcripts, and field notes

3.6.1.3 Persistent Observation

The purpose of "persistent observation", suggested by Lincoln and Guba (1985, p. 304), is to "identify those characteristics and elements in the situation that are most relevant to the problem or issue being pursued and focusing on them in detail". "If prolonged engagement provides the scope, persistent observation provides depth". This

involves spending sufficient time observing various aspects of a setting, speaking with a range of people, and developing relationships and rapport with members of the culture.

In this study, the main source of data collection, the children's reading observations, was carried out in the field over the five months. Sine, the reading activity settings, were coordinated in multi-session reading context including a) individual and shared context, b) two types of reading content such as storybook and educational reading apps, and c) read the story or listen to the story, the researcher had frequented reading sessions observation through a combination of settings during the data collection periods.

3.6.1.4 Peer Debriefing

Planning and establishing an audit trail through documentation of the research process is a way of ensuring that the researcher will be able to do this at the end of the study (Strauss & Corbin, 2010). Auditor "reality check" , suggested by Menard (2008), of qualitative data, practices the confrontation of credibility and trustworthiness of research procedures. Moreover, (Lincoln & Denzin, 2003) highlighted that auditing involves the researcher with the "provision of a methodologically self-critical account of how the research was done". On the other hand, "member checking" or "respondent validation" , suggested by Flick (2014), is similar to what "inter-rater-reliability" offers in the quantitative method. It provides participants a chance to go through the data and eliminate anything to suggest personal push (researcher) to the data. In this study, peer debriefing was employed by the help of another researcher colleague to examine the several videos and transcriptions for both observations and interviews. It helped the researcher to become more aware of their views on collected data to detect vague descriptions, biases, and assumptions made by the researchers, irrelevant statements and to incorporate the concepts. In addition, the researcher's exposure to preliminary study on the same topic helped her to collect clear and concise feedback from peers.

Moreover, the auditing process followed by several rounds of review sessions on transcription with the supervisor who had great exposure to the research topic.

3.6.2 Transferability

The term transferability corresponds to which extend the result of a study is applicable to other setting as an external validity (Merriam, 2009). It seeks the answer to if the study is generalizable. The researcher should describe in details the participants and setting of the study to provide an opportunity to transfer information to other settings in which the same findings can be transferred (Creswell, 2007). In this study, the data collection procedure and analysis of qualitative data are shown in Figure 3.7, which describes processes in details.

3.6.3 Dependability

Dependability refers to the consistency of results with given the data collected (Merriam, 2009). In this study dependability was established through a detailed process of study, the data collection techniques, date of data collections, and settings (see section 3.5).

3.6.4 Conformability

Corresponds to objectivity and indicates that the data accurately represent the information that the participants provided, and interpretations of those data are not invented by the researcher (Elo et al., 2014). Also, it refers to the idea that research findings and interpretations are linked to data in ways easily understood by others (Kihn & Ihantola, 2015). All the data collection procedures were documented for rechecking purpose, all verbatim statements from participants were stores as they were being stated and are available in appendixs. Researcher provided a rationale for the decisions have been made in research process. In addition, the step by step procedures and their details facilitated understanding of how the themes emerged from the data.

3.7 Ethical Procedure to Conduct the Study

In all steps of the research process, the researcher needs to engage in ethical practices. Ethics has become a more pervasive idea stretching from the origins of a research study to its completion and distribution (Creswell, 2012).

As such the researcher addressed the ethical considerations in this study by:

1. Obtaining data collection permission from the University of Malaya and supervisor before undertaking in site data collection.
2. Obtaining approval from the desired school, Sri Hartamas primary school principals before starting data collection (Appendix G).
3. Setting the introductory sessions with the teacher to explain the objective of the study both written and orally.
4. Distributing the study information sheets to the children's parents. (Appendix H)
5. Distributing the children consents letter and obtaining parents' permission by providing information sheet which explains the steps, objectives, and location of the study (Appendix I)
6. Conducting an introductory session with children for ice breaking and explaining the objectives of the research clearly and allow them to interact with the iPad to provide a better understanding of further reading activities.
7. Obtaining a parent's consent letter for taking part in individual interview sessions through the online call.
8. Taking steps to protect the privacy and confidentiality of the children using coded references (pseudonym).
9. Informing all respondents before data collections activities are audio/video recorder.

10. Respecting the students and teacher major examination and holidays schedules.

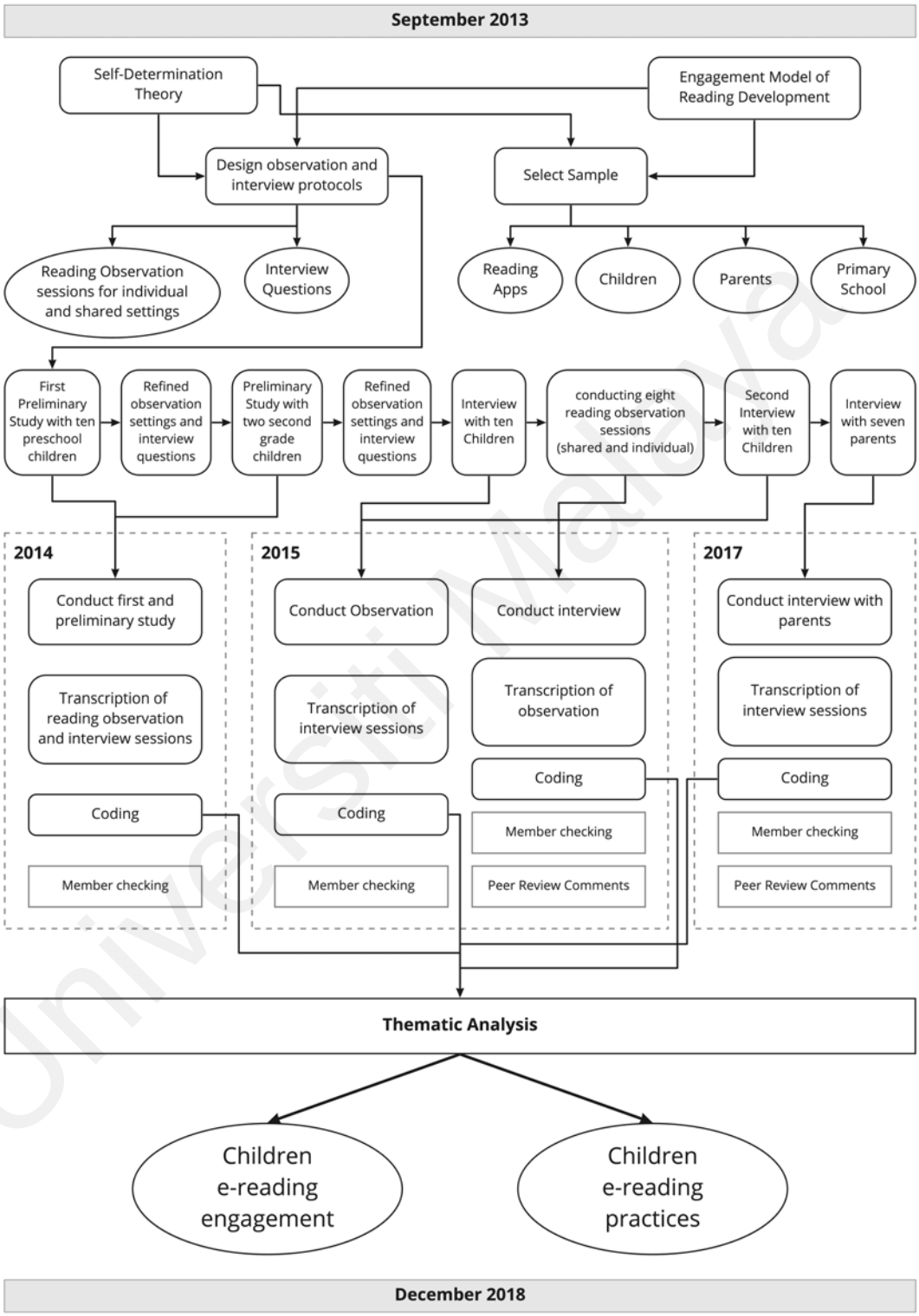


Figure 3.7: Research Process on Data Collection and Analysis

Before conducting the data collection, the researcher submitted an application letter together with the research proposal to the faculty of computer science committee to get approval to undertake the study. After permission was granted, the researcher went to the school and submitted the information sheet, together with the approval from the University of Malaya to the Sri Hartamas School to ask for principal permissions to conduct the research in the schools and involve some of their teachers and students as respondents for the study. After obtaining the approval letter from the principals of the school, the researcher next provided and distributed consent letter for all respective respondents accordingly.

The respondents were briefed on the objective of the study, activities, and the role expected from them once they were identified. During the data collection process, one of the main concerns was to make sure the privacy and the confidentiality of the research respondents specifically children. As such, pseudonym references were utilized to protect the anonymity of the children during the process.

3.8 Data Analysis

Qualitative data deals with meanings. Meanings are analyzed through conceptualization (Dey, 2005). When qualitative data come from recording interactions, knowledge and meaning are reported by participants. Hierarchy phase of qualitative analysis is circular and non-linearly. The data encompass concepts, opinions, values, and behaviors of participants (Nigatu, 2009).

This research employed a case study approach. The unit of analysis are children (aged 7 to 8 years old), parents' perception in e-reading and home literacy practices, and storybook and educational reading apps. In this study, the inductive analysis was carried out for generating categories and themes to address the research questions posed using NVivo a qualitative analysis software (see 3.8.1 section). The primary analysis was conducted while collecting data. The process was inductive, and the results are rich

descriptive and presented as themes and categories. That data derived from participants were incorporated together so that they were combined into larger themes moving from particular to the general through comparison. Theoretical framework enabled the researcher to focus the inquiry and interpret data, as highlighted by Merriam (2009).

Framework analysis or thematic adopted from Ritchie et al. (2013) has been employed as inductive analysis strategies in this study. The main processes of framework analysis include as follows:

a) Transcribing and reading data
b) Identifying a coding framework based on prior issues and emergent issues
c) Coding, using textual labels to identify specific bits of data where correspond to different themes
d) Categories (charts), based on cases or themes or both
e) Mapping and interpretation, using patterns and connection, concepts and explanation in the data.

3.8.1 NVivo

Qualitative analysis software provides an excellent medium for sorting data. Big volume and variety of qualitative data require the efficient approach of managing. The software can facilitate access to stores of data through collaboration, cooperation, and enable the researcher to understand unstructured data more effectively. The core task of qualitative analysis depends on selecting a meaningful bit of data and assigning it to a category called coding data. Benefits of using software for data analysis are as follows:

- Keep, record, and store data and categories automatically
- Data are accessible and retrievable easily
- Coding and retrieving data enhance by speed and thoroughness
- Searching and linking data
- Provide reports and auditing analysis

The analysis in this study was carried out using NVivo software. The NVivo software has a simple and effective user interface. It enables the researcher to analyze data in the following steps as identifying similarities, extracting themes, identifying relationships, highlighting differences, and create generalization. The data can be extracted by identifying occurring terms and collate data relating to a theme or concepts. The visualization tools of NVivo can illustrate the relationships and report knowledge developed from data.

Since 2011, NVivo software supports the framework analysis using new framework matrices. Framework matrix is a grid that provides a way to summarize source materials by case and theme (QSRInternational, 2012). As it was explained in 3.8.1 in inductive analysis codes are derived from the data. This software manages data by storing different data sources such as text, audio, and video, so that it facilitates inductive analysis of organized data. Here, the content and purpose of the different sections of NVivo are explained by the screenshot of the interface retrieved from the NVivo website (Image 3.1).

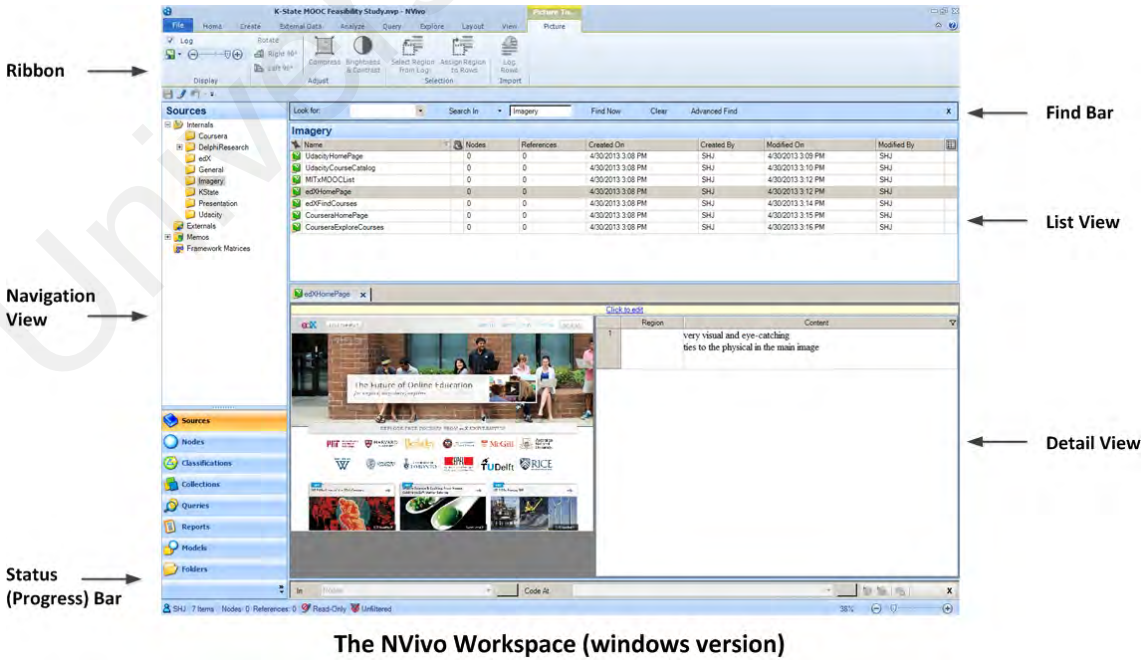


Image 3.1: Screenshot Retrieved from the NVivo Website

Researcher structured data in NVivo into two main folders in the workspace which encompasses the following elements:

a) Navigation view: This section includes sources which encompass stored interviews and observations for each reading session according to the name of the selected app. The external folder includes some literature review and memo (i.e., reports, field notes). All collected data were assigned to respective sources (Image 3.2).

b) Status Bar: Nodes: It included a collection of references about a specific theme, case or relationship. Nodes were classified as theme nodes for themes and topics, and case nodes refer to the unit of observation (children).

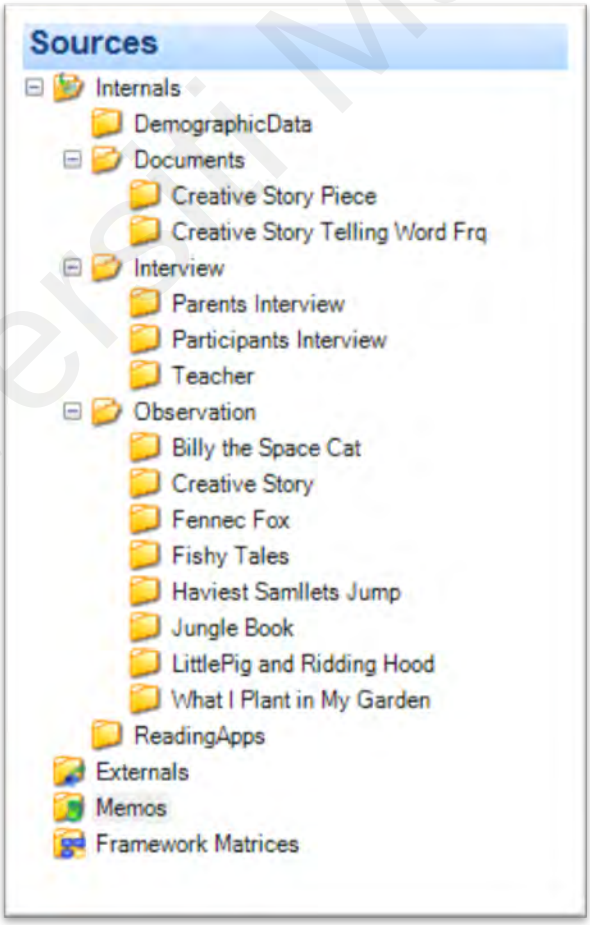


Figure 3.8: Internal Resources in Nvivo Software

Most importantly, it is only the researcher who decides how to record and how to analyze all the input while Nvivo is only an assisting tool which cannot meddle with data at any level. Hence, the use of QSR Nvivo as data analysis software of this study cannot substantially influence the procedure and results of data analysis, and it will not introduce any bias to the findings. Based on these facts, the researcher attended workshops and trainings about how to use QSR Nvivo step-by-step, discussed with peers using NVivo in conferences of qualitative research, to gain experiences about how to use it properly from people who are not only fully equipped with knowledge about NVivo, but also are solidly grounded in qualitative research methodology.

3.8.2 Data Analysis Processes

Qualitative methods are subjective; therefore, all analysis processes are explained in this section. It is all about transparency and credibility. Perhaps using software for data analysis ensures that the analysis processes are conducted more methodically, more thoroughly, more attentively (Bazeley & Jackson, 2013). NVivo has several basic functions to analyze the qualitative data including importing files, analyzing data, organizing cases and characteristics, visualizing and exporting finings. Data analysis process includes data cleaning, uploading the data into Nvivo, recognizing data, data exploration (using query), coding relevant information in data, generating themes to address the research question. Steps are explained as follows:

First, all data was transcribed into Microsoft words or Excel files in order to keep the raw version as a backup. Then all raw data files were imported into NVivo, in navigation view, under source >internal where several folders were created to store different data sources (observational data, interviews, documents) in this study. In the observational folder, data was stored according to reading activity sessions for each reading app for both individual and shared settings. In interview folder data were stored according to individual participants' interview, individual parents' interview. In

document folder data was stored according to demographic data. In addition, rough notes and ideas were jotted into analytical memos including future directions, unanswered questions, frustrations with the analysis, insightful connections' as suggested by (Saldaña, 2009).

The research questions were assigned by a label (Anchor codes) such as a) reading practices, b) emotional engagement and reading behaviors, c) behavioral engagement and reading behaviors, d) cognitive strategies. The relevant statements from observational data were coded under the respective anchor code.

Researcher adopted the analytic structure by Ritchie et al. (2013) indicating the hierarchy stages as data management, descriptive account, and explanatory account.

3.8.2.1 Data Management

The first stage of analysis involved data management. Qualitative data is unstructured and inconsistent; therefore at the initial stage of analysis, they are inclusive rather than exclusive (Dey, 2005). The unstructured qualitative data including observational videos, interviews voice records, and comprehension reports were imported into the NVivo under the sources (internal).

Coding is the most popular categorizing strategy where data segments are labeled by creating and adapting concepts relevant to data. Data were sorted and reduced by generating sets of themes and concepts. Bits of data were assigned to relevant nodes (themes/concepts) to portray meaning. Flick (2014) suggested that distinctions and similarities should be identified both within and between categories which for qualitative data it is difficult because the data is rich and specific. In that respect, generating categories required the researcher to make a comparison between observations. In such, a set of criteria was defined in order to make a distinction between rich data (grouping data based on criteria). Each category indicated clear criteria (cannot be fuzzy or overlapping) and allowed making a differentiation between

included and excluded data. Distinctions are always conceptual and empirical (Dey, 2005)

In NVivo, codes are stored within nodes. Each node should encompass one concept only and data can be coded as multiple nodes. A tree displays each concept; conceptually related nodes. Codes can be identified as descriptive codes (describing the situation or events) are built through classifications and attributes, thematic codes (identifying concept, theme or problem) are built through annotation and memos, and analytic codes (identifying impacts) are built based on the memo (QSRInternational, 2012).

3.8.2.2 Descriptive Accounts

In this stage, synthesized data are utilized to provide descriptive accounts, identifying key dimensions and mapping range and diversity of each phenomenon. In order to conceive the phenomena, first, the actual words used by participants were considered for descriptive analysis. Then, subsequent meanings were assigned to the content of people's accounts to clarify the nature of the phenomenon. This assignment required the researcher to carefully review and capture qualitative evidence to understand different perspectives and descriptions. Researcher reviewed data and recognized patterns of events or processes by attending to their characteristics and boundaries. The strategy was to break the data in order to classify it and to know how, why, and what. The core task lied on describing phenomena thoroughly and comprehensively (thick description), creating concepts to classify the data, and then the connection between concepts provided the basis of a new description. This circular process includes classification, description, and connection. Here, three aspects of thick description adopted from (Dey, 2005) are displayed in table 3.7. Description development involved summarizing events, identifying key episodes, determining roles and characters, and setting out chronological sequences to construct an illuminating narrative.

Table 3.7: Key Aspect of Thick Description

Aspects of Description	Explanation	Reference in this study
Context in action	Detailed description of the reading settings within which actions occurs, Time frame within which action take place.	• Scope: e-reading for pleasure • Participants: bi/multilingual children age 7-8 years old (male and female) • Content: Reading apps (storybooks and educational reading apps) • Reading mode: read to me and read it myself (with and without narration) • Medium: iPad • Location: school common room, school library, and school computer room
Intention	Children's e-reading behaviour in the study, how they perceived the reading sessions.	• Reading Intention: pleasure/fun (playfulness/amusement) as well as satisfied feeling of gaining knowledge and reading in English (intrinsic motivation and self-efficacy)
Process	sequence of e-reading behaviors and events in which the children are engaged, interactive method of producing data, analyzing changes over the time.	• Collecting reading experience by observing participants verbal and non-verbal behaviors on both individual and shared reading settings • Collecting children and parents' perspectives on e-reading for pleasure using iPad through interview • Collecting the comprehension result by the end of reading observation. • Capturing external and internal distraction and children's disengagements

Classification is a conceptual process; here, it was applied based on research objectives. Sorted data were classified based on relevant characteristics. Through the rigorous process of conceptualization, data was classified coherently. To sum, elements and dimensions were identified, categories refined through further review, and data were classified.

3.8.2.3 Explanatory Accounts

The last stage of analysis involved identifying recurrent themes and patterns through associations and related themes to build a sequence of events where answering research questions. Explicit associations were identified including those that occurred between experiences, behaviors, perspectives, and characteristics of the study population. Identified associations helped the researcher to explain at the level of meaning, rather than cause; it explains why patterns, recurrent linkages, processes or contradictions were found in data by looking at regularities, variations, and exceptions. The explanation was built based on different meanings and understanding within a situation come together to influence the outcome. The aim was not finding a reason for a set of circumstances; it was set to understand circumstances in such a way to shape whatever was done in those circumstances. It follows that fact that human has different ability to make things happen, and their consequences of human actions are unpredictable and unintended (Ritchie et al., 2013).

Due to this, first, the connection between key features and patterns were examined precisely. Next, patterns were identified by analyzing the frequencies with which characteristics occur as well as cross-tabulation different characteristics. Then, regularities, variations, and exceptions were recognized. Last, researcher supplied the connections with plausible explanations. Connections were recognized between chronological and narrative sequences, and between concepts. NVivo facilitated linking data by identifying relationships between different parts of the data empirically and effectively. However, it required the researcher to refine and infer some connection between categories to conclude.

3.8.3 Execution of Data Analysis Diagram

The data analysis process is presented in figure 3.9. It summarizes the collected data and involves the interpretation of data through the use of the first and second cycle of

coding to determine patterns, relationships, and finally emergent themes. The process includes five type coding and labeling data methods. The attribute coding refers to collecting and organizing the basic descriptive data (participants, and reading apps, data collection settings and locations, and type of data collection techniques). The descriptive coding summarizes the primary topic of the transcribed interview and observation data. It is considered an initial step of data analysis. The process coding corresponds to a word or phrase that captured children's action/behavior during the individual and shared reading sessions in sequence. The themeing coding refers to categorizing and finding the pattern of data. The value coding captured and labeled subjective-value perspectives which refers to individual feelings and opinion entering the decision-making processes. It captures children and parent's perspective of using the tablet for reading, reading for pleasure, and the reasons for reading, and preferred topics and language to read.

3.9 Summary

This chapter describes the research methodology of the study. The review of the literature reveals the significance and the applicability of the qualitative case study research design to carry out an in-depth study of a phenomenon where not much has been studied about the topic previously. This chapter also discusses in details different stages of data analysis procedures, particularly the meticulous three levels of main data analysis. The next chapter will cover findings addressing the first research question; the e-reading experience for pleasure reading and emergent themes.

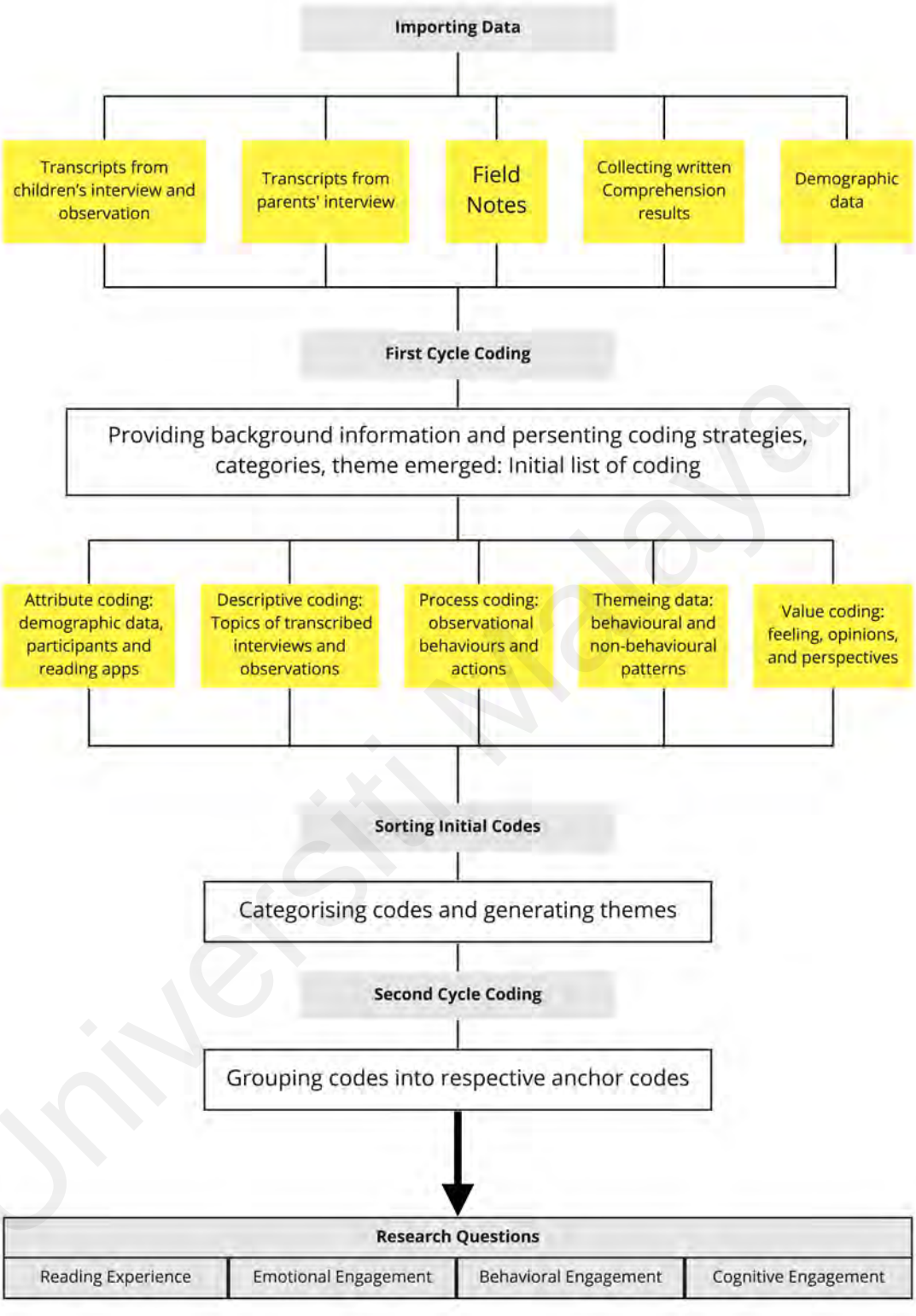


Figure 3.9: Data Analysis Process

CHAPTER 4: EXPERIENCE IN E-READINGTHE FOR PLEASURE

4.1 Overview

A qualitative case study method was conducted to find out how children read from iPad for pleasure reading. This chapter presents the key findings of the children's experience on e-reading for pleasure to answer first research question: how do children demonstrate their e-reading experience when using touch screen device? This chapter will discuss the major themes and other findings that emerged in the children's e-reading experience. The data were collected through children's e-reading observation, children's interview, and parent's interview.

4.2 E-reading Experience of Children

This section describes children's e-reading experience when using iPad. All children's e-reading activities were observed in a total of eight reading sessions including five individual reading sessions, and three shared reading sessions in 'read to me' and 'read it myself' modes to understand their reading behavior and exercise with reading apps using the storybooks and educational reading apps in iPad reading for pleasure. To facilitate a thorough investigation, the data was studied and analyzed in two stages. During the first stage, the children's e-reading exercise and behaviors were examined and tabulated for the first research objective. The findings were accordingly presented. The second stage of data analysis was conducted where the e-reading practices components from the previous stage were merged, compared, resulting in improved and more accurate themes. Moreover, this led to e-reading experience for pleasure. Summary of children's reading practices and behaviors in individual and shared reading sessions are available in Appendix J and Appendix K.

4.2.1 E-reading Experience from Individual Reading Sessions

There were five individual reading sessions. On each session, children were given one reading apps to be read individually either in 'read to me' or 'read it myself' modes

in order to understand children's exercise and practices when readings for the pleasure of storybooks and educational apps in iPad. The reading exercises were captured through children's verbal and non-verbal reading behavior, attention and interaction with the multimedia elements of the reading app, and operating on the device. Figure 4.1 shows the emergent themes of individual reading behaviors for the e-reading experience.

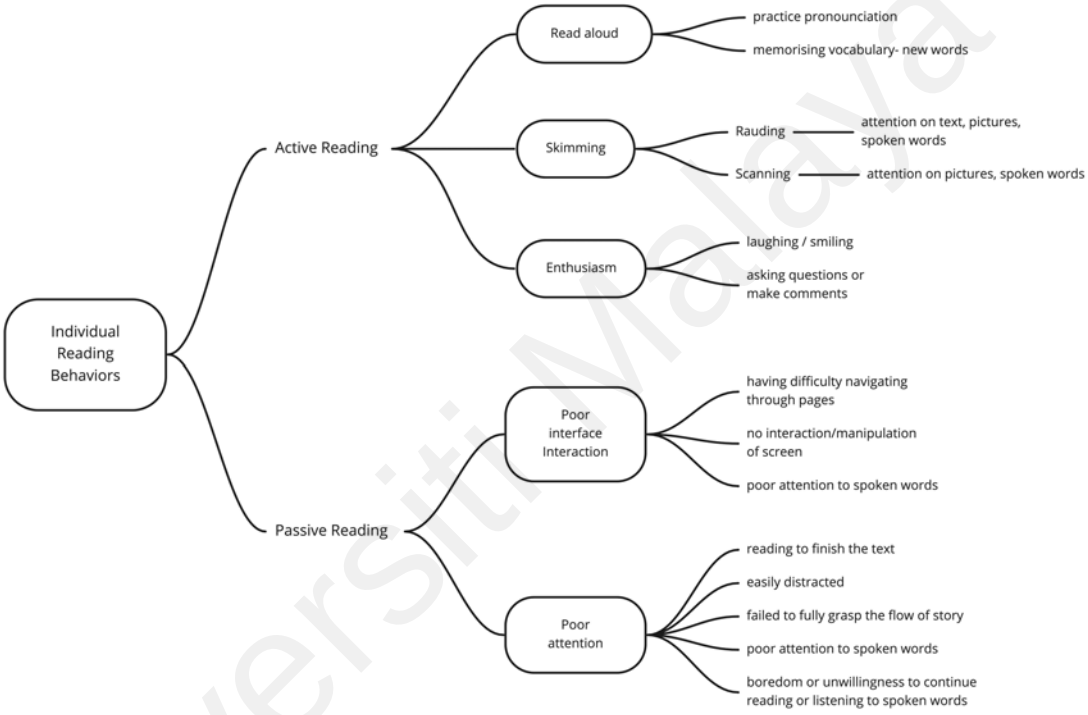


Figure 4.1: Themes Emerged from Individual E-Reading Sessions

4.2.1.1 Active Reading (Read Aloud, Skimming, and Enthusiasm)

Read Aloud refers to the act of reading when children enounce written or spoken words. For example, Farish, Kyrie, and Hiba choose to repeat along, after, or before the narrator (Observation Session 2: Little Red Riding Hood). This reading strategy might provide help for children to practice the pronunciation or memorizing new words as they were reading or being read. The observational data shows that when children encountered difficult or unfamiliar words, they repeated words until they get correct pronunciation.

Skimming refers to rauding or scanning the written words. For example, in ‘read to me' mode, the narrator was activated, and Najwa was listening to the narrator as she was looking at the text and pictures (Najwa; Observation Session 2: The Three little pigs). It was evident that children chose to read in silence (Skimming), when trying to skip difficult or unfamiliar words (Maneesh, Najwa; Observation Session 3: Billy The Space Cat) and (Aina, Observation Session 2: The 3 Little Pigs). Moreover, if the story was long, children changed reading aloud to read in silence (Aina, Eisha, Hiba, Maneesh, Farish; Observation Session 3: Billy The Space Cat). It may indicate that they become tired of reading long stories aloud. Some children were looking at the text and merely listening in both reading modes (Naveesha, Irfan, Nadia; Observation Session 2: The 3 Little Pigs), and (Naveesha, Eisha, Hiba, Maneesh, Nadia, Najwa; Observation Session 2: Little Red Riding Hood). Sometimes their eyes were following the words being read by a narrator (scanning) and sometimes spending more time on animation movement (Naveesha, Irfan, Nadia, Najwa; Observation Session 3: Billy The Space Cat’)

On the other hand, some of the children exhibited rauding which indicates reading and auding (comprehending and retaining the information in spoken words that is heard). It indicates processing words through hearing and recognizing spoken words as well and scanning words in order to understand the meaning. The notable indicator of rauding is asking questions about the specific words (Farish; Observation Session 4: Fishy Tales); he had his main attention on text and made efforts to follow each sentence on the passage by asking questions about the unfamiliar words or topic in general. Children tend to use their finger to point to words in both reading modes. It may refer to the fact that they were trying to keep their focus on the flow of the story, or trying to catch up with the narrator (Farish; Observation Session 2: The Three Little Pigs) and (Naveesha, Farish; Observation Session 3: Billy The Space Cat’).

Enthusiasm refers to children's responses to the actions and events inside the stories or educational apps. Some children were laughing and smiling over some comic events, funny characters conversations, entertaining animation movements (Hiba, Farish, Maneesh; Observation Session 5: How I Build My House). Some would ask some questions, make comments, and attend to reading activity on each session by their own will. For example, Farish exhibited his enthusiasm as he was reading 'Fishy Tales', the part that was relating to the sharks. He was asking many questions about another type of sharks which were not discussed in the app. Farish wanted to read and know more about this topic. He also made lots of comments and prediction about what will happen next for the character (Farish, Observation Session 5: How I Build My House). Another example of enthusiasm would be when Maneesh insisted on sharing with the researcher about the similar story he was reading a few days back at home. That indicates the enjoyment of sharing the favorite content with someone.

4.2.1.2 Passive Reading (Poor Interface Interaction and Poor Attention)

Passive reading behavior refers to the poor interface interaction and attention to what being read. Poor attention refers to disengagement to distraction from the flow of written or spoken words. For example, when children were waiting for the researcher to tell them to start or how to start, or flip the page (Najwa and Nadia; Observation Session 2: The 3 Little Pigs). They would not take actions. In addition, they also get easily distracted with external environmental elements such as noises, or if someone was entering the room (Nadia, Eisha, and Maneesh; Observation Session 5: How I Build My House). Besides that, some children missed providing an answer to the narrator's question. They notice the question or understand it. It seems they were not paying attention to the narrator and were only browsing the pages (scanning); Most of children except Farish. Some children exhibited boredom for the long story and unwillingness to continue reading the story by asking questions about the end of the story and their facial

expression. (Eisha, Farish; Observation Session 3: Billy The Space Cat) and (Farish; Observation Session 4: Fishy Tales).

Poor interface interaction refers to the difficulty of navigating the apps and get lost on the current page. Some children had difficulty navigating the app such as swiping the page (Neveesha, Hiba, Maneesh, Najwa; Observation Session 3: Billy The Space Cat) or failed to understand the flow of the story. Moreover, they failed to identify that the story was incomplete; as free version apps are partly covered (Field notes; Observation Session 2: The 3 Little Pigs). Researcher helped children when they encountered difficulty to navigate the page or were unable to identify the interactive elements on the page to proceed to the next event. (Field Notes; Observation Sessions 5, 3, 2: 'How I Build My House', 'Fishy Tales', and 'Billy The Space Cat'). Some interactive elements in the reading apps were not just for fun; basically, they were embedded as a navigation feature and help to proceed with the reading sections in which the reader should manipulate the screen. For example, the "How I Built my House" app required the reader to tap, drag and drop interactive elements (stones) into the correct spots. Then the reader was able to proceed or see the next event. However, in this app, there was not sufficient information or hints on the screen for children to identify those features and take actions accordingly, except for some illuminating spots on the screen. It was unclear for most of the children what is happening or how they should proceed to the next step. In another instance, Aina was staring at the screen and waiting for something to happen; she was unaware of required interactions. Researcher helped her to identify spots, drag and drop objects, and proceed to the next section. On the other hand, Irfan was able to identify all hotspots and respond to them quickly without the help of the researcher.

Nonetheless, it was evident that most of the children tend to play with animation rather than interact with language assisted features such as 'Dictionary' or 'repeat after

me’ button (Field notes, Observation Session 2: The 3 Little Pigs). Furthermore, they showed more attention to animation than text, particularly, when story plot reached the crisis or climax (Field notes, Observation Sessions 2, 5: ‘Little Red Riding Hood’ and ‘How I Build My House’). It may refer to children’s triggered imagination and curiosity. As such, it is believed that children had more focus on animation and text than narrator (Field Notes; Observation Sessions 4, 2, 3: Fishy Tales, The Three Little Pigs, Billy The Space Cat).

4.2.2 E-reading Experience from Shared Reading Session

In this study, three reading sessions observation was conducted to explore children e-reading practices in a shared setting, ‘read to me' and ‘read it myself' modes in order to understand their exercise and practices when readings for the pleasure of storybooks and educational apps in iPad. Children were grouped in the same gender and age. In total four reading groups were formed for shared reading activities. Each group was given one reading app for each reading shared session. Figure 4.2 shows the emergent themes from shared reading behaviors. In each group, children were given the option of taking a turn to read it aloud or listen to the narrator. Children were assigned to each shared group as below:

1. Male Group – Grade 2: Kyrie and Maneesh
2. Female Group – Grade 2: Aina, Nadia, and Hiba
3. Male Group – Grade 1: Farish and Irfan
4. Female Group – Grade 2: Eisha, Naveesha, and Najwa

The reading exercises were captured on children's verbal and non-verbal reading behavior, attention and interaction with the multimedia elements of the reading app, and operating on the device in the joint reading context.

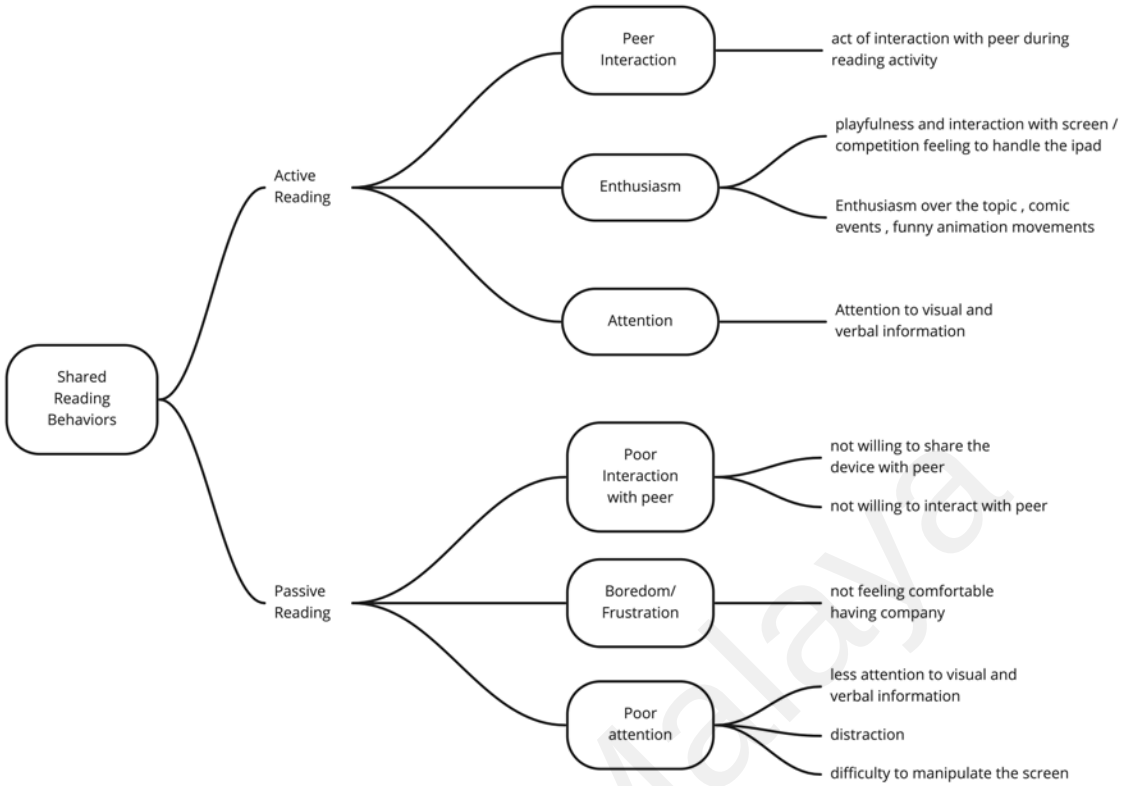


Figure 4.2: Themes Emerged from Shared Reading Sessions

4.2.2.1 Active Reading (Peer Interaction, Enthusiasm, and Attention)

Peer interaction refers to children's interactions with a peer during the shared reading session. Most of children were interacting with each other during the reading session, such as making comments and correcting each other's wrong pronunciation. In addition, they exhibited some competitive behavior when interacting with the screen such as who is the first to open or flip the page or start reading.

Enthusiasm refers to children's responses to the actions and events inside the stories or educational apps. All groups were amused in shared reading activities and had fun and engaged in playful acts except Male Group, Grade 2 (Field Notes; Observation Sessions 7, 6, 8: 'What I plant in My Garden?' and 'Tiny World' and 'The Jungle Book').

Attention refers to focusing on the visual and verbal information voluntarily. It was obvious that children had more focus over some of app features such as background

noises and some funny illustrations, character movements, and key events. They were showing each other the interactive elements and the animation movements and made comments, pointed to the screen, and did label referencing towards some events in the story.

4.2.2.2 Passive Reading (Poor Interaction, Boredom/Frustration, and Poor Attention)

Poor interaction with peer refers to unwillingness to read together or attend in shared setting. For example, the shared reading experience was different for Male Group, Grade 2. They did not like or want to share the screen on their turn, and they preferred to keep the screen near their own body in which the peer would have difficulties to look at the screen. It was apparent that Maneesh and Kyrie in this group did not enjoy shared reading sessions, and were not comfortable to have company in reading. Another reason might be because they were not classmate and not even friend, compared with other groups who were from the same class and were friend. There was no interaction among them during the shared reading session as well.

Poor attention refers to disengagement to distraction from the flow of written or spoken words. In a shared setting, children had less attention to visual and verbal information in a way to understand or recall. They usually were in a playful mood and interaction with each other. The reader would get distracted easily by others talking and laughing. The background noises or some funny events seemed to be distracting as well since children were enjoying activating them particularly in shared reading, again and again, they had less focus on the text. They laughed together and enjoyed experiencing this with their peers. Thus, the reading became a source of entertainment for them (Field Notes, all observation sessions). It was evident that children had difficulty to retell the stories from shared reading settings. In a shared setting, they retained less information when they read together. Majority of children forgot about the sequence of events and

the main idea of the story. However, all of them were able to recall the name of the characters. They could not retell the whole story accurately. They were able to recall partially.

Navigating the screen was not smooth as well, because each of wanted to move something on the screen and sometimes they lost what the correct next step is. For example, in the 'How I build my house' observation session, required reader to manipulate the screen to proceed to next stage of the story; building the house for the character by dragging the stones. Nonetheless, it was clear that children had difficulty to figure out how to navigate, swipe the page or identify the hotspots. Nevertheless, it was seen that some of the children mostly used their finger to point to words in both individuals and shared a setting in order to keep track of reading and better concentration on the story, as they might get distracted by narrator or peers talking or laughing.

Boredom or frustration refers to children's unwillingness to attend in reading activities either share or individual. Children exhibited boredom and frustration in some reading sessions when the story was too long or if the session happened to be near time of going home.

4.3 Summary

This chapter reported findings from individual and shared reading sessions to address the first research question: how do children demonstrate their e-reading experience when using touch screen device?. In summary, there are substantial reading behaviors and strategies that were captured from observational data. The emergent themes from individual and shared reading include active and passive e-reading behaviors. The next chapter will report the findings from individual and shared reading sessions, as well and interviews from children and parents.

CHAPTER 5: E-READING ENGAGEMENT FOR PLEASURE

5.1 Overview

This chapter discusses the major themes and other findings that emerged in the children's engagement with reading apps to answer following research questions: what drives children emotional engagement in e-reading exercise when using touch screen device? what drives children behavioral engagement in e-reading exercise when using touch screen device? How do children demonstrate their understanding of the e-reading exercise when using touch screen device?. The data were collected through children's e-reading observation, children individual interview, and parent's interview.

5.2 Emotional Engagement in E-reading

In this study, children participated in on-screen readings activities using iPad and interview sessions to uncover their engagement with storybooks and educational reading apps. Emotional engagement corresponds to emotional responses when reading storybooks or educational apps for pleasure. Following a thorough analysis, the emotional engagement construct was identified on the affective theme. Figure 5.1 shows the emergent themes for emotional engagement.

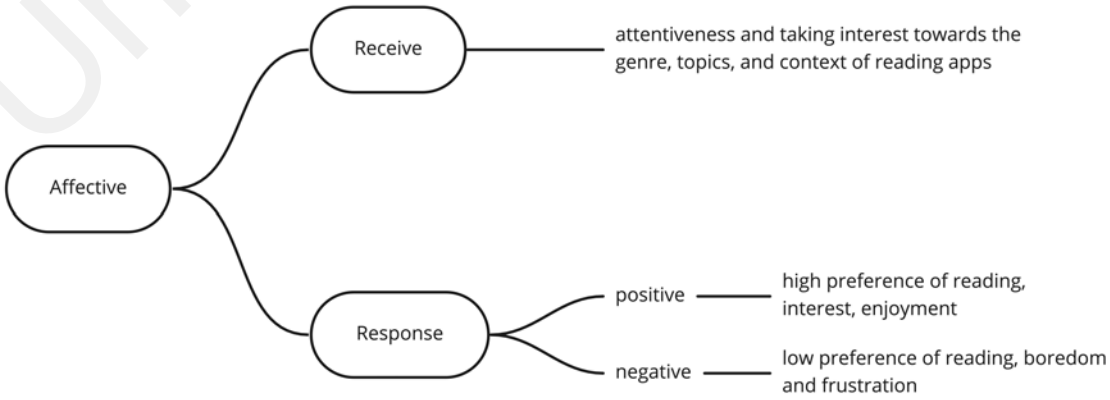


Figure 5.1: Themes Emerged from Emotional Engagement

5.2.1 Affective

The emotional engagement construct associates to attitudes, feelings, and emotions. The themes explain children's reaction to the reading apps as stimuli. Two engagement indicators, (a) receive; and (b) response, were classified under the “Emotional” theme.

5.2.1.1 Receive

The affective indicator of the receive revolved around the attentiveness and taking an interest towards in the genre, topics, and context of reading apps. There are some example of receive theme as follow:

"…. I like to use iPad …I read storybooks on it… you can see many things on page…. It has some different activity in the apps" (Maneesh, Grade2, Interview1)

“Cinderella story … I like that one …it is a sad story … so many things happened to her”. (Aina, Grad 2, Interview1)

“I can play when read storybook in tablet ... it comes with some quizzes and games”. (Hiba, Grade2, Interview1)

“after I finish my homework … my dad allow me to have iPad… sometimes I choose musical stories… I like them a lot"(Naveesha, Grade 1, Interview 1)

“… Whatever money we give him, he wants to buy books”. (Maneesh Mother, Parent Interview).

Children indicated that they enjoy using iPad. It was clear that they are willing to perform many other activities with iPad as well (i.e. watching YouTube, playing games and puzzles). Some of them exhibited interest in some topics where include many event happening inside the story. Moreover, some talked about their favourite reading books when it comes with questions for reader. It seems some of the children have desire on use iPad as reading medium.

5.2.1.2 Response

The positive and negative emotional responses were recognized through facial expressions or reactions towards the events. Positive responses revolved around the children excitement and amusement towards interaction with game-like features of the app and negative responses was about the exhibition of passive reading in a way that was skimming the text unwillingly upon boredom or frustration. There are some example of response theme as follow:

When Naveesha is dragging the stones using the finger in the page … she has smiled on her face. As she finished moving all stones, the narrator said 'well done! you build a stone house', … she gets excited and starts laughing and clapping for herself. (Naveesha, Grade 1, Fennec Fox, Individual Reading)

As Aina was reading the page, the narrator reads the text. The animation is activated and shows the plants and birds and girl character planting in a garden. She taps on the screen. Animations move differently. Children start talking about what happened on the page. They laugh together. (Female Group, Grade 2, What I Plant in My Garden, Shared Reading)

"I believe when he is going to be alone he prefers to read from tablet … because his brother is not around … they fight over the screen… and besides that when he is alone, he is amused by reading from apps that have video inside … so he does not feel lonely as well". (Farish Father, Parent Interview)

Hiba starts reading along with narrator… she mimics the rhythm of narrator and characters' voice (Hiba, Grade 2, Fennec Fox, Individual Reading)

Farish taps on the bottom of the page, a preview of all pages is displayed…he looks at the researcher with socked face and asks: 'do I need to read all of these pages today?! … it's too long' (Farish, Grade 1, Fishy Tales, Individual Reading)

Najwa is looking at the first page … and take no actions. The researcher asks her 'you can proceed and turn the page … this is page one! This book has more pages'. She is swiping the page and make a quick glance on each page. She swipes the pages without the intention of reading. (Najwa, Grade 1, Billy The Space Cat, Individual Reading)

Children were excited and showed enthusiasm as they received positive feedback from the app interface upon successful interaction and completion of challenges in the reading apps. Moreover, they were amused by the key events in the story and what was happening for the characters in animation representation. However, the result shows the negative feeling of the children as they become tired or felt boredom over reading a long story. Another sign of boredom is passive reading behavior, which is reading unwillingly and just scanning and browsing without the intention of reading.

5.3 Behavioural Engagement in E-reading

Behavioral engagement refers to children's involvement, effort, and persistence of on-screen reading for pleasure. Engagement constructs were grouped into three broad themes; a) effort, b) perceived benefits, c) self-efficacy, and d) scaffolding. Figure 5.2 shows the emergent themes for behavioral engagement.

5.3.1 Effort

Two engagement indicators, namely; (a) physical effort; and (b) mental effort were classified under the "effort" theme. These engagement indicators were identified both reading contexts.

5.3.1.1 Physical Effort

The focus of this engagement construct was on operating the iPad, scanning the page, manipulating the screen. The physical effort revolved around the multi-sensory skills (looking, enouncing, listening) and touch-based gestures (swiping, tapping, dragging) for interactive elements in a natural way to interact with a tangible object. It

associates with the iPad physically which resembles a book and carrying it in their hands as well as interactive features of the reading app which is enjoyable for children.

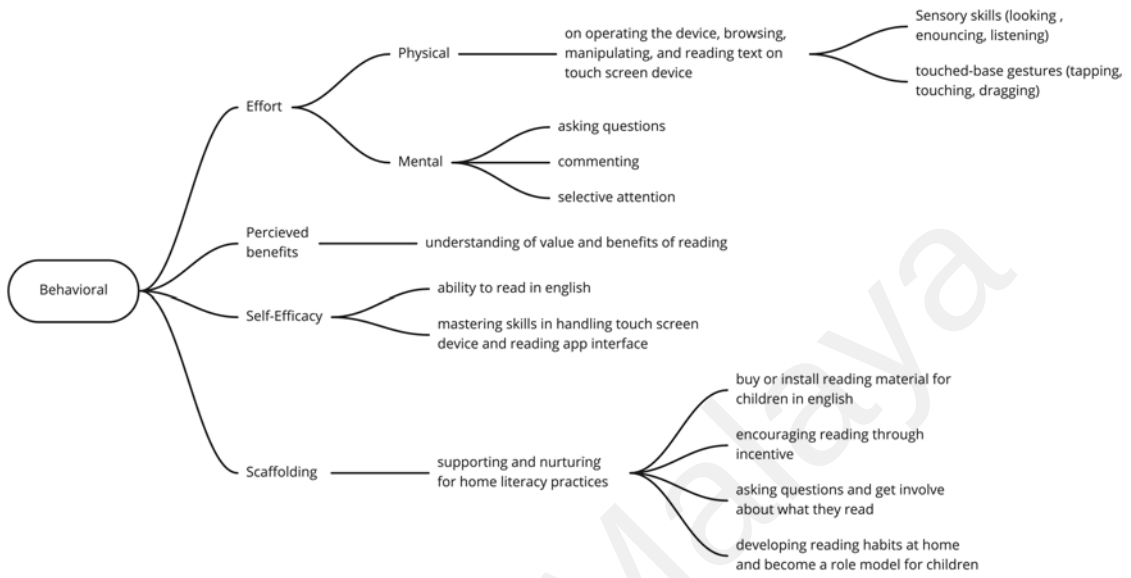


Figure 5.2: Themes Emerged from Behavioral Engagement

There is some example of physical effort theme as follows:

Maneesh touches the screen to swipe the page. A toolbar is displayed at the bottom of the page showing the preview of all pages. He taps on the screen and toolbar is disappeared. He keeps reading (Maneesh, Grade 2, Fishy Tales, Individual Reading)

Farish swipes the page. The new page is displayed. The narrator starts reading the text. Farish tries to tap/touches the highlighted text on the screen. (Farish, Grade1, Fishy Tales, Individual Reading)

The narrator starts reading the page. Farish pulls the screen closer to themselves. Farish and Irfan both are listening to the narrator and looking at the screen. After a few seconds, the animation is activated, and the characters are moving and jumping. Farish quickly taps on animation and try to drag them and also makes a sound like a bird. (Male Group, Grade 1, Shared Reading)

Children were able to figure out the embedded tools of reading apps that can help them to navigate the screen. Highlighted text helped them to keep track of the storyline and provided better concentration as integrating the spoken words and the highlighted word. In addition, they were able to identify the hotspots on the screen and take action to manipulate the screen and proceed to the next level of the story. Using finger to interact with game-like features of the reading apps is an intuitive act of handling a tangible object.

5.3.1.2 Mental Effort

Mental effort corresponds to an effort that required attention and concentration on reading activities including a) asking questions (to get more information about device, app, features, and tools of the reading app), b) commenting (utterance about the character, events, and activities of the reading material), and c) selective attention (preference for vision over audition or illustration over text in allocating attention or vice versa as well as entire focus on reading material; unaware of surrounding). There are some example of mental effort theme as follows:

i) Making comments

New Page is displayed. The illustration shows Jelly Fish under the sea. Maneesh said" Yaaakk…I do not like them…their body is too soft". (Maneesh, Grade2, Fishy Tales, Individual Reading)

"… Fennec Fox should build the house with bricks and wood …it will be stronger". (Hiba, Grade 2, How I Built my House, Individual Reading)

Children exhibited facial expression and exclamation according to the event they read. Sometimes they shared an evaluative comment about an event or sequence of events.

ii) Asking questions

The new page is displayed. It shows shark in the middle of the page. Farish asks: "is there a white shark in this book as well? … They are huge and scary" (Farish, Grade 1, Fishy Tales, Individual Reading)

"… what will happen if the girl goes to the jungle at night?". (Naveesha, Grade 1, Little Red Riding hood, Individual Reading)

Some of them asked questions about the topic in general as well as about some events in the story. Sometimes, they shared their feelings and thoughts about the events in the story.

iii) Selective attention

Sometimes his eyes are moving to the right side of the page where the narrator still is reading from the left side of the page; because He is following visual changes on the screen. (Irfan, Grade 1, Fishy Tales, Individual Reading)

The new page is displayed. The illustration shows the Billy Cat fell into the water. Background noise of falling into the water is heard. Irfan is not looking at text on top of the page. He is looking at the illustration in the middle of the page. After a few seconds, he starts reading the text. (Kyrie, Grade2, Billy Space Cat, Individual Reading)

Najwa was reading the new page. She taps on the left side of the which shows an illustration. The animation was activated. All participants were looking at the animation on the left side of the page for a while. (Female Group, Grade1, Shared Reading)

The new page is displayed. Nadia looks at the illustration on top of the page for a few seconds and then she looks at the passage on the bottom of the page and starts skimming the texts. (Nadia, Grade2, Billy Space Cat, Individual Reading)

'Maneesh loves reading if he is reading something and I want to call him, I need to call him so many times … because he is so much into the reading and cannot hear me'.(Maneesh Mother, Parent Interview)

'if Naveesha is reading her favorite the topic, she is completely lost in reading … last time I was doing grocery shopping with her, and she was reading the whole time and did not get distracted …. Until I finished and told her that I am done with shopping'.(Naveesh Mother, Parent Interview)

Children were able to connect to the story event and character using their prior knowledge about the topics. The willingness to have undisruptive reading time indicates the reader's intention to have the concentration on reading. Asking questions, commenting, and labeling references about the context of the reading material show the children's involvement in on-screen reading and topic of interest. Focusing and concentrating on visual representation sustain children's attention to the key events and characters. Integrating the visual and verbal is a way to understand the story flow and grasp the main idea of the passage.

5.3.2 Perceived Benefits

Perceived benefits refer to participants' understanding of the value and benefits of informal reading, particularly in English. It revolved around children's perceived attainments of reading for pleasure from apps in the iPad. This engagement indicator was captured during children's interview sessions. There are some example of perceived benefits theme as follows:

"reading is good … we learn and discover things… if I learn more … I can be good at everything". (Irfan, Grade1, Interview2)

"reading storybook is good ... it makes me smart" (Kyrie, Grade2, Interview2)

"... I can learn new words and spelling and writings." (Farish, Grade 1, Interview2)

“it is good ... because we can learn ... about good manner” (Aina, Grade1, Interview2)

"my grandma wants me to learn more languages; then my English get better… she [grandma] knows another language… she speaks French as well" (Hiba, Grade2, Interview2)

These statements mostly show children's willingness to read more and to know more through informal reading. English as a second important language in Malaysia requires parents to promote language learning at very young age. Therefore, spending extra time on reading in English for pleasure is encouraged for most of the families. In addition, since children look up to their parents, children want to follow them and repeat, as they believe it would be best for them. Moreover, because of the novelty of digital reading devices (tablets) they get more excited to read from such medium.

5.3.3 Self-efficacy

Self-efficacy is a motivational factor in reading. Children engage better in a reading activity if they can do it properly and able to manage that. Therefore, the self-efficacy here revolves around the ability to read in English as well as mastering the skills on using handheld touch-based devices for on-screen reading. Self-efficacy was identifiable through their reporting on the time they spend on reading in English in their leisure time alone or installing apps and operating the tablet on their own with no help, as well as reading the text correctly even faster than narrator and finish the story. Some instances of children’s self-efficacy are as follows:

i) Reading in English

"I like to read in English … it is easier to read in English". (Aina, Grade 2, Interview

Maneesh was asked about what he is doing in his free time. He stated that “… after I have done my homework, I use iPad … to read stories … right now I am reading Wood Cutter who is losing his hammer in the river… it is fun “(Maneesh, Grade2, Interview1)

Children identify their interest in reading in English. They stated that they are allowed to read story books from tablet after they finished school works. Some of them choose to read for pleasure in their free time.

ii) Reading alone (no assistance)

"I would like to read 'Sofia a princess' … it is fun… I read the whole story by myself". (Eisha, Grade 1, Interview 2)

The narrator starts reading the words on illustration. He started reading aloud words on illustration faster than the narrator or before the narrator reads them. (Hiba, Grade2, Fishy Tales, Individual Reading)

Some children indicated they prefer to read alone. They consider joint reading a distraction when they are curious to know what happened in the story.

iii) Operating the tablet

"I install apps myself all the time, I go to play store, and I type and search then I select. But, sometimes my parents will check what I downloaded". (Farish, Grade 1, Interview 2)

Most of the children preferred to read in English. In "Read to Me" mode, most the children read along with the narrator or repeat after that if it was a single word or phrase pronunciation. They reported that they could operate a tablet on their own at home in order to search and install new apps. Some stated that they have some of the topics of interest to read in their leisure time. Similarly, some of them are more interested in reading the favorite story which for example was advertised in a movie.

5.3.4 Scaffolding

The scaffolding described through the parents' role in providing a nurturing environment for children in order to practice literacy at home. Parents encourage and support reading activities at home either online or print, particularly in English. There are some example of scaffolding theme as follow:

i) Providing reading material and digital reading device

“Hiba likes reading more than watching TV… I buy books for my kids ... different books … I also love reading … I set myself to finish one book each month …. recently I bought Hiba Encyclopaedia about space and human evolution…because she loves that topic".(Hiba Mother, Parent Interview) - book purchase

“I buy them more books than toys … educational, storybooks, activity books”. (Nadia Mother, Parent Interview) – book purchase

"they are allowed to use tablets only at the weekend… the tablet is good and convenient to use… if you have control over the usage when it comes to games, it will become an addiction, but if it is for reading you can gain more knowledge" (Maneesh Mother, Parent Interview)

"I think she becomes a better reader in English since we have sent her to drama class … and we buy books every month for them … yeah, she has good focus when she is reading. (Eisha Mother, Parent Interview)

"He selects and downloads apps himself, but first he needs to show me what he is getting … I check to see if appropriate" (Farish Father, Parent Interview).

Parents highlighted how they encourage children to read at home in their free time. Some parents had to do it because they noticed great interest in reading and e-reading from their child.

ii) Encouraging reading practices

“I prefer Kindle for them … because tablet screen is not good for eyes” (Farish Father, Parent Interview) – preference medium

“Hiba is a good reader because she loves reading and she uses to collect book series, for example, she has all books from harry potter collection … oh, then every time she finishes a book I ask her to write down a summary of that book.” (Hiba Mother, Parent Interview) - summary

"when she was younger we used to read storybook together … now she knows how to read, and she reads alone…. But I ask her to tell mama what you have read and what was the story about".(Naveesha Mother, Parent Interview) - summary

All of the parents in this interview stated that they prefer to read in English in their free time. They mentioned about the variety of topics they can find in English rather than Malay language and they felt comfortable and easier to understand in English. They preferred to buy reading materials for their children in English as well. Some of them preferred reading from a paper book because they can go through the pages and they like the fact of having a bookshelf at home (Hiba's Mother). On the other hand, Irfan's mother mentioned about having quick access to the internet and reading about things she needs to know from more resources that's why she prefers to read online. Most of the parents indicated that they buy books for their children regularly and monitor their reading activities through the parent-child discussion over the topics or asking them to write down the summary; as they develop habits of reading on their household. All of the parents stated they intentionally motivate their kids by visiting bookstores and allocating money to buy books for children.

All of the parents reported that they have some restriction over tablet usage and give permission only for weekends for specific hours. Most of the parent did not encourage reading from the tablets, and the main reason was the screen effect on children's eye sights. However, Maneesh' mother pointed out the importance of gaining a variety of knowledge using online reading material through iPad, as long as it does not become an addiction to the screen. She provided some example of Maneesh wanted to learn and understand 'Fraction' in math topic: 'he went and watched YouTube understand better about the fraction, and the came back and even though me how to do it… the same thing is happening for cooking … he goes and read and tell me what he found'. It was obvious that Maneesh has such a passion for reading to learn. He reads not only in his

free time for pleasure like storybooks, but also, he seeks for information and knowledge and would like to share with others. That is when he gets most of the enjoyment of his informal reading. In addition, all of the parents indicated that their children use the iPad as a source of amusement. For example, watching YouTube, Music and Dancing application, and playing games. In addition, all of them mentioned that their children are free to choose what they want to install from the app store, but they need to review and approve it first. It shows that parent will fully monitor children's tablet use.

5.4 Cognitive Engagement in E-reading

This section describes the cognitive process of children, particularly what they recalled or understood when they took part in reading for pleasure activities using the iPad. The list of reading apps used for this study is shown in Table 3.3 in chapter 3. To understand children's cognitive process, they were asked to answer several comprehension questions end of each reading session. The focus, here, is to explore children's comprehension in the multimedia environment; a combination of text and interactive and non-interactive visual elements. Reading comprehension questions included literal, inferential, and evaluative questions. This section highlights emergent themes that correspond to how children retrieve information stored before (recall). Figure 5.3 describes the emergent themes for children's cognitive strategies. In this section, children's e-reading cognitive process to recall or retell the reading content from each reading apps are elaborated furthermore. The list of reading apps with their content is available in Appendix L for each reading apps, and the detailed list of comprehension questions and children's answers are available in Appendix M. Children were able to draw a conclusion and infer from the story by relating the key events. For example, Irfan explained that the second house in the story was stronger because it was made out of wood; this comparison was not stated in the text (Irfan, Observation Session 2: The 3 Little Pigs). Also, Eisha mentioned she thought the 'ill' means 'old'.

She assumed about the word because in the story it was related to the grandma. She did not know the meaning directly and connected it to the rest of the information she received (Eisha, Observation Session 2: Little Red Riding Hood).

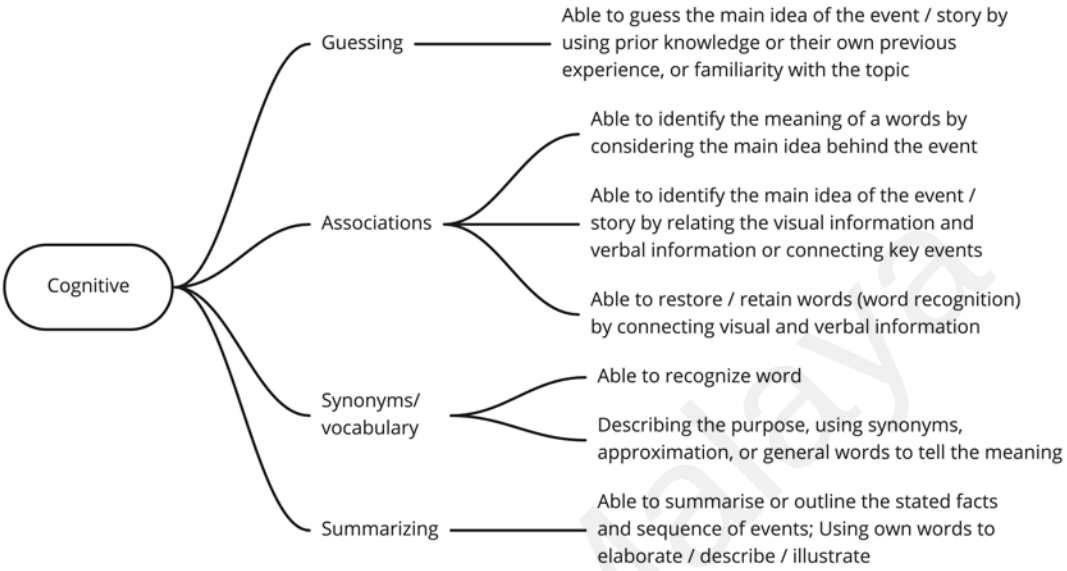


Figure 5.3: Themes Emerged from Cognitive Strategies

Surprisingly, only Maneesh was able to identify that story was incomplete; some free versions apps are covered partially (Field Notes, Observation Session 5: How I Built my House). It may show that Maneesh was fully engaged to the story as he was able to recognize the line of events and end of story. However, some children were confused remembering that part. They thought they had forgotten the last part of the story or they had skipped some pages. However, their previous knowledge also could lead some children to provide the wrong answer. For example, Hiba provided the wrong answer for the question about the Hummingbird's house. Her answer was correct but was different from the text (Hiba, Observation Session 8: Tiny World).

5.4.1 Associations

The visual and verbal information helped them to use new words to remember key events or characteristics of elements inside the story. For example, Hiba used the term

‘golden straw' to explain the material was used to build the house by one of the characters. The term ‘golden straw' was not in the text; she relied on the visual information to use that term (Hiba, Observation Session 2: The 3 Little Pigs). Some of the children recalled the story based on the illustration only. For example, for ‘Billy The Space Cat’ story, some of the children mentioned that *‘Billy flew with the balloon and got stuck over the tree’* which was not indicated in the text. All of these events were illustrated only.

Moreover, they used their own words or terms, like Hiba mentioned that Billy flew by a ‘*toy airplane’*, or Farish said by ‘*mini airplane’*, these terms were not in the text and influenced by the illustration of airplane and their understanding of visual information (Farish, Observation Session 3: Billy The Space Cat). There were cases when children could not recall the whole story from the text (stated facts), but used visual information to retell some illustrated events. They used their own words to retell (Field Notes, Observation Session 7: What I plant in My Garden?).

However, there were cases when children were confused and processed visual information inaccurately. For example, for ‘Tiny World’ apps, the picture of a cat at the bottom of the last page made children confused about the stated fact about the greatest jumper in the world which is flea; all answered cat. Similarly, another example of the wrong association between visual and verbal information is when Farish answered mistakenly about the hummingbird food. The picture shows that a bird is eating from the flower; he responded ‘honey' as an answer to the bird's food. Their poor answer to comprehension questions may correspond to disturbed reading behavior. In Shared setting, children had been distracted by interaction among each other and their playfulness behaviors (Field Notes, Observation Session 7: Tiny World).

5.4.2 Synonyms (Vocabulary)

Familiarizing or providing synonyms refers to recognizing the words and their meaning, to be able to elaborate the meaning. For example, Naveesha provided synonyms by elaborating the meaning of the term ‘ill’ by indicating ‘oh yeah … I’m sick, I got flu ... I stayed at home yesterday”. She was able to provide synonym by making connection with the concepts and stated facts (Naveesha, Observation Session 2: Little Red Riding Hood). Moreover, children would provide answers in synonyms based on the functionality of the objects, like the body part of the animal; used ‘hand' instead of ‘fin' (Field Notes, Observation Session 4: Fishy Tales). It was evident that children forget unfamiliar/new words or are not able to retain them when they do not know the meaning of the words. Most of the children, except Hiba, failed to mention the word ‘fertilize’ in the ‘Billy The Space Cat’ story. In the text, it was explicitly indicated that ‘grandpa bought the airplane to fertilize the farm’. Only Hiba was able to recall the word ‘fertilize’ and used it when she was asked ‘why did grandpa buy the airplane?' (Field Notes, Observation Sessions 3, 4: ‘Billy The Space Cat’ and ‘Fishy Tales’).

Besides, it was seen that some children could not recall the started fact in English, they were able to answer it in Malay; for example, Aina could not remember the word "hood" or cap" she mentioned the word in Malay and also pointed to the screen to show it. She understood the question but could not say it in English (Aina, Observation Session 2: Little Red Riding Hood). Same happened to Najwa, and she answered in Malay if she could not remember. However, when Farish was not able to remember the word ‘cap’, he pointed to the animation on the screen where the cap was displayed (Farish, Observation Session 2: Little Red Riding Hood).

5.4.3 Summarizing

Summarizing refers to outlining the story and retelling the sequence of events correctly. In some cases, children retold the events in summary in their own words.

However, some of the children confused some stated facts and sequence of the events. For example, in 'The 3 Little Pigs' apps, the story is developing by describing how each character had built their house. Some children could not remember which character or which materials were used for the house (Field Notes, Observation Session 2: The 3 Little Pigs).

Nonetheless, it was evident that when the questions were about the events with a smaller number of incidents or facts, most of the children were able to recall the main key events. Most of them were able to outline the events and recall the main sequence of events as well. In contrast, when the events target more facts, most of the children were able to recall the main key event but failed to retell the sequence of events correctly (Field Notes, Observation Session 3: Billy The Space Cat). However, Hiba was able to retell the stories using her own words. She recalled most of the details and sequence of events (Hiba, Observation Session 6: The Jungle Book). In similar instances, Naveesha retold the story by repeating some of the key events (Naveesha, Observation Session 6: The Jungle Book).

Moreover, when the story was too long, some of the children were reluctant to retell or describe the chain of events. It required the researcher to ask more detailed questions to see what they recall from the events. For example, Najwa and Aina were not willing to retell the story, as they would answer only if the researcher were asking them through multiple detailed questions about the events (Field Notes, Observation Session 3: Billy The Space Cat). They preferred to retell in sum and provide short answers. It might show, probably, they forget longer and nested events. In addition, children might provide a short answer when they were asked to retell about the particular events. They usually would respond in short, like a word or phrase; not able to summarize the events, or retell in the sequence of multiple events (Najwa, Aina; Observation Session 3: 'Billy The Space Cat' and Kyrie, Observation Session 5: 'How I built My House').

5.5 Summary

This chapter reported findings from individual and shared reading sessions to address the following research questions: what drives children emotional engagement in e-reading exercise when using touch screen device? What drives children behavioral engagement in e-reading exercise when using touch screen device? How do children demonstrate their understanding of the e-reading exercise when using touch screen device?. The emergent themes are indicators of emotional, behavioral and cognitive engagement from individual and shared reading sessions as well as interviews. The next chapter will discuss about the results of the study.

CHAPTER 6:DISCUSSION AND CONCLUSION

6.1 Overview

This study examined bilingual children e-reading practices and engagement for pleasure using a touch screen device like an iPad. Today, reading, reading instruction, and more broadly conceived notions of literacy and literacy instruction has changed in a way that new technologies require new literacies to exploit their potentials effectively. Technology can facilitate engagement in ways which are difficult to achieve otherwise. Many of the influential studies on children's literacy development experiences were focused almost entirely on print literacy or print versus digital, and not much is known about e-reading engagement and behaviors when children are reading for pleasure using touch screen devices. The role of reading for pleasure is important, drawing on the growing body of research around literacy benefits, cognitive benefits, and social benefits (Merga, 2015). This study attempted to add to the body of knowledge by examining bilingual children e-reading exercises in technoliteracy area, as the literacy development is not the focus of this study. Moreover, comparing ebook reading with print book reading is not the purpose of this study, here, the investigation focuses on children's experience and engagement with e-reading apps including storybooks and educational reading apps in iPad.

The discussion on the findings begins with presenting children's e-reading practices and experiences when reading for pleasure. A discussion on e-reading engagement components follows this through engagement theory of reading development by (Guthrie and Wigfield, 2000) as well as self-determination theory by (Ryan and Deci, 2000) within reading for pleasure context and how these components shape the e-reading experience for bilingual children reading in English. This section is then concluded with a summary of the conceptions, integration, and e-reading experience using a touch screen device like iPad.

6.2 Addressing the Research Objective

Every possible effort was taken and directed towards answering the following research objective understanding children's e-reading practices and engagement when reading for pleasure. See Figure 3.1 for relationship between adopted theories and research objective and research questions.

6.2.1 Children's E-reading Practices When Reading for Pleasure

Children e-reading practices were examined through reading storybooks, and educational apps for pleasure both in individual and shared reading settings. This section develops the active and passive reading behaviors.

6.2.1.1 Individual Reading Setting

In the individual setting, children exhibited the following main e-reading behaviors: reading aloud or skimming. They would read aloud own self or read along with narrators. It may provide an opportunity to practice pronunciation properly in English, and also help them memorizing vocabulary better as they enounce it. The ability to read aloud corresponds to children's knowledge of words in the oral domain (Nation & Cocksey, 2009). It echoes the finding from a study by Wilson, Dickinson, and Rowe (2013) identifying the impact of early reading activates targeting the language learning on children who are bi- or multilingual. Their findings show that reading aloud of mainly supports children's vocabulary learning and help them to build phonological awareness and letter knowledge. Nonetheless, children in this study preferred to read in silent more than reading aloud. In addition, in case of reading from relatively long stories, those children who chose to read aloud had switched into skimming after a while. It may correspond to preferred reading habits in the second language. In regards to home reading practices of bilingual families, a study by Klein, Biedinger, and Becker (2014) reported that families with native parents tend to read aloud daily to their children, and it is less likely for non-native parents to attempt to read aloud for their

children. It is believed that children who read in the second language also might less likely read aloud in their reading for pleasure. This finding associates with the *Perceptual Processing* (O'Malley & Besner, 2012) which explains the reader's preference for reading aloud or in silence.

Furthermore, a study by Merga (2015) reported the positive impact of teacher reading aloud for the student at primary school. It was indicated that participants were encouraged more to read for pleasure at home when the teacher had exercised reading aloud for them at the school.

It is believed that the spoken words (narrators or voice of character) in reading apps also foster reading for pleasure which highlights the case of listening and skimming reading modes. The skimming rendering intent for reading and can be identified in two modes of readings: a) Rauding which is reading in silent when reader browse the words and/or listen to spoken words to be able to comprehend or retain spoken words, b) Scanning which reading in silent in a way to just quickly browse the verbal information and the visual information and merely listening to the spoken words, if any.

It is believed that in individual reading children enjoyed skimming the reading apps content. The skimming activities as an act of browsing produce valuable serendipitous discoveries (Beheshti, 2012). Browsing is considered a visual activity and support learning and investigating. However, Mangen (2016) stated that screen-reading tends to be superficial and skimming rather than deep. From a developmental perspective, deep reading is described as a slow and immersive process. Therefore, a quick act of browsing or scanning as opposed to the concept of reading engagement. Besides, a study by Liang and Huang (2014) distinguished on-reading and off-reading behaviors. The former includes rauding (silent reading), skimming (keyword spotting) and scanning (reading selectively); and latter includes flipping (flip the pages – glance and glimpse). They defined reading the pattern of e-book readers as a) fluctuant readers

(read at high speed where skimming or scanning status), and b) coherent readers (read at a steady reading rate with rauding status).

On the other hand, some children exhibited passive reading behaviors such as (give up, withdrawal, inattentive, unprepared, distracted) when they encountered difficulty to navigate the app, lack of interaction with the screen, browsing the page without reading the text and flipping the pages to reach the end, become easily distracted, and failed to grasp the flow of the story entirely. Nonetheless, some showed poor attention to the text or spoken words compared to the animations. They showed low preferences for verbal information. On the other hand, some children exhibited boredom and unwillingness to continue reading or listening. The study by Chaudron (2015) echoes these findings and highlights the fact that children are a digital native but to some extent. They can acquire basic operational skills, yet they also encounter difficulties that cannot manage and have to ask help. The Chaudron's study concludes that reading and writing skills influence the quality of children's digital interactions.

6.2.1.2 Shared Setting

In a shared setting, children exhibited amusement of sharing reading sessions through peer interaction and playfulness when interacting and manipulating the screen which is in line with the study by Kucirkova et al. (2015) indicated the importance of meaningful interaction in shared reading experience when the intention is reading for pleasure. The study recognizes the reading for pleasure as a social practice, in a way that the pleasure from involving in a narrative increase through the possibility of sharing this experience with others. It prompts conversation, interaction among peers, and create bonds between readers.

However, in shared setting one group showed boredom and frustration during reading activities. It is important to mention that peers in this group were selected from a different classroom and they were not friends as well. Children in this group were not

willing to share the screen, showed a low preference for reading selected apps. The observation data show that number of children had more focus and attention in individual reading setting compared with the shared setting. Except one group, most of children exhibited enjoyment by laughing or smiling, asking questions, or making comments, and peer interaction. These behaviors can be an indicator of amusement when get involved in a shared reading activity for pleasure. In addition, some of these behaviors followed by screen manipulation of interactive elements, navigation features, and language feature on the screen.

6.2.2 Children's Engagement in E-reading When Reading for Pleasure

The nine engagement components were developed from children participating in this study. The themes and components are presented in table 6.1. The components were thoroughly developed and refined by combining the children's on-screen readings and their direct understanding of e-reading experience for pleasure. The findings are then compared against Moody, Justice, and Cabell (2010) and Roskos, Burstein, and You (2012) works to look for similarities and differences of the idea presented as these models specifically focus on on-screen engagement.

This study generated emotional, behavioral, and cognitive engagement constructs which are classified into nine broad themes. The nine themes are: 1) affective; 2) effort; 3) perceived benefits, 4) self-efficacy, and 5) scaffolding, 6) guessing, 7) association, 8) synonym, 9) summarizing.

6.2.2.1 Emotional Engagement

Generally, two prominent contexts for reading are school reading and reading for enjoyment. The focus of this study is reading for pleasure. The reading for pleasure can draw upon having opportunities for enjoyment. For example, children tend to enjoy applying sensory skills and touched-based gestures to operate the device or get lost in their favorite topic to read. Indeed, it relates to recognize the capacity of their skills and

to master the external environment as an individual experience the real world. Emotional components are elaborated as follow:

Table 6.1: Component of E-Reading Engagement

Engagement Component	Themes	Components
Emotional	1) Affective	Receive • Focuses on attentiveness and take an interest
		Response • Refers to motivation to proceed, perform, and contribute
Behavioral	2) Effort	Physical • Revolves around the sensory-motor skills and gesture-based skills
		Mental • Revolves around commenting or labeling references, asking questions, and selective attention.
	3) Perceived benefits	• Understanding of the value and benefits of informal reading
	4) Self-efficacy	• The ability to read in English, read alone without assistant and mastering iPad interaction
	5) Scaffolding	• Parents/guardian support and encouragement of literacy practices in children's leisure times, and providing reading materials
Cognitive	6) Guessing	• Able to guess the main idea of the event/story by using prior knowledge or their own previous experience, or familiarity with the topic
	7) Association	• Able to identify the meaning of words by considering the main idea behind the event • Able to identify the main idea of the event/story by relating the visual information and verbal information or connecting key events • Able to restore/retain words (word recognition) by connecting visual and verbal information
	8) Synonym	• Able to recognize a word • Describing the purpose, using synonyms, approximation, or general words to tell the meaning
	9) Summarizing	• Able to summarise or outline the stated facts and sequence of events; Using own words to elaborate /describe/illustrate

a) Affective

Affective component corresponds to feelings, interest, enthusiasm, and attitudes. The receive theme relates to attentiveness and take an interest, and selected attention. The response theme indicates motivation to proceed, perform, and satisfaction. According to flow theory by Csikszentmihalyi (1990), the enjoyable activities are those that require concentration and attention. Enjoyment and preferences are used as an indication of satisfaction. When the on-screen activity is enjoyable to use then, this becomes an extrinsic motivation to do the activity again. The affective aspect of reading e-book develops children's confidence and interest to read in English (Lin, 2010). The on-screen reading experience creates a joyous atmosphere while interactive multimedia elements in reading apps, background noises, animations, and characters offer technical aid and help to sustain children attention. Reading app features, such as play/pause/ replay, and forward/backward buttons in either "read it myself" or "read it to me" modes, stimulate the orientation toward reading and facilitate the enthusiasm for reading.

Similarly, participants' response upon on their concentration comes from the relationship between text and oral reading through highlighted, or bold words as the narrator read them which lead to better vocabulary acquisition in "read it to me" mode. Children demonstrated eagerness and excitement during the reading sessions through their smiles and laughs, navigating the app interface, and requesting more time to explore and commenting about the app, as well as asking about the date of next/incoming reading sessions.

Children's on-screen reading interest is associated with both individual interest (a sustained preference for specific content and activities) and situational interest (appeal of a particular set of stimuli, short-lived, episodic). Using the iPad as a reading device

and its popularity and novelty may increase children individual interest to take part or proceed in reading sessions. We know the number of released apps for children in both education and entertainment (edutainment) has increased in numbers, and most of them are in a constant phase of upgrading and enhancement, as developers try to compete with the market trend. On the other hand, children's situational interest may shape based on the popularity of particular app for a while, mostly those that are released based on TV programs or movies/animation, for example, “frozen” was very popular by the time of this study. Nonetheless, the affective themes can be influenced and shaped by the novelty of iPad and digital content, which contribute towards the children’s willingness to take part at reading sessions for pleasure and interact with reading apps content and interface. However, it is important to mention the children’s playfulness, excitement and freedom of using iPad and skipping from the daily classes were influenced children’s willingness to take part in all reading sessions. They considered it as an extra leisure time at the school.

6.2.2.2 Behavioral Engagement

Behavioral components are elaborated as follow:

a) Effort

The physical efforts, such as using the finger as a direct input for on-screen reading interaction, lead to a pleasant experience for children in using digital devices, as they may get frustrated to hold and control keyboard or mouse otherwise. It was evident that participants were more active and respond better when using the finger for those game-like features of reading apps. Physical strains like difficulty to operate the device may decrease the satisfaction of the reading experience. The mental efforts component associates with skills involved reading in literacy and ability to translate text into animation or illustration and audios (background noises and narration), to highlight the

context and relate to prior knowledge, and moreover, to anticipate the flow of the story through exploring, asking for help, needing coaching, or observing.

Participants cognitively drag information from visual elements onto verbal and vice versa. Animations, images, illustrations in reading apps are concise and highlight relevant information. However, interface features may be distracting as require more memory allocation which can be led to shallower understanding. It is believed that mental engagement with problems and artifacts construct the knowledge (Wells, 2002). As children expose more to on-screen reading, mastering the on-screen interaction requires less mental effort. Engaged readers willingly spent physical and mental effort to explore and interact with reading apps features.

b) Perceived Benefits

The perceived benefits theme corresponds to individuals identify with or find personally important the reasons for performing an activity. It is recognized as an extrinsic motivation and had facilitated children engagement with reading apps. As participants perceived personal significant of reading, they identified it as valuable such as being smart or to know, learning new language/vocabulary (English), and gaining formal/informal knowledge. It was evident that children's identified regulation was influenced by verbal information they receive from parents or guardians highlighting the importance of reading and learning English. Thus, not only the reading from the iPad itself was enjoyable, but also valuable and supported.

However, in this study, children had psychological freedom when reading for pleasure which corresponds with autonomous motivation. The control over outcome was not concerned, and the participants exhibited their willingness to repeat reading sessions or continue in next sessions. It is explained by the self-determination concept where it recognizes the willingness and autonomy in engaging behaviors. According to Grolnick, Gurland, Jacob, and Decourcey (2002) and Vansteenkiste, Simons, Lens,

Soenens, and Matos (2005), when the individual identifies with the personal importance of the activity, he/she is more likely to engage in the activity with a sense of volition and willingness. It is in contrast with controlled motivation which involves pressure and behaving in particular ways. As, Lai (2011) indicated that children with better self-regulation of emotion experience more positive social relationships in learning settings, which in turn increases their level of engagement. It may also relate to their perception of being engaged in an activity because they have been told to do so. On the other hand, Poulsen, Rodger, and Ziviani (2006) stated that according to play theorists, children intrinsically become motivated because of the self-initiated and self-directed aspect of free play and also because they choose their own goals be they leisure. Consequently, identified regulation and intrinsic motivation are often combined and correlated positively, as they both are an autonomous form of motivation (Guay, Ratelle, & Chanal, 2008).

c) Self-efficacy

The self-efficacy corresponds to the ability of participants to read in a foreign language (English) as well as mastering the interaction with handheld devices (iPad). Self-efficacy indicators were recognized through children's device operation, perceived ability to search and install new apps with confidence and navigating the page to follow the storylines, as well their ability to read in English or select their favorite topics in English. That is promoting self-confidence and having control over e-reading from reading apps. It can be seen through participants commitment to take part in all reading sessions and choose to be part of it as well. Children seemed comfortable doing that and indicated that they used to do it as part of their home activity at their leisure time. The iPad itself as a popular device was appealing for the participants to interact with that even in school time. Having said that, such extrinsic motivator had a positive influence on participants perceived self-efficacy as well. This finding is in line with the study by

Ciampa (2013) exploring grade 1 students' self-efficacy by taking to account their perceived ability to do good on ebook reading and recalling what they had read in storybooks.

Similarly, the study by De Naeghel et al. (2012) focused on developing and validating motivational factors on recreational reading and academic reading. They defined self-efficacy as a belief that one can be successful at reading. This indicator was highlighted on recreational reading when readers chose to read in free time and emphasized the importance of reading besides reading academic material. The study considered all the concepts under the motivation theory of self-determination.

d) Scaffolding

The scaffolding corresponds to guide, support, and encourage the habit of reading for children through informal literacy practices at home during their free time. Tablets with a variety of literacy-related applications with rich multimedia elements appear to be a viable tool to provide play-and-learn literacy resources for children. Parents utilize filter features on many app stores to select and install appropriate apps from an extensive list of reading material. Although, reading apps offer many features that can support assisted reading by combining oral narration, animation, and text for those who are in early stage of reading or need to learn new language (reading to learn, learning to read), children still need to receive support and encouragement from a peer to develop reading habits.

The importance of learning English for Malaysian plays a significant role for many families in the early stage of reading to learn and learning to read to assist children to develop literacy skills outside of the school. Moreover, for Asian families, the habit of reading is valuable and is recognized as acceptable behavior. For many participants, it was evident that the reading for pleasure was shaped through their independent exploration of different types of reading apps using touch screen tablets or laptops as

well as parents or guardians' affective scaffolding at home. The positive encouragement and feedbacks from them contributed to children's willingness to choose reading as leisure time activity. Those participants who received more support and encouragement from parents exhibited a greater sense of comfort reading different apps during reading sessions.

Theory of zone of proximal development by Vygotsky (1978) explains that children's learning and capabilities are extended through assistance. Participants' home reading practices through the guidance from parents provided the zone of proximal development in terms of reading to learn or learning to read in leisure reading context using touch-screen devices or laptops. In some families, it was started from early childhood through parent-child-interactions by reading books, playing storybooks on CDs, or on-screen readings using tablets, and the regular visit of children library in Kuala Lumpur or book stores. Parents had provided participants help to operate and use touch screen tablets. That explicit guidance enhances children home literacy practices and child engagement with reading materials on touch screen tablets. However, parents have concerns about too much screen time using tablets could cause eye problem for children. Many of them set a limited screen time at the weekend for a few hours only and preferred to use the print version of the books as an alternative.

Abovementioned facts about the scaffolding are consistent with findings from Tseng, Liu, and Liu (2012) work indicated that for better reading engagement children need adults' scaffold to participate in the reading and sharing activity specifically in the early stage of reading. Similarly, the study of Peralta, Salsa, Maita, and Mareovich (2013) pointed out that children enjoy moments of being with others and involving in shared setting activities such as play and learn together, referring to the theory of flow in which highlights the concept of social interactions help children to learn more, as aid thinking. Moreover, Neumann and Neumann (2013) proposed a framework for emergent literacy

development through the use of touch screen tablets. The model describes the initial stage where children exposed to digital interfaces and recognize visual and verbal features, and then they develop literacy skills through a) parent-teacher scaffolding, and b) socio-cultural interactions, which lead to conventional reading.

Figure 6.1 shows the connection between selected theories and emergent themes for emotional and behavioral engagement.

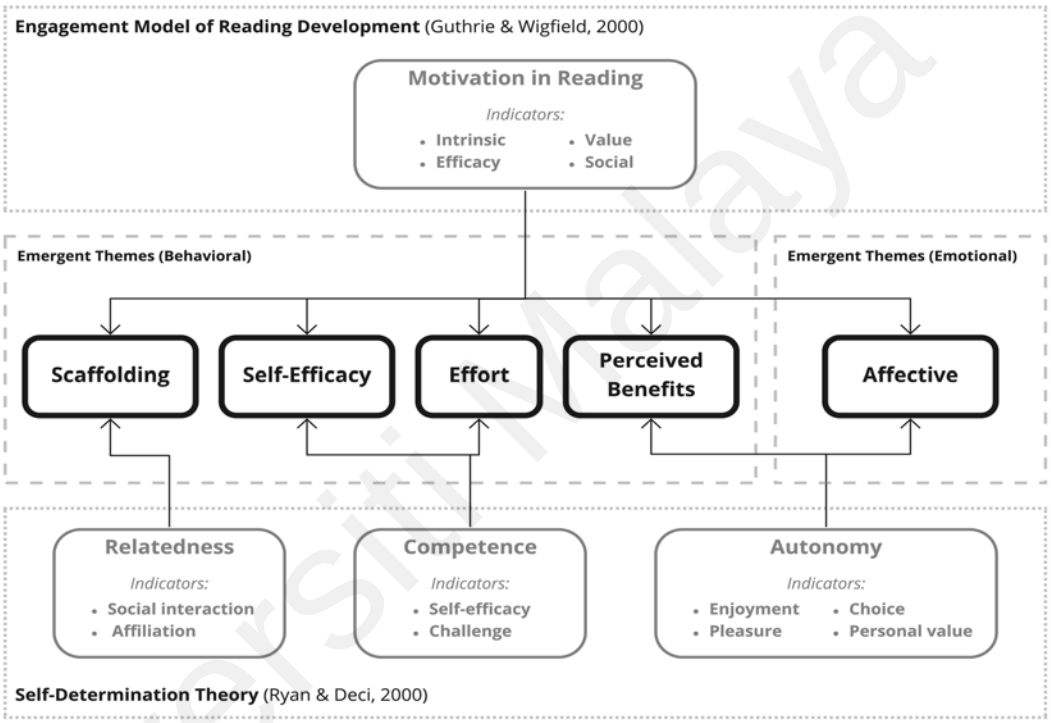


Figure 6.1: Connection between Theories and Emergent Themes for Emotional and Behavioral Engagement

Examination on other studies reveals some similar results although the dimensions of concepts tend to vary in sophistication and details. There are also differences in settings and the goal of reading activities that are unique to specific studies , suggesting impact of socio-economic-status, children's impairment, and the context of study as shaping the concepts, (Chiarenza, Olgiati, Trevisan, Marchi, & Casarotto, 2013; Chiong et al., 2012b; Korat & Shamir, 2007; Matis, 2013; Smeets, Dijken, & Bus, 2012; Stephen, Stevenson, & Adey, 2013; Tzovaras, 2008). Findings from Moody, Justice, and Cabell (2010) study are comparable to those in the present study. Four of their themes, namely

persistence, enthusiasm, compliance, and labeling conceptions are found to be closely related to the result of this study. These constructs revolve around the children attention, motivation, utterance, and take interest to proceed with the reading activities, as in child-led or adult-led reading sessions. The findings also highlight the role of adults as a mediation with interactive e-storybook which provide great support to children. Some similarities in the findings by Roskos et al. (2012) examined the children's reading e-books at the classroom. They identified children's reading behaviors through observation of ebook reading sessions. According to associated behaviors they defined engagement indicators such as control with corresponding to psychological investment and effort towards learning which has been linked to future school achievements. Two other indicators are multisensory behaviors (touching, gesturing) and communication (facial expression and making noises) during reading e-books. Their findings on engagement behaviors were in line with the traditional storybook reading. However, they stated that children's behavioral regulation was a potential governor of children's engagement with e-books. A comparison of findings from Moody, Justice, and Cabell (2010) and Roskos et al. (2012), and the present study is summarized and displayed as Table 6.2. The table highlights the emergent themes and their indicators in this study (study 1) and compare it with themes from other two studies (study 2 and study 3).

Table 6.2: Comparisons of E-Reading Engagement Components

Emergent Themes	**Present study: Study 1 (2018)**	**Moody, Justice, & Cabell: Study 2 (2010)**	**Roskos, Burstein, & You: Study 3 (2012)**
Theme: Effort In all studies (1,2, 3)	**Indicators:** **Mental and Physical Effort** Feelings, interest, enthusiasm, and attitudes.	**Indicators:** **Compliance** when the child provides timely responses, stays seated, follows directions.	**Indicators:** **Control** Power to take meaningful action and see the results of decisions and choices

(Table 6.2, continued)

Emergent Themes	**Present study: Study 1 (2018)**	**Moody, Justice, & Cabell: Study 2 (2010)**	**Roskos, Burstein, & You: Study 3 (2012)**
		Labeling active conversational participation from the child in the traditional storybook reading condition	**Multisensory Behavior** Using visual, auditory, and haptic-kinesthetic senses **Communication** Using verbal and non-verbal behaviors to respond to language and express comprehension
Theme: Enthusiasm In Study 1 and 2	**Indicators:** **Receive and Response** Attention, interest, enjoyment, concentration, and performance.	**Indicators:** **Enthusiasm** Focuses on motivation and excitement. when the child smiles/laughs, turns pages, positively comments about the book, and shows excitement **Persistence** child's ability to complete and maintain participation in the book	**Indicators: -**
Perceived benefits Study 1	**Indicators:** **Values** Reasons to performing an activity	-	-
Self-efficacy Study 1	**Indicators:** The ability of successful on-screen reading	-	-
Scaffolding Study 1	**Indicators:** Scaffolding and encouragement	-	-

On the other hand, a study by Reuter (2007) views reading engagement through the *reader response* in aesthetic relevance context. It refers to how readers engage with literature during the selection process. They believed book selection plays an important role in encouraging children to engage with books in recreational reading notion; reading for fun/leisure. It is similar to *the response* theme in the present study which associates to motivation to proceed, perform, and contribution. In Reuter's study elicit engagement preserved through rich, visual properties of books in recreational reading which is in contrast with classroom strategies as it emphasizes more on understanding instead of enjoying the text. In that context, children might lack the experience to evaluate a book's potential for engagement.

From different contexts, a study of Ronimus, Kujala, Tolvanen, and Lyytinen (2014) explores children engagement using game features in reading such as challenge and rewards. They examined children reading engagement through *enjoyment* and *interest* which associate with extrinsic motivation. These themes revolve around children's *motivation* and *concentration* through game-like reading e-books. Moreover, a study by Chiong, Ree, Takeuchi, and Erickson (2012) views children engagement by comparing reading print book and electronic books (basic and enhanced) in shared reading context. The engagement was defined through *Communication* and *Attitude* theme. The communication refers to the parent-child conversation when reading print and e-books including labeling or pointing to pictures or texts, asking questions, elaboration, talking about book features, turning pages, and hotspots. The attitude associates to parent and child positive and negative behaviors and distractions when reading print and e-books. The study concluded that children benefit more on literacy building in a shared reading print book, whereas the e-books, particularly enhanced e-books, increased the children reading engagement and prompting physical interaction.

6.2.2.3 Cognitive Engagement

In this study, four cognitive strategies including guessing, associations, synonym, and summarizing were recognized in children's e-reading experience. The text-level strategies include guessing, association and summarizing. The word-level strategies include activating background knowledge and synonyms. Some strategies can be used during the reading such as guessing, activating background knowledge, and associations and some strategies can be used after reading such as summarizing and synonyms.

The cognitive engagement components were thoroughly developed and refined by combining the children's on-screen readings and their direct understanding of e-reading experience for pleasure. The findings are then compared against several studies to look for similarities and differences in the idea presented as these models specifically focus on on-screen engagement.

The engagement model of reading comprehension development proposes that engagement in reading is the joint functioning of motivational processes and cognitive strategies during reading comprehension (Guthrie & Wigfield, 2000). The 'Comprehend' or 'understand' term refers to the ability to transfer the reading material to new situations, such as recalling stated facts, reasoning or evaluating, and vocabulary development. Cognitive engagement refers to the use of processing strategies and self-regulation strategies (Marton & Saljo, 1997; Miller, Green, Montalvo, Ravindran & Nichols, 1996). In this perspective, highly engaged readers are both internally motivated and strategic, and less engaged readers show lower motivation and less use of strategies for comprehending text (Wigfield et al., 2008). Comprehension strategies correspond to comprehending a task, employing textual cues, understanding the context of the text, figure out those parts they do not understand (Block, 1986). In reading, cognitive engagement components correspond to reader's cognitive strategies and the represented information (multimedia material on reading apps) including on-screen text, spoken

words (either reader's voice, or narrator), and pictures (illustration or animation). The emergent themes are discussed as follow:

a) Guessing

The Guessing theme is utilized in two cognitive engagement components including guessing the word meaning from word recognition and context as well as the reasoning of the concepts. The guessing strategy can be identified through the information (verbal/visual) to making a guess. The guessing vocabulary from contexts was recommended as an effective way for the bilingual language learner. According to theory by Parreren (1989), vocabulary can be learned through reading. However, the theory highlights the ineffective practice of list memorizing. It indicates that words in a bilingual list are mixed up, quickly forgotten, and are not corresponding in the contexts encountered by the language learner. Learning words in a text provide many points of references for recalling new words. It was recommended to teach ESL (English as Second Language) readers to be better guesser. In this way, the reader has a focus on guessing by relying on context clues while building the meaning of a text; less vocabulary development and more meaning extraction.

There is a question of whether or not reading apps have been designed to encourage children to guess word meaning from the text. There are cases that guessing-from-context strategy is not effective, like when reading material is not supporting sufficient information for children, as they encounter new vocabulary in the text (unfamiliar words). For example, in ‘Fishy Tales' app, when comprehension questions target the animal body part children were not able to identify words such as ‘Snout', ‘tentacle', ‘Sucker', ‘Claw'. Similarly, in ‘Billy the Space Cat’ app, only one of the children was able to recall the word ‘Fertilizer’ from the text. Children were not familiar with these words.

Activating background knowledge (prior knowledge) is more about the integration of the reader's general background knowledge of the topic or life experience or recalling words and context encountered before. In this study, some of the children were able to integrate contexts given in reading apps and comprehend what they read before. They would recall and retell based on their previous reading experience. For example, one of the children was able to recall what would happen to a third pig in 'The 3 Little Pigs' and 'Little Red Riding Hood', even though the apps did not cover that sections (free app versions are not complete). Alternatively, another child was more familiar with the animal body part in 'Fishy Tales' apps because s/he had read before about them and it was his favorite topic to read about. Children may be familiar with the story, has seen it or had read it in the paper book version, and know about the events and character; more of his/her understandings relate to the remembering from the previous reading experience. However, familiarity with topics was not the only factor that helped them to comprehend better. Their ability to interact and manipulate the screen (mastering on-screen interaction) allowed them to explore and browse the interface better and retrieve more information.

b) Association

The association strategy in some research was defined as making integration of personal experience and reading material (Block, 1986). However, association in this study refers to identifying the main idea of the story and meaning-making through the association between visual and verbal information as well as connecting explicit and implicit information in the text (literal and inferential). This result echoes the findings from Mayer and Sims (1994) which children's spatial and temporal ability help them to devote required cognitive resources to build referential connections between visual and verbal representations of presented material. Any associations, verbal as well as non-verbal, may strengthen the word's codability and memorability (Hulstijn, 2001). It helps

in constructing the meaning of unfamiliar words from verbal and non-verbal information.

In the case of children's limited comprehension or words recognition, the animations or illustrations features of the reading app are utilized for constructing the meaning, as alternative knowledge resources (e.g., context clues and picture support). Moreover, these features provide independent reading mode as a child can navigate the reading app at his or her pace. However, as a potential downside, embedded hotpots, animation, and illustration influence children understanding as well. For example, some of the children provided the wrong answer in ‘Tiny World' app for the ‘who is the greatest jumper?' question. The correct answer was ‘flea' but they responded ‘cat'. It is because of the incongruent illustration of a cat on the same page, as developing this knowledge. They could not recognize the stated fact in the text. The text was elaborating information about the ‘flea' but the illustration was showing a cat at the bottom of the page. It is clear that the app was not designed according to spatial or temporal contiguity and confused children's understanding. Spatial and temporal contiguities are multimedia design principle, where referring proximity of corresponding verbal and visual information on the page to the or screen (spatial) and simultaneous or successive representation of corresponding verbal and visual information (temporal) (Mayer, 2002).

From another view, the observation data shows that many children were looking more at the animation when the narrator was activated. Some of the children spend more time on looking at the animation or illustration than the text. Also, in ‘read it myself’ modes, when they were reading aloud or in silence, some of the children paused for few seconds to look at the interactive elements in next page. Some of them also paused at the beginning of each page before they start reading aloud the text. For example, in three reading apps such as ‘The Three Little Pigs’, and ‘Jungle Book', the

text was located on left side of the page and animation on the right side of the page. These findings indicate that children were generally drawn to animation or illustration in the page.

Moreover, they recalled from pictures when the story was long and included several subsequent key events. In a long story like ‘Billy The Space Cat', most of the children elaborated the pictures better than recalling the exact words from the text. For example, the airplane in the story was described by two of children as ‘tiny airplane', ‘toy airplane', as well as the word ‘balloon' which were not given in the text. They were adding adjectives to the words based on the impression they received from the pictures. When both visual and verbal information is available, children may direct higher attention to the type of information perceived and more important or more interesting. The embedded non-verbal information (illustration and animations) in reading apps helped children to comprehend multiple events by matching verbal information with corresponding visual information. This finding is consistent with dual code theory by Clark and Paivio (1991) indicating the integration of word and image enhances the cognitive load in a way that connects the details of the image with the word. The importance of presenting text and illustration together and close was highlighted on several studies (Bus et al., 2015; Mayer & Sims, 1994; Schnotz & Rasch, 2005). These studies suggested that the embedded multimedia should support and enhance the story in which can improve the comprehension. However, the overdoing of these features encourages passive reading and disturb comprehension.

c) Synonym (Vocabulary)

One of the cognitive strategies is providing synonym(vocabulary) to give words from verbal or visual presentations. In this study, many children used synonyms when encountering unfamiliar words or could not recall the exact words. For example, in the ‘Fishy Tales' app, most of the children provided synonyms for unfamiliar words. Those

children were able to identify the functionality of animal body parts and responded accordingly. This result is in line with findings by (Brisbois, 1995) in which in second language reading, the reader uses their first language syntactic knowledge to understand about the meaning of unfamiliar words from second language context. It is believed that there was not enough information (verbal and visual) provided to facilitate recalling the unfamiliar/new word from the text. These are the instances when children encounter the words for the first time. Therefore, in the situation of limited contextual clues in the app, it will be more difficult for children to understand or recall new or difficult words. The guess-ability increases if the text includes redundancy of context and occurrence of synonyms that can be associated with the unfamiliar words (Mondria & Wit-De Boer, 1991).

Despite that, there are cases when there was ample verbal and visual information in the app to facilitate the word recognition and meaning-making of the words in the text, but most of the children still had difficulty in identifying or illustrating the word meaning. For example, in ‘How I Build My House', when children were asked about the word ‘season', they had difficulty to respond correctly. It is believed this has nothing to do with insufficient supporting resources on the given context. It may correspond more to the fact that Malaysian children do not have enough knowledge about climate changes and weather in their personal life since Malaysia has only one season in the whole year. So, they may never experience this context in real life regularly, unless they had traveled somewhere with the different season or had seen in movies. One of the suggestions of the (cognitive) constructivist theory (Ladbrook, 2008; Piaget, 1973) is that prior life experiences influence the learning of new knowledge, and that knowledge facilitates making connection to new information in familiar context.

In addition, spelling or pronunciation caused difficulty in recognizing words for some children. Those words that can be guessable for native English readers may be

incomprehensible for the second language learner. The second language learner may have a natural ability to guess, but their understanding of other words limits them in the immediate context (Haynes, 1984). It may refer to the fact that children may need strategies other than guessing word meaning and synonym (vocabulary) to grasp the main idea of the text. Children may select or own specific sets of reading strategy for comprehension. It is believed that some of them are more effective than the others and can facilitate the comprehension process.

d) Summarizing

Forming summarizes one of the in-depth processing strategies. In this study, some of the comprehension questions required children to recall the main idea of the story and sequence of events and form a summary and then retell the target part in a meaningful sequence. Some of the children were able to summarize successfully and highlights key events in a way that kept the structure of the story. Some children used their own words to retell the story, and in addition, some also used visual information and used their own words to retell. Summarizing requires understanding the second language and the ability to manipulate the language. However, it was difficult for some children to retell key events in proper sequence. As such, when the researcher divided the main comprehension questions into multiple smaller questions that targeted shorter key events with less sequence, they were able to recall and answer correctly.

It was evident that the summarizing strategy is what children are familiar with. The interview data from parents showed that they would also ask children to tell them the summary of what they had read after shared or individual reading of home literacy practices.

Furthermore, the enjoyment of sharing the favorite topics with friends or family could be another application of summarizing strategy. In many cases, children mentioned about their favorite story or recent books they had bought. For example,

Maneesh insisted on sharing with the researcher the story he had read the night before in summary in one of the reading sessions. This example may show that summarizing is a popular strategy that children use. It could be the willingness of sharing a favorite topic/story with someone, as they become connected deeply to the story or a more natural way to recall long events. Children's summarizing skills shows how they can recognize information or concepts (main idea of the story and key events) and integrate stated facts (literal). In sum, in order to evaluate children's e-reading understanding when they read for pleasure, it is important to take into consideration how and what they recall the main idea of the story and key events. Figure 6.2 shows the connection between adopted theory and emergent themes for cognitive engagement.

Some studies had looked at the children's e-reading cognitive engagement from a similar perspective. A study by Kucirkova et al. (2015) focused on young children's engagement with narrative in reading for pleasure using digital books. They introduced six facets of engagement as creativity (possibility thinker), interactivity (child's active contribution), affective (pleasure, enjoyment, and sense of belonging), personalization (self-paced reading), sharing (joint book reading), and sustained reading (uninterrupted reading time). In terms of multimedia affordance on second language learning and comprehension, the study by Zoi, Bellou, and Mikropoulos (2011) focused on teaching the second language in elementary school when student using multimedia for learning. The tools provided an audio and textual translation of unknown words as well as pictures. The audio translation (spoken words) in native language promoted learner's understanding of new words. At the same time, integration of audio and textual translation assisted the vocabulary acquisition in the second language. Thus, it is clear, in this situation, language learners do not need to spend extra time to get the pronunciation right.

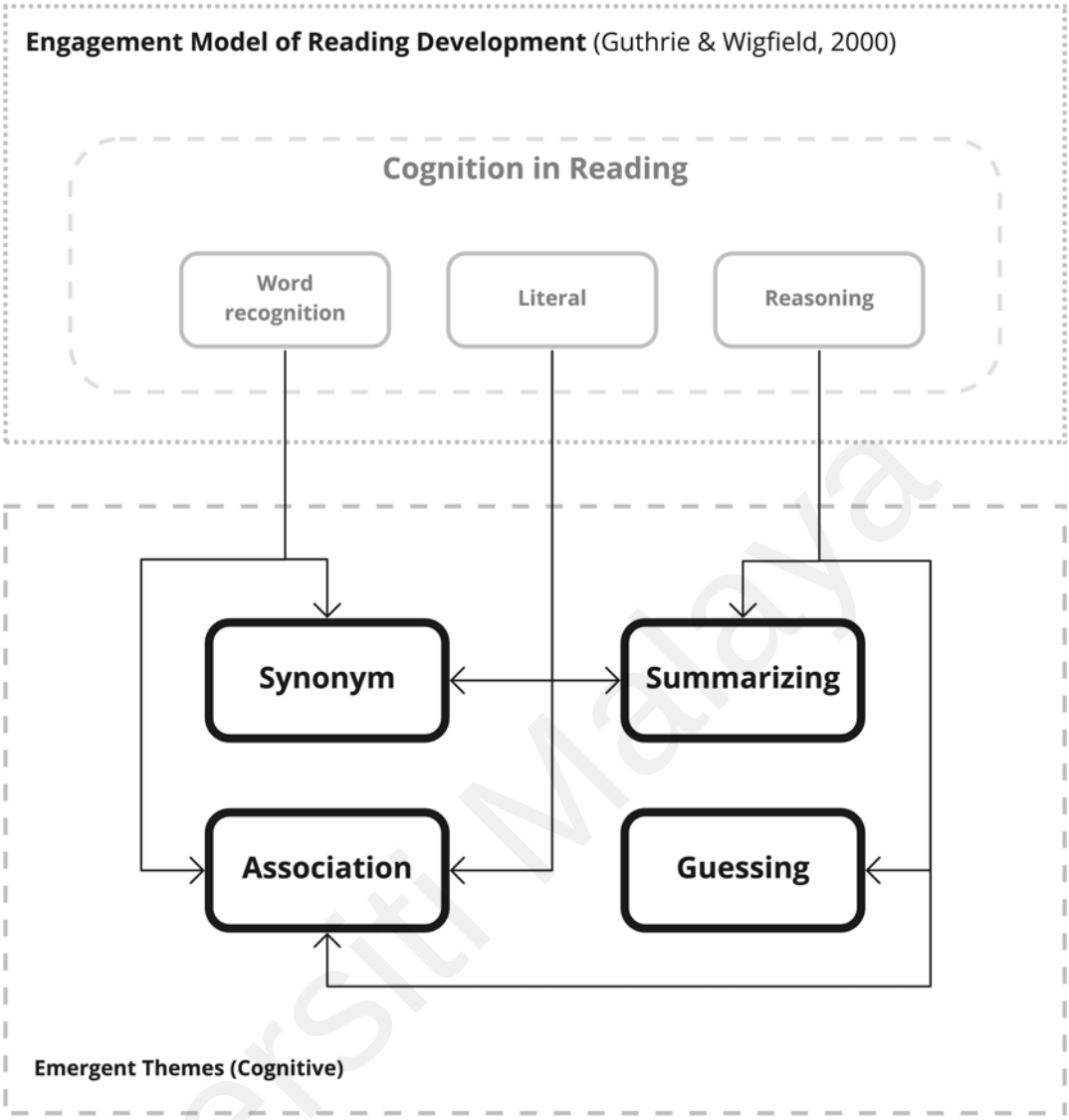


Figure 6.2: Connection between Theory and Emergent Themes for Cognitive Engagement

Several studies look at the cognitive engagement from the motivational perspective in school and personal life achievements. They defined cognitive engagement as use of processing strategies as well as self-regulation strategies (Marton & Saljo, 1997; Miller, Green, Montalvo, Ravindran & Nichols, 1996; Appleton, Christenson, Kim, & Reschly, 2006). Deep involvement in the text means a high level of cognitive engagement with the text. In reading to learn perspective, the learner is thinking and pondering material, sometimes slowly and sometimes rapidly. This cognitive engagement leads to the full

experience of the text and a deep understanding of content after reading. An involved reader is frequently satisfying curiosity and will choose books that provide this experience of immersion in favorite topics and pursuits (Wigfield & Tonks, 2004). Findings from Cox and Guthrie (2001) work focused on reading for school as well as enjoyment. Both settings revolve around motivation and cognitive strategy use to predict student's amount of reading and reading frequency. Their findings highlight that in reading for enjoyment context, student interests prevail and the reading amount is determined more strongly by motivation than cognitive constructs.

On the other hand, study by Elia, Var Den Heuvel-Panhuizen, and Georgiou (2010) focus on mathematical cognitive engagement. The study investigated the role pictures on children mathematical understanding. The results show that the picture book as a whole has the potential for cognitively engaging children. The empirical study by Dupont, Galand, Nils, and Hospel (2014) identified self-perception variables including autonomous, relatedness and competence as important indicators for optimal behavioral, cognitive, and emotional engagement. Their investigation took part in school. According to their findings, in particular, students with a higher score on perceived competence or self-determination were more likely to use cognitive processing strategies in their learning. The study by Scott and Walczak (2009) investigated cognitive engagement through the use of multimedia material. They identified attention focus, intrinsic interest, and curiosity as cognitive engagement components. They reported cognitive engagement, a form of intrinsic motivation, shows significant differences in self-efficacy when using the computer.

In this study, the aim was to investigate children's cognitive engagement through the use of cognitive strategies of retelling the story and answering the comprehension questions. The multiple-choice questions and open-ended questions required a direct retrieval of information, while the retelling required children to highlight the key events,

characters, and sequence of events. Th inferential comprehension requires reader to develop skills on construction of schema and extraction of the deeper meanings of the text (Van Kleeck, 2008).

6.3 Limitation of Study

Careful considerations were made in planning and designing this study to stay in focus with the research objectives. While all necessary efforts have been taken to ensure efficient and credible research, the researcher faced with several challenges which might have interrupted or changed the initial research plan of the study. The challenges were:

Firstly, data collection, particularly finding a school that permits to conduct the study there was difficult and time-consuming. In some cases, school permission was obtained but could not get parents' permission. In addition, school routine and examination time caused a longer data collection period. An improved version of information sheets with more detailed process of data collection as well as study's objectives and aims captured more parent's attention and led to obtaining permission easier. In addition, facilitator helped the researcher to remind and talk to parents during their school visits to explain the data collection process in person.

Secondly, fieldwork observation initially was conducted in the computer lab, and seminar room at the school where there were students involving some school activities or the windows were designed that way the student's loud sounds during the break time or recess was disturbing. So, therefore, the reading session was scheduled on days with less traffic on the library and computer lab room with the help of the facilitator.

Thirdly, some parents were reluctant to take part in an interview. Researcher managed to communicate more with parents through email or short SMS to briefly go through the interview questions. Moreover, some students were not willing to answer questions. In some occasion, children should leave school earlier than the scheduled

time due to change in the school shuttle bus. Thus, the researcher had to set another reading session later.

Fourthly, data analysis software, the license was expired for the first round and took longer to repurchase new package.

Fifthly, recording devises, some functionality disoperation happened with a voice recorder for some of the sessions that resulted in longer transcriptions of part of interviews through matching and checking the audio and video.

6.4 Contribution of the Study

The findings from this study contribute to the current children technoliteracy literature from the point of theory, the method used and practices.

6.4.1 Theoretical Contributions

This study has developed the use of the engagement model of reading development and self-determination theory to identify children's e-reading practices and engagement when reading for pleasure from reading apps using iPad. The engagement model of reading development and self-determination theory has been used in the reading engagement and motivation. However, this study investigates its application in the context of reading for pleasure among children at the age of seven and eight in Malaysia. This study takes forward the understanding of technoliteracy when bilingual children read for pleasure using touch screen devices. It extends the findings from previous study by providing a typology (model) of e-reading engagement with reading apps in the area of new literacy and technoliteracy. The original contribution is a derived insight from bilingual children's e-reading engagement and interaction with reading app when they read for pleasure in the area of new literacy and technoliteracy, as focus of adopted theories is on formal setting such as school or formal reading at home when print book was the medium of reading. The emergent term of "scaffolding", one of the behavioral engagement indicators, was derived from this study and has not

been indicated in any of adopted theories. Moreover, the findings highlight the contribution to the field of new literacy and/or technoliteracy by considering bilingual children. Being Malaysian specifically hasn't impacted the findings but reading in second language has illuminated some findings in this area of research, particularly cognitive engagement and e-reading behaviours on how they understand e-reading apps in second language.

6.4.2 Methodological Contribution

This study sets up several reading sessions for participants at their leisure time at school and seeks to understand e-reading experience and behaviors and their engagement with storybooks and educational app in iPad. There is no study in e-reading for pleasure context, which models and illustrates early reader's experiences in the second language for fun using iPad. Parents and teachers can benefit from this to encourage and practice the literacy-related practices for fun using touch-screen devices which is appealing to most of the children. Also, app designer may be able to understand better the bi- and multi-lingual reader's needs when designing rich multimedia apps for storybooks or educational apps for those who are in the stage of learning to read and reading to learn in the second language.

6.4.3 Practical Contribution

This study illustrates children's e-reading experiences behaviors and engagement to interact with reading devices as well as cognitive strategies to understand or recall verbal and visual information presented in reading apps in English. Therefore, in the future, by considering the motivation and engagement components of e-reading for pleasure, app designers, can identify essentials characteristics of representation of visual and verbal information in app interface for children. In addition, parents and guardians can promote the habit of on-screen reading through regulating the use of hand-held

devices for reading activities and encourage reading for pleasure habits which can be led to the development of reading skills (literacy development).

6.5 Recommendations for Future Research

Future research could expand on the use of the cognitive theory of multimedia learning to investigate children's e-reading practices and engagements with rich multimedia elements inside the reading apps in iPad. As development of apps is growing fast, app developer and designer can benefit from this theory to dig into the way children extract and retain information from advanced reading apps in another language.

Since this study explores children's e-reading activities for pleasure at the school campus, future research could be extended to reading for pleasure practices at home to understand the characteristics of similarity and differences of home literacy practice of recreational readings. Moreover, it might be interesting to explore and compare e-reading practices and engagements with a variety of reading apps in the first and second language.

6.6 Concluding Remarks

It is believed that children actively search for meaning, construct and interpret meaning, but some children are more eager to read and some of them not. The advent of technology has changed the notion of literacy development as well as entertainment. Motivation to read for pleasure, the ability to learn to read in English and understanding visual and verbal information in English as well as enjoyment and enthusiasm corresponds to autonomy motivation which is associated with affective and behavioral engagement. As, children perceive their ability to read in English better, they might able to implement reading culture in their daily life. Therefore, they may improve their oral language through word recognition, vocabulary development, and sentence pattern in English. Peer interaction during reading and experiencing enthusiasm and enjoyment

corresponds to relatedness which is related to affective engagement. Reading together or joint reading, the ability to navigate the reading apps interface, and the ability to learn to read in English and understand visual and verbal information in English corresponds to competence which is associated with behavioral and cognitive engagement. Reading engagement model and self-determination theory was employed to address research objectives on this study. Combination of reading engagement and motivation to read lead to satisfactory experience enhance performance (reading comprehension) and persistence in reading habits. Figure 6.3 illustrates the outcome of reading engagement and motivation to read for pleasure.

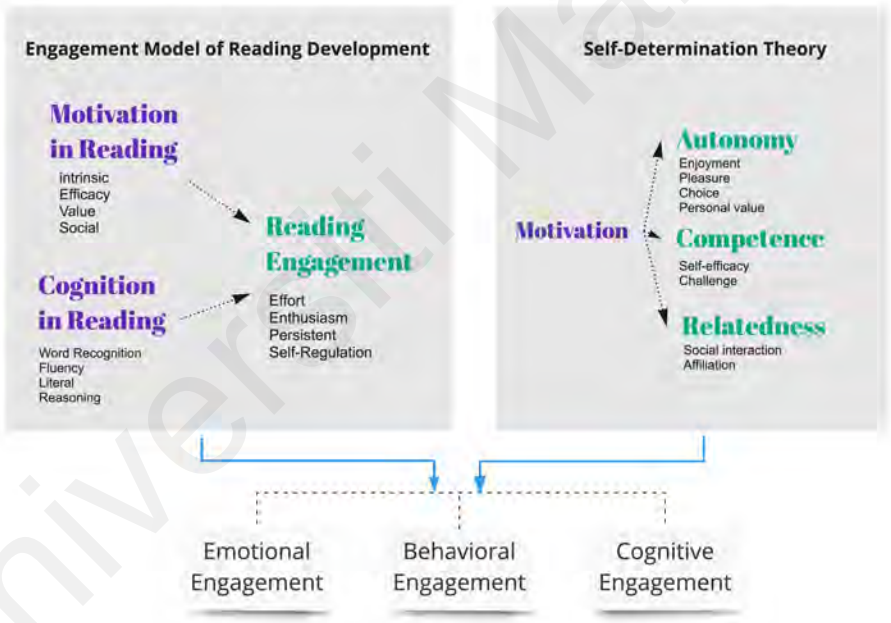


Figure 6.3: Illustrating the Engagement Model of Reading and Self-determination and the Outcome.

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