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A Comparative Study of UK and Chinese Adolescents' Perceptions of Digital Reading

by

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degree of the Doctor of Philosophy in Education

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Declaration

I hereby declare that this thesis is my own work and has not been published before. This thesis has not been submitted for a degree at another university.

Abstract

This research examines adolescents' perceptions of digital reading in the UK and China on the basis of their print and digital literacy practices in school and in out-of-school settings. The comparative perspective employed in this research helps to provide deep insights into the nature of reading literacy and literacy in the changing social and cultural contexts.

A mixed methodological approach was employed to investigate how the students interpret digital reading. Multiple methods were chosen, including focus groups, a survey and in-depth individual interviews. Eight focus groups were conducted as a preliminary stage. The result of focus groups and the existing literature review helped to lay the foundation for the design of the subsequent questionnaire. 798 valid questionnaires in total were collected. Deeper insights into students' perceptions were gleaned through the individual interviews. The three data collection methods therefore enabled both a breadth of evidence to be collected, in addition to an in-depth analysis of the views of a smaller number of students.

The findings suggest that both the UK and Chinese students shared similar expanded notions of reading, which confirmed that reading is more than the ability to decode printed texts in relatively fixed space. All the students in this study claimed to use both printed and digital texts. However, the Chinese students were found to be in a more paper-based reading environment and they had more subject-based practices of reading. The students' preferences for certain text formats were influenced by various factors and their choices of text formats were dependent on the nature of certain texts and reading purposes. The gender gaps of reading among the UK students were found to be larger than among their Chinese counterparts. Meanwhile, this study suggests that reading

online is more complicated than print reading. A range of strategies that are unique to online reading comprehension are expected to deal with various challenges in order to have successful online reading comprehension. However, the findings suggest that the UK students might be more skilled in online reading than the Chinese students. According to the students' claims, differences between the UK and Chinese students in terms of literacy practices, preferences for text formats, gender differences and online reading comprehension could be associated with the social and cultural situations.

This research, as the first exploratory study which investigates adolescents' perceptions of digital reading across the UK and China, has contributed substantial knowledge in an under-researched field. It enriches our understanding of the nature of literacy in different social and cultural contexts.

Chapter One Introduction

This PhD thesis is an investigation of what two groups of adolescents in the UK and China think about print and digital reading based on their daily literacy practices in both in-school and out-of-school settings. The choice of this topic is related to my educational background and interests in individuals' interactions with widely adopted technologies in daily living and learning.

The courses of Journalism and Media Studies in my undergraduate and master study provided me with insights into changes of how texts were presented. During these courses, the features of texts and how journalists and media professionals respond to changing features of texts were frequently discussed. Digitalisation, interactivity and non-linearity were considered as three main features of texts. Professionals of journalism and communication were expected to have the capability to use new technologies to report news in the new media age. With extensive discussions regarding these changes, I realised that the way people read would be different in the future from what it was, especially younger generations who were born into an electronic reading environment. Instead of focusing on the changes of journalism and communication professionals, I became very curious about how readers, especially younger generations, read with emerging digital technologies. I have always been fascinated by how young people respond to texts and their use of different technologies.

According to the insights gained through my education background and the literature of literacy research, it seems that individuals nowadays are reading in an environment in which printed and digital texts co-exist. Reading in the digital age means far more than reading physical books. Rather, individuals are encountering digital texts through a range of devices that they could access in daily lives. This leaves the question that whether reading is changing because so many texts are being access online and whether this is causing learners problems

or opportunities, or indeed both.

There have been significant debates over the impacts of digital technology on reading. An under-researched aspect, however, relates to how adolescents perceive digital reading and the influence upon these perceptions of purpose, preference and reading comprehension. In addition, little is known about their perceptions of digital reading in different social and cultural contexts.

All these suggest the need for a deeper understanding of reading literacy in the digital age from adolescents' perspectives. The investigation of the perceptions of reading in the digital age in this study is concerned with the way in which groups of UK and Chinese students interpreted reading through different media and how they understood the reading environment mediated by changing technologies, in the light of their daily experiences of literacy practices with both printed and digital texts in both in-school and out-of-school settings. The ways that groups of UK and Chinese students viewed digital reading within certain social and culture contexts are also considered.

Therefore, this research will focus on the perceptions of reading in the digital age that UK and Chinese adolescents have in their current social and cultural contexts together with the exploration of how they have responded and are responding to the changing technological, social and cultural situations.

1.1 Background to this research

In the current decade technology has been penetrating into all aspects of people's daily life in terms of the public and private domains (Futurelab, 2009). A multitude of changes, both social and technological, in how individuals work, communicate and learn within this fast-changing age have been widely explored to gain an understanding of the meaning of 'being literate' in the digital age (e.g.,

Lankshear & Knobel, 2011; Leu et al., 2013). Adolescents are seen as the most relevant group to such technological changes in living and learning because they are growing up surrounded by digital technologies and social media (Coleman, 2011).

Both the UK and Chinese adolescents seem to be exposed to a wide range of digital technologies at home and in school. According to the newly released report of 'Internet access - households and individuals' (ONS, 2016), 89% of households in Great Britain had internet access in 2016. It appears that in the UK the internet could be relatively easily accessed at home. Educational institutions have been responding to the proliferation of technologies by providing technology devices and computer related courses. It was reported (Coughlan, 2014) that tablet computers had been integrated in 70% of primary and secondary schools in the UK. Technological changes in teaching and learning are also reflected in the national curricula in which computing and design and technology are included. Students are expected to apply computing skills with critical thinking and creativity to understand the fast-changing world. It seems obvious that UK adolescents are living in a digital-rich environment both in school and at home.

Even though information and communication technologies were introduced in the late 1990s (Ge et al., 2012), a little later than in the UK, China has also witnessed wide adoptions of digital technologies in several aspects. According to the latest annual report on internet development in China (CNNIC, 2017), by December 2016, there were 736 million internet users in China, with an internet penetration rate of 53.2%. The integration of technology has been highly emphasised by the central government and some researchers and educators (Ge et al., 2012; He & Wray, 2017). The China Ministry of Education launched 'Education and Information Technology Ten-Year Development Plan (2011-2020)' (MoE PRC, 2012) to address the integral role of technology in teaching and

learning. Meanwhile, ICT has also been involved in the curriculum of China's education system. It therefore could be seen that similar to UK adolescents, Chinese adolescents are exposed to technologies in school and outside of school.

Adolescents who are living in technology-rich environments would inevitably encounter a variety of platforms, including both printed and digital texts. Under such changing situations, digital texts and multimodal texts could be easily accessed through various digital media platforms for a range of literacy practices (e.g., Jewitt, 2008; Lankshear & Knobel, 2011), such as social networking and some innovative ways of learning (e.g., Ito et al., 2009). In a national survey of young people's reading in the UK, texts, websites and social media were found to be the most common reading materials outside of class among young people aged 8 to 16 (Clark, 2012). Apart from reading online texts, many UK adolescents have been found to participate in creative activities and civic participation, such as editing pictures, making videos and creating avatars (Ofcom, 2016).

For adolescents in China, by December 2016, there was evidence that 23.4% of young people below 19 years old were internet users (CNNIC, 2017). Creative activities like making personal blogs and social networking have also been found among many Chinese adolescents as well as reading information on screens (CNNIC, 2016). It seems that adolescents are not just reading texts transferred from paper onto screens. Rather they are making meaning through the use of technologies. Adolescents therefore are experiencing changing literacy landscapes in which interactions with texts and social practices are mediated by the changing technologies (Leu & Forzani, 2012).

However, there have been on-going debates, especially in the popular media, over the advantages and disadvantages of the prevalence of technologies both in the UK and in China. An increasing number of negative narratives regarding the use of technologies in terms of impacts on children's learning have appeared in the

mass media. In the popular media in the UK there have been some concerns regarding the lack of deep reading and concentration if reading digitally (Harkaway, 2014). In China, the public media also seem to be worried about the negative impacts of digital reading on individuals' reading habits and deep reading (e.g., Xu & Chen, 2017) even though some positive effects of integrating technologies in daily living and learning have been noticed (Beijing Daily, 2016). It appears that arguments concerning the impacts of the use of technologies are unlikely to be resolved quickly because individuals are responding to technological changes in their current social and cultural situations, rather than using technologies merely as tools. The use of technologies is always embedded within current social and cultural situations. In this sense, social and cultural situations cannot be ignored as we attempt to understand individuals' interactions and perceptions of technologies.

Even though technologies have been widely adopted in the UK and China, individuals' practices of using technologies are also influenced by social and cultural situations. This suggested that it might be interesting to see if there were different literacy practices of using technologies among UK and Chinese adolescents and in the ways in which they perceived reading digitally through those practices in their social and cultural contexts. Adolescents across the UK and China are obviously growing up in different social and cultural situations. Chinese students are facing fierce competition partially due to an examination-oriented education system (Hu, 2002; Jin & Cortazzi, 2006). All Chinese adolescents in general secondary schools face the GaoKao (National Higher Education Entrance Examination) which is the largest biggest and most important examination to take for university entrance. The overall score that a student gets on these examinations decides the level of the university. Under such pressure from an exam-oriented education system, quite a lot of time is spent on preparation for examinations. It could be speculated that the way that Chinese students use technologies and their perceptions of digital media and

technologies would be different from UK students, who, arguably, tend not to face as much intense pressure from examinations as Chinese students. The fact of different educational systems across the UK and China reflects distinct cultures as underpinnings between the two countries. The interplay between the penetration of technology and culture (Confucian-heritaged) in China could therefore be different from that of the UK, which may also lead to different perceptions of digital reading across the UK and Chinese adolescents. For this reason, a socio-cultural perspective was included in this research to understand the nature of digital literacy in social and cultural contexts as well as in the changing technological situations.

1.2 Rationale for this research

Researching the reading of digital texts is not a new topic. However, more of the studies relating to digital literacy focus on students in higher education. Adolescent literacy in the changing landscapes remains under. Even though there have been an increasing number of studies investigating adolescents' literacy practices, to understand the characteristics of young people who are growing up with technologies, what adolescents think about reading through various platforms is not well studied. Therefore it was felt that that researching young people's perceptions of reading literacy in the digital age based on their literacy practices could enrich the understanding of the nature of literacy in an era shaped by the changing technologies.

It has been argued that adolescents, who are in a transformational stage from children to young adults, need instructional supports (Ippolito et al., 2008) to develop their abilities to deal with printed and digital texts to make meaning and 'build relationships in their academic and social work' (IRA, 2012, p.2). More research into adolescent literacy is needed in order to better support adolescents to be literate in the changing situations.

Meanwhile, little research has been done to investigate the interplay between technologies and social and cultural situations. Little is known about adolescents' responses to new technologies within their current social and cultural contexts. Studies exploring literacy in different contexts of culture and social situations therefore will be needed to enrich the understanding of the nature of literacy in the digital age.

1.3 Structure of this thesis

This thesis consists of six chapters. The background to this research is introduced in Chapter One (the current chapter) regarding the changes in the living and learning environments of young people, as these have responded to the penetration of technologies. Social and cultural differences across the UK and China are also discussed briefly here, as well as the rationale for this research, which is based upon the current situation of reading literacy with the use of various technologies in the UK and China, and the need for a deeper understanding of the nature of literacy in various contexts.

Chapter Two contains a review of the research literature relevant to the research topic. This chapter presents a detailed literature review of the expanding concepts of literacy in terms of the social and digital turns in literacy research. Literacy practices with printed and digital texts are discussed along with the comparisons between printed and digital texts with respect to preferences and reading performance. Studies of online reading comprehension, concerning reading strategies for online texts, are also covered. As this research investigates adolescents from the UK and China, social and cultural contexts are demonstrated in terms of notions of learning. Gender differences in reading with both printed and digital texts also form part of the literature review.

Chapter Three describes and discusses the methodology and methods employed

in this research. This research employed a mixed-method approach using focus groups, questionnaires and individual interviews to examine the perceptions of groups of UK and Chinese adolescents concerning the reading of printed and digital texts both in school and outside of school. Three methods were chosen for data collection to obtain both quantitative and qualitative evidence regarding adolescents' perceptions of reading in the digital age within their current social and cultural contexts. Before data collection, I found it problematic to make contact with schools, especially those in the UK to gain a relatively large number of students to participate in this research. In the end, a sufficient number of participants were enlisted, and there was subsequently a very high return rate of the questionnaires and continuous support from schools for the follow up individual interviews.

Chapter Four presents the results of this research. The findings provide research evidence in breadth and depth to understand the perceptions of digital reading held by groups of adolescents across the UK and China. The findings of focus groups, the survey and individual interviews are presented separately because each phase of the data was done to set the agenda for the next one. All of the findings presented in this Chapter will also be related to the research questions. Similarities and differences between the UK and Chinese students will be explored in this chapter.

Chapter Five contains a discussion of the findings. This chapter will discuss how the research outcomes are related to the literature. As the findings suggest, both the UK and Chinese adolescents were responding to technologies in their daily living and learning in their current cultural and social situations. The cultural and educational differences across the UK and China appeared to be related to the different perceptions explored in this study. Issues related to similarities and differences will be addressed in this chapter to understand how they related to research questions of this research.

Chapter Six summarises this research by illustrating the significance, contributions and limitations of this study. Recommendations for future research are also discussed in this chapter.

Chapter Two Literature Review

Introduction

Reviewing the background to the chosen topic is important in order to understand the ways in which existing studies relate to the proposed research. This chapter will review the literature surrounding the topic of adolescent digital reading with the aim of developing a set of research questions, which are listed at the end of this chapter. This review presents relevant research on the concepts and theories of literacy research, perceptions of reading and literacy research in the digital age in terms of reading with both printed and digital texts, online reading comprehension and gender differences. A comparison of cultures of learning across the UK and China will also be presented.

The literature reviewed for this chosen research topic was retrieved through the use of major search engines (e.g., Ebsco, ERIC, Proquest Education and Google Scholar), databases (e.g., the university library's database and some publishers' database) and hand searches of books, reports and policies in regard to literacies/digital literacies. Both the use of general search and advanced search were adopted. Some key phrases such as 'digital literacy', 'theories of literacy' and 'adolescent literacy' were used for the general search of the literature review. Regarding advanced research, the modifications and combinations of terms were usually used: (digital literacy or reading or adolescents) and (social practices and digital reading or literacy) and (reading or computer or gender) and (technology or computer or multimedia). The time frame for the literature regarding digital literacies and digital reading was specified within the past 10 year, during which time digital literacy/literacies has been acknowledged as an important strand of literacy research. The time frame for the general search for the concepts and theories of literacy research was not set because getting a good understanding of theories and concepts of literacy would be useful for the chosen topic. Apart from reviewing the studies searched through the above mentioned methods, I also

used the references of the reviewed literature to locate the data that was related to the chosen topic.

2.1 Expanded notions of literacy and perceptions of reading

This chapter will firstly consider the dynamic nature of literacy within changing social and cultural situations, so as to help with the understanding of how aspects of reading are perceived in the current situation in terms of the text, the reader and the reading activity.

2.1.1 The changing nature of literacy

It has been widely recognised that definitions of literacy have changed over time (Levy, 2009) and have been updated to take account of changing technological, social and cultural situations (Barton & Hamilton, 1998; Barton et al., 2000; Gee, 2010, 2015; Gilster, 1997; Hagerstrand, 1966; Kozol, 1985; Lankshear & Knobel, 2011; Leu et al., 2011; Kress, 2003b; Martin, 2008; Oxenham, 1980; Scribner & Cole, 1981; Street, 1984, 2003).

Literacy as a social practice

Many argue that literacy can be defined on the basis of behaviourism and cognitive theories (Goodman, 1976; LaBerge & Samuels, 1974, Ortony, 1975; Rumelhart, 1994; Ruddell, 1976) with focuses on the abilities to read and write as mental phenomena, which situates literacy 'in the individual person rather than in society' (Gee, 2015, p. 31). However, traditional ways of defining literacy as individuals' interpretations of texts in their minds seem insufficient to support individuals to be well prepared for economic or technological changes (e.g., Graff, 1987a; Hull & Schultz, 2001; Kozol, 1985; Larson & Marsh, 2005; Scribner & Cole, 1981; Street, 2003).

Due to global economic changes, from the 1970s, 'knowledge workers' for a

'knowledge economy' have been in a great demand (Gee, 2015; Kozol, 1985; Lankshear & Knobel, 2011), which suggests that abilities to read and write are linked to society and its social problems (Graff, 1997). This idea is evident in the discussion regarding the relationship between literacy levels and economic growth (Anderson, 1966; Hagerstrand, 1966; Oxenham, 1980). The link between literacy and social problems led many scholars to question traditionally defined literacy. A sociocultural perspective grounded in the work of Vygotsky (1978) was largely adopted in a range of disciplinary fields, including socio-linguistics (Cope & Kalantzis, 2009; Gee, 2003; Kress, 2003), cultural psychology (Markham, 1998; Miller & Slater, 2001), social cognition, and cultural studies (Gee, 1990, 1996; Alvermann, 2009) to answer the question 'what is literacy' in changing situations. (Bakhtin, 2010; Barton & Hamilton, 1998; Gee, 2012; Graff, 1979; Heath, 1983; Lewis et al., 2007a; Scribner & Cole, 1981; Street, 1984; Tracey & Morrow, 2006).

A large body of work with a sociocultural approach researching the changing nature of literacy within social and cultural situations has been termed the 'social turn' of literacy research (Gee, 2015). These studies are now collectively known as the 'New Literacy Studies' (the NLS for short) (e.g., Alvermann, 2008; Gee, 1996, 2015; Gregory & Williams, 2000; Lewis et al., 2007a; Luke, 2003, 2004; Street, 2003). The NLS emphasise 'the description of literacy practices of everyday life' (Stephens, 2000, p.10) which helps to understand that literacy 'occurs in-between in everyday interaction as tools for building and maintaining social relations' (Larson & Marsh, 2005, p.18).

From the sociocultural perspective, the relationship between social practices, orality and literacy was explored within complex interfaces where linguistics, anthropology and epistemology were employed (Halliday, 1973; Perry, 2012; Street, 1984). Street (1984) grounded his work in anthropology based on sociocultural theory focusing on people using reading and writing in different

contexts. It was found that ‘the construction and dissemination of conceptions as to what literacy is’ was ‘in relation to the interests of different classes and groups’ (ibid., p.105). Therefore some argue that ‘an understanding of literacy requires detailed, in-depth accounts of actual practice in different cultural settings’ (Collins & Blot, 2003, p.64). Gee (2015) demonstrates that literacy as one form of language ‘always comes fully attached to ‘other stuff’: to social relations, cultural models, power and politics, perspectives on experience, values and attitudes, as well as things and places in the world’ (p.1). In this sense, contextual knowledge of culture and society and different practices are expected and required for learners in their everyday lives (e.g., Gee, 2015; Green, 1988; Heath, 1983; Hirsch, 1987; Street, 1984) in order to be able to ‘engage critically with the condition of their working lives’ (Kalantzis & Cope, 1997, p.6). It is not hard to see that the concept of ‘practice’ became ‘a key construct within sociocultural approaches to literacy’ (Lankshear & Knobel, 2011), and the ‘embeddedness’ of literacy has been highly valued among socioculturally oriented theorists. In other words, literacy has been defined as being embedded in social practices within social, cultural and historical contexts (e.g., Gee, 2015; Lankshear & Knobel, 2011).

Literacy therefore is more than the exercise of cognitive skills within people’s brains. According to Barton et al. (2000), literacy would work as ‘a powerful way of conceptualizing the link between the activities of reading and writing and the social structures in which they are embedded and which they help shape’ (p.7). It seems that the strong association between knowledge, learning and literacy cannot be neglected and the term ‘literacy’ has become a metaphor for making meaning, in which individuals use basic abilities to read and write together with the notion, awareness and beliefs to communicate effectively within their contexts. Based on a number of studies into literacy within a sociocultural perspective, Barton and Hamilton (2000) indicate that the nature of literacy includes six propositions:

1. Literacy is best understood as a set of social practices; these can be

-
- inferred from events which are mediated by written texts
2. There are different literacies associated with different domains of life
 3. Literacy practices are patterned by social institutions and power relationships, and some literacies become more dominant, visible and influential than others
 4. Literacy practices are purposeful and embedded in broader social goals and cultural practices
 5. Literacy is historically situated
 6. Literacy practices change, and new ones are frequently acquired through processes of informal learning and sense making. (p. 8)

The concept of multiliteracies

Theories of literacy as social practices emphasise the power relations within cultural and linguistic diversity. However some argue that such theories tend to focus more on practices of print literacy (e.g., Cope & Kalantzis, 2000; Perry, 2012), which accordingly places less emphasis on 'multiple communication channels' (Perry, 2012, p. 58) caused by technological changes. Derived from perspectives of literacy as social practices, some scholars have introduced the theory of multiliteracies (e.g., Cope & Kalantzis, 2009; Kress, 2003; New London Group, 1996) which acknowledges both the 'embeddness' of literacy in perspectives of literacy as social practices and 'modes of representation much broader than language alone (Cope & Kalantzis, 2000, p. 5)'. Cope and Kalantzis (2000) indicate that the theory of multiliteracies emphasises meaning-making through multiple modes 'in which written-linguistic modes of meaning are part and parcel of visual, audio, and spatial patterns of meaning' (p.5). Such a conception was termed as multimodality (e.g., Kress, 2003; Jewitt, 2006; Rowsell & Walsh, 2011; Walsh, 2009). In this sense, the theory of multiliteracies employs a broader scope to define *text* 'in multiple modes of visual, gestural, spatial and other forms of presentation' (Perry, 2012, p.59) through multiple media and technologies.

Studies that employ the perspective of multiliteracies then focus more on literacy practices with the use of digital technologies, which are usually regarded as *new literacies* (Lankshear & Knobel, 2011). It is worth noticing that how the text is defined within the perspective of multiliteracies and the focus of *new literacies* in fact suggest that the nature of literacy is being updated with the changing contexts of digital technologies (e.g., Coiro et al., 2008; Leu et al., 2004; Gilster, 1997; Gillen, 2014; Martin, 2008).

Digital literacy/literacies

Based on concepts and the nature of literacy discussed above, it has been recognised that literacy nowadays is associated with digital technologies as well as social and cultural contexts (e.g., Martin, 2008; Gilster, 1997; Leu et al., 2004). Coiro et al. (2008) argue that literacy acquisition in a technology-rich environment is situated in 'a larger mindset and the ability to continuously adapt to the new literacies required by the new technologies' (p.5). This suggests that 'literacies of digital' (Leu et al., 2004) involve 'mastering ideas' and 'mastering keystrokes' as two main aspects to understanding in what way technologies affect the definition of literacy (Bawden, 2008). Bawden (2008) regards 'mastering ideas' as a 'special key of mindset or thinking' of effective meaning-making by using multiple forms of texts, while 'mastering keystrokes' as technical proficiency of skills, tasks and performances with digital devices. Therefore, essential components of digital literacy involve basic technical skills, ability to assemble knowledge, background knowledge, attitudes and perspectives of the whole process of interactions with technologies (ibid.).

Gilster (1997) defines digital literacy as 'the ability to understand and use information in multiple formats from a wide variety of sources when it is presented via computers' (p.6). He comments that digital literacy is not just about central technological competencies. It also involves 'adapting our skills to an evocative new medium, [and] our experience of the Internet will be

determined by how we master its core competencies' (ibid.).

Martin (2008) proposed the definition of digital literacies as being:

the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesise digital resources, construct new knowledge, create media expressions, and communicate with others in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process. (p.167)

It appears that the ability to read and write, technological competencies and affective factors are involved as inevitable parts of digital literacy. A large number of studies employing such notions therefore tend to focus on individuals' interactions with technologies both 'to generate, communicate and share meaning' (Lankshear & Knobel, 2011, p.53) within a certain social and cultural context.

Therefore, literacy refers to more than the cognitive scope of reading and writing printed texts. Instead, literacy is embedded in social practices and its nature is updated with changing technological, social and cultural situations. Within the expanded notions of literacy, it is not hard to see that what individuals read, how they read and their roles in interactions with various forms of texts have accordingly changed, which has promoted changing perceptions of reading.

2.1.2 Perceptions of reading

Traditional views of learning to read are usually grounded in psycholinguistic theories, including behaviourist theories, interactive theory, cognitive psychology and schema theory (Goodman, 1976; LaBerge, 1974, Omaggio, 1993; Ortony, 1975; Rumelhart, 1976; Ruddell, 1976). Deriving from these theories, reading is

related to the ability to 'break-the-code-of print' (Turbill, 2001, p. 274), which is considered to be the main goal of learning to read (Perry, 2012). However many argue that learning to read is associated with more than 'sight word recognition and phonic decoding' (Stuart et al., 2008, p. 61) happening in individuals' minds. The ability to decode print has been perceived as being insufficient (e.g., Bearne, 2004; Kress, 2003; OECD, 2003) for the dynamic nature of literacy caused by technological changes in society.

Aligned to the changing nature of literacy over time, definitions of reading and reading literacy have accordingly kept up with social and cultural changes. Definitions of reading involve 'understanding, using and reflecting on written texts, in order to achieve one's goals and potential and to participate in society' (OECD, 2003). Written texts here refer to both printed texts and other formats presented through media (e.g., Bearne, 2004), which require readers to have abilities to communicate with a variety of modes effectively (Alvermann, 2009). In this sense, reading in the digital age includes many components: the basic ability to read print, abilities to construct meaning from multiple modes from different resources and the awareness, notions, values and beliefs of reading 'in a networked society' (Alvermann, 2008, p.14). In order to have a better understanding of perceptions of reading in the digital age, it would be useful first to examine the overall reading environment in the digital age and changes in three elements of the reading process (Snow, 2002): the text, the reader and the reading activity.

The changing digital environment of reading

Since computers began 'gaining a strong foothold' (Reinking, 1998) from the mid-1980s, the dominance of printed texts in literacy has been changed. Printed and digital texts can be found in workplaces, educational institutions and households (e.g., Ito et al., 2009; Moje et al., 2008). The co-existence of printed and digital texts in the digital age has been widely recognised in literacy research

(Kupier et al., 2008; Lankshear & Knobel, 2011; Leu et al., 2008).

'A changed classroom' packed with various technologies (Rochette, 2007) for teaching and learning is an explicit example of the digital environment of reading. Students accordingly are exposed to a changing context in terms of texts, values, beliefs, attitudes and social identities when technologies of multimedia are included in their classrooms (Leonard & Hill, 2008). Such an example could be found in many countries, such as the UK and China, which have witnessed the wide adoption of technologies. Buckingham (2007) recorded that the UK government provided successive support for the introduction of technologies to education. Students in 70% of schools in the UK had access to tablet computers by 2014 (Coughlan, 2014). In China, the Education and Information Technology Ten-Year Development Plan (2011-2020) was launched by the central government to enhance the integration of technology in education (MoE PRC, 2012). It seems that the general environment of reading has been partially identified by the changing technologies (e.g., Leu et al., 2013) in both the UK and China. It could be assumed that the way that students interpret reading and their literacy practices may be mediated by their practices of using both printed and digital texts.

In the light of the expanded notion of literacy located in social practices, the environment of reading outside of school has been broadened into a wider range of literacy practices with texts from paper and on screens (e.g., Lankshear & Knobel, 2011) due to the vast adoption of technologies in households. In the UK, by 2015, 86% of households had internet access (ONS, 2015). In China, the internet penetration rate reached 46.9% among the whole population (CNNIC, 2014). Investigations of individuals' literacy practices, digital remixing (Lankshear & Knobel, 2011; Lessig, 2005, 2008), blogs and wikis (Baumer et al., 2011; Wheeler & Wheeler, 2009), instant messaging (Lewis & Fabos, 2005;), and the use of social network sites (Ellison, 2007; Greenhow & Robelia, 2009) in the

technology-rich environment at home have revealed the changing digital environment of reading in non-institutional settings.

The digital environment of reading shaped by the wide spread of digital technologies seems to be an explicit embodiment of the 'digital turn' of literacy/literacies. Meanwhile, such a 'digital turn' tends to be embedded in the transforming aspect of the text.

The changed texts of reading

It has been largely recognised that the text of literacy/literacies no longer refers just to the printed format within the changing 'textual landscapes' (e.g., Carrington, 2005; Jewitt, 2008, 2012; Kress, 2003), especially when digital technologies have been largely adopted in various living and learning settings. The text, as a basic component of reading, has also been moving beyond the scope of printed texts. It is argued that digital technologies contribute to 'intensifying multimodal possibilities' (Lotherington & Jenson, 2011).

Texts used in practices of using technologies have been recognised to be a digital hybrid of text, sound, image, digital video, and other communication functions (Marsh, 2007; Jewitt, 2005). According to research (e.g., Littlejone et al., 2012; Mills, 2010), digital hybrid of texts could be found in Wikis, blogs, databases, and online news and other forms of electronic texts. In Reinking et al.'s (1998) research into the characteristics of texts used through multimedia, it is suggested that electronic texts are 'much more than translation of printed documents into binary electronic form' (p.1). Meanwhile, texts in online settings are featured in non-linearity composing with multiple-media texts, hypertexts and interactive texts (Coiro, 2011, 2012; Tapscott, 1998). In other words, texts are not perceived in a linear and fixed context. Instead, texts are presented in various modes in a non-linear and open context, in which individuals are expected to jump through many resources by locating, evaluating and integrating online texts to construct

meaning for what is read (e.g., Afflerbach et al., 2013; Coiro, 2009; Gilster, 1997;).

The concept of multimodality in literacy (e.g., Kress, 2003) has been recognised due to emerging hybrid digital texts used in individuals' daily living and learning together with printed texts. Multimodality refers to employing more than one mode of representational and communicational resources, including modes in written words, visual, audio, gestural, spatial and actions/movement and so on (Bearne, 2004; Cope & Kalantzis, 2000; Jenkins, 2006; Jewitt, 2008; Littlejone et al., 2012; Mills, 2010; New London Group, 1996).

It should be noted that a multimodal perspective is not unique to digital texts. Jewitt (2005) argues that both print and digital texts are multimodal. Printed texts are multimodal in terms of involving words-plus-images (Bearne, 2004). However, digital texts are more concerned with 'the configurations' of modes of texts (Jewitt, 2008, p.241). Therefore *the text* of reading in the digital age needs to be perceived in a broader context where 'words and print are no longer the dominant mediums' (Walsh, 2003, p.123), and texts are presented in various modes due to technology changes.

The changed nature of readers

According to traditional views of reading grounded in psycholinguistic theories, readers extract the meaning of what they read in their heads by decoding texts and drawing on prior knowledge of reading materials (e.g., Goodman, 1976; Kirby & Savage, 2008; Kucer, 1987; Sheridan, 1981). However, the changed texts in a variety of forms of presentation in new textual landscapes have promoted new forms of interactions between readers and texts. Readers who are exposed to multiple modes of texts are expected to adjust themselves to make sure that they are not lost 'in a multimodal context' (Leu & Forzani, 2012), especially when reading online.

The multimodal features of texts enable individuals to engage in interactions between texts and other people, which are keys for meaning-making so as to be in the contextual situations (Jewitt, 2008; Gee, 2014). For example, Patterson (2000) demonstrates that reading with digital hybrid forms of texts tends to be different to print reading. He argues that the roles of readers and authors have to some extent been restructured because the non-linearity of digital texts allows readers to participate more in the text rather than their being passive receivers, which may to a degree support the practices of meaning-making. It seems that the multi and hybrid forms of texts in the digital age have promoted a more interactive process of reading, during which the readers' own construction of meaning takes place.

Some suggest a 'reader-viewer' perspective (Serafini, 2012) to explore changes of readers' roles 'in a networked society' (Alvermann, 2008). As Serafini describes, reader-viewers refer to those who 'attend to the visual images, structures, and design elements of multimodal texts in addition to written language' (p.27). Serafini argues that the construct of 'reader-viewer' can be a new means of thinking about non-conventional reading because readers would take roles as 'navigator', 'interpreter', 'designer' and 'interrogator' when they deal with multiple modes of texts. Hedberg and Brudvik (2008) suggest that the use of social software in Web2.0 enables readers to become producers rather than simply consuming information. Such changes of roles for a reader in new textual landscapes may to some extent affect individuals' motivation, purpose, together with other affective aspects of their reading (Coiro, 2009; Robb, 2000). It could be assumed that people who are surrounded by multiple modes and are exposed to the Internet might not struggle when reading in a multimodal and nonlinear context. Readers in the digital age therefore may have several reading identities (McKenna et al., 2012) when they interact with both printed and digital texts in a range of reading or literacy practices.

The changed reading activities

The multimodal perspectives on literacy address the issue of the components of the meaning making process by adopting and interpreting various modes of 'presentational and communicational resources' (Jewitt, 2008, p.246). Interactions between individuals and complex multimodal ensembles have been seen as important for meaning-making in the digital communication age. The hybrid digital forms, therefore, are integral to most new literacies in which new types of engagement and interactions are embedded in a range of new literacy practices in everyday life (Lankshear & Knobel, 2011; Mill, 2010). In this sense reading activities happen within individuals' practices of meaning-making in a blended reading environment in individuals' daily living practices by configuring, circulating and recycling various modes represented through digital technologies in different ways (Jewitt, 2009).

Reading activities then move beyond reading print or reading picture books. Reading could happen in practices of instant messaging (Lee, 2007) and production of multi modes such as online fan fiction writing (Black, 2009), movie making (Ranker, 2008), digital story telling in class and remixing (Lankshear & Knobel, 2011). According to research (e.g., Alvermann, 2001, 2010; Alvermann et al., 2007; Livingstone, 2010), young people who are exposed to changing technologies tend to employ multimodal texts in various meaning-making processes especially in social networking in out-of-school setting. Ideas of 'what is to be learnt' and 'how is to be learnt' could be inevitably reshaped through social practices with the employment of multimodal texts (Jewitt, 2008, p.241). It has therefore been gradually realised that multimodal texts may link personal practices outside of school to learning in formal setting, which would tend to support the need to embrace multimodality in classroom practices (Jewitt & Kress, 2003; New London Group, 1996; Walsh, 2010).

However, it seems that reading activities using multimodal texts are still not

popular in curriculums although such technologies have been largely adopted in schools (Bearne & Wolstencroft, 2007). Such situations have caused many debates over the teaching of reading in a multimodal context. It has been argued that if meaning making processes are to be supported, then the literacy practices required for multimodal texts in a period of rapid societal and technological changes also require a pedagogical shift from monolingual to multimodal representations of texts (Luke, 2003; New London Group, 1996; Siegel, 2012). The pedagogical shift in response to societal and technological changes emphasises the need to assist both teachers and students to investigate multimodal texts in teaching and learning (Siegel, 2012).

Meanwhile, the use of multimodal texts has been seen to positively engage students in literacy practices by promoting interactions (Jewitt, 2008; Zammit, 2013). In a study of the introduction of multimodal texts in pedagogical instructions (Zammit, 2013), multimodal texts have been recognised to be able to scaffold active engagement in 'thinking, feeling and acting' (p.205). It has been well established that multimodal literacies should be employed in school literacy curricula to keep pace with societal and technological forces (Siegel, 2012; Serafini, 2012) by focusing on cultivating students' capability of interpreting multimodal texts. The notion of employing multimodal texts in pedagogical practices for teacher education, profession development and policy making is also becoming accepted even though multimodality is still finding its way to fit into the transformation of pedagogies (Bazalgette & Buckingham, 2013).

It appears that reading activities involving configurations of hybrid digital forms and written texts in both in school and other settings are results of responses to the shifting and changing textual landscapes (Kress, 2003; Jewitt, 2005, 2008; Rowsell & Walsh, 2011; Walsh, 2010; Siegel, 2012).

Based on the discussion above, texts in the digital age are fluid, nonlinear and

multimodal (Bolter, 1998; Kress, 2003) rather than fixed on paper in printed format. Multimodal texts are linked to social and cultural contexts (Gee, 2010) through interactions embedded in literacy practices to facilitate individuals' being and meaning-making. Meanwhile the 'dynamic quality' of texts on screen has promoted changes in the way that individuals respond to various formats of texts in the digital age (e.g., Hamilton, 2010; Martin, 2006; Gee, 2015). Therefore, reading in the digital age as a meaning-making process is embedded in social practices, which are aligned to the nature of literacy in the digital age.

It could be speculated that what young people think about reading within the digital environment would be different to their thoughts about reading in the print-dominant environment, especially for those who were born and are growing up in the digital age. Understanding what individuals think about reading in the digital age in terms of their preferences for text formats, skills for successful online reading comprehension, and strategies for reading various modes of texts would deepen our understanding of what reading is and the nature of literacy.

This study considers adolescents' perceptions of reading. This suggests I need to examine what is meant by perception in this study and to justify why adolescents' perceptions of digital reading matter.

2.2 Why do we consider students' perceptions and adolescents' perceptions of reading?

In the discussion above regarding the changing notions of literacy within the digital environment of reading, perceptions of reading in the 'new textual landscapes' (Carrington, 2005) have been placed in broader contexts. Simply deriving meaning from what is read seems to be not enough (OECD, 2003). It has been argued (e.g., Lankshear & Knobel, 2008, 2011; Street, 2005, 2008) that

reading is embedded in social practices where ‘understanding, using and reflecting on written information for a variety of purposes’ (OECD, 2003) are included. It appears that affective aspects of readers have been emphasised as well, rather than just focusing on the cognitive components of reading, such as reading skills (e.g., Hock et al., 2009; Morgan & Fuchs, 2007). In terms of digital reading, McKenna et al. (2012) argue that there has been an expanded idea of what constitutes literate activities because ‘digital environments are not simply electronic version of print counterparts’ (p.285). Martin’s (2008) definition of digital literacy also involves the ‘awareness’ and ‘attitudes’ as components, which suggests that affective aspects need to be considered as well for insights into what constitutes reading. Echoing such expanded ideas, Bulfin and Koutsogiannis (2012) demonstrate that ‘a skills-based strand’ is not enough to understand the ‘complex meaning making activities’ due to the changed elements of reading.

Therefore, on the basis of the dynamic nature of literacy in the digital age, serious consideration of what readers think about digital reading seems to be important in order to deepen our understanding of the nature of reading in the digital age.

Another reason to explore readers’ perspectives of reading is that investigations into readers’ perceptions of reading may ‘contribute to our understanding of reading comprehension and reading difficulties’ (McKenna et al., 2012, p.284). Studies (e.g., Anmarkrud & Bråten, 2009; Taboada et al., 2009) of the relationship between motivational components and overall reading achievement are in line with such an idea. For example, Anmarkrud and Bråten (2009) researched the link between motivation and reading comprehension. They found that the motivational component of reading tasks was a positive predictor for reading comprehension when achievement in the domain, topic knowledge, and strategic processing were controlled. These investigations suggest that affective dimensions can provide a more holistic picture of reading development, which offers some confirmation that a greater range of factors, such as the perspectives

of students, are useful for a fuller understanding of successful reading experiences.

Meanwhile, it has been argued that students' perspectives of reading, such as their awareness, attitudes, motivation and reading habits, can support the effective teaching of reading in schools in terms of engaging students (e.g., Alvermann, 2002; Gunthrie et al., 2011; Levy, 2009; McKenna et al., 2012; Wray & Medwell, 2006). Wray and Medwell (2006) researched a group of UK pupils' perspectives on literacy teaching (the literacy hour) to demonstrate the importance of a greater understanding of students' perceptions of literacy. They argue that 'learners are continually involved in socially constructing the reality of their classroom experiences' (p.205), which makes a curriculum impossible to impose on students. They suggest that that much more consideration of students' perceptions of literacy would be needed to support better outcomes of literacy instruction. Similarly, Levy (2009) studied young children's perceptions of reading by examining their use of literacy schemes from Nursery and Reception. It was found that young children's perceptions of reading were shaped and influenced by the dominant literacy scheme in school which discouraged some of them from attempting to read outside of the scheme. According to the relationship between students' perceptions of reading and their reading habits found in her study, she argues that staged reading systems should be used especially when reading has been perceived far more than the ability to read and write. It seems that students' perceptions of literacy or reading play an important role in ensuring that teaching approaches of literacy work well.

Investigations into the perspectives of adolescents stress on the one hand the possible impacts of young people's voices on policy and teaching (e.g., Hasley et al., 2006; Rudduck & Fielding, 2006). On the other hand such investigations may give insights into the developmental needs of adolescents especially in literacy development in the digital age (e.g., Ippolito et al., 2008; Coleman, 2011; Gee,

2000; 2012; Singer & Singer, 2012). There have been more advocates of more investigations into adolescents' voices and their perspectives on literacy in recent years (e.g., Alvermann, 2002; Atkinson, 2006; Hasley et al., 2006; Melnick et al., 2009). Halsey et al. (2006) reviewed 26 research articles on the impacts of young people's voices. Based on evidences found by reviewing those studies, they demonstrate that the voices of young people play an active and positive role in both policy and practices of teaching and the curriculum.

Young people are key stakeholders in education. The call for more consideration of adolescent literacy (e.g., Alvermann, 2002; Blanton et al., 2007; Cassidy & Grote-Garcia, 2012) appears to echo such a concept. The changed assumptions of adolescents within the changing social and technological situation have caused some concerns about 'the particular challenges of post primary-grade reading' (Jacobs, 2008, p.7). The notion of a literacy 'crisis' among adolescents has been discussed in the USA (Jacobs, 2008; Salinger, 2011; Sulkunen, 2013) when literacy has been perceived to involve abilities to read and write, and the technological skills and awareness and beliefs to make meaning. 'An urgent call for action' (Sulkunen, 2013) of adolescent literacy therefore would be needed to enable adolescents to be well prepared for both post-secondary education and the workplace in a technology-rich environment.

It has been widely acknowledged that reading in the digital age is different from print reading because of the changed elements of reading discussed above. Adolescents who are regarded as the most relevant group in terms of the impact of technological changes (Coleman, 2011), are engaging in a range of textual engagements with both digital and printed texts. Moore et al. (1999) discussed that 'adolescents entering the adult world in the 21st century will read and write more than at any other time in human history' (p.3). However, many students struggle as adolescents in terms of reading (e.g., Jacobs, 2008; Slavin et al., 2008). One of the causes or correlates of adolescent reading difficulties may well be

students' beliefs about being a reader (Guthrie, 2008; Salinger, 2011; Yudowitch et al., 2008). It could then be speculated that the way in which adolescents interpret reading and the whole process of reading is likely to affect reading performance. Hence, explorations of what adolescents' perceptions are regarding reading in the digital age would be useful to assist with the identification of reading difficulties and challenges. Effective teaching instruction of reading could then also be promoted.

The study of adolescents' perceptions of reading in the digital age could broaden our understanding of adolescents' identities in reading (McKenna et al., 2012; Moje et al., 2008; O'Brien, 2012). It has been discussed that adolescents' reading identities are usually examined by assessing their school-based literacy performance (O'Brien et al., 2009). However, this may lead to relatively incomplete views of the reading identities of adolescents, for example students may be regarded as struggling readers although they might have positive reading identities gained through a wider range of literacy practices in out-of-school setting (ibid.) Therefore, investigations of how adolescents construct themselves as readers and their views about reading in the digital age would provide useful information towards a more holistic picture of their multiple reading identities. Inclusive and motivating teaching instruction could also be designed to enhance students' approaches to reading if we had better understanding of what they think about reading (Pitcher et al., 2007). More importantly, the ways adolescents interpret digital reading provide a useful dimension in understanding their responses to a digital environment for reading and an expanded notion of literacy. Melnick et al. (2009) argue that the perceptions 'that individuals possess about literacy will play a vital role in shaping their engagement with' the process of literacy practices (p.2). It could therefore be assumed that adolescents' perceptions of digital reading provide insights into the dynamic nature of literacy that is being updated with changing technologies within certain social and cultural contexts.

However, few studies of adolescents' perceptions of reading have been conducted (Alexander & Fox, 2011; Melnick et al., 2009; Pitcher et al., 2007). Melnick et al. (2009) designed Reader Self-Perception Scales 2 to investigate students' perceptions of reading beyond Grade 7. Similarly, Pitcher et al. (2007) also conducted a study to examine adolescents' perceptions of reading in terms of their motivation to read by using several surveys. But neither of these was largely adopted. It is not hard to see that less is known about adolescents' perceptions of reading in the digital age, which suggests more consideration and investigation into this area is required.

As discussed, this study will investigate how adolescents perceive digital reading in the light of their literacy practices both in and outside school settings. Therefore it is important to establish an idea of adolescents in the digital environment of reading and their literacy practices in the digital age. Meanwhile, perceptions of reading have moved beyond the ability to read and write, which suggests that it would be worthwhile to understand preferences among text formats, gender differences in reading and online reading comprehension in the digital age.

2.3 Young people in the digital age

It has been largely recognised that technologies are playing an important role in people's daily life, especially in their daily social practices (e.g., Cassidy & Grote-Gracia, 2012; Clark, 2013; Lankshear & Knobel, 2011; Livingstone, 2008). Coleman (2011) argues that changing technologies are apparent to everyone, however, for 'no group is thus of more relevance than adolescents' (p.8). Singer and Singer (2012) explain that it may be because young people nowadays are surrounded by technologies and all these digital tools are easily accessible to 'even some of the youngest children' (p.1).

The concept of 'digital natives' (Prensky, 2001) or the 'Net generation' (Tapscott,

1998) suggests that younger people who were born after the 1980s are immersed in technology-rich environments. This generation are said to have sophisticated skills and knowledge of technologies, different from those of older generations, referred to as 'digital immigrants', who tend to be less skilled in digital technologies. Prensky (2010) argues that changes in education are needed because of the gap between 'digital natives' and 'digital immigrants' in terms of knowledge of, and skills with, technologies, which means that education today carries the risk that it does 'not meet the needs of a new generation of 'tech-savvy' learners' (Bennett & Maton, 2010, p.324). However, it should be noted that there are several flaws with the concept of 'digital natives' because this was developed 'on the basis of claims rather than evidences' (ibid., p.321).

The widespread assumption of 'digital natives' addresses the availability of digital technologies (Hargittai, 2010), which however does not necessarily suggest that people would automatically pick up technical skills if they were to be exposed to digital technologies. Wesch (2010, cited in *The Economist*) noticed that many young adults had a superficial familiarity with the digital tools that they usually used. Helsper et al. (2009) also found that older generations ('digital immigrants') in several instances could be skilled in technologies as well. The 'digital natives' theory focuses on the dichotomy between the younger generation and others on the basis of technological immersion. This results in a failure to see actual practices across the generations. It has been argued that both skills with and knowledge of technologies are linked to breadth of use, experience, self-efficacy and education, rather than just to individuals' ages (ibid.). Therefore, generation is not the only determining factor of individuals' technical skills and knowledge.

More importantly, concepts of 'digital natives' fail to see variation within the younger generation in their practices (Bennett et al., 2008). According to research (Bennett et al., 2008; Hargittai, 2010; Helsper & Eynon, 2010;

Livingstone, 2008), the younger generation may not be skilled in accessing and evaluating information critically, although 'they are more likely to use the Internet as a first port of call for information' (Helsper & Eynon 2010, p.5). In other words, the fact that young people tend to use the internet regularly does not necessarily guarantee successful online reading with sufficient online reading skills. Young people's exposure to unbounded online environments in the digital environment of reading (Lawless & Schrader, 2008) also causes debates over the impacts of the use of the internet on deep reading. Carr (2010) demonstrates that deep reading suffers as technologies advance with digital environments of reading being reshaped and the nature of the texts changing. Readers are accordingly expected to deal with various challenges when reading digitally to support successful online reading experiences (Coiro et al., 2011). It could then be assumed that as with other generations, young people are still confronting challenges when using technologies and the internet. The availability of technologies and age then are not the only issues to be considered when examining people's technical skills.

Critiques and debates about the concepts of 'digital natives' have led to the suggestion that more nuanced investigations into young people's daily practices and the ways they respond to changing situations of technology are needed (Bennett et al., 2008; Ryberg & Larsen, 2012).

It has been recognised that adolescents nowadays are exposed to 'a range of print and nonprint materials from infancy through adolescence' (IRA 2012, P. 4) due to the widespread popularity of digital technologies. Moore et al. (1999) realised that 'adolescents entering the adult world in the 21st century will read and write more than at any other time in human history' (p.3). Many studies have been completed in response to this realisation that extend our knowledge of adolescent literacy in the digital age in terms of policy and pedagogy (Graham & Perin, 2007; Heller & Greenleaf, 2007; IRA, 2010; OECD, 2010), literacy

development (Meltzer & Hamann, 2005), and other dimensions. Although many studies exploring young people's literacy practices (e.g., Alvermann, 2002; Beach et al., 2009; Lessig, 2008;) have been completed to investigate the nature of adolescent literacy within the changing digital environment of reading, little is known in terms of how adolescents themselves perceive reading with both printed and digital texts in their current social and cultural contexts. Research into what young people think about the reading literacy of digital reading based on their responses to various text formats would provide supports for adolescents as incomplete adults (Alvermann, 2002) to step into adulthood with sufficient knowledge and skills of being literate in the digital age.

2.4 Literacy practices of reading in the digital age

It has been widely acknowledged that in the new textual landscapes of reading, young people are experiencing the 'changing equipment use' (Burnett, 2014, p.192) of technologies in the settings of school and outside of school (Bulfin & Koutsoginannis, 2012; Rowsell & Walsh, 2011; Smith & Moore, 2012; Walsh et al., 2007). Gillen and Barton (2010) demonstrate that 'humans interact with technologies in new ways with innovative purposes' (p.4) because of the availability of digital tools in daily living and learning and their impacts on individuals' ways of engagement with texts (e.g., boyd & Ellison, 2007; Brown & Rruthkosky, 2012; Ito et al., 2009). Inspired by the expanded notion of literacy in the digital age, it appears that young people's literacy practices of reading are shaped by the technologies within certain social and cultural contexts (e.g., Edward, 2012; Gee, 2010; Leu et al., 2008; Street, 2003, 2008).

2.4.1 Literacy practices of reading in school

It has been discussed that there has been 'a changed learning and communication paradigm' (Walsh, 2008, p.101) in institutional settings due to the penetration of technologies. The idea of integrating technologies in education

has been widely adopted in many countries, for example UK and China (e.g., BESA, 2015; MoE PRC, 2012) by putting huge investment in facilities and networks as well as teachers' professional development (e.g., FT, 2015; MoE PRC, 2010). Underwood (2009) provided some empirical evidence in terms of improved academic performance with technologies in education in some UK schools to support a positive view of educational technology integration. According to a report of BESA (2015), by 2014 there were 2,722,000 computers in UK schools and the majority of them were connected to the internet. Meanwhile, around half of computers in school were portable. '47 percent of computers in schools were portable laptops and tablets' (p.10). In China, since the 1990s many educational institutions including schools and universities started introducing informational and communicational technologies into teaching and learning (Ge et al., 2012). Apart from facilitating schools and universities with computers and networks (Lei, 2010), some schools carried out 'Digital Schoolbag' projects, in which teaching and learning happen on digital portable devices, in order to enhance the integral role of technologies in education (Xu et al., 2013; Zhang, 2011).

Under such a changed teaching and learning paradigm in schools, students inevitably use both printed and digital texts within a range of literacy practices (Mills, 2010). It could be assumed that literacy practices of reading in school would be more complicated than just reading from paper. According to research, students in the digital environment of reading have various digital textual engagements through teachers' active use of technologies in class (Bitter & Pierson, 2002; Firmin & Genesi, 2013; Williams et al., 2000), such as digital story telling (Ohler, 2013; Sadik, 2008) and collaborative discussion (Robin, 2008). According to Ohler (2013), digital storytelling seems to have become a powerful technological application which supports personalised content production in many English language arts classes. During the process of storytelling, students are encouraged to be active in combining story materials with multimedia, including graphics, music, audios, and video. In a case study as an initial pilot

study in a UK secondary school using wikis based on a history-based research (Grant, 2006), it was found that collaborative discussion happened more about technological subjects, such as visual design and other skills than on knowledge building. In this sense, it appears that student literacy practices of reading include the manipulation of various modes of texts to support knowledge building and meaning making, and at the same time they are shaped by the use of technologies. Similarly, students in China are also exposed to the multimedia classrooms with an integration of ‘texts, graphics, audio, and animations’ (Ge et al., 2012, p.186), which may result in textual engagements with both printed and digital texts. A study of a group of Chinese undergraduate students using an online discussion forum on web-based learning systems showed that students had textual engagements by having access to blogging software, installing bookstore and other learning resources (Zhao, 2008).

Meanwhile, it has been noted that when students are engaging in practices of reading different formats of texts they are also experiencing a changing role in the ‘changed learning and communication paradigm’ (Walsh, 2008, p.1), such as the role of a collaborator, a partner or a constructor of meaning. Teachers then have been taking more responsibility as a guide or a facilitator when integrating technology in teaching (e.g., Cviko et al., 2014; Goos et al., 2000; Zhu et al., 2010). According to research (e.g., Moeller & Reitzes, 2011), the changing roles of teachers and students could be a result of the positive impacts of technological integration on the transformation of pedagogy in terms of student-centred teaching and learning.

It seems that students’ literacy practices of reading by manipulating different modes of texts have been promoted in the technology-rich context of school. However, students do not necessarily have the chance to interact with digital texts actively, especially when teachers use technology in class with relatively negative beliefs about technology integration (Inan & Lowther, 2010), even

though they are surrounded by digital technologies in the context of school. Inan and Lowther (2010) explored influencing factors of technology integration among teachers and found that the level of technology integration was mediated by teachers' beliefs, their readiness and the school culture (Hew & Brush, 2007). Some other studies also examined the factors that influence technology integration in education, such as teachers' role in integrating technology in terms of their acceptance and attitude towards technology (Chen, 2008; Teo, 2008, 2009; Ting, 2010; Robertson et al., 2012). Therefore some researchers argue that transformation of pedagogy with technology integration is still a long way ahead because the process of technology integration is affected by various factors that act as potential barriers such as teachers' attitudes technology integration as well as their competencies of using technologies to teach (Ertmer, 1999; Ertmer et al., 2012; Guzman & Nussbaum, 2009; Lawless & Pellegrino, 2007) rather than being simply determined by the availability of technologies (Bennett & Matton, 2010). It could be seen that the level of technology integration is varied, depending on a range of factors, which may also influence students' literacy practices of reading and their ways of interacting with texts.

Apart from literacy practices of reading shaped by technology integration in teaching, students also have some self-determined literacy practices in school. For example, an increasing number of schools in the UK have adopted 'Bring Your Own Devices' schemes, which encourage students to bring their digital devices to school, to support flexibility in learning with technology and to help students engage more in learning (BESA, 2013). However, in China, there is not an equivalent project that allows students to use personal devices in school.

These studies in fact indicate that students' literacy practices of reading in school are situated (Hamilton, 2010) in certain ecologies of the reading environment where there are a range of relevant factors, such as the availability of technologies, teachers' integration of technologies, school regulation of students' use of devices and possibly students' view of new textual landscapes.

2.4.2 Literacy practices of reading out-of-school

Due to the penetration of technologies, literacy practices of reading in out of school settings also go beyond printed texts (Gee, 2009). Using technologies for textual engagements seems to be very common among young people in out-of-school settings.

According to the 2014 Ofcom CMR (The Communication Market Report, 2014), 60% of young people (aged 16-24) in the UK tended to choose to read news online. Meanwhile, the use of portable devices, especially mobile phones, has become very popular among the young people in the UK (Clark, 2013). A report by YouGov (2015) showed that smartphone was one of most commonly used devices for internet access. By 2014, 41% of children aged 5-15 owned a mobile phone and 31% of them had a smartphone (Ofcom, 2014). Lenhart et al. (2010) demonstrate that many young people embrace the smartphone 'as the centrepiece of their communication strategies with friends' (p.1). Accordingly, a wide range of literacy practices for both learning and entertaining through technologies have been discovered among young people. A national report into UK young people's reading (aged 8-16) showed that texts (text messages), websites and social media were found to be the most common reading materials outside of class (Clark, 2012). The most common online activities for adolescents aged 9-16 include using the internet for schoolwork, playing games, instant message, watching video clips and so on (Livingstone, 2013).

In China, mobile phones are also very popular among young people. 46.5% of young people aged 12-17 were found to have at least one smartphone (eMarketer, 2014). A report discovered that by 2014, 41.9% of surveyed citizens claimed to have had experience of reading on mobile phones. The survey also reported that there had been a rapid increase in digital reading, including online reading, texting, e-reader reading and reading on mobile phones (The Academy of Press

and Publication, 2014). Regarding the textual engagements using technologies, examples included using online dictionaries, texting, email, participating in online discussion, social networking and searching for information have been found to be the most regular reading activities in daily life (Lee & Wu, 2013).

Following the notion of literacy as a social practice, the literacy of digital reading is far more than the change of media from paper to screen, or simply using technologies as tools to enhance students' interest in learning (Glover & Miller, 2001). However, some researchers (e.g., Bulfin & Koutsogiannis; 2012; Luke, 2004) demonstrate there has been a home-school literacy mismatch. They indicate that literacies outside of school are broader than those of school literacy and have been drawing on social practices such as reading online news (Johansson, 2014), emailing (Lenhart, 2012), texting for social and academic (Ahn, 2011), social networking (boyd & Ellison, 2007; Thurlow et al., 2004) and interest-driven or themed online discussion (Carr, 2011), which are not well valued in school.

It has been argued that literacy practices outside of school are regarded as creative and active practices (Bulfin & Koutsogiannis, 2012) and are embedded in contemporary culture and social practices (Gee, 2015; Lankshear & Knobel, 2011). Intensive attention has been paid to literacy practices in informal contexts by exploring 'complex meaning making activities' in the digital age (Bulfin & Koutsogiannis, 2012, p.333) to understand the way people 'generate, communicate, and negotiate meaning' through individuals' textual practices with multimodal texts (e.g., Black, 2009; Gilster, 1997; Ito et al., 2009; Leu et al., 2004).

Johansson (2014), for example, explored the way that individuals read digital news and found that users were active when they 'remediate, share news texts, manage, and/or archive information' (p.31) instead of simply reading news online. Meanwhile, users were found to negotiate and present meaning in their

own formats and share it with other online users. She argues that reading online is a sociocultural activity through which users as readers, listeners or writers would be able to make meaning in a networked culture.

Meanwhile, many studies have been carried out of the literacy practices involved in social networking because social networking has become a 'significant dimension' (Buckingham, 2007) in the life of the younger generation. Buckingham demonstrates that during the textual practices of using 'a multiplicity of modes' (Kress, 2003) the relationships of young people have to some extent been reformed 'in the domain of popular culture', which he argues as a culture shift. Thurlow et al. (2004) suggest that young people's textual practices of social interactions on the internet support relationship building and maintenance during their process of meaning making within the mediated contexts of digital culture (boyd & Ellison, 2007). Such notions of power relations being embedded in literacy practices of social media or digital media (Brown & Ruthkosky, 2012) are echoed in the concept of affinity (Gee, 2004; Lammers et al., 2012; Lankshear & Knobel, 2011). Based on Gee's argument (2004), affinity can be regarded as some particular spaces in which 'newbies and masters and everyone else' are interacting around a 'common endeavour' (p.85). It has been argued that literacy practices, especially those that take place online, are not about literal issues *per se* (Lankshear & Knobel, 2011). They are indeed more about individuals who have similar interests or identification engaging 'in these spaces together in collaborative relationships' (Lammers et al., 2012, p.48). Ito et al. (2009) traced 'friendship-driven' and 'interest-driven' patterns of participation among adolescents' literacy practices outside of school, which supports that literacy practices are embedded in the contemporary culture.

Given that literacy is situated in certain social and cultural contexts, literacy practices at home could also be mediated by various factors such as the availability of technologies and parents' support or attitudes toward textual

engagements with printed and digital texts (e.g., Plowman et al., 2008). Plowman et al. (2008) examined young children's use of technology at home. It was found that children's learning with technology was a result of copying, observation and response to the social landscape of the family. They argue that the social landscape of the family, including parents' support and their practices and beliefs about using technologies, plays an important role in the culture of family literacy. It could be assumed that literacy practices at home could also be shaped by the family literacy environment.

Overall, it appears that literacy practices in the context of school and outside of school have moved beyond textual practices of print and become embedded in a variety of social practices (e.g., Gee, 2004, 2010; Lankshear & Knobel, 2011; Street, 2008), even though there is a mismatch between school and home literacy, as has been argued (Bulfin & Koutsogiannis, 2012). A large number of literacy practices within the changed textual landscapes have been investigated, however, little is known about what young people think about their interactions with both printed and digital texts within their daily social practices. Investigations of young people's interpretations of their use of printed and digital texts in the changed landscapes would broaden our knowledge of the nature of reading/literacy in the changing social and cultural contexts.

2.5 Reading print and reading digitally

The comparison between screen-based and printed texts has been attracting research interest for several decades due to the pervasive use of digital technologies in individuals' daily living and learning, together with the use of printed texts (Dillon, 1992; Fortunati & Vincent, 2014; Noyes & Garland, 2008). Noyes and Garland (2008) argue that the comparison is not concerned with 'which medium will dominate', although there are reports showing that digital books outsell physical ones (Miller & Bosman, 2011; PwC, 2014; Sweney, 2014).

It is rather focusing on the effects of text formats and use of medium on readers' reading behaviour/habits. A number of studies have investigated into the reading process of print and digital reading to get insights into affecting factors of certain text formats and of the use of medium on reading comprehension and performances (Ackerman & Goldsmith, 2011; Daniel & Woody, 2013; Eden & Eshet-Alkalai, 2013; Lai et al., 2012; Mangen et al., 2013; Rockinson-Szapkiw et al., 2013; Siegenthaler et al., 2011; Woody et al., 2010). It has been recognised that individuals nowadays who are exposed to both digital and printed texts could exercise choice over which text formats to use and how to use them, taking into account both usability and compatibility of texts (Fortunati & Vincent, 2014). Studies of investigations into the equivalence of texts on screens and printed texts on reading performances and reading habits have been enriching our understanding of factors that influence individuals' preferences of certain text formats to meet their reading purposes and tasks (DeStefano & LeFevre, 2007; Foasberg, 2014; Fortunati & Vincent, 2014; Noyes & Garland, 2008; Mueller & Oppenheimer, 2014; Zhang & Kudva, 2014). Moreover, as literacy practices and the nature of literacy have been recognised as being related to social and cultural contexts, a cross-culture exploration has been employed to obtain a more complete picture of influencing factors in different contexts (Fortunati & Vincent, 2014).

As reading goes digitally, some other comparisons between printed texts and digital texts are concerned with how digital forms of texts affect deep reading (e.g., Douglas-Fairhurst, 2011; Nielsen, 1997; Weeks, 2001). Some of the public media (e.g., Weeks, 2001) concerns that deep reading is fading away because many readers are browsing, skimming and scanning when reading online or on screen rather than actually reading. Nielsen (1997) suggests that as readers read slower on screen than with print reading (Evans et al., 2009) which leads them to read on screen can be regarded as a lack of deep reading. However, it has been argued that browsing, scanning and skimming digital texts are reading strategies

that humans use to respond to digital texts in order to adapt to the changed reading environment (Rosenwald, 2014). It might be true that if individuals did not think of reading on screen 'as technological' they might respond differently if a technology for digital reading 'becomes commonplace' (Lankshear et al., 2000, p.238). In other words, some habits or behaviour of reading digitally might make us think of reading digitally as a natural way of reading if individuals are experienced in digital reading. Meanwhile, aforementioned habits of reading digitally do not necessarily suggest the decline of deep reading because individuals are reading 'lengthy pieces of writing' online digitally, instead of reading small pieces of writing (Poole, 2014). According to Palfrey and Gasser (2008), young people have a 'deep-dive' into online information for 'the news gather process' rather than simply browsing digital texts when they find something that could meet their reading goals. Therefore, it could be speculated that individuals are responding to certain text formats based on the nature of the texts together with reading tasks, rather than simply thinking of the change of medium.

2.5.1 Studies of text formats preferences

The question of the nature of student reading behaviours for both academic and pleasure purposes in the digital age has always been an interesting topic for many researchers (Liu, 2005; Li et al., 2011; Liu & Zhang, 2008; Woody et al., 2010) when digital formats of texts have been widely adopted in individuals' formal learning and informal reading and learning practices. Accordingly, there have been ongoing debates about individuals' choices of text formats in terms of reading behaviours such as the use of the medium and how they deal with different text formats for various learning and reading tasks.

In a qualitative study of students' reading practices with both print and electronic formats, Foasberg (2014) found that students read quite a lot on

screens 'primarily of brief, non-academic materials' (p.719). But for academic reading, especially with long forms, students were found to have a preference for print over electronic forms. Woody et al. (2010) also discovered a similar tendency to prefer print texts. In their examination of factors influencing preferences for e-books, it was found that students were more likely to choose print textbooks even if they already had experiences of using e-books. It seems that printed texts are preferred over digital texts, especially for academic purposes. An online survey launched by Springer Publishers (Lenares et al., 2013) in 2012 investigated the use and acceptance of e-books in higher education in the US. 1,661 students, academic staff and faculty completed the survey. It was discovered that three times as many participants claimed to prefer print over e-books, although they all claimed to use e-books.

It should however be noticed that an overwhelming preference for printed texts does not necessarily happen among those reading and learning for academic purposes. Individuals tend to adjust their reading behaviours and choose certain text formats to best facilitate their situations and reading/learning tasks. Ji et al. (2014) discovered that some students would like to read on screens if print texts were too expensive. It appears that in the situations where costs or other factors are taken into account, individuals may reshape their use of medium or text formats. Meanwhile, it is argued that individuals' patterns of preferences for texts formats could be varied by disciplines (Liu, 2005) rather than simply linking preferences for printed texts to academic purposes or pairing preferences for digital texts with pleasure reading. Individuals might have updated their reading behaviour with certain text formats with intensive use of both printed and digital texts. To obtain deep insights into text format preferences when individuals are utilising a mix of print and digital reading materials, investigations need to focus more on how individuals deal with the effects of text formats and how they adjust their reading behaviours according to the effects to obtain good reading or learning outcomes.

2.5.2 Preferences for text formats: several considerations

Studies of preferences for certain text formats have always been related to the comparisons between texts on paper and texts on screens in terms of the nature of texts (Briddon et al., 2009; Chang & Ley, 2006; Shelburne, 2009; Singer, 2014), reading behaviour (Evans et al., 2009), reading process (Siegenthaler et al., 2011), reading comprehension (Ackerman & Goldsmith, 2011; Chen et al., 2014; Fortunati & Vincent, 2015; Mangen et al., 2013; Mizrachi, 2015;) and general reading habits (Neilson, 2008; Poole, 2014; Rosenwald, 2014). Investigations of comparisons in multidimensional aspects mentioned above provide various angles from which to obtain a better understanding of individuals' preferences and use of certain text formats. Meanwhile, multidimensional aspects also promote insights into how individuals interact with texts to support reading and learning tasks, which contributes to the knowledge of how literacy is socio-culturally contextualised in the digital age.

Differences between printed and digital texts seem to be apparent in terms of how texts are presented and in how they appeal to readers (Briddon et al., 2006). Some studies focus more on factors that affect user attitude and practices of using e-books to further facilitate library resources (Briddon et al., 2009; Shelburne, 2009). In a study of staff and students' use and perceptions of e-books in a UK university, Briddon et al. (2009) found that one of the most significant advantages that e-books carry is their availability, which allows readers to get access at any time and any place. It is the advantage of availability of digital texts that attracts many readers to choose to read digitally. Such an advantage was found in another study of the awareness and attitudes toward the use of e-books and their resources in the library in a U.S university (Shelburne, 2009). Shelburne (2009) discovered that the acceptance of e-books had been reaching a level among students and faculty, and e-books were regarded as an important part of library resources. Likes and dislikes were examined as being vital to

understanding user attitudes and awareness of e-books. Ease of use, including instant access, ability to keyword search, availability and portability, has been found to be the principal advantages of digital texts to support e-book usage and reading (Briddon et al., 2009; Sheburne, 2009). Apart from ease of use as an important feature of digital texts, the lower cost of e-books compared to printed books has been found to appeal to many users (Foasberg, 2014; Ji et al., 2014). In Ji et al.'s study (2014) of the preferences and behaviour of 101 undergraduate students who took part in courses with supplies of both electronic and print reading, students were found to have a slight preference for electronic texts over printed ones due to the lower cost of electronic texts compared to printed reading materials. It can be noticed that e-books have been gradually accepted in academia because of availability, convenience, instant access, portability and low cost.

However, many studies that investigate user attitudes toward text formats have focused more on functional features of digital texts in formal learning settings or in laboratory situations. There is little research looking at how individuals' choice of certain text formats is influenced by the nature of texts when they are reading outside of laboratory and classroom situations. It is necessary to understand the differences in the nature of texts rather than simply knowing the various functions that certain text formats can offer. Some studies paid attention to the learning efficacy of printed and electronic texts to understand the relationship between user preferences or choice and nature of texts. Daniel and Woody (2013) indicate that there is little difference in reading between reading on screen and from paper in both at-home and in-school settings. However, it was found that students who reported the use of digital reading were more likely to have higher levels of multi-tasking. It appears that the nature of digital texts in terms of non-linearity and encoded texts could offer readers/users more opportunities to get socially connected compared to being exposed to the relatively closed reading space. Digital texts, especially online texts with

multimodal characters (Jewitt, 2008; Kress, 2003), might appeal to users for some practices both for academic and pleasure purposes. Such aspects of digital texts are not usually mentioned when investigating user choice of certain text formats, which however, could be critical for decision making about choosing text format and use of medium. Meanwhile, non-linear and multimodal features of online texts have been seen to contribute to 'coherent configurations' (Barton & Hamilton, 1998, p.9) to support the sense of identity during individuals' construction of meaning. The sense of identity has also been recognised as being related to the idea of affinity and Discourse (big 'D') (Gee, 2015; Lammer et al., 2012), which reveals that individuals' practices of meaning making by using, communicating and interacting with digital text are supported by the nature of digital texts. Although the nature of digital texts, such as multimodality and non-linearity, is less talked about compared to the functional features of digital texts as explanations for individuals' choices of certain text formats, it is important to bear in mind that the increasing use of digital texts could be closely related to both the functional features and the nature of digital texts.

As reviewed in the previous section regarding studies of text format preferences, paper has been found to be popular for academic reading even though digital reading has been increasingly accepted in academia because of its several advantages (Ji et al., 2014). Many researchers have found that printing off digital reading materials is common behaviour among many students for either later use or better learning outcomes (Daniel & Woody, 2013; Liu, 2005). It has been recognised that paper-based reading materials seem to promote greater efficacy for learning compared to digital texts (Ackerman & Goldsmith, 2011; Mangen et al., 2013). Some suggest that printed texts tend to offer greater reliability (Dilevko & Gottlieb, 2002) so that individuals could consequently focus more on the content than sparing working memory on other factors, for example the glittery surface of the medium for text presentation. Other researchers argue that printed texts have been used for quite a long time which provides 'a kind of

nostalgic link with old technologies' (Fortunati & Vincent, 2014). The habit of using printed texts might not be easily changed even though individuals' preferences for digital texts were found to be positively related to experiences of using e-books (Woody et al., 2010). The sensory experiences of reading from paper, such as touch, smelling, turning pages and holding something in one's hands have been discovered to be positively related to the emotion of reading (Fortunati & Vincent, 2014; Mangen, 2008, 2010). With experience both of the sensory action and lower cognitive load involved with printed texts, it has been found in many studies that printed texts are still favoured as it is perceived that print reading supports better reading performances although individuals are using a mix of print and digital reading resources (Chen et al., 2014; Mizrachi, 2015). It seems that individuals' choice of using certain text formats may not simply be a process of decision making. The comparison between printed and digital texts in terms of reading or learning performances by examining individuals' interactions with certain text formats to support learning/reading outcome could contribute to the understanding of individuals' choice and preferences of text formats.

2.5.3 Text formats and reading performance

It has been recognised that the shift toward digital texts appears to be evident in many aspects of individuals' daily life, such as in social activities and in academia throughout the generations (Cargill, 2011; Eden & Eshet-Alkalai, 2013; Heider et al., 2009). However, it is argued that readers need to deal with some usability problems created by digital texts (Altonen et al., 2011; Konnikova, 2014) although preferences for digital texts over printed texts have been claimed among young people in some studies (Clark, 2012). The biggest concern regarding the impacts of text formats is in how reading comprehension is affected and how individuals accommodate certain text formats to achieve learning and reading tasks (Ackerman & Goldsmith, 2011; Armitage et al., 2004;

Chang & Ley, 2006; Chen et al., 2014; Daneil & Woody, 2013; Mangen et al., 2013; Mueller & Oppenheimer, 2014; Woody et al., 2010; Worden & Collinson, 2011).

It has been found that some students would like to print off online or electronic reading materials because it is believed that better learning outcomes could be achieved by reading from paper compared to reading on screens (Ji et al., 2014). One of the most discussed explanations regarding differences in comprehension between printed and digital texts is the varied cognitive load created by texts (Ackerman & Goldsmith, 2011; DeStefano & LeFevre, 2007; Winter et al., 2010). Nakamura et al. (2012) argue that the human brain performs differently in its construction of mental presentation to deal with various reading formats. Ackerman and Goldsmith (2011) employed metacognitive regulation of learning to examine performances across two media: on screen versus on paper. They found that in laboratory setting under fixed time constraints, learning performances showed no differences between the two media. However, when learning in self-regulated situations, there was poorer performance with texts on screen than on paper. They argue that metacognitive processes across screens and paper are different which leads to various meta-metacognitive judgements. In self-regulated learning environments, students might face a more difficult learning situation because self-regulation for learning tasks requires more metacognitive regulation compared to the fixed learning situation. Individuals therefore are expected to be able to have metacognitive control to gain effortful learning experiences. Meanwhile, the non-linear character of online/digital texts might be perceived as being less reliable compared to printed texts which require more control sensitivity. In this sense, effortless learning with texts on screen would be reduced when parts of working memory are needed for the metacognitive decision making. Cognitive load regarding text presentation is not a new idea to confirm whether printed and digital texts are equivalent in reading performance. According to cognitive load theory (Sweller, 1994), individuals tend to spare less working memory to learning tasks when they are exposed to a high

level of interactivity. Following up on this idea, Wästlund et al. (2005) found that cognitive load would be increased to deal with irrelevant information when encountering online/digital texts, especially in online reading/learning environments where self-regulation is needed. In a review of cognitive load in hypertext reading, DeStefano and LeFevre (2007) adopted the working memory model and the construction integration model of reading to explore reading comprehension and navigation under the influence of hypertext features. They indicate that different processes that are required by hypertexts would increase the cognitive load and 'thus may have required working memory capacity that exceeded readers' capacities' (p.1636). With printed texts, however, individuals are more likely to have more attention paid to the content by devoting efforts to the comprehension of static texts (Ackerman & Goldsmith, 2011; Goldsmith et al., 2012).

Apart from the varied cognitive loads created by certain text formats affecting reading comprehension, the affecting roles of written texts or texts on paper have been found to have critical effects on learning outcomes in terms of memorisation and knowledge retention (Baccino & Pynte, 1994; Cataldo & Oakhill, 2000; Mangen et al., 2013; Medwell & Wray, 2008, 2014; Gerlach & Buxmann, 2011; Mueller & Oppenheimer, 2014; Taipale, 2014). Spatial stability provided by static printed texts has been discovered to be one of the determining reasons that support knowledge retention (Baccino & Pynte, 1994; Cataldo & Oakhill, 2000; Mangen et al., 2013; Noyes & Garland, 2003). In Mangen et al.'s study (2013) of effects of text formats on reading comprehension among 72 tenth graders in Norway, reading comprehension with texts on paper was found to be significantly better than that derived from computer screens. They argue that in the situation of reading paper-based materials, individuals who have 'the text in its entirety' (p.66) are more likely to have a good sense of the spatial stability of the text layout, which supports better outcomes in terms of knowledge retention (Baccino & Pynte, 1994). The mental map of digital or

online texts might be disrupted due to the lack of overview of whole structure and layout, which could lead to poorer conceptions of the flow of texts and hamper the recall of knowledge and reading comprehension (Kerr & Symons, 2006).

According to the view that there is better knowledge retention with texts on paper compared to digital texts, individuals might have better memorisation results to support retention. Regarding memorisation, some studies have found that the use of pen and paper supports better learning outcomes than dealing with texts on screen, especially in terms of memorisation (Medwell & Wray, 2008, 2014; Mueller & Oppenheimer, 2014). Mueller and Oppenheimer (2014) conducted a study to explore differences in learning outcomes between using pen and paper and laptops for note-making. It has been found that note-making with the use of laptops has been very common in university classrooms, which could be good for learning if more notes were taken. However, they discovered that note-making with traditional pen and paper might work better in information processing and reframing compared to using laptops for note-making. Using pen and paper could in fact facilitate 'higher order composing processes by freeing up working memory' (Medwell & Wray, 2008, p.42), which promotes better understanding of both factual and conceptual knowledge compared to verbatim transcription (Mueller & Oppenheimer, 2014).

However, some researchers argue (Chen et al., 2014; Rockinson-Szapkiw et al., 2013) that any difference in comprehension between printed and digital texts might not be significant. Chen et al. (2014) indicate that individuals could achieve effective learning with both printed and digital texts as long as users become familiar with different digital devices. It seems that there are some other factors involved in comparing texts on screens and texts on paper that affect reading performances. Apart from the familiarity of devices, the sense of disorientation and the discomfort caused by texts on screens have also been found to have

impacts on reading performances (Armitage et al., 2004; Bremer, 2005). Eye fatigue, headache and pains from reading on screen contribute to the incoherence of reading comprehension (Noyes & Garland, 2005). This is why the e-reader industry is reported to be trying to reduce the discomfort of reading on screen by introducing new technologies (Jabr, 2013) in order to reduce concerns when choosing the medium for reading. Even though some new technologies have improved how they display digital texts quite considerably, thereby promoting the sale of e-books (Miller & Bosman, 2011), the emotion of reading promoted by possessing a printed book could hardly be obtained when having a digital book in digital devices (Sellen & Harper, 2002).

It therefore appears that there is no conclusive statement regarding which text format is more popular than the other as the procedure of choosing a certain text format might not be a straightforward and simple one. Several factors would be taken into account when deciding text formats or the use of medium, including the nature and features of text formats and the advantages and disadvantages of texts formats that affect reading and learning outcomes. In addition, individuals have been found to be able to adjust reading processes and strategies to meet reading tasks, which suggests that individuals' preferences for text formats could be updating with new contexts and learning tasks. Further, contextual factors might potentially influence individuals' preferences, which, however, have not been widely researched in previous studies. A comparative perspective across UK and Chinese adolescents in terms of their preferences for text formats will enrich our understanding of literacy in various contexts. From the literature reviewed above, there has been less research about preferences for certain text formats in terms of reading outside of formal learning settings. This study sets out to address this imbalance by exploring preferences for text formats. The study can to some extent contribute to insights into how adolescents interact with various text formats across various reading purposes.

2.6 New literacies and online reading comprehension

Reading comprehension research has a long and rich history (Duke et al., 2011) with a largely recognised perspective that reading comprehension is a multifaceted process (Tompkins, 2014) and that how readers interpret what they read is mainly influenced by reading strategies and prior knowledge. According to traditional reading comprehension research, prior knowledge of a specific topic plays a vital role in traditional reading comprehension. However, for online reading comprehension, prior knowledge seems to be less important than for print reading (e.g., Willoughby et al., 2009), because readers can use search engines through the Internet to obtain related background on a topic and to continue reading with flexibility in the open space of the Internet. Many researchers (e.g., Afflerbach et al., 2013; Coiro, 2009; Leu et al., 2004) indicate that the direction of reading research in comprehension recognises that the definition, notion and strategies derived from print-based materials is necessary but not sufficient for a society where readers are experiencing alternative texts which integrate all kinds of formats. Therefore a new set of abilities and capabilities include technical skills together with an array of knowledge, cognitive capabilities, dispositions, awareness and beliefs is expected for successful online reading experiences (Carrington, 2009; Gilster, 1997; Johns & Hafner, 2012; Martin, 2008; Pianfetti, 2001; Snow, 2002).

The transforming elements of reading comprehension in response to changing technological, social and cultural situations suggest that the understanding of online reading comprehension is more associated to social practices than to the cognitive processes of traditional print reading (Coiro, 2005; Leu et al., 2013). Contextual factors such as social contexts and cultural variables have been recognised as having important roles in individuals' practices of meaning construction in online inquiry (RSSG, 2002). Leu et al. (2009) frame 'the Internet as a literacy issue, instead of a technology issue' (p.265) because the Internet is

more communicative than its informative character in which it shows ‘a continuous state of becoming, regularly transforming each one of us as we, in turn, transform it’ (p.264). The wide dissemination and speed of the Internet promotes the notion of being tentative with regard to changing reading environments (Friedman, 2006) to understand ‘what is being literate’ and what are reading strategies and skills when encountering online reading. It has been argued that insights into online reading comprehension and strategies for successful online reading experiences seem not to be isomorphic with offline reading comprehension (Coiro, 2007; Leu et al., 2009). Online reading containing non-linear, multimodal and hybrid forms of texts, which is different to reading static printed texts, has been seen to be more complicated than reading from paper (Afflerbach & Cho, 2009; Cho & Afflerbach, 2015; Coiro, 2011). Strategies used to support print reading comprehension have been demonstrated to be insufficient for comprehending online texts (Hartman et al., 2010). According to research (e.g., Coiro & Dobler, 2007), some strategies unique to online reading comprehension should be understood and investigated to better serve students’ online reading experiences. It should be noted that research into online reading comprehension focuses more on the interplay among reading strategies used for both print and digital reading. Meanwhile reading strategies employed for online reading are negotiating with reading purposes and responding to the idea of new literacies of online reading to support successful online reading experiences (Cho & Afflerbach, 2015; Coiro, 2011; Willoughby et al., 2009).

In the age of Web 2.0, reading online is more than a change of medium for text presentation. It is in fact concerned with the changing nature of reading with a transformative position that is updating with the changing situations (Alverman, 2008; Coiro, 2009; Schugar et al., 2011). According to the theory of New Literacies, online reading comprehension as a process of meaning construction requires

‘...the skills, strategies and dispositions necessary to successfully use and adapt to changing information and communication technologies and contexts that continuously emerge in our world and influence all areas of our personal and professional lives’. (Leu et al., 2004, p.1570)

Individuals who are in a relatively open access space or in digital space when encountering the internet (Tierney, 2009) are expected to go beyond technological skills (O’Byrne & McVerry, 2009). Affective variables and motivational factors have been seen as important for online reading comprehension (Coiro, 2012), which might lead to patterned online reading practices and reading behaviour. The dispositional aspects of online reading comprehension within New Literacies are concerned with what individuals think about the changing nature of the online reading environment and how affective variables intertwine with strategies and skills to support online reading comprehension (Guthrie et al., 1996; O’Byrne & McVerry, 2009; Rand Reading Study Group, 2002). O’Byrne and McVerry (2009) carried out a study to identify and measure dispositions of online reading comprehension and indicated five predicted factors: reflective thinking, critical stance, collaboration, flexibility, and persistence that could affect performance of online reading comprehension. It is, however, suggested (ibid.) that much more work needs to be done to validate dispositions of online reading comprehension because when reading online readers are negotiating with the nature of online reading environments by coordinating skills, strategies and dispositional factors to ensure successful online reading experiences.

It should be noted that strategies for online reading comprehension are employed in response to the multimodal character of online texts and the changing online environment (Cho & Afflerbach, 2015). New strategies and skills may be required to deal with dynamic unbounded online texts, which are more than those for print reading comprehension (Hartman et al., 2010; Lawless &

Schrader, 2008; Kingsley, 2011). According to research (e.g., Coiro, 2011), individuals tend to have inquiry-based reading practices to seek answers or relevant information when being exposed to the open access of the internet. Many scholars have studied strategies for successful online reading comprehension, including information location, searching, evaluation of information, ability to synthesis and communication with information (Afflerbach & Cho, 2009; Castek et al., 2015; Cho & Afflerbach, 2013; Coiro, 2005, 2009, 2011; Coiro & Dobler, 2007; Kingsley & Tancock, 2013; Leu et al., 2013). It has been recognised that all these strategies used by skilled readers for online reading comprehension are similar to traditional skills and strategies for print reading, even though some of the strategies might be unique to online reading (Afflerbach & Cho, 2009; Coiro, 2011).

Regarding information location, skilled readers have been found to be able to employ strategies to explore the reading scope of the internet and search for relevant information (Coiro, 2011; Cho & Afflerbach, 2015). During the stage of locating information for inquires, successful readers tend to be tentative towards online information based on reading purposes (Cho & Afflerbach, 2015). It is argued that within unbounded reading environments readers appear to reshape their reading processes and paths based on what they have found on the internet for specific topics (Kingsley & Tancock, 2013). The awareness of reading purpose works as a part of the mindset for reading to support responsive reading processes for online texts (Kymes, 2005; Pressley & Afflerbach, 1995). Active readers have been found to interact with information found in the relatively open access of the internet to meet reading tasks. It is not hard to see that the mindset for reading plays a critical role in both reading digital and print texts (Coiro & Castek, 2012). In a case study of a teenager girl's inquiry about obesity among adolescents, Cho and Afflerbach (2015) demonstrate that it is important to adjust reading strategies by considering both reading purposes and unbounded nonlinear texts. Such a process of being tentative and responsive has been

recognised throughout whole reading processes rather than for some specific strategies (Cho & Afflerbach, 2015; Kymes, 2005; Pressley, 2000). It is worthwhile noticing that reading and writing can hardly be separated within inquiry-based practices, especially for self-directed reading activities with online texts. Constructing questions to put in a search engine to explore the reading scope for the inquiry seems quite common for information location (Kingsley & Tancock, 2013). In order to obtain the most relevant or the best information, skilled readers might need to construct different questions according to links of information shown for the topic to fit the reading purpose. The practices of writing are a good reflection of being responsive to unbounded and nonlinear online texts.

Unlike reading static print texts, the unbounded reading environments of the internet require readers to read selectively by examining the relevance, reliability, accuracy and multiple perspectives and ideas (Castek et al., 2007; Cho & Afflerbach, 2015; Coiro, 2011; Goldman et al., 2012; Leu et al., 2013; Pressley, 2000; Shanahan & Shanahan, 2008). The unique features of online texts such as nonlinear and multimodal texts provide readers with multiple texts and, accordingly, more choices compared to printed texts (Zhang & Duke, 2008). Being critical towards multiple texts, sources of texts, a wider range of perspectives and opinions has been seen important for skilled readers (Schugar et al., 2013). Having an idea of the source or author of information has been found to be one of the most commonly used strategies to evaluate online information (Goldman et al., 2012; Shanahan & Shanahan, 2008). Apart from knowing who the contributor of online information is, it has been demonstrated that skilled readers tend to employ prior knowledge to judge the quality of texts (Coiro, 2011; Goldman et al., 2012; Kymes, 2005). In a study of investigations of patterns of reading processes of better and poorer readers, Goldman et al. (2012) found that better readers employed prior knowledge in sense-making, self-explanation, and comprehension-monitoring processes more often than

poorer readers. It might be argued that the importance of prior knowledge is less noticeable in online reading comprehension compared to traditional offline reading comprehension, because the Internet contains information which can be found straight away to support understanding of some texts. However, some empirical evidence shows that strategic readers use prior knowledge to support overall online reading processes, such as information navigation, evaluation and meaning construction (Dillon & Gabbard, 1998; Coiro, 2011; Willoughby et al., 2009). Practices of calling on prior knowledge for online reading comprehension are in fact active readers' negotiations with online texts to ensure their successful reading experiences. In this sense, strategic reading of online texts could be achieved by employing both traditional print reading strategies and new strategies for online reading. Meanwhile, as the nature and features of online reading environments are updated and mediated by changing technologies, newer strategies may be promoted when readers interact with other users and nonlinear online texts.

In the process of meaning construction in online reading comprehension, synthesising as one of stages always goes far beyond putting different pieces of information together (Coiro, 2009, 2011). Similar to information location and evaluation, being critical is also highly valued for synthesis due to the nature of online reading environments. Individuals have been found to have on-going decision-making phases within which reading paths are reshaped and adjusted by dealing with interactions with texts and others users on the internet (Cho & Afflerbach, 2015). Kingsley and Tancock (2013) found that many students were more likely to randomly copy and paste links to information without critically judging and choosing what they encountered. They argue that within multiple websites and information, readers need to connect their ideas across internet texts to obtain new presentations of thoughts or ideas to answer their own inquires or to meet reading tasks. Being able to communicate with online information is regarded as one of four competencies for online reading

comprehension especially for self-directed inquire practices (Coiro & Castek, 2011). They therefore propose that students use concept maps by employing the example of a jigsaw puzzle ‘to create a larger, more meaningful picture’ (Kingsley & Tancock, 2013, p.396) for reading tasks. The concept map is designed to be used as an explicit model to guide readers to choose relevant information both selectively and effectively to answer inquires. During the phase of selecting information to construct meaning for the inquiry, individuals are also expected to engage in a collaborative online environment by communicating with various perspectives and even with biased ideas (Coiro, 2011). The collaborative online environment is contributed by all readers and online users because the role of readers and contributors can be easily switched (Huffaker, 2005, 2005; McVerry, 2007; Zawilinski, 2009). Individuals thus need to seek information among the complex environment of the internet rather than being constrained to the relatively closed space of print reading. In this sense, higher level research skills of online reading are needed. Teachers’ support, however, has to an extent been felt to be relatively absent from students’ cultivation of their online reading comprehension because of insufficient instructions and assessment regarding the use of technology (Hutchison & Reinking, 2011). However, direct instruction from teachers would be helpful for adolescents nowadays who have a wide range of self-directed online research outside of school, both for academic and personal purposes. Further, the complex online reading environment with its potential challenges requires instructional support for effective and successful online reading experiences.

The dynamic nature of online reading environments and the speed with which they are updated for changing technologies also contribute to several challenges that may affect comprehension of online reading, such as distractions, credibility and reliability of online information (Coiro, 2011; Coiro & Castek, 2011; Kingsley & Tancock, 2013). Distractions that emerge in the online reading environment have not been widely discussed in online reading comprehension. More attention

has been paid to the effect of on screen distractions upon reading performance, for example reading coherence is affected by eye fatigue, overwhelming irrelevant information, pop-ups and so on (Noyes & Garland, 2005). However, dealing with distractions in online reading should be regarded as part of abilities and competencies for readers when engaging in the unbounded reading space of the internet to support the coherence of reading experiences. Distractions are inevitable parts of an online reading environment, which accordingly increase readers' cognitive load because of the high element of interactivity (Sweller, 1994) caused by multimodal texts, interactions between the text, the reader and the practice. In a study that examined the relationship between reading comprehension and familiarity of digital devices, Chen et al. (2014) found that students who were less familiar with functions of digital devices were more likely to have poorer comprehension. Goldman et al. (2012) suggest the need for self-regulation when readers have self-directed literacy practices with online texts to facilitate effective online reading experiences. Apart from distractions, credibility and reliability have been seen as challenging for readers in terms of information location, evaluations and construction or synthesis (Cho & Afflerbach, 2015; Coiro, 2011; Fabos, 2008; Goldman et al., 2012; Kingsley & Tancock, 2014; Leu et al., 2008; Zawilinski et al., 2007). Handling credibility and reliability can be happening throughout the online reading process when readers negotiate with online texts to meet reading tasks (Cho & Afflerbach, 2015). Due to the dynamic nature of online reading comprehension together with the potential challenges, it is suggested that support and instruction for strategic and successful online reading experiences should be introduced to classroom practices (Huang & Yang, 2015).

The insights mentioned above regarding strategies for successful online reading experiences have been researched for years. However, online reading strategies mediated by the changing technologies are not static, which requires on-going research to maintain a relatively complete picture of what contributes to

effective and successful meaning construction within online reading comprehension. Moreover, little is known about online reading comprehension across UK and Chinese students, especially the effects of contextual factors such as social and cultural variables on students' use of strategies for online reading. This study will help to gain a comprehensive picture of the changing strategies used by students across different cultures and educational systems, and will to an extent enrich the understanding of the nature of literacy within changing technological, social and cultural situations.

2.7 Gender difference in reading

2.7.1 Gender differences and reading research

Gender differences have always been an important issue in research about reading. There have been many studies concerning gender gaps in reading behaviour, reading skills, reading choices, reading attitudes and reading motivations (Coles & Hall, 2002; Logan & Johnston, 2013; McGeown, 2015; McGeown et al., 2012; Mullis et al., 2007, 2012; OECD, 2011). It has been found that gender differences in reading attitudes and reading motivations could be used as predictors of gender gaps in reading achievement (McKenna et al., 1995; Logan & Johnston, 2009), especially in the context of print reading. Meanwhile, some studies have discovered that the gaps in gender in reading skills and reading test results, or in reading achievement are happening across many countries and are not simply national issues in particular countries (Cheung et al., 2013; Mullis et al., 2012; OECD, 2011). In the context of print reading, from a broad perspective, girls have been found to have better performances in reading achievement, at least in reading tests, than boys, especially in elementary years (Mullis et al., 2012). Such a gender difference has been found to continue into adolescence (Chui & McBride-Chang, 2006; Swalander & Taube, 2007). In recent years, however, with the widespread use of digital technologies in daily living and learning, some studies have been focusing on how gender gaps change in the

contexts of digital reading or reading on screens (Cheung et al., 2013; Karim & Hasan, 2007; Liu & Huang, 2008; McKenna et al., 2010). It has been recognised that even though girls outperform boys in some aspects of digital literacy, such as the amount of reading time and reading performances in academic reading, the gap tended to be smaller than that commonly found in print reading (Nasah et al., 2010; Tsai & Tsai, 2010; Ünlüsoy et al., 2010).

It seems that to better understand the role of gender in reading skills, achievement, attitudes and motivations, the changing situations in certain contexts where readers/learners are living should be involved in research. Chui and McBride-Chang (2006) argue that contexts should be taken into account when investigating gender differences in reading to know more 'about gender in a given phenomenon' (p.331). In their large-scale study of investigating gender differences across 43 countries, they found that the gender issue in reading is a complex issue associated with the individual country (i.e. culture), family (e.g., socioeconomic status, the number of books in the family home and parental attitudes) and individual levels (e.g., reading enjoyment). Following up on this idea, gender issues in reading achievement or attainment appear to relate closely to contextual and other factors rather than gender being the only determining predictor of differences in performances (McGeown, 2012).

Therefore, more research should be done to investigate gender differences in reading practices, behaviour and performance, for example in reading comprehension of both printed and digital texts by taking accounts of changing technological, social and cultural situations. Such studies will enrich our understanding of how changes in gender differences in reading mediated by changing contexts and how gender differences respond to the concurrent contexts. This study focuses on a comparison between UK and Chinese adolescents in digital reading, and will therefore extend existing knowledge of gender differences in reading-related perspectives in the digital age, such as

reading activities, preferences, comprehension with digital texts across different social and cultural contexts.

2.7.2 Gender differences and reading practices

Studying the gender differences in what readers choose to read and how they deal with different types of reading has been a common approach to understanding gender gaps in reading practices in many studies (Clark, 2014; Coles & Hall, 2002; Logan & Johnston, 2009; McGeown et al., 2012). In recent years there have been increasing studies suggesting that gender issues in the use of information technologies have been increasing (Hupfer & Detler, 2006; Liu & Huang, 2008; Nasah et al., 2010; McKenna et al., 2012; Tsai & Tsai., 2010). These studies explore gender differences in reading practices within the electronic reading environment where there is a co-existence of print and digital texts. When bringing up the issue of gender and reading, a general assumption is almost always mentioned: that girls are more likely to read more than boys, especially in print (Clark, 2012, 2014; Coles & Hall, 2002; Mullis et al., 2012). It is often explained that such a difference is closely associated with the perceptions of reading that boys and girls have. Reading, especially reading in print, has been found to be more highly valued by girls (Wigfield et al., 1997) and perceived more as a feminine activity (Millard, 1997).

It should, however, be noted that it is a rather simplistic and broad assumption regarding girls' reading more than boys, even though it has been found to be evident in many studies. On the one hand there are multiple aspects which require closer attention regarding this general assumption. For example, Cole and Hall (2002) demonstrate that in terms of reading choices of types of reading, boys were found to be more likely to read more in some types than girls. In a report from the National Literacy Trust in the UK (2013), which investigated boys' reading habits, choosing what materials to read was seen as a vital decision

for both girls and boys. The report cited data from PISA (2009) to support the idea and described how girls were reading more in genres such as fiction and magazines, while boys read more comic books and newspapers. Understanding the reading choices that boys and girls have would be useful to gain a more complete picture of gender differences in reading habits.

On the other hand, in the changing contexts of technology in individuals' daily living and learning, the aforementioned may not be justified regarding literacy practices with the use of technologies. Further, with the expanding concepts of literacies and the perspective of New Literacy Studies (Gee, 2010; Lankshear & Knobel, 2012; Street, 2003, 2005), investigation of gender differences in reading should also be extended from looking at gaps in reading practices with printed texts to a wider range of social literacy practices in different contexts.

Within the changing technological situations in daily living and learning, some studies have been focusing on gender differences in attitudes toward, and practices of, the use of computers and other information technologies (Copper, 2006; Hargittai & Shafer, 2006; Hupfer & Detler, 2006; Li & Kirkup, 2007; Liu & Huang, 2008; Karim & Hasan, 2007; Thomas, 2004). In a review of the digital divide from the perspective of gender issues, Copper (2006) demonstrates that girls are more likely to be in a disadvantaged status than boys, in terms of learning with the use of computers, and such gaps would persist into adulthood. He found that females tended to have a higher level of anxiety regarding the use of computers than males, which is the fundamental problem for the gender gap in learning performance with computers or technologies. It should be noted that with the pervasive exposure to digital technologies, such tendencies towards gender differences in attitudes toward the use of technologies are likely to be changing, which requires further examination.

Other researchers took different perspectives to see how practices with the use of technologies and the internet differed by gender (Hupfer & Detler, 2006; Li &

Kirkup, 2007). Hupfer & Delter (2006) indicate practices of web information navigation are gendered. They suggest that females tend to engage more in communication-related practices when exposed to online information, such as emails and chats. Males then work more on precise information for finance and personal interests (Weiser, 2004).

However, in Li and Kirkup's (2007) investigation of gender and culture differences in internet use across the UK and China, they found that men were more likely to be engaged in chats than women in both countries. Meanwhile, men were found to be more active in computer games than women. Regarding gender differences in reading behaviour with the use of laptops, Kay and Lauricella (2011) demonstrate that females were more likely to engage in note-making and academic activities than their male counterparts when they were doing academic-related tasks. While, for off-task behaviours, no difference in gender was found except that males played more games than females, which is echoed within Li and Kirkup's study. From this perspective, it is clearly not easy to summarise which group reads more than their gender counterparts as it appears that gender differences in the use of computers or the internet are updating with the developing technologies in daily life. Moreover, it seems that, with the vast adoption of digital technologies in daily lives in the digital age, there are multiple ways of constructing meaning in literacy practices (Thomas, 2004) in terms of different practices with both print and digital texts. In this sense, a wider range of perspectives should be considered when investigating gender differences in reading in the digital age, such as literacy practices, preferences of text formats, reading behaviours, and reading comprehension.

Examining differences in the reading materials that boys and girls choose in print seems to be a common perspective to gain an understanding of gender differences in reading. With the availability of both printed and digital texts, it may be considered if there are any differences between boys and girls in

choosing presentation of the medium (Liu & Huang, 2008; Woody et al., 2010). This, however, is not a widely discussed topic. Liu and Huang examined 240 undergraduate students aged 18-23 in a Chinese university in terms of their reading behaviours and preferences with both printed and digital texts. Gender differences were tested in the study and they found that females had a stronger preference for paper-based reading materials compared to their male counterparts. Additionally, females were found to be more likely to print out electronic reading materials than males. However, when Woody et al. (2010) conducted a study focusing on undergraduates' preferences for e-books, they found that gender did not work as a predicting factor for the choice of the presentation of the medium. No association between gender and the use of e-books was found. They argue that the gender gap in the preference for the use of e-books might have decreased during the previous decade because of individuals' continuous exposure to digital technologies in various settings in their daily lives. Even though it is recognised that gender might not be a predictor for reading behaviours, especially in the digital age (McGeown, 2015), having more studies of preferences for certain text formats would be a valuable perspective to assist the understanding of how individuals interact with texts in both print and digital formats.

2.7.3 Gender differences and reading performances

It has been confirmed in many studies that girls tend to perform better than boys in reading skills and abilities (Chiu & McBride-Chang, 2006; Mullis et al., 2007, 2012; National Literacy Trust, 2012; OECD, 2011). This performance gap has been found to be an international issue across many countries (Cheung et al., 2013; Lynn & Mikk, 2009; Mullis et al., 2012). Lynn & Mikk (2009) used data from three PISA (Program for International Student Assessment, conducted in 2000, 2003, 2006) and two PIRLS (Progress in International Reading Literacy Study, conducted in 2001, 2003) studies to examine the gender differences across

participating nations in reading achievement. They discovered that girls tended to outperform boys in reading ability in every participating country across 5 studies that they carried out. Cheung et al. (2013) also adopted the data from the 2009 PISA study to explore gender differences in digital reading literacy across Hong Kong and South Korea. They demonstrate that females outperformed males. Apart from the gender difference in reading abilities, a study focusing on young people's reading in the UK with 21,000 survey participants (Clark, 2012) found that reading enjoyment was gendered as well, which could be another perspective from which to see gender differences in reading performance. It was reported that girls were more likely to have more enjoyment from their reading than boys.

However, it should be noted that investigating gender differences in reading performance with the adoption of digital technologies would be a more complex exercise because literacy practices with the use of new technologies are in a dynamic state and constantly being updated as technologies change (Leu et al., 2013). Various perspectives therefore should be taken into account, such as attitudes toward the use of technologies, technical competences, including online skills and strategies for online reading or learning, as well as the overall reading performances on screens.

It has been largely recognised that females tend to have lower levels of positive attitude toward the use of technologies in terms of use of technologies for learning and self-assessment of technological skills (Copper, 2006; Hargittai & Shafer, 2006; Liu & Huang, 2008). However, it is argued that the result of self-assessment of reading and learning with the use of technologies does 'not always translate into the actual disparities' (Hargittai & Shafer, 2006, p.432). Hargittai and Shafer demonstrate that even though females were found to have lower scores in self-assessments regarding their ability to obtain online content compared to males, no great differences were actually discovered between

females and males in actual practices. It seems that changes in the gender gap in reading performance in the digital age have been taking place with individuals' excessive use of technologies. From the exploration of gender differences in digital reading literacy in Cheung et al.'s study (2013), which examined data from PISA (OECD, 2011), the gender gap in reading performances was smaller for digital than print reading. It is suggested that the narrower gender gap in reading performance for digital literacy could be related to engagement in digital literacies in both school and out of school settings (Liu & Huang, 2008), within which varied mechanisms would be promoted (Hohlfeld et al., 2008; OECD, 2011). The engagement mentioned here is concerned with far more than, for example, access to digital technologies or how much time females and males spend in using technologies or online in school and at home. Rather, more attention should be paid to how girls and boys deal with online or electronic information to support successful reading and learning on screens. Online reading comprehension (Afflerbach & Cho, 2009; Coiro, 2009, 2011; Coiro & Dobler, 2007; Leu et al., 2013) has been attracting attention, examining individuals' interactions with online texts. This would also be worth investigating from the perspective of gender differences, which has not yet been widely explored.

Regarding gender differences in online reading comprehension, more of the research focuses on the skills and strategies of information navigation or location (Tsai, 2009; Wu, 2014). To understand gender differences in navigation skills and metacognitive strategies in both print reading assessment and electronic reading assessment, Wu used a dataset from PISA (carried out in 2009), which included information about 34,104 participants from 19 countries. He discovered that girls outperformed boys in metacognitive skills and navigation skills and print reading assessment. Regarding electronic reading assessment, there was no significant difference between girls and boys in Wu's study. In another study focusing on the role of gender in online information searching strategies among

324 high school students (Tsai, 2009), some results differed from Wu's research in terms of metacognitive skills. Tsai discovered no significant difference between female and male students in metacognitive domain strategies. Male students were found to have better performance than females in behavioural (i.e. control and disorientation) and procedural (i.e. trial & error and problem solving) online information searching strategies. More research about gender differences in skills and strategies for comprehension online texts is therefore needed and it will be helpful to improve support for instructions for online reading comprehension.

2.7.4 Gender differences and social cultural contexts

It has been recorded in many studies that gender differences in reading in terms of reading performances and reading behaviours have been international issues rather than only happening in certain nations (Mullis et al., 2012). Even though these are it does not mean that social and cultural contexts in different countries have little impact on the gender differences in reading. In fact, certain characteristics embodied in social and cultural situations have been found to be closely related to individuals' practices and attitudes toward the use of technologies (Li & Kirkup, 2007). Li and Kirkup had a brief review of cross-cultural studies of perceptions and practices in the use of technologies and the internet, and they argue that cultural differences underpinned varied practices and attitudes as well as some gender differences. Therefore, it is critical to investigate how the social and cultural situations underpinnings these contextual factors influence the practices, skills and perceptions of females and males. Further, putting sociocultural perspectives into research could also contribute to the understanding of different patterns or trends in gender differences across nations.

2.8 Cultures of learning in the UK and China

It has been widely recognised that literacy is embedded in social practices, which are mediated by social and cultural contexts (e.g., Gee, 2010, 2015; Lankshear & Knobel, 2011; Leu et al., 2008; Street, 2003, 2008). Therefore, it is important to have an insight into social and cultural situations to understand the nature of literacy. The comparative perspective in this study requires an understanding of the differences in cultures of learning and their related influences on literacy practices between the UK and China.

The culture of learning is usually used to refer to a whole set of beliefs, expectations, attitudes, experiences, values and behaviours that are embedded in a certain culture and society relating to teaching and learning (e.g., Cortazzi & Jin, 1996a, 1996b; Hu, 2002; Skyrme, 2014). This acknowledges that a culture of learning is rooted in and influenced by the context of the local culture (Cortazzi & Jin, 1996; Jin & Cortazzi, 2006). Individuals tend to bring a history of cultural traditions of the society in which they are living into practices of how to teach and learn (Armstrong et al., 2005; Lave & Wenger, 1991). The notion of culture of learning seems to have been widely discussed in the area of language learning (e.g., Flowerdew & Miller, 1995; Jin & Cortazzi 2006). The culture of learning is a concept of teaching and learning and embedded in local culture and cultural traditions. Therefore, it would still be a valuable concept for an investigation of how students interpret reading in the digital age.

In a study of the exploration of participants' understanding of the meaning of a good teacher and a good learner in language classrooms in China, Cortazzi & Jin (1996a) found that the Chinese culture of learning is different to that in the UK in several respects. These are summarised in Table 1.

Table 1 Differences in cultures of learning: China and UK

(Cortazzi & Jin, 1996a; p.74)

China	UK
Knowledge from teachers & textbooks	Skills in communicating & learning
Collective consciousness co-ordination, group support, social & moral learning	Individual orientation personal needs, attention, talent, uniqueness
Teaching & learning as performance pace, variety, presentation, virtuosity	Teaching & learning as organization pairs, groups, activities, tasks
Learning through practice & memorization towards mastery, preparation, repetition confidence building	Learning through interaction & construction experience, activities, tasks, initial creativity
Contextualized communication, listener/reader responsibility	Verbal explicitness speaker/ writer responsibility for communication
Hierarchical relations, agreement, harmony, face, respect	Horizontal relations discussion, argument, informality
Teacher as model expert, authority, parent, friend, teacher-centred	Teachers as organizer mentor, guide, helper, learner-centred

In Chinese culture, learning is regarded more 'as a process of accumulating knowledge' (Hu, 2002, p.97). Hu argues that the concept of the source of knowledge is related to the notion of learning as a process of knowledge accumulation. He demonstrated that learning is seen as being 'equated with reading books' because true knowledge is seen to be preserved in written texts (Wang, 2001). Many Chinese old sayings embody such concepts of the source of knowledge and the way to obtain knowledge, for example 'one can find a house of treasure by reading books' (书中自有黄金屋/shu zhong ziyou huangjinwu). This helps to explain why textbooks are widely used and highly valued in the Chinese education system and have an influencing role in teaching and learning (Cai et al., 2011; Fan, 2013). Textbooks in China are structured by a group of specialists in various subjects to serve the national uniform curriculum. Specialists are summoned by Ministry of Education to design textbooks when it is needed (Park & Leung, 2006). Some changes may be made to textbooks but only irregularly. The People's Education Publishing, the officially appointed publisher, distributes

books to the provinces in China except Shanghai and the provinces of Fujian, Jiangsu and Zhejiang. Every student at the beginning of a new semester gets one book for each subject.

In the context of western countries, learning is perceived more in a utilitarian light (Cheung & Pomerantz, 2012), as 'a practical process of constructing and using knowledge for immediate purposes' (Hu, 2002, p.97). The source of knowledge is seen to be more embedded in daily practices of understanding the world, developing skills and accomplishing goals (Tweed & Lehman, 2002). Accordingly, this could be one of the reasons why the notion of using textbooks in education is not as highly valued as in China. Unlike China, there is no official appointed publisher in the UK taking responsibility for publishing textbooks for most schools. There are a range of textbooks published by various publishers from which schools can make their own choices. Meanwhile, although there is a National Curriculum, UK schools have no obligation to use certain textbooks.

Drawing on the differences in the notion of the source of knowledge and ways to learn between China and UK, there have been some comparisons between Chinese learners and UK learners or learners in other western countries. Due to the dominance of the book-centred approach in their education (Rao, 2006), Chinese students are seen to be respectful of books and reluctant to ask questions or express own ideas and opinions in public (Ballard & Clanchy, 1991; Carson & Nelson, 1996; Liu, 1998). Chinese learners have been criticised as being passive or rote learners (Clark & Gieve, 2006; Paton, 2005) who learn by memorising the content of books rather than by thinking critically (Atkinson, 1997; Kumaravadivelu, 2003). Atkinson (1997) argues that critical thinking is not rooted in the values of Confucianism or Confucius' philosophical thoughts. Rather, critical thinking is highly valued in education in western countries. According to Carrison et al. (2000), critical thinking is a higher order skill, involving the ability to evaluate and generate information. Critical thinking is also

regarded as a powerful strategy for self-regulated learning (Neber et al., 2008) that individuals apply 'prior knowledge in new situations' (Garcia & Pintrich, 1997). However, there have been some contradictory views of Chinese students which demonstrated that Chinese students are similar to their western counterparts by being active learners and valuing active thinking and open-mindedness (Shi, 2006). Biggs (1996) argues that there is a western misconception of Chinese learners, especially in terms of some approaches they use for learning. Chinese learners are criticised for being passive in their learning because they memorise what is in books. However, some see memorisation as playing a vital role in deep learning (Goh & Kwan, 1997). Meanwhile, a recent study found that critical thinking was not absent among Chinese students and could be promoted in traditionally instructed classes in China (Liu et al., 2015).

The conception of learning in China is largely influenced by the Confucian education philosophy (Hu, 2002). These influences have been noted to be embodied in Chinese people's beliefs of learning and the effort that is put into education (Watkins & Biggs, 1996). It has been well recognised that Chinese people place a high value on education (Francis & Archer, 2005; Huang & Gove, 2012). Education there is often linked to a person's social class (Huang & Gove, 2012). According to Confucius, scholarly-related occupations are the most respected (Park & Chelsa, 2007). They believe that educational success will lead to a higher social class and to a better life, which is the embodiment of Confucius' education philosophy that education is associated with social recognition and material reward (Lee, 1996).

Education as a goal has been a deeply rooted idea throughout Chinese society (Hu, 2002). Therefore, students, teachers and parents are willing to invest huge amount of effort to support education. This is one of the most important explanations for some current issues in the Chinese education system, such as exam-based assessment and high-stakes competition in education (Lau & Chen,

2013; Mok et al., 2007). Owing to such competition, most Chinese schools, particularly in the secondary sector have very long school days of 12 hours or more. Normal school teaching and learning and self-learning sessions in the evening are all included in a school day (Ferrerias & Olson, 2010; BBC, 2009). Some schools in mega cities like Beijing and Shanghai have shorter school days of around 8 hours. Both teachers and students spend a great deal of time in teaching and learning to achieve better performance in exams. It can be assumed that students and teachers are under great pressure in the system of high-stakes public examinations. As the importance of education has been internalised in Chinese students from a very young age, they therefore tend to sacrifice their time for personal interests and holidays to studying, such as spending many hours doing homework (Hu, 2002). Hence, Chinese students are also seen to be more subject-based for learning than learning on the basis of their interests (Li, 2002; Shi, 2006).

In the UK, by contrast, teachers and students tend to have less pressure from examinations because of the different philosophy of learning that is embedded in society that was discussed earlier. The length of school days in UK secondary schools is around 7 hours (Telegraph, 2014). UK students seem to have less homework than Chinese students and would be able to spend more time on interest-based practices compared to their Chinese counterparts.

Parents in China have been shown to be willing to invest time and money in their children's education because education is regarded as a family business in Chinese society (Chen, 2001; Huang & Gove, 2012). Chao (1994) demonstrates that parental support and involvement in children's learning are two major responsibilities in the pattern of Chinese parenting. Due to their pervasive involvement in children's learning, Chinese parents have been seen to be 'controlling' or 'authoritarian' (Lin & Fu, 1990). However, Chao (1994, 2000) argues that the concept of 'controlling' parenting has different implications

between Chinese and European-Americans societies. He illustrates that the concept of 'controlling' in Chinese parenting styles is one of the embodiment of *guan* (管). The idea of *guan* has been seen to have positive connotations in China and includes the notions of 'to govern', 'to love' and 'to care for'. In this sense, Chinese parents focus on children's scholastic achievement as well as the development of academic, emotional and social adjustment (Chao, 1996; Cheung & Pomerantz, 2011; Parmar et al., 2004). It has been recognised that Chinese parents tend to be very strict with rules and regulations related to their children's learning. The relationship between children and parents in Chinese society is considered as a hierarchical one. Meanwhile, just like their children, Chinese parents are also under great pressure (Huang & Gove, 2012). Judging from the parenting style in a high-stakes competitive environment, Chinese parents would be willing to sacrifice time (Lueng & Shek, 2011) for family events or family literacy practices, which may lead to fewer interactions within the family. However, in a study of Chinese parents' guide for children's use of technology, Chinese parents were found to employ 'a combination of restrictive, instructive and co-using approaches' to support their children's learning (Wu et al., 2014). It may be speculated that Chinese students nowadays are experiencing a changing style of parental involvement partially due to the penetration of technologies.

In Western contexts, there has been a cultural tradition or orientation toward independence in the values of education (Markus & Kitayama, 1991). Such a notion has exerted a significant influence on the roles of parents and their practices of involvement in their children's education (Cheung & Pomerantz, 2011). Therefore, the sense of being 'authoritarian', in terms of being strict and controlling, is not seen as being beneficial to the psychological well-being of children in terms of their independence (van Campen & Russell, 2010). According to western beliefs, children's development of independence is related to the cultivation of autonomy, which is seen to be critical to children's learning

(Chao, 1996). The emphasis on the critical role of autonomy in children's learning may lead UK parents to support of a more autonomous than controlling kind (Wang et al., 2007; Cheung & Pomerantz, 2011), which in turn may lead to a relatively relaxed relationship between parents and children, compared to Chinese counterparts. Parents reading to their children, reported as a common family literacy practices in the UK (Formby, 2014) could be seen to be an embodiment of parenting style in the UK. However, it should be noted that the emphasis on the development of independence and autonomy does not necessarily mean that there is parental involvement or regulation in their children's education. In recent studies of parents' mediation toward children's use of technology (Livingstone & Helsper, 2008; Nathanson, 2001a, 2001b), active mediation, restrictive mediation and co-using approaches have been recognised as the three main strategies. However, Livingstone and Helsper (2008) suggest that the use of restrictive mediation by parents is adjusted on the basis of perceived risks, which echoes Davies's (2011) finding that children's 'parents move freely between one approach to another, from laissez-faire to co-use or restrictive regulation' (p.327). It could be assumed that, in general, UK students encounter a less restrictive parenting style compared to Chinese students.

Conclusion

In this review, the changing and expanded notion of the nature of literacy has been considered by discussing the movement of theoretical underpinnings of literacy from the cognitive scope to a sociocultural perspective. This review has discussed the social and digital turn of literacy in terms of the notion of literacy as social practices, together with the changing textual landscapes with the existence of both printed and digital texts. The notion that literacy is shaped by the changing social and cultural situation, including changing technologies has been acknowledged by reviewing a range of literacy practices from a sociocultural perspective.

The literature suggests that the nature of literacy has been affected by social and cultural changes, for example the penetration of technologies in people's daily lives. It has been acknowledged that digital technologies provide the 'intensifying multimodal possibilities' to contribute to changing textual landscapes, in which texts are presented on both paper and screens and can be access online (Carrington, 2005; Lotherington & Jenson, 2011). Reading therefore has been accordingly adjusted as a practice to keep up with technological changes in terms of the text, the reader and the reading activity.

Texts on screens are much broader than written texts and language alone (e.g., Cope & Kalantzis, 2000; Kress, 2003) and are presented in various modes. In a blended reading environment, readers are exposed to multimodal texts both in print and digital formats and they are expected to have the awareness of the changing features of texts and the ability to construct meaning from multiple modes. The availability of technology tools that present multimodal texts provide readers opportunities to configure, circulate and recycle various modes for meaning-making practices of reading.

The reviewed literature shows that young people who were born in the digital age are familiar with the use of technologies for various practices of meaning-making by interacting with multiple modes of texts. Meanwhile, the nature of reading in the digital age also suggests a changing situation of gender difference in reading. It is not clear whether gender different of digital reading is similar to that of print reading such as girls outperform boys.

However, most of the research about literacy in these changing situations focuses on students in higher education contexts. Less is known about adolescent literacy in the digital age, even though there have been calls for more research into adolescent literacy to support good preparations for adulthood. More importantly, it is well recognised that adolescents are exposed to a changing

textual landscape with various literacy practices involving printed and digital texts. But what adolescents think about such a changing textual landscape and in what way they interpret reading through different media and with various text formats are subjects that are relatively under researched. Further, literacy research is more based upon western cultures, and little knowledge has been obtained regarding how literacy is situated in and mediated by other cultures, for example the Chinese culture of learning.

Against the background discussed in this review, this research therefore is aimed at investigating how adolescents perceived digital reading in the light of their literacy practices with both printed and digital texts both in school and outside of school. Meanwhile, comparisons between UK and Chinese adolescents' perceptions were set out to be examined. It was believed that this research would enrich and deepen the nature of the understanding of adolescent literacy in changing social and cultural contexts in which technologies have been largely adopted in living and learning.

The next chapter will discuss the methodology and methods used in this research.

Chapter Three Methodology and Methods

Introduction

The literature review discussed in the preceding chapter introduces the dynamic nature of literacy and the social and cultural changes in text production and reading practices. The review suggests a number of issues concerning individuals' exposure to both print and digital texts including comparisons between reading off paper and onscreen, concerns of online reading comprehension and gender differences. The importance of adolescents' perceptions of reading for their reading and literacy development has also been addressed. However, there has been little comparative research carried out. This is a gap as a comparative study will throw light on how the impact of technology can be mediated by social cultural traditions. In this study a comparative approach to two contrasting societies is explored. This study looks at perceptions of digital reading across UK and Chinese students. The overarching question of this study is: whether reading is changing because so many texts are being access online and whether this is causing adolescents opportunities and challenges, or indeed both?

A number of sub-questions have been emerged on the basis of the literature review.

1. What access do UK and Chinese adolescents have to digital reading; what types of reading with both digital and printed texts do they come across in school and after class; and are there any differences in these things across the two countries?
2. How do adolescents perceive reading using different media (print and digital) in both the UK and China; and how are their purposes for reading different across text formats and across the two countries?
3. What skills do adolescents perceive that they need to read online? Is there any difference regarding perceived online reading comprehension across the two countries?

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4. Do adolescents' perceptions of and reported practices in digital reading differ by gender, and are these differences similar across the two countries?

Therefore this research is exploratory in nature, with the aim of investigating how adolescents perceive digital reading based on their daily practices of digital and print reading across the UK and China.

This chapter aims to propose and justify the underlying research paradigm and to explain the choice of certain methods for this exploratory study. Philosophical assumptions underpinning the research paradigm will be discussed. The research design, including sampling, instrumentation, the procedures employed in data collection and in the analysis of data will be described.

3.1 Philosophical and methodological considerations

This section will discuss ontological and epistemological assumptions that led to the chosen methodology and methods to answer these research questions.

Assumptions about the nature of reality and the essence of things are concerns of ontology (Bryman, 2012). Ontology is the theory of being, and it concerns the question that 'is there a 'real' world 'out there' that is independent of our knowledge of it' (Marsh & Furlong, 2002, p.17). Objectivism and constructivism are two main positions that are often discussed regarding views on how the world and life is built. Blaikie (2007) considers these two opposite positions as realism and idealism. Realists and objectivists claim that social entities or beings are not influenced by social actors. According to realists and objectivists, social entities are independent from individual understanding. Social reality is something 'out there', waiting to be understood, regardless of individual consciousness (Cohen et al., 2011, p.5). Constructivism, however, holds an absolute opposite position to objectivism.

Constructivists argue that social phenomena impose themselves on social actors and that 'their meanings are continually being accomplished by social actors' (Bryman, 2012, p. 33). The presence of individuals or actors is believed to influence beings and their meaning (Blaikie, 2007; Burrell & Morgan, 1979). Interactions between social actors and the environment elaborate how social reality is accomplished continually as 'a constant state of revision' (Bryman, 2012, p.33). Social constructivism is also often discussed within the scope of constructivism. Social constructivism emphasises that reality is constructed through human activities, which are situation specific and context bound (Eggen & Kauchak, 1999; Schunk, 2012). Social constructivists believe that knowledge is constructed socially and culturally (Schunk, 2012), which leads to the suggestion that researchers who are studying human science and the social world should pay attention to how individuals perceive social reality as social actors and how social actors influence their understanding during social interactions (Burr, 2015).

Epistemology is concerned with the very nature and forms of knowledge and how knowledge can and should be acquired (Burrell & Morgan, 1979; Crotty, 1998). Hammond and Wellington (2013) describe epistemology as 'what we believe about and how we come to know and understand the world' (p.57). The critical issue in epistemological assumptions of knowledge is whether the approaches, principles and procedures in the natural sciences should be imitated and employed in the study of the social world (Bryman, 2012). Positivism and interpretivism are two philosophical positions related to the acquisition of knowledge. Positivists suggest conducting the research objectively with natural science models, which take a value-free position. However, anti-positivism such as interpretivism or phenomenology (Gill & Johnson, 1991) criticise the application of scientific methods to study the social world (Guba & Lincoln, 1994). Interpretivism distinguishes social sciences from the natural sciences because interpretivists believe that human actions take place in response to the

meanings of the social reality that they interpret in their daily life. 'Interpretive researchers assume that access to reality (given or socially constructed) is only through social constructions (Meyer, 2008), which means social reality is obtained through the multiple meanings that people attach to it. In other words, individuals make sense of the reality around them (Bryman, 2015). According to interpretivists, it is important to understand individuals' meanings from individuals' perspectives (Hennink et al., 2011) and their knowledge, experiences, and beliefs embedded in certain social and cultural contexts (Rubin & Rubin, 1995).

As this study is aimed at investigating how students interpret digital reading based on their daily practices of print and digital reading, it is aligned with concerns of constructivism and interpretivism discussed above. Knowledge of perceptions of reading in this study was obtained from students' perspectives and their interactions with various text formats in different social and cultural contexts. Therefore, the subjective nature of constructivism and interpretivism was employed in this study as a philosophical stance. The constructivist and interpretivist orientations adopted in this study led to the choice of a subjective strategic approach with multiple methods, including focus groups, survey and individual interviews, which will be discussed in the following section.

3.2 Research paradigm

Based on the aims of this research and the nature of its research questions, the research paradigm in this study includes a set of beliefs and concerns relating to constructivism and interpretivism. A paradigm describes a belief system that guides the way individuals figure out knowledge (Morgan, 2008). Cohen et al. (2011) suggest that a paradigm could refer to four main aspects, including ontology, epistemology, human nature and methodology. Two basic traditions have emerged that are in response to these four dimensions: objectivist and the

subjectivist paradigms (Opie, 2004). According to Cohen et al. (2011) the most relevant aspect for research is how we acquire knowledge, which is related to debates over the assumptions of positivism and anti-positivism. The quantitative and qualitative paradigms therefore have become regarded as common paradigm for research to facilitate how investigate knowledge (Tuli, 2010).

Opie (2004) argues that it is common among academics to adopt the quantitative/qualitative divide for obtaining knowledge on the basis of debates over positivism versus anti-positivism. A quantitative paradigm addresses positivism as its methodological root, where researchers tend to adopt quantitative methods concerning quantifications through numbers. A qualitative research paradigm emphasises interpretivism as its methodological stance in which qualitative methods are usually employed. However, it has been noticed that these two extremes do not always apply to actual research because there are often several types of data, both numeric and textual (Gorard, 2004). Gorard (ibid.) claims the 'false dualism' of the qualitative and quantitative divide, and he argues that 'The most unhelpful of the supposed paradigms in social science are the methodological ones of 'quantitative' and 'qualitative' approaches' (ibid., p.150). Similarly, Bryman (2012) has explored examples of research that transcend the distinction between quantitative and qualitative research. He demonstrates the both quantitative and qualitative research have 'their epistemological and ontological commitments' but the connection between is not deterministic and the connections are not perfect (p.618). He believes that 'the contrast between quantitative and qualitative research should not be overdrawn' (ibid., p.615).

Many scholars (e.g., Mertens, 2014; Teddlie & Tashakkori, 2009) suggest 'the combination of methodologies in the study of the same phenomenon' (Denzin, 1978, p.291) to counter the suggestion that there is an incompatibility between qualitative and quantitative research (Guba & Lincoln, 1994). The breaking down

of the distinction between quantitative and qualitative research has been regarded as part of 'pragmatic paradigm', i.e. mixed methodology (MM) trend in social research (Morgan, 2008). According to the concept of 'pragmatic paradigm', it is believed that adopting various methods in a study would support a stronger research claim (National Research Council, 2002). For example, Yin (2006) indicates that quantitative methods, such as surveys, are often combined with other qualitative methods by taking a pragmatic stance.

This study takes a mixed methodological paradigm which supports the integration of quantitative and qualitative elements and allows the free-floating of research methods (Bryman, 2015; Teddlie & Tashakkori, 2009). Teddlie and Tashakkori (2009) argue that the adoption of MM would address both confirmatory and exploratory questions. Apart from benefits of MM, the adoption of this research paradigm is based on the purpose and aims of this study.

This study aims to achieve knowledge of digital reading from the viewpoints of students in the UK and China. This is the first study investigating adolescents' perceptions of digital reading, using a comparison of different social and cultural contexts. It is hoped to have data both in depth and breadth to best support the investigation. Interviews and a survey were employed in this study to make sure rich data can be collected, both in terms of breadth and depth, to strengthen research claims. Meanwhile, perceptions of digital reading across the UK and Chinese students could be quantitatively measured. The adoption of a survey in this study would also help understand for example the patterns of literacy practices and perceived skills of online reading and preferences for text formats. Multiple methods in the sequence of focus groups, survey and individual interview were employed in this mixed methodological research to obtain data in depth and breadth in order to answer the research questions.

3.3 Research strategy

Based on the nature of the research questions, this study was based on a qualitative paradigm, including considerations drawn from constructivism and interpretivism. Within the mixed methodological paradigm, the approach of multiple methods was employed in this exploratory study to obtain the breadth and depth of corroboration and understanding of the chosen topic. As has been argued, qualitative and quantitative methods can be involved and combined in social research because there is no purely numeric or textual data (Teddlie & Tashakkori, 2009).

For instance, although case study as a research approach is usually associated with qualitative studies, researchers would use 'whatever methods and data seem appropriate' involving qualitative and quantitative approaches to answer research questions (Punch, 2009, p.119). This study is intended to investigate how adolescents interpret digital reading in the light of their practices of print and digital reading; therefore, qualitative methods would work well to understand the meanings that individuals attach to reading in the digital age. Meanwhile, as issues explored in this study have not been widely addressed previously, obtaining data by adopting quantitative methods would to some extent contribute to the understanding of patterns of literacy practices and perceptions among adolescents across the UK and China, which is one of aims of this study. Therefore, depending on the nature of the research questions and aims of this research, both qualitative and quantitative methods were employed for collecting data, including focus groups, survey and individual interviews.

The focus groups were employed to obtain a general picture of what these UK and Chinese students thought about reading in the digital age relating to their daily literacy practices. Two main aspects were considered for employing focus groups to gain general ideas concerning how the students were interpreting

digital reading. Firstly, adolescents' perceptions of reading have not been well researched, although the literature review has suggested the importance of listening to students' voices. Additionally, as literacy practices are shaped by fast-changing technologies, the existing literature may not cover students' perceptions of digital reading that are influenced by their most recent textual engagements. Therefore, focus groups were planned to achieve insights into the perceptions of reading from students' perspectives based on their recent common practices. Built upon the findings of the focus groups, a survey using self-completion questionnaires was chosen to explore patterns of adolescents' literacy practices and perceptions of reading printed and digital texts in both countries. Although this study does not intend to generalise, patterns of what adolescents were thinking about digital reading and their practices could be better examined through broad data. These patterns, to some extent, would suggest the nature of reading literacy in different social and cultural contexts. However, what is behind these patterns is still unknown. Therefore, individual interviews which involved the collection of in-depth data were employed following the survey. According to the patterns found in the questionnaires, the individual interviews were used to elaborate the issues behind those patterns to gain a deeper understanding of the UK and Chinese students' perceptions of reading within different social and cultural contexts. Therefore, multiple methods were employed to help to guarantee the quality of data, together with its depth and breadth. Rationales for choosing these methods will be discussed in detail in the following sections.

3.4 Participants

3.4.1 Target population

A population in research refers to a group of people or items with similar features or characteristics that have caused researchers to interests for investigation. In this study, adolescents at their secondary school in the UK and

China were targeted as the research population. According to WHO (World Health Organization), adolescence nowadays happens between the ages of 10-19. This study focused on adolescents in secondary school which means that the target population was aged 12-16. The reasons why adolescents aged under 12 and aged 17-19 were excluded was firstly because adolescents below 12 are usually primary school students and regarded as children. More attention is usually paid to this group of children due to the need of children protection, which may have caused some unexpected challenges throughout the data collection. Additionally, students who are 17-19 are busy with preparation of A-levels or who are in their adjustment to universities. After consulting teachers of Year11 and above, it was felt that these students might be less willing to participate in this research than younger students due to their busy schedules of learning. Therefore, considering research aims, convenience, the real situation and practical reasons, adolescents aged at 12-16 in secondary school were targeted in this study.

3.4.2 Sampling

Sampling can be defined as the process that a researcher uses to select units from the population that he/she wishes to investigate. Sampling works as a way to gather data based on a relatively small amount of a population because it is impossible to obtain access to every single individual in a population (Gorard, 2001; Uprichard, 2011).

There have been on-going discussions about what and how a chosen sample can meet research aims driven by theoretical considerations. Two sampling methods are mostly discussed and employed when a researcher selects units for research: probability sampling and non-probability sampling (Bryman, 2012). Probability sampling refers to a sampling technique with a complete sampling frame to select a small amount of a population, in which the selected sample is expected to

meet the representative of the population. Non-probability sampling has no sampling frame and is usually adopted for qualitative research purposes in which explorations of events and practices are emphasised (ibid.). Through non-probability sampling, a sample is selected purposefully to meet research aims, but does not attempt to generate representativeness (Merriam, 2011). The aim of this research is to explore how adolescents perceive digital reading in terms of their preferences for text formats, online reading comprehension and gender differences when interacting with both printed and digital texts in a changing textual landscape. In other words, this research aims to discover instead of to generalise. Therefore, non-probability sampling was chosen to choose units for this exploratory research.

It is argued that purposive sampling or purposeful sampling is the most commonly used sampling strategy in qualitative research (Bryman, 2012). Purposive sampling identifies and selects cases 'based on specific purposes associated with answering a research study's questions' (Teddile & Fu, 2007, p.77). As qualitative research 'focuses in depth on relatively small sample' (Patton, 1990, p.169), it is important to identify and select cases to purposefully include those who have experiences of a phenomenon (Cresswell et al., 2011). Sampling participants purposefully would support 'the most effective use of limited resources' (Palinkas et al., 2015, p.533). In addition to the importance of selecting those who are experienced with a phenomenon of a study, the availability of such individuals and their willingness to participate are also believed to be important (Bernard, 2002). Regarding types of sampling strategies among purposive sampling, typical sampling, unique sampling, maximum variation sampling, convenience sampling, snowball sampling and theoretical sampling are regarded as six main types of purposive sampling (Merriam & Tisdell, 2015). This study employed multiple methods in a sequence of focus groups, survey and individual interviews. Sampling for these three methods will be discussed below.

Prior to the discussion of sampling in each method, it is important to bear in mind that there should be no significant gap between schools in the UK and in China in terms of the availability of digital devices for teaching and learning. Resources of technologies for both printed and digital reading practices in schools and adolescents' ownership of digital devices were considered when deciding which city and schools to be sampled. Coventry, Birmingham and Leamington Spa were chosen as the research sites because they were readily available to me in terms of distances. Meanwhile, schools in these cities are installed with smart whiteboards and computer suites, which provide students with opportunities to read on screen in school. In China, more and more schools have been funded to introduce technology into teaching and learning. Students in China, especially those who are in urban areas, have access to digital texts as well as printed materials in school. The research site in China was Xiamen, a city in the southeast of China. It is not a very advanced and developed city like Shanghai or Beijing, which means that the technology resources are at the average level of other cities in China. Therefore, it could be assumed that there was not much variation in the availability of digital texts and digital reading in these cities in China and UK.

Focus groups sample

As the aim of focus groups was to gain a general picture of students' voices about digital reading based on their experiences of reading print and digitally, it is important to get 'a fair picture of the diversity' (Mertens, 2011, p.317) of participants, including those who have rich and few experiences of reading through different technologies. Therefore, a large number of schools facilitated with technologies for teaching and learning were contacted and informed of the purpose of focus groups and this research. Considering the responses from secondary schools and adolescents regarding the availability and willingness of students to participate, convenience sampling was used. Eight groups of students were sampled, four in each country. Each group involved four to five students,

both girls and boys from different Year/Grade groups.

Survey sample

As focus groups were used as the primary stage of data collection, the findings of focus groups regarding adolescents' perceptions of reading and their textual interactions were designed to be used as guidance for the survey design. The survey was planned to explore patterns and reading practices of adolescents across the UK and China. Although self-completion questionnaires in the survey aspect of this study focused on students' perceptions of reading in the digital age, the aim was for as many students as possible to finish questionnaires, which may to some extent generate representativeness. However, the number of adolescents in the UK and China is considerable. It is not possible to get a complete copy of adolescents' contact information not only because the number is so large, but also because of the need to protect adolescents as vulnerable individuals. Therefore, snowball sampling was used. As contacts with some schools had already been successfully made for focus groups, these schools were asked if they could help with the survey stage by inviting students from their own school and other schools to complete self-completion questionnaires.

Based on the response from schools, two schools in China and three schools in England were chosen because teachers in these two schools showed great interest in the study which was likely to help ease data collection. 800 questionnaires were planned to be distributed, 400 in each country. In China, students at 7th to 10th Grade aged (in the 12-16 age range) were selected to be participants. Similarly, students in the UK at Year7 to Year10 normally aged 12-16 were selected. Each Grade group needed to have 100 students to complete questionnaires to make sure that participants were balanced in terms of numbers. The average students' academic performance of each class was similar. Therefore, any class could be approached as long as permission was gained from schools and participants.

Individual interviews sample

Given that the aim of this study was to discover not to generate, obtaining in-depth data from adolescents experienced with textual interactions both printed and digital in the digital environment of reading would be insightful. In addition, as has been suggested, the availability of participants and their willingness to participate were important (Bernard, 2002). Therefore, participants for individual interviews were sampled from those who completed questionnaires and who were experienced in various reading practices through different media with both printed and digital texts. Convenience sampling was then adopted. It is believed that students who completed the questionnaire for this research would be 'well-informed informants' (Hitchcock & Hughes, 1995) on the research topic. Meanwhile, interviewees were chosen from those who showed interest at the end of the questionnaire in participating in individual interviews. It could be speculated that these students would be willing to talk about their experiences of and knowledge about reading in the digital age. On the basis of actual problems, such as the availability of participants and limited time and funding, 20 interviews were planned, 10 in each country.

Sampling strategies and processes in this qualitative study with multiple methods were selected purposefully because of the nature of this research and situations of actual practice. The detailed processes of collecting data will be presented in the section on data collection.

3.5 Research methods and data collection

The data to be collected focused on students with experience in reading digital and print texts in their daily living and learning to understand what they thought about reading in the digital reading environment. Based on the purpose of this study, methods were selected to explore and investigate deeply rather than to generate representativeness.

Clear ideas of what students are doing and what they think in real life along with what has shown in the literature would be helpful for researchers to 'lay the groundwork for subsequent survey research' (Krueger & Casey 2008, p.12) when students are encouraged to talk in groups. Focus groups were used as the preliminary stage in the study. Features, advantages and disadvantages will be discussed later to make the rationale clear for choosing focus groups.

Based on the findings of the focus groups and knowledge from existing literature, questionnaires were conducted following focus groups to examine patterns in adolescents' perceptions of reading in the digital age. Strengths and weaknesses were taken into consideration when deciding research constructs and the design of the questionnaire.

As an exploratory study, it is important to have participants share rich information if they are willing. In-depth individual interviews were chosen to elaborate what was behind the patterns found in the focus groups and the questionnaires.

In this study, all methods and research questions were adapted with consideration of their validity and reliability by using pilot studies. Rationales of each method in terms of features and practical reasons in the actual study were considered to make sure all methods employed can meet the research needs and answer the research questions well.

3.5.1 Focus groups

Rationale and uses of focus groups

Focus groups are usually employed within the traditions of qualitative research in order to explore participants' experience, perception, belief and attitudes (Bryman, 2012). A focused topic, organised discussion, group interactions and

collective activities are generally regarded as the main features of focus groups (Bryman 2012; Gibbs, 1997; Kitzinger, 1995; Powell et al., 1996). Therefore, the aim of focus groups is to obtain collective information of a specific topic through group discussions 'led by a trained moderator or facilitator' (Hennink et al., 2011, p.136).

Several advantages of using focus groups are well recognised in social research. It is believed that through focus groups, a range of views and perspectives can be collected within a short period time, which helps researchers save time and money. More importantly, a researcher may come up with new issues or ideas that may not be realised in the literature review stage (Hennink et al., 2011). In other words, various views obtained through focus groups could help with generating a general picture of selected topics or a social phenomenon, which provides insight into what researchers want to study. Gibbs (1997) suggests that focus groups are often used as 'the preliminary or exploratory stages of a study' to 'lay the groundwork for subsequent survey research' (Krueger & Casey, 2008, p.12). In this sense, clearer ideas for the chosen topic could be achieved if focus groups were used at the exploratory stage, which may set the agenda for later research procedures. Hennick et al. (2011) demonstrate that it has become common to use focus groups with research methods, either qualitative or quantitative. Focus groups can be used prior to or after a quantitative research method, or used in parallel with other methods based on the research needs and aims (Morgan, 1997). In this study, focus groups were adopted before self-completion questionnaires as an exploratory stage to achieve general ideas of the chosen topic. As discussed earlier, literacy practices are shaped by fast-changing technologies (Leu et al., 2011) which affect how we perceive literacy. Existing literature may not fully cover updated practices and perceptions of digital reading. Therefore, using focus groups in the first place is believed to help understand knowledge of the chosen topic that is not discussed in literature review. What was found through focus groups, together with knowledge gained

from literature, provided a relatively full picture of the chosen topic, which laid the groundwork for the survey.

Apart from the advantages of focus groups, some disadvantages, limitations or challenges have also been identified (Bryman, 2012; Hennink et al., 2011; Krueger & Casey, 2008; Morgan, 1997). As has been argued, focus group participants may feel uncomfortable in an environment where a group of individuals with different backgrounds share their own ideas and experiences (Krueger & Casey, 2008). This leads to the concerns about their unwillingness to talk, a lack of confidentiality, and the presence of dominant opinions or drifting views (Greenbaum, 1998; Hennink et al., 2011). Therefore, a well-trained moderator (Greenbaum, 1998) with control techniques is expected, such as encouraging 'self-disclosure among participants' (Krueger & Casey, 2008, p.4) and avoiding dominant speakers. Control techniques can be achieved by conducting pilot studies to understand the characteristics of participants and how they interact in a group. In order to minimise possible concerns, pilot studies of focus groups were conducted in this study, which will be discussed below. Regarding concerns about confidentiality, confidentiality and anonymity were clearly stated in the consent. Schools, teachers and students were informed about confidentiality before the start of focus groups as well. Some other limitations, such as assembling participants, choice of interview locations and control over focus groups data were considered to ensure that the use of focus groups helped me get a clear idea of adolescents' literacy practices and perceptions. Later sections, will present how problems caused by limitations and challenges were overcome.

Planning and conducting focus groups

Arranging

As indicated, assembling participants is a challenge for researchers (Bryman, 2012; Morgan, 1997; Krueger & Casey, 2014). In order to guarantee the

possibility of getting responses from schools, emails were sent to a number of schools in the UK and China whose contacts could be found online. The purpose of the research was fully explained and group composition, the expected numbers of groups, sizes of groups and cost of time for each group were provided in the email so that schools could have a clear idea of the research and actions they might need to do if they could assist the data collection.

Regarding group composition, mixed groups (Morgan, 1997) were chosen which included students, both girls and boys, from different Year groups in order to gain various perspectives from different groups of students. For the size of a group, Krueger (2002) suggests that 5 to 10 people per group can be accepted although 6 to 8 is a preferred size. However, in real research, it is hard to recruit the exact numbers of participants as expected. In this study, 4-5 students were gathered in a group depending on their availability and willingness, Two UK schools responded positively that they would manage to arrange focus groups. Two focus groups in each school were conducted. In order to match the number of groups in the UK, it was decided that four focus groups would also be conducted in China.

Two UK schools provided a deputy head teacher's office as a research venue. Schools requested to have one teacher to sit in the corner of the room during focus group discussions. It was of some concern as to whether the appearance of a teacher would cause silence or hesitation. In the event, students felt no pressure with this arrangement. For the Chinese groups, online/virtual focus groups were used due to limitations of time and money.

Virtual focus groups are useful for researchers who are living too far away from participants to conduct in-person focus groups (Bloor et al., 2001; Galloway, 2011; Kenney, 2005; Turney & Pocknee, 2005). Virtual focus groups used to be conducted through email (Murray, 1997) or audio teleconferencing (White & Thomson, 1995). Today, virtual focus groups can be conducted through online

group chat or video conferencing. It is believed that this enables savings to be made both in terms of money and travel time. However, there are several concerns with the quality of focus groups, such as technical issues and the lack of interaction among participants (Murray, 1997; Kenney, 2005). When contacting schools in China, online focus groups were proposed. The teachers arranged some students who were willing to help with organising members of focus groups. These students were told to inform parents of their participation in this research. Focus group participants gathered together at one of the student's house, which helped to avoid complicated technical issues, such as setting up online groups individually for each participant. Four focus groups were conducted through video conferencing, which meant that participants' non-verbal interactions were not missed. Each group had 4 to 5 students, both girls and boys.

The schools in the UK said only around 40 minutes could be guaranteed because students could miss too many class sessions. Chinese students, who are used to extensive amounts of homework spared no more than one hour for interviewing. Having an idea of how long each focus group lasts was helpful for question design.

Questions

The importance of questions in focus groups has been widely recognised (Hennink et al., 2011; Krueger, 2002; Krueger & Casey, 2000). Detailed information and deep insights can be obtained in focus groups if good questions are asked. Krueger and Casey (2000) suggest that basic characteristics for good questions are that they should be short, easy and clear so that participants can understand them without confusion or too much thinking. Their nine qualities of good questions (p.40-41) are that they should:

- Evoke conversations (one of the purposes of focus groups is to 'encourage participants to have a conversation in response to a question, building on

one another's comments, rather than directing each comment to the moderator' (p.41)

- Use words participants would use (participants feel more comfortable with words they use in common life rather than being expected to talk like an academic)
- Talk about the issue
- Be easy to say
- Be clear
- Be short
- Usually be open-ended ('Open-ended questions are a hallmark of focus group interviewing') (p. 41)

Meanwhile, using different types of questions is regarded as important for meeting research purposes, collecting more information and achieving a variety of perspectives. Questions have been identified as the following types: opening questions, introductory questions, transition questions, key questions, and closing questions or ending questions (Krueger & Casey, 2014).

In this study, to get more information relating to the research closed questions were avoided in focus groups because yes-or-no answers would cause silence and make discussion boring. As this study focused on adolescents' perceptions of digital reading in the light of their reading experiences, general questions about students' usage of digital devices related to literacy practices in daily life were considered as opening questions. Asking about participants' experience of reading with different technologies is believed to be a good way to introduce them to the topic. 'What kinds of technologies do they use which involve reading and/or writing?' was designed as the opening question. Key questions are essential questions designed to meet the purposes of focus groups (Hennink et al., 2011). As adolescents are exposed in new textual landscapes (Carrington,

2005), questions regarding what they think about reading through different media are important for investigations of their perceptions of reading. Questions about their choices of text formats and reading strategies were designed. In this part, exploratory questions were designed to gain deeper insights. Questions such as ‘What do you feel when you read on screen/print?’ and ‘Could you tell me some reasons why you prefer this?’ were used combined with key questions. In the final section a brief summary based on discussion was designed. Participants were asked what else related to the topic so that any important further information would not be missed. The same questions were used in the focus groups of both British and Chinese students, although obviously in different languages (see below). A copy of the questions used in the focus groups can be found in Appendix 1 and Appendix 2 of Chinese version.

Language

Questions were designed in English, and they were translated into Chinese when conducting focus groups with Chinese students. Hennink et al. (2011) agree that a moderator feels less pressure when questions are translated into the language that is to be used in focus groups. Quality of translation is quite important. I translated questions from English to Chinese and someone who is not from my research area also did the translation. The translated questions were reviewed and translated into the original by a third person. Based on comparisons and comments, questions were translated to make sure the precise meaning of questions was fully captured and expressed accurately.

Pilot study

Owing to the fact that problems may occur because of limitations and challenges in focus groups, pilot studies were conducted. The purpose of a pilot study is to test the adequacy of research instruments (Van Teijlingen & Hundley, 2001). The objectives of pilot studies in this research were to establish whether questions could be understood as intended, to investigate what kind of behaviour the

students may have, to test whether the question order was appropriate and to gain an idea of whether sufficient information can be obtained within the suggested period of time. Based on the availability of participants, one UK student focus group and one Chinese student focus group were conducted. The UK student focus group was conducted in person. The Chinese one involved an online group chat. Each group had four participants, both boys and girls, aged 12-16.

I found that participants tended to produce long silence (lasting around 30 seconds) after questions were posted at the beginning. Participants were more talkative once they had become familiar with the moderator. Therefore, making participants feel relaxed before the start was quite important so that time was not wasted. The researcher took part in some small talks with participants before focus groups, by having jokes and discussing relaxed topics, such as music and pop star news. Although questions were understood, some of them were too wordy, which meant that participants had to pay greater attention. Prior to data collection, long questions were revised into shorter ones. Regarding participants' behaviour, some participants asked questions of others by taking the moderator's place and moving the discussion into non-related topics. In the real research, the moderator had more involvement and control in leading the conversation by avoiding merely posing questions. Eye contact with participants who spoke less was found helpful to encourage them to speak.

Data collection

On the arranged date of conducting focus groups with UK students, I arrived at the school 20 minutes before interviewing. After handing copies of a DBS check to the reception, self-introduction was made to the teacher who would be present during the interview. The purposes of this research were briefly explained and a list of questions was provided to the teacher. The need for voice recording was confirmed. Permission to record the conversation was gained from

all focus group members before the start. Details of data collection of UK focus groups are shown in Table 3.1 below.

Table 3.1: Focus groups of the UK students

	Number of participants	Composition of group	Date and duration	Venue	Teacher or adult accompanied	Audio recorded
Group 1 (School A)	5	3 girls (1 Year7 and 2 Year8); 2 boys (Year9 and Year10)	9 June 2014; 35 minutes	Deputy head teacher office	Yes	Yes
Group 2 (School A)	4	2 girls (Year9 and Year10); 2boys (Year7 and Year8)	11 June 2014; 36 minutes	Deputy head teacher office	Yes	Yes
Group 3 (School B)	4	2 girls (Year8 and Year9); 2 boys (Year 7 and 10)	8 October 2014; 40 minutes	Deputy head teacher office	Yes	Yes
Group 4 (School B)	5	2 girls (Year8 and 9); 3 boys (2 Year8 and 1 Year9)	14 October 2014; 38 minutes	Deputy head teacher office	Yes	Yes

Focus groups with Chinese students were conducted through visual conferencing. They were face-to-face simultaneous focus groups. As parents had been told about the research purposes and what questions would be asked in the interview, it was not necessary for an adult to be present during discussion. Chinese student focus groups were audio recorded as students did not feel comfortable having their visual movement recorded. Details of data collection of Chinese focus groups are shown in Table 3.2 below.

Table 3.2: Focus groups of the Chinese students

	Number of participants	Composition of participants	Date and Duration	Venue	Teacher or adult accompanied	Audio recorded
Group 1	4	2 girls (Grade7); 2 boys (Grade8)	11 October 2014; 37 minutes	Participant's house	No	Yes
Group 2	5	2 girls (Grade9); 3 boys (2 Grade7 and 1 Grade9)	18 October 2014; 39 minutes	Participant's house	No	Yes
Group 3	4	2 girls (Grade8); 2 boys (1 Grade7 and 1 Grade9)	25 October 2014; 34 minutes	Participant's house	No	Yes
Group 4	4	2 girls (Grade10); 2 boys (Grade10)	8 November 2014; 36 minutes	Participant's house	No	Yes

3.5.2 Survey

Rationale and uses of questionnaires

Questionnaires can be employed in quantitative research to generate structured and numeric data (Cohen et al., 2012; Nelson & Cowles, 2015). However, some researchers use questionnaires to obtain qualitative data for exploration in terms of individuals' beliefs, perspectives, attitudes and perceptions (Harris & Brown, 2010). It seems that questionnaires can be used in both qualitative and quantitative research to meet research needs and purposes. As discussed earlier, gaining knowledge of the patterns of what the students thought about digital reading in new textual landscapes through data in breadth would provide insight into the nature of literacy and reading literacy in different social and cultural contexts. Employing questionnaires could be a good way to provide evidence of patterns of perceptions and practices of reading in the digital age among UK and

Chinese adolescents. Building upon the findings of the focus groups and upon the existing literature, questionnaires, therefore, were chosen to explore patterns of adolescents' perceptions of reading in breadth.

As has been argued, questionnaires are often used because rich data can be gathered relatively quickly at low cost without the presence of the researcher (Bryman, 2012; Cohen et al., 2012; Newby, 2010). There are several ways to distribute questionnaires, such as by using postal, emails or web links, and they allow participants to finish a questionnaire at their convenience, which may require no presence from the researcher. However, Cohen et al. (2011) argue that the absence of the researcher may lead to a low response rate. They suggest that a possible way to 'ensure a good response rate' is to have 'the presence of the researcher'. They argue that the presence of the researcher or the questionnaire designer can 'enable any queries or uncertainties to be addressed immediately' (p.404). However, the presence of researchers who are normally strangers to participants may cause 'a sense of compulsion' (ibid.) to respondents. Such a challenge was considered in this study before I started collecting questionnaire data. During the collection in the UK schools, I showed no presence because, on the one hand, the teachers suggested that it would be easier to arrange students to complete questionnaires if teachers could take charge of the administration. On the other hand, I was told that some students preferred online questionnaires so that they could complete them after school. In China, I appeared with the main teacher of the class to wait for students' inquiries and completion.

In addition to challenges relating to the response rate, some other concerns, such as question types and the use of language are widely discussed (Bryman, 2012). Bryman (2012) argues that it is hard to 'probe respondents to elaborate an answer' in a questionnaire. In other words, in-depth data may not be easy to collect even from open-ended questions. Meanwhile, it is possible that individuals may not be willing to participate if they need to spend a long time

writing answers. Considering these challenges, the questionnaire in this study was designed mainly with multiple choices questions and Likert scale type questions. Regarding the use of language, the students' literacy rate was considered. 12-16 years-old students were invited to complete the questionnaires, and thus the words used needed to be understood by both older and younger students. School teachers in the UK and China were consulted by sending them questionnaire drafts with an inquiry about the use of language before piloting questionnaires. How the questionnaire was designed will be discussed later.

Designing and conducting the questionnaire

Designing questionnaires

As explained in the section on research strategy, the questionnaires in this study were adopted to explore patterns in adolescents' perceptions of reading and their practices of reading through various media. The findings from the focus groups and the knowledge of the existing literature laid the groundwork in terms of what questions to ask in the questionnaires. Based on what the literature review (e.g., McKenna et al., 2012; Melnink et al., 2009) and the findings from the focus groups suggested, preferences for certain text formats, feelings of reading certain texts formats and beliefs about online reading comprehension were mentioned. Meanwhile, as adolescents' perceptions of digital reading were explored in the light of literacy practices, investigations of reading activities of both printed and digital texts were also included.

As research constructs for the questionnaire in this study had been clearly established through the focus groups and the literature review, a number of multiple choice questions and Likert scale questions were used as these types of questions would be straightforward for participants (Brace, 2013). Multiple choice questions can 'enable respondents to select the response that most closely represents their views' (Cohen et al. 2012, p.384). Meanwhile, the teachers in

both countries said that they could spare no more than 20 minutes for the questionnaire completion. Given this practical issue, having multiple choice and Likert scale type questions could be straightforward and easy to finish within the limited period of time. The questionnaire had six sections. Two sections covered questions of facts regarding adolescents' access to digital texts and their reading practices of print and digital reading. Three other sections dealt with their views about reading through different media, such as preferences and strategies for online reading comprehension. The last part covered participants' basic information: gender, age and year group. At the end of the questionnaire, a question regarding whether the participant would like to participate in the follow-up individual interview was also added. A very brief introduction of the purpose of this study was given at the beginning on the questionnaire, together with a guarantee of confidentiality.

The first part was designed to explore adolescents' access to digital reading both in and outside school. As suggested by the existing literature, adolescents are exposed to the digital environment of reading. Some findings of focus groups also suggested this. The exploration of adolescents' access to digital texts would be useful to understand their reading environment, which may influence how they perceive digital reading. Multiple choice questions were designed to refer to both in and out-of-school settings, including accessing digital texts through schools' digital devices, personal devices and others' devices. One simple open question, termed 'Other', was included in case participants wanted to provide answers that were not covered in the multiple-choice options.

Followed by the section on access, questions about reading activities were asked in the second part. Based on the existing literature, reading in the digital age is known to involve far more than reading from paper (e.g., Lankshear & Knobel, 2011). Meanwhile, the students in the focus groups had claimed to use several reading activities with multiple modes. Therefore, understanding their reading

activities would help to gain an understanding of what reading in the digital age means for adolescents. Multiple choice questions were designed which covered reading that transferred from a printed format into a digital one. Reading that happens in social networking, texting or using a search engine were included. 10 reading activities in school and 12 activities outside school were listed based on the focus groups and the literature review. One open-ended question at the end of each setting was given so that they could write any other frequent reading activities that they had in daily life.

The three remaining parts were designed as Likert scale questions with a five point scale to explore adolescents' preferences for text formats, the nature of a reader when reading print and digitally, and their beliefs about skills for online reading. Rating scales (Conradi et al., 2013; McKenna et al., 2010) are frequently used to test students' attitudes toward reading. Likert scales do not simply look for 'yes/ no' answers. The degree of opinion could be achieved by using answer choices ranging from one extreme to another (Allen & Seaman, 2007). However there have been ongoing debates over using a middle range choice on Likert scales or not (e.g., Garland, 1991; Moors, 2011). It is argued that omitting a mid-point may cause respondents to veer more towards positive answers (Worcester & Burns, 1975). Garland conducted a study focusing on the effects of having no mid-point in Likert scale questions, and found the opposite results to Worcester and Burns. It may be that having a middle choice on a Likert scale is content specific (Garland, 1991). In this study, middle range choices were included because this research focused on the students' personal opinions of reading both digital and printed texts rather than simply making choices from provided answers. For example, the mid-point in the question of 'I prefer digital texts when reading for enjoyment' may suggest either negative tendency or tendency of using both printed and digital texts for enjoyment reading. The evidence of mid-points used in the questionnaires would provide evidence for elaboration in the follow-up interviews.

As suggested by the literature and by the focus groups, adolescents seem to read certain text formats depending on their reading purpose. Therefore, questions about preferences for differences were designed in the third part of the questionnaire. Meanwhile, it has been argued (e.g., Ito et al., 2009) that many adolescents have a range of interactions with digital texts, which suggests the changed nature of the reader in the digital age. The findings from the focus groups also suggested similar issues. In addition, it was found that many students in the focus groups claimed that they learnt better with certain text formats. Hence, the fourth section included questions concerning adolescents' notions of and behaviours in various textual engagements. Regarding online reading comprehension, strategies and skills for reading online have been recognised as being different to those involved in print reading (Leu et al., 2011), which was also suggested by the focus groups in this study. Questions in the fifth part were concerned with reading skills and strategies for online reading comprehension, including information location, evaluation, and synthesis. A detailed description of how the questionnaire was designed based on the findings from the focus groups and the existing literature will be discussed later in the Findings chapter.

Web questionnaires (See Appendix 3) were also designed because one UK school asked if their students could complete it online. The structure and question order were the same as the paper-based questionnaire. The questionnaire was designed in English (See Appendix 4) and translated into Chinese (See Appendix 5). Questionnaires in two languages were piloted to assure meanings were well expressed with appropriate uses of words.

Pilot study

The issues of participants' interpretation of questions, use of words, measurement and range of response choices were considered in piloting the questionnaire. Pilot studies were conducted with both UK and Chinese students using both the web questionnaire and the paper-based questionnaire. It

appeared to make no difference whether respondents completed the paper or online version.

Three UK students (aged 13-15) were invited to complete 'mock' questionnaires. One student could not find a suitable time, therefore a copy of the questionnaire through a web link was sent to him. The student's feedback, including the use of language, and the total time spent on the questionnaire was sent to me through email. Ideas concerning some questions were given according to what he understood about these. He thought that the questionnaire was well designed and could be finished within 15 minutes. The other two students completed the questionnaire in the researcher's presence. Their reactions to questions were recorded. After completion, several questions were asked based on their recorded reactions. One student hesitated in one question for almost 30 seconds at the beginning. He explained that he was not sure whether it was necessary to put examples after the questions. Another student who was 14 years old said that some younger students may not be able to understand the word 'Neutral' because it sounded too academic.

Two Chinese students were asked to take part in the pilot study online because of the distance. Copies of the questionnaire were sent through QQ (a popular multifunction online chatting tool). Feedback was sent to me by texting on QQ. One student said that some words were not easy to understand. Some sentences were too long which made them a bit tired of reading.

Based on all feedback, some changes were made. Examples were not introduced in the questionnaire. The word 'Neutral' was changed to 'Not sure'. Some sentences were shortened. The final questionnaire was then designed so that it could be finished within 15 minutes.

Data collection (questionnaires)

Paper-based copies of the final questionnaire and a link to the web questionnaire were sent to UK teachers. Teachers were expected not to tell potential participants about the content detail of the questionnaire beforehand. As I would not be present in the UK schools, some expectations about questionnaire completion and some explanations of potential inquiries were given to the teachers. According to talks with the UK teachers after collection, they walked around the classroom and supervised students to ensure full completion. They also helped to check whether students chose the middle range answer for every question without carefully reading the question. Therefore, all paper-based questionnaires distributed with the help of the UK teachers were returned with very high response rates. Apart from distributing paper-based questionnaires, web questionnaires were also distributed. The web link was sent to several schools. The teacher from one school responded that students could complete questionnaires in an ICT class by using computers in the school. One organisation helped to send the link to students as well. 168 questionnaires in total were returned through web questionnaires. After checking all web questionnaires one by one carefully in terms of time spent and answers, all these questionnaires can be considered as valid data. See Table 3.3 regarding data collection of questionnaires in the UK schools.

Table 3.3: Data collection of questionnaire in the UK with return rate of 99.3%

	Date		Copies Distributed		Copies Returned	
Online questionnaire	18 April 2015; 30 September 2015		Web link sent to one school (School A) and one organisation		168	
Paper-based questionnaire	School B	School C	School B	School C	School B	School C
	28 June-2 July 2015; 15-17 September 2015	13-15 October 2015	120	160	118	153

I travelled to China and showed up on site during the questionnaire distribution. Copies of the questionnaires were sent to head teachers. A copy of the questionnaire was sent to the teachers of sampled students before my arrival. I was invited to meet with the main teachers and the head teacher of each Year group (Grade 7 to 10) every time before distributing the questionnaire to sampled students. Some rules in terms of contact with students and time were discussed at the meeting. Three days after this meeting when all things had been arranged by the main teachers, questionnaires were distributed to 8 classes in two schools (4 classes in each school). The researcher presented with the teacher in case of any inquires. Teachers asked students to finish the questionnaire carefully with no question left blank. With the teachers' help, the return rate was very high (See Table 3.4). Some students did not put the information of their Age or Gender. These questionnaires were not used due to the incompleteness of the questionnaires.

Table 3.4: Data collection of questionnaires in China with return rate of 93%

	Date				Copies distributed	Copies returned
School 1	22 April 2015 Grade 7 (One class)	23 April 2015 Grade 10 (One class)	24 April 2015 Grade 9 (One Class)	27 April 2015 Grade 8 (One class)	200	185
School 2	21 April 2015 Grade 7 (One class)	22 April 2015 Grade 8 (One class)	23 April 2015 Grade 9 (One class)	24 April 2015 Grade 10 (One class)	200	187

3.5.3 Individual interview

Rationale and uses of interviews

Individual interviews were employed in this study to ‘get better data or more data’ (Dexter, 1970; cited in Merriam, 2009, p.88) to see what else lay behind the patterns of adolescents’ perceptions of digital reading, related issues and their literacy practices suggested by results of the questionnaires. In-depth interviews were conducted with samples of both UK and Chinese students to explore more deeply their beliefs and views about reading in the digital environments where printed and digital texts co-existed in multiple modes.

In qualitative research, the interview ‘is probably the most widely employed method’ (Bryman, 2012, p.469) and can be seen as ‘the overwhelmingly dominant method’ (Yin, 2009, p.134). Many (Cohen et al., 2011; Holstein & Gubrium, 1997; Kvale, 2006; Punch, 2009) have considered the view that knowledge could be generated through individuals’ discussion of different social situations in the real world. Therefore, the interview is often employed as a successful means of exploration of individuals’ ideas, feeling, perceptions, beliefs

and interpretation of social situations (Mason, 2002; Punch, 2009). Mason (2002) suggests that the interview is an appropriate method if the researchers think 'knowledge and evidence are contextual, situational and interactional' (p.64). Jones (1985) claims that 'In order to understand other persons' construction of reality, we would do well to ask them [...] and ask them in such a way that they can tell us in their terms (rather than those imposed rigidly and a priori by ourselves) and in a depth which addresses the rich context that is the substance of their meanings' (p.46). In this study, knowledge of digital reading was expected to be achieved through adolescents' interpretation of their textual interactions. The qualitative individual interview therefore seemed to be the best way to obtain deeper and more complete investigations of students' beliefs, opinions and understandings of reading under different education systems, social economic situations and cultures.

It has been recognised that researchers use different types of interviews to meet research purposes and aims (Cohen et al., 2011). Structured interviews, unstructured interviews, in-depth interviews, semi-structured interviews and focused and group interviews are largely discussed as the main types of interviews (Bryman, 2012; Merriam, 2009; Punch, 2009; Yin, 2009). A structured interview usually includes pre-established questions, which results in little variation for participants' responses (Punch, 2009). Due to the need for maintaining 'the same consistent behaviour and demeanour' of a structured interview (Yin, 2009, p.133), the researchers work like facilitators and tend not to use follow-up questions based on the interviewee's responses. Therefore, a structured interview is more like a survey with purposes of quantification rather than exploration (Punch, 2012).

Distinct from structured interviews with the purpose of quantification, unstructured interviews, semi-structured interviews and in-depth interviews are usually regarded as qualitative interviews to explore individuals' complex

behaviour and their interpretations and meaning of social phenomena (Punch, 2009). These types of interviews are usually conducted in a 'relatively informal style' (Mason, 2002, p.62) without any rigid guides to questions. In other words, interviewees are encouraged to talk freely about the questions/topics. Participants' discussions related to the questions could continue if the researchers think it is important to probe and explore by using follow-up questions. Legard et al. (2003) suggest that using a series of probes can achieve greater depth and permit 'the researcher to explore fully all the factors that underpin participants' answers: reasons, feeling, opinions, and beliefs' (p.141). The researchers then are expected to 'dig nuggets of data or meaning out of a subject's pure experiences' (Kvale, 1996, p.3) as well as to interpret participants' responses and to ask follow-up questions whenever necessary. Unstructured interviews tend to be used when the researchers have little information about the topics being researched. Semi-structured interviews are usually conducted with the guidance of a list of questions relating to the studied phenomenon (Merriam, 2009). Given that results of the questionnaires in this study had provided dimensions to be explored in interviews, semi-structured interviews were preferred for exploring more deeply what the adolescents thought about digital reading and to examine something behind what was claimed in the questionnaires. What was found in the questionnaires provided a general guide for the individual interviews. However, what was found in the focus groups and questionnaires could not provide sufficient information to dig out what was hidden behind participants' experiences and practices in different situations. Therefore, semi-structured in-depth interviews were chosen in this study to elaborate upon questionnaire findings.

Planning and conducting interviews

Preparing and designing questions

It has been largely recognised that good questions are essential to interviews (e.g., Patton, 2002). Some key features of good questions for interviews were

discussed earlier in the section about focus groups. Good questions in the in-depth interviews were required to share those features discussed earlier. It has been said that good questions have to be clear, easy to understand and 'talking about the issue' (Kureger & Casey, 2000). The aim of in-depth interviews for this study was to elaborate what was found in the questionnaires in order to have a deeper and more complete picture of adolescents' reading in terms of their beliefs, feelings and perceptions. Therefore, questions in individual interviews needed to be explorative for rich information and further elaboration. Questions in the semi-structured interviews were designed based on the findings of the questionnaires. Meanwhile, follow-up questions were expected to be asked during the interviews according to interviewees' responses and the research purposes. The questionnaires were concerned with adolescents' access to digital texts, reading activities, preferences for text formats, feelings and behaviour about print and digital reading and online reading comprehension. Different types of questions therefore were designed to elaborate these five dimensions.

The investigation of the perceptions of reading in the digital age in this study was concerned with the way in which groups of UK and Chinese students interpreted reading in the light of their reading practices through different media. Therefore, some descriptive questions to explore the students' experiences of reading digitally and print in school and outside school were designed. Merriam (2009, p.103) argues '(descriptive) information lays the foundation for the questions that access the interviewee's perceptions, opinions, values, emotions, and so on'. These types of questions were included throughout the interviews and were asked whenever the interviewees wanted to express their feelings, opinions and views about reading based on their experiences. An example of an experience question is: What do your parents and teachers know about your out-of-school literacy practices?

Meanwhile, the interviews for this study aimed to deal with opinions, insights

and interpretations of reading based on daily social practices, therefore, good questions needed to be 'open-ended and yield descriptive data' (ibid., p.99). Open-ended questions were designed to provide interviewees with opportunities to elaborate further. Yes-or-no questions were not adopted. For further elaboration, for example, regarding adolescents' preferences for text formats, questions such as, 'Do you like to read digitally when you read for enjoyment?' were not included because interviewees could easily say yes or no and thereby close the topic. Additionally, asking 'why' too frequently following participants' responses was avoided. Based on pilot studies of the individual interviews, it seemed that asking too many 'why' questions sounded 'unprofessional' and 'why' questions promoted a sense of 'being pushed' to answer quickly. Having considered these points, exploratory questions were designed. For example, an exploratory question 'What makes you prefer printed/digital texts over the other text format?' was used. Exploratory questions were believed to be useful to for investigating potential factors that influenced the students' practices, such as their choices of certain text formats.

Although the questionnaires examined the degree to which students believed they would read online with strategies like information location, evaluation and synthesis, little however is known of the complete picture of their online reading in terms of challenges, perceived performances and learning outcomes. Therefore, exploratory questions were also considered as a suitable type to investigate what the students thought about being a good reader for successful online reading comprehension.

The sequence of the designed questions in this study was flexible and not rigorously set beforehand because it is said that every interviewee is different in terms of personality and responses to questions (Mason, 2002; Merriam 2009). Another reason why the order or sequence of questions cannot be decided ahead is that follow-up questions may jump queues at any time. An interviewer often

uses follow-up questions to achieve further explanation 'if the participant gives a brief and uninformative account' (Magnusson & Marecek, 2015, p.54). These questions are beyond the topics of the interview guide, but would provide valuable information to the study. Follow-up questions can be asked to encourage the interviewee to talk following a silence or to know more from a single word or a sentence (Glesne & Peshkin, 1992, cited in Merriam, 2009). Therefore, follow-up questions were expected to be asked whenever further exploration was felt to be necessary. Meanwhile, some questions were designed to be contextual based on the interviewee's social situations since the UK and Chinese students as interviewees were living in different social and cultural contexts. For example, some questions related to the Chinese students' literacy practices in a long school day were designed.

Apart from key questions mentioned above, the final part of the interviews involved asking simple questions about something that students wanted to say about the whole topic in order to make sure that everything was revealed during the interview time.

The questions of the interview guide were designed in English and translated into Chinese. See Appendix 6 for the individual interview questions for the UK students and Appendix 7 for the Chinese students. The interview guide was carefully pretested and pilot tested in order to achieve thick and high quality information from the interviewees.

Pre-tests and pilot study

Two friends who were PhD students were invited as imaginary participants to have a mock interview. They were expected to give feedback to the interview guide, including about the wording of questions and the interview process. Based on their feedback, a small number of questions were found to be unsuitable for interview purposes because they were too broad and could have led to abstract

answers. For example, the question ‘what differences do you see between reading on screen and normal print?’ was said to be too broad, which might result in valuable information being missed if the interviewee gave very brief answers. Therefore, those broad questions were broken down into several sub questions to make sure they were easy to answer.

Due to the availability of intended participants, only two pilot studies were completed, with one UK student and one Chinese student. The new interview guide was used based on the feedback from these pre-tests. It transpired that the order of questions was somehow decided by answers that the interviewee gave. When the Chinese student answered one question, he mentioned something which was expected as the answer to other questions. The UK student suggested that there was no need to explain questions in detail to the interviewee because students would ask if they did not understand what the question was about. All the suggestions from participants and how they responded during interviews were recorded and these were taken in real interviews in order to collect useful information for this research.

Conducting interview

The interviews were conducted after the completion of questionnaires. All interviewees were expected to be those who had already completed the questionnaire and thus might have some understanding and thoughts about the topic. Therefore, questionnaire respondents were asked to leave contact information if they were willing to take part in the interviews. Some students left their phone number and email address for interviews. UK teachers suggested the researcher should not email or call them even though they left contact information willingly. Therefore, UK students were selected by teachers as interviewees based on students’ willingness. 11 students were selected from two schools by teachers for interviews. In one school, I was given no more than 40 minutes for each student because students were not expected to skip classes. In

one school, interviews could only be completed during their tutor session in the early morning for around 30 minutes.

Similarly, for the interviews with the Chinese students I did not contact those students who left their contact information. Instead I went to school and selected 10 students who stood up to indicate their willingness to participate in the interview from two schools. The interviews were conducted during the lunch break and only around 40 minutes were allocated for each interview because students had to have rest or have self-learning sessions.

No teacher sat in during the interviews in either the UK or Chinese sessions because the schools already had clear ideas about this research through the questionnaires. A list of questions was sent to schools (in both U.K. and China) before the interviews. Before the start of the interviews, students were informed about the use of data in terms of confidentiality, non-traceability, privacy and anonymity, as well as the right to withdraw at any time. 23 students were interviewed in total and interviews were audio recorded with permission from the students and teachers.

3.6 Validity and reliability

Validity and reliability are important aspects for the trustworthiness in both qualitative and quantitative research (Cohen et al., 2011). As Merriam (2009) demonstrates, 'all research is concerned with producing valid and reliable knowledge in an ethical manner' (p.209) and these two aspects should be taken into consideration in 'the way in which the data are collected, analysed, and interpreted' (p.210).

Validity refers to 'the integrity of the conclusions that are generated from a piece of research' (Bryman, 2012, p.47). There are many kinds of validity. However,

both qualitative and quantitative research emphasise internal and external validity. Internal validity is concerned with the extent to which the data can explain certain events, social practices or phenomenon and how the events can be presented by the data, which sometimes is discussed using the concept of accuracy (Cohen et al., 2011; Leech, 2006). The aim of external validity is to achieve the transferability of findings (Cohen et al., 2011) so that the results of certain research can be generalised and applied to the wider research contexts. It is suggested that in quantitative research rigid sampling strategies, the use of measurement for certain questions and the use of statistical analysis should be included to minimise invalidity and maximise validity (Bryman, 2012; Cohen et al., 2011). Issues of validity in qualitative research are often questioned by positivists (Shenton, 2004) as such research is considered to be lacking in a set of rules for designing instruments and data analysis. However, many researchers argue that validity should be considered and addressed in many forms such as 'honesty, depth, richness and scope of the data collected, the participants approached, the extent of triangulation and the disinterestedness or objectivity of the research' (Shenton, 2004)). In addition, credibility and transferability were regarded as internal and external aspects of validity to enhance trustworthiness for qualitative research (Guba, 1981; Lincoln & Guba, 1985).

Reliability is concerned with the consistency and repeatability of the measures of a concept (Bryman, 2012; Joppe, 2000) which is usually addressed in quantitative research. Stability, equivalence and internal consistency are considered as three main forms of reliability (Carmines & Ziller, 1979 cited in Cohen et al., 2011). Measurements can be stable over time and over a similar sample if the instrument reliable. Through equivalent form and inter-rater reliability, similar results and agreements between researchers can be achieved. Conducting tests with two halves of the instrument is required for internal consistency to understand whether it is reliable (Cohen et al., 2011). Based on the understanding of three forms of reliability, it can be seen that 'reliability' is a

concept of testing and evaluating of information elicitation (Golafshani, 2003). In this sense, what matters is the evaluating quality of research (Stenbacka, 2001) based on its research purposes and research paradigm (Healy & Perry, 2000) and the procedure to achieve its purposes (Patton, 2002). As qualitative research is concerned with the understanding of individual practices in social contexts, it is important to know that ‘published descriptions are static and frozen’ (Florio-Ruane, 1991) in the ‘ethnographic present’ (Linclon & Guba, 1985). Therefore, the concept of dependability should be considered in qualitative research, which closely corresponds to the notion of reliability in quantitative research. Dependability can be achieved by providing details of research design, data gathering and by reflective appraisal of the project in specific research contexts (Shenton, 2004).

Even though this study adopted both qualitative methods, focus groups and semi-structured interviews, and quantitative methods, questionnaires, the research did not aim to achieve generalisations and predictions with respect to adolescents’ perceptions of reading in both UK and China. The same procedure and instruments were applied in the administration of the methods in both UK and China in order to obtain a clear description of perceptions based on participant literacy practices in different social and cultural contexts.

As perceptions of reading in the digital age between the UK and Chinese adolescents had been under-researched, general ideas of what students were thinking about reading with different formats in real life should be gathered at an exploratory stage. Therefore, focus groups were adopted as the first stage of the data collection.

Regarding focus groups, the researcher managed to approach target participants with school support. Questions were well prepared through discussion with the research supervisor and school teachers to ensure that students could fully

understand what questions meant without confusion. Meanwhile, focus groups were piloted carefully. Feedback from focus groups regarding the researcher's questioning style, structure of questions and usage of words was analysed. Participants in focus groups were encouraged to talk freely about their experience of reading and literacy practices in order to gather as much related data as possible to enrich understanding of adolescents' perceptions and to help to set the research constructs and research items for the questionnaire.

Questionnaires were used as a research instrument in order to work as a convenient and efficient way for the exploration of adolescent perceptions of digital reading because of the difficulties in the real research which were discussed previously. Validity and reliability of questionnaires can to some extent be achieved at the beginning because the research items were based upon results of focus groups. In addition, even though the sampling strategy for questionnaires was non-probability sampling, due to practical difficulties, the researcher tried not to recruit respondents from only one class or one school. A pilot study was carried out to make sure each research item could be interpreted easily and understood with similar interpretations among students in terms of words and expressions, which was described in detail in the previous section. Changes were made based on students' feedback and discussion with colleges, teachers and the research supervisor.

Semi-structured interviews were conducted individually so as to have a deep look at the underpinnings of students' perceptions, demonstrated through the results of questionnaires. Research questions were discussed with both the research supervisor and school teachers before pilot studies. Sequencing and structuring of questions, words and distance from students were improved after piloting with some students. I talked to interviewees and teachers to gain basic ideas about reading related practices before the start of interviews. Adequate engagement seemed to be achieved through informal talks so that students

tended to talk more openly (Merriam, 2009).

How researchers deal with data can to some extent affect validity and reliability. In qualitative research, the same data can have different interpretations. It is critical to interpret data within the context, so called 'ethnographic present', because social practices are embedded in highly contextual settings (Merriam, 2009). Therefore, I analysed focus groups and individual data within the contexts of technology integration, digital text availability, the current curriculum, education system and so on. In this study, validity and reliability were achieved through careful data collection procedures, including design, collection, and analysis with the support of rich and thick data.

3.7 Ethical Considerations

The underpinning view of ethical issues in research is said to be concerned with 'the dignity, rights, safety and well-being of those who take part in research' (Stuart & Barnes, 2005, p.3). The general considerations for research ethics in educational projects are seen to be derived from principles that are adopted in most research involving human participants (Chang & Gray, 2013). Based on considerations of the well-being of people who were involved in this research, principles with regard to the value of trust, mutual responsibility and ethical equality were followed as research ethics in this study.

3.7.1 Informed consent

Informed consent is considered as the chief issue for respecting participants' willingness and 'the right to know'. In this study, informed consent was gained from the schools in the UK and China. Formal emails (See examples of emails sent to schools: Appendix 8 (English) and Appendix 9 (Chinese)) regarding the purpose of the project, target participants, research instruments, the procedures for data collection and the protection of data, were sent to head teachers of the

schools that would be the research sites at the first stage. Copies of the DBS check and Student Status Letter were presented to the head teachers as required when meeting with head teachers in person. An invitation letter was not required as the head teachers suggested that they had had enough knowledge of my research after the meeting. As some teachers were asked to become involved in the data collection, I contacted these teachers to make the research purposes and whole data collection procedure clear to them. Based on the full information about the research project, teachers were asked to deliver information to students and to look for participants who were willing to take part in this study.

Owing to the distances involved, the focus groups of Chinese students were conducted online and participants in each group gathered in one participant's house for online video conferencing. Apart from providing related information to the schools and teachers, phone calls were made to the parents of the members of these focus groups to explain the research and to ask for their support. Parents were informed of the voice-recording of the focus groups.

For the audio-recording of interviews, I informed the schools that all voices of focus groups and individual interviews would be recorded. Moreover, participants were informed again of audio-recording to make sure that they were happy with the approach.

3.7.2 Consideration of vulnerable participants

It is argued that the rights and interests of the child 'must be the primary consideration' (BERA, 2011, P.6) in terms of being well informed and free to express their opinions. According to this principle, before starting focus groups and individual interviews, the purposes of the study, procedures, confidentiality, the right to withdraw and anonymity were addressed with students even though they had been informed earlier by their teachers. With respect to surveys, related

ethical issues and participants' rights were clearly stated at the beginning of the questionnaires.

Students who finished the questionnaire could decide whether they would like to attend the follow-up individual interviews by leaving their names and contact information. In order to respond to Child Protection requirements, they could choose to go to their teacher to offer voluntary participation in the individual interviews rather than leaving contact information. And also the teachers were informed that I would tell them before making contact with students.

Regarding the Right of the Child, all research questions were asked in a way that matched individuals' understanding level in order not to cause distress or other emotional harm. In addition, participants were informed that they had the right to ask teachers to accompany them if they felt this was needed.

3.7.3 Right to withdraw

In line with voluntary participation, participants were always assured that they could withdraw from the research for any reason or for no reason, at any time during the research procedure (BERA, 2011). In this study, this recognition was delivered to both the teachers and participants before each stage of the data collection. For the questionnaire completion, it was clearly explained that students were not required to answer every question if they did not want to.

3.7.4 Privacy and confidentiality

It is suggested that participants' data should be treated as anonymous and confidential (BERA, 2011). In this study, I expressed this understanding of privacy and confidentiality to both the teachers and students. Regarding reporting findings, names of participants were pseudonyms and any related information concerning the schools and students was reported anonymously.

Another important issue related to privacy and confidentiality is the storage and the use of data. In accordance with to Data Protection requirements, I stored all the data confidentially in password protected computer files. Similarly, data obtained in the study was only shared between the researcher and supervisor and would only be used for academic purposes.

3.8 Data analysis

Cohen et al. (2011) demonstrate that data analysis is the process of exploration based on the 'principle of fitness for purpose' (p.538). It is important to plan at the beginning whether to summarise, to generate themes or to test and so on, otherwise researchers might easily get lost in large piles of data (Punch, 2009). The purpose of this study was to gain an understanding of what the UK and Chinese adolescents thought about digital reading based on practices in school and out-of-school settings. Therefore, identifying different patterns of literacy practices of digital texts, generating themes about beliefs and perceptions of digital reading, and making comparisons between groups were determined by the research purposes because the aims of the data analysis are in abiding by the research questions.

The data for the study covers both qualitative and quantitative data to investigate perceptions of reading in the digital age in student groups in the UK and China. Therefore, the data could be analysed both within the individual group and across the two groups in order to achieve meaningful comparisons based upon a deep understanding of each group of students. The same analytic framework was applied to data of the UK students and the Chinese students. Therefore, how data was analysed was based on different types of data-interview data and survey data, rather than on the category of groups. The way to analyse data will be discussed in the next section.

3.8.1 Analysis of interview data

As discussed in preceding sections, one of the aims of the study was to understand the similarities and differences between participant perceptions in two groups of students. Therefore, ‘thematizing meanings’ (Holloway & Todres, 2003, p.347) of each group would be the best way to make the comparison between groups rather than looking at characteristics of individual participants. Thematic analysis is credited as a method that mainly focuses on thematizing by discovering patterns of meaning with a clear set of procedures (Braun & Clarke, 2006). Meanwhile, in thematic analysis, themes are generated or developed from codes across all data rather than coding step by step. For me, analysing across all data sets is a good way to think of the contextual settings in terms of the social and cultural perspectives of the data, which is critical for comparative studies. Based on the purpose of data analysis and advantages of thematic analysis, interview data of this study was analysed through the use of thematic analysis.

Interview data in this study consisted of the data from focus groups and individual interviews. All recorded focus groups and individual interviews were transcribed in the language that was used during the data collection. All the transcribed data were analysed in the original language.

Codes of individual interviewees are presented in the tables below. Examples of coding the focus groups and interviews could be found in the Appendix 11, Appendix 12, Appendix 13 and Appendix 14.

Table 3.5 Codes of participants in the focus groups

Focus groups	Description	Codes
UK focus group 1 (5 students)	3 girls (1 Year7 and 2 Year8); 2 boys (Year9 and Year 10)	FGUK11, FGUK12, FGUK13, FGUK14, FGUK15
UK focus group 2	2 girls (Year9 and Year 10); 2boys (Year7 and Year 8)	FGUK21, FGUK22, FGUK23, FGUK24
UK focus group 3	2 girls (Year8 and Year9); 2 boys (Year7 and Year 10)	FGUK31, FGUK32, FGUK33, FGUK34
UK focus group 4	2 girls (Year8 and Year9); 3 boys (2 Year8 and 1 Year9)	FGUK41, FGUK42, FGUK43, FGUK44, FGUK45
Chinese focus group 1	2 girls (Grade 7); 2 boys (Grade 8)	FGCN11, FGCN12, FGCN13, FGCN14
Chinese focus group 2	2 girls (Grade 9); 3 boys (1 Grade 7 and 2 Grade 9)	FGCN21, FGCN22, FGCN23, FGCN24, FGCN25
Chinese focus group 3	2 girls (2 Grade 8); 2 boys (1 Grade 7 and 1 Grade 9)	FGCN31, FGCN32, FGCN33, FGCN34
Chinese focus group 4	2 girls (2 Grade 10); 2 boys (2 Grade 10)	FGCN41, FGCN42, FGCN43, FGCN44

Table below presents codes of participants of individual interviews in this study.

Table 3.6 Codes of participants of the individual interviews

Interviewee	Description	Code
UK Student one	A girl who was 13 years old at her Year8. The interview was carried out on 07 October, 2015	IUK1
UK Student two	A thirteen-year-old girl at her Year8. The interview was carried out on 07 October, 2015	IUK2
UK Student three	A boy who was 13 years old at his Year8. The interview was carried out on 08 October, 2015	IUKS3
UK Student four	A twelve years old boy at his Year8. The interview was carried out on 08 October, 2015	IUKS4
UK student five	A fifteen-year-old boy at his Year10. The interview was carried out on 06 November, 2015	IUKS5
UK student six	A fourteen-year-old girl at her Year9. The interview was carried out on 17 November, 2015	IUKS6
UK student seven	A fifteen-year-old girl at her Year10. The interview was carried out on 18 November, 2015	IUKS7
UK student eight	A fourteen-year-old girl at her Year 10 The interview was carried out on 18 November, 2015	IUKS8

UK student nine	A fourteen-year-old boy at his Year9. The interview was carried out on 19 November, 2015	IUKS9
UK student ten	A fourteen-year-old girl at her Year10. The interview was carried out on 19 November, 2015	IUKS10
UK student eleven	A fifteen-year-old girl at her Year11. The interview was carried out on 04 December, 2015	IUKS11
Chinese student one	A fifteen-year-old girl at her Grade10. The interview was carried out on 21 May, 2015	ICN1
Chinese student two	A fourteen-year-old boy at his Grade9. The interview was carried out on 21 May, 2015	ICN2
Chinese student three	A fourteen-year-old girl at her Grade9. The interview was carried out on 22 May, 2015	ICN3
Chinese student four	A fifteen-year-old girl at her Grade10. The interview was carried out on 25 May, 2015.	ICN4
Chinese student five	A fifteen-year-old boy at his Grade10. The interview was carried out on 25 May, 2015	ICN5
Chinese student six	A fifteen-year-old girl at her Grade10. The interview was carried out on 26 May, 2015	ICN6

Chinese student seven	A fifteen-year-old boy at his Grade10. The interview was carried out on 26 May, 2015	ICN7
Chinese student eight	A fourteen-year-old girl at her Grade9. The interview was carried out on 27 May, 2015	ICN7
Chinese student nine	A fourteen-year-old boy at his Grade9. The interview was carried out on 27 May, 2015	ICN9
Chinese student ten	A thirteen-year-old boy at his Grade8. The interview was carried out on 28 May, 2015	ICN10
Chinese student eleven	A thirteen-year-old boy at his Grade8. The interview was carried out on 29 May, 2015	ICN11
Chinese student twelve	A fourteen-year-old boy at his Grade9. The interview was carried out on 29 May, 2015	ICN12

In accordance with the procedures of thematic analysis, data was analysed according to its step-by step rules. I listened to a voice recording of the interview on the day of interviewing. Notes and thoughts about the interview were written down in a separate file while listening to the audio recording. By doing this, I learnt from interviewing to improve my interview skills for following interviews and to think about the data beyond a surface level. After collecting all interview data for each stage, I listened to the whole data set and read alongside with verbatim transcriptions and the thoughts written down on the day of interviewing. Reading entire data is regarded as an important phase to familiarise oneself with data (Braun & Clarke, 2006). During this phase, any

quick and relevant thoughts and notes regarding meanings of the data were also written down beside the textual transcriptions to work as ‘memory aids and triggers for coding and analysis’ (ibid, p.61).

After becoming familiar with the data by reading through the data three times, the systematic analysis of the data began with coding. All data was uploaded to Nvivo to build different blocks of analysis. As coding is the early stage of analysis, and a stage of discovering, anything related to the research questions was coded according to the principle of ‘inclusivity’ in order to assure an inclusive coding process. Generating themes started after all data was coded inclusively. Code clusters are a useful way to search for themes because finding boundaries for different areas of codes can be regarded as an active procedure of data display and data reduction (Miles & Huberman, 2013) by drawing overlaps and similarities to obtain themes. When searching for themes, I used tree nodes on Nvivo as a way to see different clusters of codes. Apart from reviewing tree nodes, I considered to what extent themes from clustered codes could answer the research questions, and whether supporting data for the themes were meaningful and coherent.

Analysis of Focus group data

The focus groups were adopted as a preliminary stage to gain a general picture of the students’ interpretations of digital reading on the basis of their most recent literacy practices and reading experiences. The coding structure for analysing focus groups was partially determined by the existing structure. For example, according to research (Woody et al., 2011) students prefer reading from paper for academic purposes. Therefore, the coding of ‘preferences for printed texts’ was used as a node, which included sub-nodes such as ‘Academic purposes’ and ‘Enjoyment purposes’. The coding structure emerged from the existing literature which suggested the deductive coding strategy. Based on the literature, literacy practices, preferences for text formats, notion of reading, and online reading

were used as parent nodes. Meanwhile, as the focus groups were used to see the latest practices and experiences of print and digital reading, some practices and experiences may not have been researched and discussed in the literature. Therefore, an inductive coding strategy was then adopted to get issues that were not expected. By adopting the thematic analysis, themes of the focus groups were explored as similarities and differences between the UK and Chinese students, which will be presented in the Findings chapter.

Analysing individual interviews

The aims of conducting individual interviews were two-fold. On the one hand they were designed to elaborate and explore the findings emerging from the questionnaires with the aim of allowing a deeper understanding of the questionnaire responses. On the other hand, they were an attempt to explore and explain something relating to the different social and cultural contexts of the UK and Chinese students, which lie behind the findings from the questionnaires. Therefore, both deductive and inductive approaches were used for analysis of these interviews. Some issues were explored and themes generated based on the prior findings of the questionnaire. There were also some issues and themes which were unexpected and emerged from a close analysis of the interview data.

In the following section, themes, sub-themes and codes used for analysing interviews will be discussed along with examples of how the analysis was carried out.

Themes based on the findings from the questionnaires (deductive coding)

The questionnaire consisted of five different sections, each designed to explore a different aspect of students' literacy practices towards both digital and printed texts in and outside of school, and their perceptions of digital reading based on their literacy practices. According to the findings concerning students' access to digital texts and reading activities with print and digital reading in both in school

and out-of-school settings, themes regarding student literacy practices with different text formats in various settings were created to examine practices that were not covered in the questionnaire. By creating these themes, it was hoped to explore more diverse practices based on students' daily experiences. There were two sub-themes under the main theme of literacy practices: literacy practices with digital texts and literacy practices with printed texts. All practices carried out in school and outside of school were coded. It was also thought that this theme would help in understanding whether what students claimed in individual interviews regarding their literacy practices dovetailed with the findings of the questionnaire.

The second theme was concerned with students' preferences for different text formats. It was revealed that students from the UK and China tended to prefer different text formats depending on their purposes for reading. When reading for school work, education or studying, more of the Chinese students tended to prefer printed texts than did the UK students. More of the UK students expressed a preference for digital texts when reading for academic purpose than did the Chinese students. When reading for enjoyment, more of the UK students preferred printed texts, whereas more of the Chinese students expressed a preference for digital texts or reading on screen. Therefore, a sub-theme was created to explore the reasons why students preferred certain text formats for different reading purposes. Meanwhile, this sub-theme was also used to help to understand why there was a difference in preferences for text format for the same reading purpose between the two groups of students.

Under the theme of text format preferences, another sub-theme to explore concerned the issue of gender differences. From the questionnaire, gender differences among the UK students were found to be statistically significant when related to text format preferences. However, no significant gender differences were found among the Chinese students. Therefore, the sub-theme of gender

difference was developed to try to understand what could cause gender differences in terms of text format preferences and why there were differences between the students from two countries in the ways gender and text format preferences interacted.

The third theme generated was based on the exploration of student self-perceptions of being a reader with printed and digital texts. These self-perceptions were explored alongside investigations of behaviour in reading digitally, sharing of reading materials and belief in digital texts for homework. From the findings of this part of the questionnaires, a theme looking at students' ideas about what counts as reading or how they draw boundaries in the definition of reading was created. Different features of reading were coded to try to understand the changing notions of reading in the digital age. Another aim for this theme was to understand the different definitions that students had for reading in the electronic environment within different social and cultural contexts.

Another theme was online reading comprehension which was also a part of the questionnaire. Both the UK and Chinese students were found to be sophisticated in locating information, comparison, evaluation and generating their own ideas. This theme included three sub-themes: skills, beliefs and distractions, each relating to how students comprehend when they read on screen. At the same time, reading strategies that students used when they were reading online were coded. In the sub-theme of skills, there were five codes, including searching, rephrasing, locating, evaluation and creation. The sub-theme of belief included the usefulness of online reading as compared to print reading. The third sub-theme was distractions, which were regarded as factors that affected reading comprehension. Things that students claimed caused distractions were analysed. In addition, differences regarding online reading comprehension between the two groups of students were analysed. According to the questionnaire findings,

both the UK and Chinese students appeared to be quite sophisticated about online reading. However, differences were found regarding various points such as skills of information location, evaluation and ability in synthesising and generating new ideas. Therefore, reasons and factors were investigated from interview data to understand the reasons underpinning such differences.

Possible themes emerging from analysis of the interviews (inductive coding)

After a thorough reading of all the interview transcripts, there were some issues which seemed to be mentioned frequently that were not apparent in the questionnaires among both the UK and Chinese students. The following themes were regarded as possible themes that were not suggested by the questionnaires. These points were generated based on thoughts when reading the transcripts. It would be possible that these points may not be themes and other unpredicted themes may emerge.

One possible theme concerned the use of transferable reading skills or strategies. This theme came from comparisons that students made based on their experiences of reading on paper and on screen. Almost every interviewee talked about the different strategies and skills they used to deal with texts in different media. In the meantime, students implicitly discussed how they developed the strategies or skills used for online reading by sharing literacy practices. Therefore, this theme aimed to reveal what type of reading skills could be transferred and the direction of transformation, from print reading to digital reading, or vice versa.

Another theme was concerned with students' reading environment. As both the UK and Chinese students shared daily literacy practices, they actually were conveying what kind of reading environment they were living in. There were two sub-themes under the theme of reading environment. One was the school

reading environment, mainly revealing how students perceived teachers' practices with different text formats and their attitudes to digital reading. The other sub-theme was the family reading environment. Family reading activities, sibling and parent literacy practices and parents' attitudes to text formats were coded as four sub-themes. This theme was generated from the analysis of literacy practices conducted in different reading environments. Analysis of the reading environment helped to create an understanding of potential factors that affect students' ideas about reading and how they perceived reading with printed and digital texts. At the same time, reasons why there were differences regarding preferences or beliefs about digital reading were to some extent revealed under the theme. Questions and issues stemming from the findings of the questionnaire were thus elaborated.

3.8.2 Analysis of survey data

Questionnaire data was uploaded to SPSS and analysed within each group at the first stage and then across the two groups of students. The questionnaire was designed based on the results of the focus groups with the purpose of exploration of students' beliefs about reading with different reading formats and purposes. Therefore, the questionnaire data was analysed according to the research constructs, digital reading accessibility, reading activities, preference and purposes, self-as-reader and online reading comprehension. When analysing accessibility and reading activities, basic descriptions of analysis such as percentage and mean were adopted to obtain ideas about different types of reading activities and frequently accessed ways of reading digitally.

In terms of the investigation of respondents' preferences and their feelings about reading with different texts, a 5-point-scale was used to measure responses. This scale: Strongly Disagree, Disagree, Not sure, Agree and Strongly Agree was designed to categorise individuals' feeling. The distance between Strongly

Disagree and Disagree may not be the same as that of between Disagree and Not sure. Therefore, the data arising could be described as ordinal rather than interval data, which cannot be analysed by way of numerical estimation. Simple descriptions were adopted to ascertain the percentage of different categories of feelings. Cross tabulations of gender and ordinal data and Year group and ordinal data were examined when analysing within groups and across groups. With regard to cross group analysis, the mean was adopted as a straightforward way to tell the differences between the two groups. For example, mean of 'I prefer reading printed books for enjoyment' was examined in both UK and Chinese students when conducting cross tabulation to obtain the basic tendency of respondents' feelings. (See Appendix 10 for the e rationales for choosing analysis techniques)

Even though the sampling strategy of questionnaires was non-probability sampling, I managed to distribute the questionnaires to more than one school and one class in order to increase reliability. Meanwhile, because of the large number of valid questionnaires, 438 of UK students and 358 of Chinese students, the researcher tried to examine some non-parametric statistics to consider patterns within groups (Gorard, 2003), such as Chi-square and the Spearman correlations. Results of non-parametric analysis of each group were then compared to explore the differences between the UK and the Chinese students and also considered as a possible dimension for the semi-structured individual interviews.

Conclusion

This study adopts a mixed methodological paradigm based on the needs and purposes of the research and the nature of the research questions. Multiple methods, including focus groups, survey and semi-structured interviews were applied in sequence in order to obtain thick and rich data concerning these

Chinese and UK students' perceptions of reading in the electronic reading environment based on their literacy practices in different settings. Ethical issues were carefully considered throughout the design, conduction and analysis of the data. Pilot studies were also carried out abiding by relevant considerations of validity and reliability. The next chapter will consider the findings of both interview and survey data to draw a clear picture of students' literacy practices and their perceptions in the UK and China. Comparisons between the two groups of students will also be presented.

Chapter Four Findings

Introduction

This chapter presents the findings from the data collected through the focus groups, the questionnaires and the individual interviews. This data provided both qualitative and quantitative research evidence concerning the perceptions of digital reading of groups of adolescents in the UK and China. The focus groups provided general ideas of what the adolescents thought about reading in the digital reading environments and the results of these helped to lay the foundation for the design of the subsequent questionnaire. The questionnaire data provided a broad picture of the students' perceptions of and views about digital texts, and reading activities, both in school and outside of school. Deeper insights into students' perceptions were gleaned through the individual interviews. The three data collection methods employed therefore enabled both a breadth of evidence to be collected, in addition to an in-depth analysis of the views of a smaller number of students.

In this chapter, I will begin by presenting the outcomes of an analysis of the focus group discussions, highlighting the similarities and differences between the UK and Chinese students. I will move on to present the quantitative findings from the questionnaire survey. The questionnaire was designed based on the outcomes of the focus groups discussions and a review of previous studies. In the final section of this chapter, the findings of the individual interviews will be presented and used to elaborate upon what was found in the questionnaires in order to provide some deeper insights into what students thought about digital reading.

4.1 Findings emerging from the focus groups

There are two parts to this section, concentrating on the similarities and then the differences in the views of the UK and Chinese participants. Four groups of the

UK students participated with a total of 18 students ranging from Year7 to Year10. 17 Chinese students divided into four groups were from Grade7 to Grade10. Each group had 4-5 students.

4.1.1 Similarities

Understanding of intensive exposure to digital texts

Both the UK and Chinese students claimed that they were aware that they had grown up with technologies. Digital devices were claimed to be a part of their lives. Some UK students defined themselves as ‘a generation of technology’. As one student (FGUK32) claimed, ‘You know we are the generation that cannot live without these (digital devices)’ and that she would ‘I still take it out on me, even though it’s like practically dead, because I just need to have it on me’. A majority of the UK students expressed their agreement to this view. Many Chinese students mentioned similar ideas. More than half of the Chinese students agreed to one student (FGCN12) who said that ‘our life is tied up with technology and everyone was linked to those devices’.

Both the UK and Chinese students claimed that digital devices were everywhere and influencing their ways of living and learning. It was claimed that due to the penetration of technologies, in school they had different types of texts, including texts on printed materials, and multiple modes of texts on the whiteboard/smart board, such as video clips, sound tracks and words and so on. Out-of-school they claimed they used digital devices to communicate with each other, to learn things and to keep them updated with the outside world. Practices that they claimed to use with texts on screen included texting, reading digital books, reading news online, emailing, social networking, researching for a topic, searching for information as well as other practices for academic and enjoyment purposes.

Understanding of the usefulness of online reading

Both the UK and Chinese students in the focus groups demonstrated that they

acknowledged the usefulness of online reading in terms of obtaining information quickly and broadening knowledge.

The students believed that reading online was a quick way to obtain comprehensive ideas about a specific topic within a short period of time. A large majority of the UK students claimed to read online for quick but detailed information. Four students defined themselves as a 'Google it' person. Many students shared similar ideas to one student (FGUK42) who argued that online reading 'it's more straight forward and it's there'. More than half of the Chinese students, although they did not use a specific word to define themselves, claimed that one of the best things about online reading was the ease of use. One student (FGCN21) described that 'when you read online for homework for example, answers to questions come out right after you type in something which saved a lot of time'.

Meanwhile, all the students suggested that reading online offered different sources of information with various perspectives in the open space of the internet, which was believed to be useful for broadening knowledge for a topic compared to reading a printed book. Around half of the UK students shared a similar idea to one student (FGUK31) who reported that 'I take in a lot more information when I read online compared to reading a book' because 'I could read other's comments and how they think about the same thing. More perspectives are there for you to understand a specific thing'. Similar to the UK students, a large majority of the Chinese participants found that online reading was something that they could use to dig deeply from related information for a broader understanding of something or a specific event. They believed that they had the chance to explore what is behind the topic or issues they searched. For instance, one Chinese student (FGCN31) said that 'What's more important for us is getting extra information to know what's behind it such as background, incentives and influence of the event'.

Understanding of the strategies for online reading

Both the UK and Chinese students realised that reading online was not just about reading the top search results when they searched. Instead, there were several things needing to be considered, including searching for relevant information for a topic, locating the right information, evaluating online information and synthesising information.

A majority of the students claimed that the most critical strategy was information evaluation. They believed that they would not be able to synthesise information unless they had ability to evaluate online information. More than half of the Chinese students said that they were careful about reading online. One student (FGCN24) reported that 'I'm always very careful when I'm reading online because you don't know who is putting the information to form this piece of reading'. Most of the UK students shared similar ideas. One student (FGUK32) said that online information 'is very tricky sometimes. Unlike books, no one checks it before putting it online'. Therefore, several Chinese and UK students claimed that the source of information was very important. One Chinese student (FGCN42) explained that information produced by 'An authoritative webpage or website is a kind of guarantee for the quality of the content'. Apart from acknowledging the sources and contributors of information, many students demonstrated that it was necessary to focus on content. Around half of the UK students said that they usually checked content when reading online. For example one student (FGUK13) said that 'I would check small facts or figures' and 'I would compare the information but from reading through different sources'. More than half of the Chinese students claimed that they read carefully to see if the content was well written.

However, although they claimed to have an understanding of the importance of these strategies, many of them said that they were not skilled at using them. They additionally felt it as kind of challenge to comprehend online reading because

they thought they had more distractions when reading online compared to print reading.

Preferences for printed texts for reading that they really liked

Both the UK and Chinese students claimed that they read printed and digital texts for both academic and pleasure purposes. However, a large majority of them demonstrated that they preferred to read from paper if there was something that really interested them.

Most of the UK students claimed that after school they read from various digital devices for learning and pleasure. However, around half of these students suggested that they would buy physical books for reading that they really like especially for pleasure/enjoyment reading, regardless of price. One student explained that she felt more relaxed with holding a book in her hands. Three other students agreed to one student (FGUK31) who said that when reading on screen 'you are kind of scrolling downing or wiping quickly. But when reading print, you kind of, open the book and turn the page back and forth and read favourite parts many times'. Another student's claim of deep reading with physical books compared to reading on screen gained several students' agreement. It was said that they had more imagination and created more scenarios when reading from paper. These students explained that it was easy and convenient to obtain digital reading, which could be accessed at any time, but it was easy to forget. Therefore they would like to 'feel it, touch it and remember it' regarding reading materials that they really liked rather than reading them for the sake of reading.

Similarly to the UK students, a large majority of students in China claimed that they would get more enjoyment from printed books than from reading on screens. It was explained that reading from paper was a habit they had had for years and they enjoyed the feeling of holding a book rather than seeing texts

through a screen. One Chinese girl (FGCN22) argued that ‘reading on screen is kind of loss of the third dimension’. Several students suggested that the aesthetic feeling of the third dimension came from ‘texts piled on pieces of paper which created different scenes and pictures on paper’, said one student (FGCN34).

4.1.2 Differences

The following sections will present some key differences between the groups of students, including views about the access to digital texts, reading practices with both printed and digital texts, and their preferences for text formats in both in-school and out-of-school settings.

The access to digital texts

All the UK and Chinese students understood that they were exposed to digital texts in school and in out-of-school settings. However, it was found that there was a difference in the access to digital texts between these two groups. It seemed that the UK students had more chances to access digital texts than the Chinese students.

In school, both the UK and Chinese students claimed that they had access to digital texts through the teacher’s usage of a projector or smart board for lecturing or in ICT classes. A majority of the UK students suggested that, apart from reading the teacher’s demonstration digitally in class, they often use the school’s computer in library to do homework or when searching for information for schoolwork. Meanwhile, many of them mentioned that they accessed digital texts by using their own smartphones, tablets or laptops during class breaks or lunch breaks. Some of them claimed to use a friend’s or a teacher’s digital device. However, very few of the Chinese students mentioned the use of their own devices or others’ devices.

When outside school, both groups of students claimed their exposure to digital

texts was due to the availability of various devices. However, it was found that the UK students read digitally from a wider range of digital devices than the Chinese students. More than half of the UK students indicated that they accessed digital texts by using a range of digital devices. One student (FGUK) said 'I use my own mobile phone, iPad, and laptop'. Some other described that they could borrow parents' Kindle, laptop, or iPad. Most of the Chinese students reported the use of mobile phones or parents' digital devices. It was agreed by most of the Chinese students that 'I use my own mobile phone or sometimes I borrow parents' mobile phone or sometimes iPad for digital reading', reported by one participant (FGCN13). Meanwhile, several Chinese students claimed that they spent no more than one hour on reading digitally, which was shorter than the UK students who claimed they spent more than two hours a day reading digitally.

Literacy practices and reading activities

The students claimed that they read different texts formats, both printed and digital texts in daily living and learning. Based on the students' claims about their textual engagements, the Chinese students tended to have more paper-based literacy practices/reading activities than the UK students in both in-school and out-of-school settings.

In school, for the UK students, all of them claimed that they had 10-minute reading session at the beginning of English and that they could either bring their favourite paperback books or tablets with downloaded e-books. As claimed, they had paper-based or print reading activities, including reading their subject or textbooks, but very occasionally, hand-outs from teachers and other printed reading materials for the class. Meanwhile, apart from reading from projectors or whiteboards in class, more than half of the UK students mentioned that some students may have interactions with a tablet provided by the school as extra supports for learning and reading if they were suffered from some reading problems. None of the Chinese students mentioned practices with the use of

school-provided portable devices to support learning. All of them claimed that their reading activities in school, included reading a range of books related to their subject of studying. It was said that they had textbooks for every subject and used these subjects in every single class session. More than half of the Chinese students suggested that they read from paper for most of the time. Additionally, a majority of reading was said to be related to their subject. Few of them claimed that they would have digital reading in school unless they brought digital devices to school without being noticed.

Outside of school, around half of the UK students claimed that they spent a similar amount of time on reading from paper and on screen. Some may read more from paper than reading digitally; others vice versa. However, it was hard to tell which text format was more popular than the other. Most of them claimed that they read printed books and digital texts for pleasure. More of the students said that they read on screen for homework or learning purposes. Around a third of them said that they read for pleasure from physical books as well as on Kindles or iPads. Meanwhile, a range of digital literacy practices were frequently mentioned including texting, gaming, social networking, doing homework, doing research for a topic that interested them. It seemed that the UK students tended not to go for certain text formats for learning purposes. However, for the Chinese students, all of them said that they read from printed books for learning purposes and around half of them claimed that they used digital devices to get learning software and for learning related practices. One girl (FGCN22) said that I bring textbooks of every subject home together with excises books or problems books and I could use them at any time I want and need instead of bothering asking parents or using devices'. Besides, this student explained that 'every student would definitely buy himself or herself at least a problem/exercise book for each subject to read and use at home so that 'you would not be left behind'. Most of the Chinese students also suggested that they regarded using digital devices as a way of getting relaxation from studying stress and endless

homework. They had similar digital practices as the UK students, but only did so for very short periods and some of the students would spare the time for learning with digital devices.

Acceptance of e-reading or e-books

Both the UK and Chinese students had literacy practices involving printed and digital texts in school and outside school. However, it was found that e-books or e-reading were more popular among the UK students than among the Chinese students.

Most of the UK students claimed that they would like to try e-textbooks if they were available. Some UK students suggested that they would like to use e-textbooks for learning. One student (FGUK42) said that it's kind of cool. It's something not very common'. More importantly, these students claimed that, based on their experiences of e-reading, it was easy to access because of the availability, convenience and low cost of digital texts on screen at any time and any place. Four students mentioned the use of 'MyMaths' to support mathematics learning in out-of-school settings and they were very happy with using it. Meanwhile, a few of them agreed that they were 'kind of visual people', according to one UK girl (FGUK23). They found digital texts were more interesting and vivid with different modes of explanations than the texts on printed textbooks. It was said that the multimodal features of digital texts to some extent made learning or reading more interesting.

The Chinese students reported that they would like to use e-textbooks. One student (FG24) said that 'it would be a kind of relief from their school bags if e-texts were released' and 'we could not suffer from carrying a very big and heavy school bag between home and school'. They also acknowledged the multimodal features of digital texts. However, more than half of them claimed that there might be some problems of using e-books. One boy (FGCN34)

explained that 'I understand how convenient it is to read from screen but I think we could not get used to reading on screen'. It was explained that they might need to spend quite a lot of time familiarising themselves with all kinds of functions with digital books, especially for learning purposes. Some of them suggested that they would not be willing to choose digital textbooks because of the time they would have to invest.

Preferences for text formats

A large majority of the two groups of students claimed their preference was for printed texts if what they read was something they really liked. However, their preference for certain text formats varied depending on their reading purposes. It was found that more of the Chinese students claimed the preferences for printed texts for academic purpose than the UK students.

Most of the Chinese students claimed that they used printed books as reference books if they needed to obtain some information related to their school lessons. Meanwhile, they suggested that would feel more comfortable by using printed books when having a class. One boy argued (FGCN31) that 'even though the teachers use PowerPoint to lecture, I still prefer having a textbook or something in my hands'. He explained that 'reading something printed out is a rather formal way of learning and reading'. They believed that reading print would lead to better learning outcomes compared to reading on screen.

However for the UK students, less than half of the students claimed the use of printed books to check for information for school lessons. More than half of them suggested that they preferred the internet over physical books. It was said that they did not find any difference between reading on screen and reading from paper regarding the understanding of what they read. One girl (FGUK14) argued that 'what matters is content rather than what you are reading'. Regarding preferences for certain text formats when having a class, most of the UK students

claimed that they did not think too much about this issue. But a few of them suggested that they preferred the use of printed texts because some teachers were not skilled at computers.

4.1.3 Summary

A general picture of ideas of digital reading across the UK and Chinese students was provided through an analysis of the focus groups with an exploration of similarities and differences. Both the UK and Chinese students shared a similar awareness of pervasive digital technology in daily living and learning. They acknowledged the usefulness of online reading in terms of getting information and broadening the scope of knowledge. Meanwhile, it was found that two groups of students believed that it was important to have strategies for successful online reading, including information searching, locating, evaluation and synthesis. With being exposed to both digital and printed texts, their preferences for certain text formats were varied based on reading purposes.

Although both the UK and Chinese students claimed to be growing up and living within technology-rich environment, it was confirmed that the UK students tended to have more chances to access digital texts in school and out-of-school than the Chinese students. Regarding digital literacy practices, the Chinese students tended to have more print-based reading activities, whereas the UK students showed no such tendency. This may to some extent shape the ideas of acceptance of e-book reading between two student groups. Meanwhile, more of the Chinese students claimed their preferences for printed texts for learning purposes.

These findings that emerged from the focus groups, together with a review of previous studies, helped to underpin the design of the questionnaire, which will be discussed in the following section.

4.2 Findings of the survey

The questionnaire was designed by taking results of focus groups and a review of previous studies. The following section will discuss how the questionnaire was designed. Apart from demographic information including age, sex and Year group, the questionnaire was designed in five parts

The focus group participants had claimed to use a wide range of digital devices in school and outside of school to read digitally, however, patterns of access to digital texts across the two countries still remains under-researched. Therefore, based on the focus group participants' reported ways of accessing digital texts, the first part of the questionnaire was designed to explore the students' access to digital texts in and out-of-school settings. Regarding the exploration of the access to digital texts in school, the questionnaire participants were expected to choose from options including 'Whiteboards/Smartboards in class', 'Computers in school', 'Personal devices' and 'Others' devices. A range of digital devices were listed as sub-options under 'Personal devices' and 'Others' devices'. Potential participants could choose any one that applied to them. Options including 'Household computer', 'Personal devices', 'Parents' devices' and 'Friend's devices' were designed to investigate what access that the students had in out-of-school settings. Participants could choose from the list of digital devices under 'Personal devices', 'Parents' devices' and 'Friend's devices'. Meanwhile participants were encouraged to fill in blanks provided to describe anything not covered in the questionnaire.

Reading activities were structured in the second part. It has been discussed in many studies that reading nowadays is not only limited to reading a physical book (Lanksehar & Knobel, 2011). The students in the focus groups discussed a range of activities they usually undertook in school and at home. Therefore, two smaller parts were designed under the reading activities. The first part was

expected to investigate what kind of reading activities the UK and Chinese students had in school. The second part looked at the context outside of school. Participants could choose from options provided and fill in information about anything that was not covered.

The remaining three parts were designed by using a Likert scale to measure to what degree the UK and Chinese students agreed or not with the statement regarding preference of text formats, themselves as a reader and their online reading comprehension.

In terms of preference of text formats, three smaller parts were included. Each part had two questions. The first part was designed to look at preferences that the students had for obtaining information for school work.

Both the UK and Chinese students in the focus groups had mentioned that they often read for school lessons, such as when they tried to get subject related information to prepare for or to review what they had learnt. Both groups of students showed a general preference for the use of printed texts from printed reference books or textbooks and digital texts on the internet to get school-lesson-related information. Therefore, students' preferences for particular text formats for school lessons, which required them to find information to read for preparation and revision were to be investigated using the following two questionnaire items: 1) I prefer using printed reference books or printed textbooks to find information for school lessons; 2) I prefer using the internet to find information for school lessons.

The second part was expected to understand what type of texts that students preferred to have when they were having a class. Students in focus groups had claimed that a lot of reading that they had done when they had classes. With the integration of technology in teaching, students are experiencing digital texts

on smart board/whiteboard or through a projector. Meanwhile, students read from a range of printed texts, such as textbooks, teacher-prepared hand-outs or books that students bring to school. Therefore, in this questionnaire, two items were designed to explore students' preference of text format in class: 1) I prefer print reading in a class; 2) I prefer digital reading in a class.

Preference for text formats in the third part was investigated based on the purpose of reading for enjoyment, which came from what both the UK and Chinese students claimed in the focus groups. In the focus groups, the UK students demonstrated that they would choose to read normal print, such as paperback books, if that was something they really liked. For the Chinese students, they claimed that they tended to read from mobile phones or using reading Apps for enjoyment. Therefore two research items in the questionnaire were structured in order to understand whether results from focus groups could be validated in breadth: 1) I prefer digital reading for enjoyment; 2) I prefer printed books, magazines/journals for enjoyment.

Apart from examining the students' preferences for certain texts formats, students' views in focus groups in terms of their feelings about the differences between reading on screen and from paper led to questionnaire items to explore what adolescents perceive about digital reading compared to reading print, and vice versa. Students in focus groups also had suggested that their behaviour of reading on screen was different from reading print. Meanwhile, it was claimed that sharing what they read with others could depend on text formats of reading materials. Therefore, questionnaire items for the investigations of behaviour of reading digitally, sharing of reading materials and use of digital texts for homework and for solving problems were designed. Seven research items were included in the section 'Yourself as a reader'. Focus group members from both the UK and China had claimed that their deep thinking when they read can vary between text formats. Some students said they found no difference in their deep

thinking between reading digitally and reading print. However, deep thinking could be stimulated when reading certain text formats, printed texts or digital reading. Therefore, this questionnaire item was designed as 'Print reading tends to make me think more deeply than digital reading'.

According to students from focus groups, many students suggested that they found it more relaxing to read from paper than on screen. The questionnaire item was phrased as 'I find it more relaxing to read printed texts than digital texts' to investigate the general and fundamental feeling of reading different formats of texts.

Apart from the feeling of relaxation with specific text formats, students mentioned in focus groups that they would have different reading behaviour for certain type of texts. Reading on screen for the purpose of information was believed according to students in focus groups to be an act of getting a quick overview. Many of the focus groups members claimed to have this belief. Therefore, a research item 'I tend to skim read when I am reading digitally online for information' was designed to investigate whether students would have certain pattern of reading behaviour when reading for information purpose with digital texts.

The students in the focus groups had claimed that during their free time in school, talking about what they had read at home or after class was one of their usual activities. Apart from having discussions of print based reading, students in focus groups said that they liked to talk about news, or information they searched online as usual events when they were out of class. Therefore, students' behaviour of discussing what they read online was designed to be explored as the questionnaire item: In free time in school, I like to discuss with my friends what I have read online.

It was claimed in the focus groups that doing homework with the use of digital texts was a common activity. With the exposure to both printed and digital texts, students in focus groups demonstrated that they had different ways, such as using printed texts and online texts to help with homework if they came across some problems. Some students said that they would think about using digital texts for sure for homework problems. However, others said that they tended to use printed books or some related texts to solve problems for homework. Therefore, a questionnaire item was designed to investigate students' behaviour towards using digital texts on the internet for homework: I always think about searching the internet when I have some problems in my homework.

Doing homework was discussed as one of main tasks in their daily routine in the focus groups. Based on students in focus groups, students had claimed that their homework was set in different ways with the use of printed texts and digital texts, such as a traditional way of using pen and paper that students were expected to finish independently. Apart from having paper based or printed texts based homework, students said that they may have a project as homework and they were expected to work with others with the use of online texts for communication through the internet. Some students suggested that working with others through the internet for homework as a project was interesting. However, others did not have the tendency to have projects as homework with the use of online or digital texts. Therefore, based on students' views of using online texts collaboratively for projects as homework, the questionnaire item was designed as: I like doing projects as homework with my classmates by using the internet.

It was discovered through the focus groups that many of the UK and Chinese students suggested that they often borrowed paperback books from friends and they lent their own to others as well. Apart from printed books, they demonstrated that they would share links of online texts that they read with

friends. Some students said that due to the convenience, they tended to share digital texts with friends rather than lending or borrowing printed books. In order to explore students' views of behaviour in sharing digital texts compared to printed texts, the questionnaire item therefore was designed as: I am more likely to share with my friends what I have read online than in printed books.

Exploration of online reading comprehension was designed with eight research items in terms of skills of using online texts and understanding of digital texts. Students nowadays read with digital texts from whiteboards or projectors in class. These texts are not simply converted from printed texts and they often contain hyperlinks and hypermedia for further reading or extra information. Some students mentioned that texts that the teacher presented on screen in class were not the same as that of textbooks or other printed books. Understanding digital texts was (such as a variety of texts formats, information load and the use of links) recognised as one of the skills for online reading comprehension even though they said that they read in class with their teacher's instruction. Therefore, a questionnaire item: I understand what the teacher demonstrates using digital texts in class was designed.

Different from traditional structured reading content, online reading includes much information that requires readers to read selectively based on purposes. As previous studies and focus groups participants suggested, being able to locate what individuals want actively from various pieces of information is critical for online reading. Students in focus groups mentioned that they thought they were able to locate related information for their reading. Therefore, the questionnaire item was designed to investigate students' feelings about their abilities in information location as: I know how to locate information when I search the internet for a specific topic.

Apart from being able to find related information, individuals are expected to

choose information that they want from piles of information because similar information appears for the same words they type in search engines. Many students in focus groups claimed that there was a need to evaluate online information rather than going for the first piece that came up on the top of search engine results because texts online information were explosive and more complicated than they imagined. However, some students argued that information online was quite similar because the same piece of information was always put in different websites many times. In order to explore students' views of information evaluation, a questionnaire item was set as: I know it is important to evaluate information online.

Students in focus groups had claimed that they usually compared different kinds of opinions that they came across to help with their decisions about choosing information they wanted for further understanding and thinking. It was said that comparing opinions always came with information evaluation in order to avoid getting into the wrong website or web link. They believed that it was wise not to trust what anyone posted online. Therefore, the questionnaire item was designed as: I often compare opinions I read on the internet to understand their behaviour for online reading comprehension.

Based on what students had suggested in focus groups, some students used online texts for small facts rather than for broadening knowledge for a specific topic. They said that they would use printed texts instead for a topic. However, many students demonstrated that they would go for online texts rather than printed texts to broaden knowledge for a topic because they could gain access to more information with online texts than printed texts in the same amount of time. A questionnaire item was set as: 'I believe that I can broaden my knowledge for a topic more quickly by using the internet than using printed books' to understand students' views of the usefulness of online texts.

Using online texts is recognised as a good way for understanding because online texts are nonlinear and unstructured with hyperlinks that provide information without boundaries. Students mentioned in focus groups that they would have better understanding when searching for academic work with the use of online texts rather than printed texts. Others, however, believed that printed texts worked better than online texts for better understanding. Thus, in order to explore students' views of how they think about the usefulness of online texts for better understanding for academic purpose, a questionnaire item was designed as: I can understand better by searching information on the internet on my own for academic work than by looking at printed reference books.

Being able to integrate online information from different sources and formats is regarded as a challenging task because the ability to integrate requires individuals to have a sense of the process of online reading and underlying understanding (Coiro, 2011). In focus groups, students claimed that they were able to have their own thinking and ideas about a specific topic rather than copying information online. With this questionnaire item, students' views of their integration abilities towards online information were explored: I am able to synthesise different information online that I need for a specific topic.

Unlike the process of reading structured printed texts, individuals might drift away from locating information or reading online texts to reading material that is not relevant to their reading task. Many students complained in focus groups that their concentration could not last as long as they expected when they were reading online, which to some extent would affect their comprehension as well. These students claimed that printed texts were presented in a fixed format which set a boundary to the mind. They believed that they can have less distraction with printed texts. Thus, students' distraction was investigated with the questionnaire item: I get distracted more easily when I am reading digital texts than when reading printed texts. (See Appendix 4 and Appendix 5 for complete

copies of the questionnaire in both English and Chinese)

The questionnaires were distributed after some changes were made according to comments from pilot studies. Questionnaires were distributed to students in schools in both UK and China. 448 questionnaires were sent to three schools in the UK (168 online and 280 paper-based). 445 questionnaires were returned and 438 were valid questionnaires, a return rate of 99.33%. In China, 400 questionnaires were distributed to two schools. 372 copies were returned and 357 were put into SPSS for analysis as valid questionnaires, a return rate of 93%. Findings of the five parts of the questionnaire will be presented in the following sections in terms of practices and what the participants thought about reading in the digital age.

4.2.1 The access to digital and literacy practices

The following section will present the results of the students' access to digital texts and reading activities in school and outside of school settings that the questionnaire participants had across two countries.

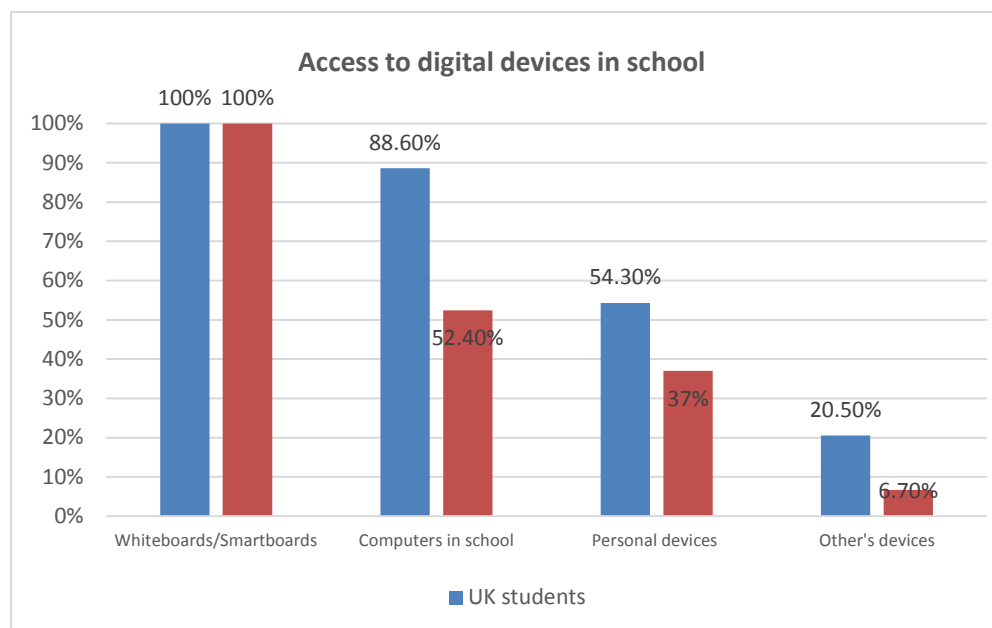
The access to digital texts

This section presents the outcomes concerning the methods and devices with which students claimed to be able to read digitally on screen in both school and out-of-school settings.

As shown in Figure 4.1, in school it was very common for the UK and Chinese students to be reading digitally from facilities provided in class. More of the UK students would have access to digital texts than the Chinese students in school with the use of computers in school, personally owned digital devices and devices borrowed from others. The percentage of the UK students' access to computers in school was around one and half times bigger than that of the Chinese students. Slightly more than one third of the Chinese students claimed to

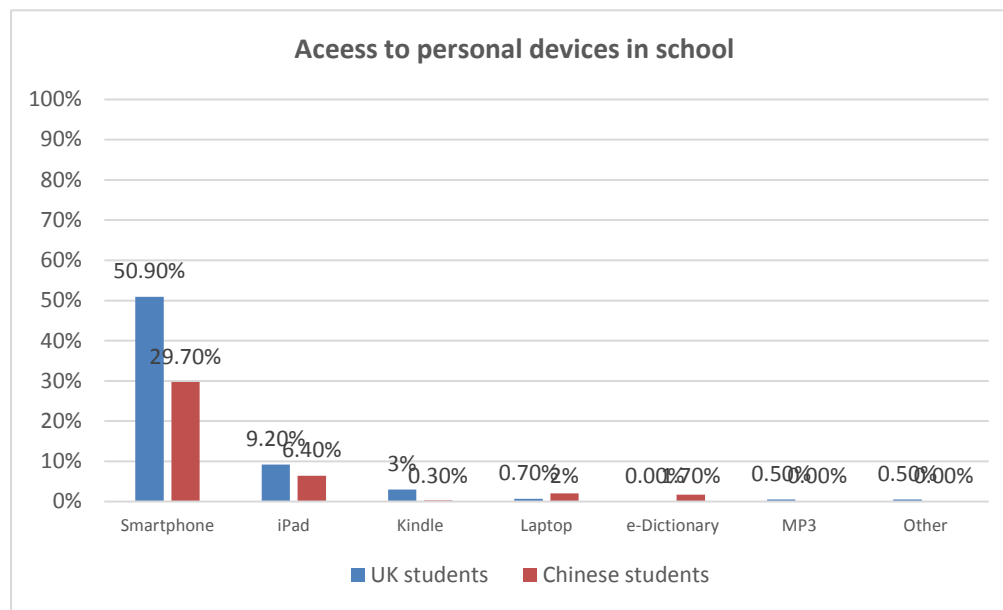
have access to personal devices, whereas more than half of the UK students claimed their access to personal devices. Three times the number of the UK students borrowed devices from others compared to Chinese students.

Figure 4.1: Percentage of the UK and Chinese student with access to types of digital devices in school



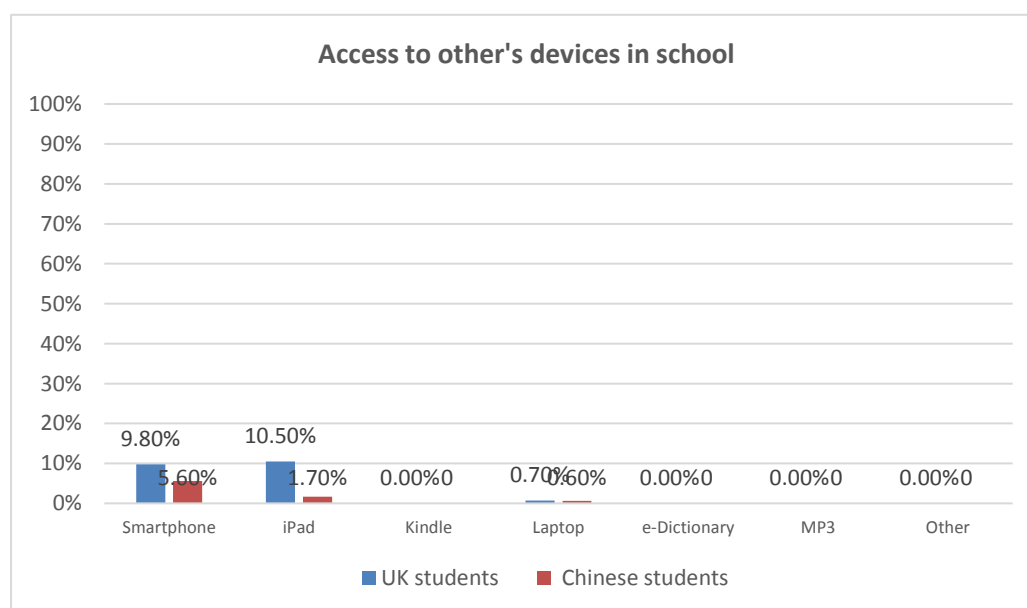
In terms of use of personally owned digital devices for digital texts, Figure 4.2 showed that the smartphone was discovered as the most frequently used device in school. Half of the UK participants who claimed to have access to digital texts with personal devices used smartphones in school, which was around twice that of the Chinese students.

Figure 4.2: Percentage of the UK and Chinese student with access to types of personally-owned digital devices in school



Within the column of ‘others’ devices’, Figure 4.3 described that smartphones and iPads were often borrowed among the UK and Chinese students. However, more of the UK students would have such access than the Chinese students.

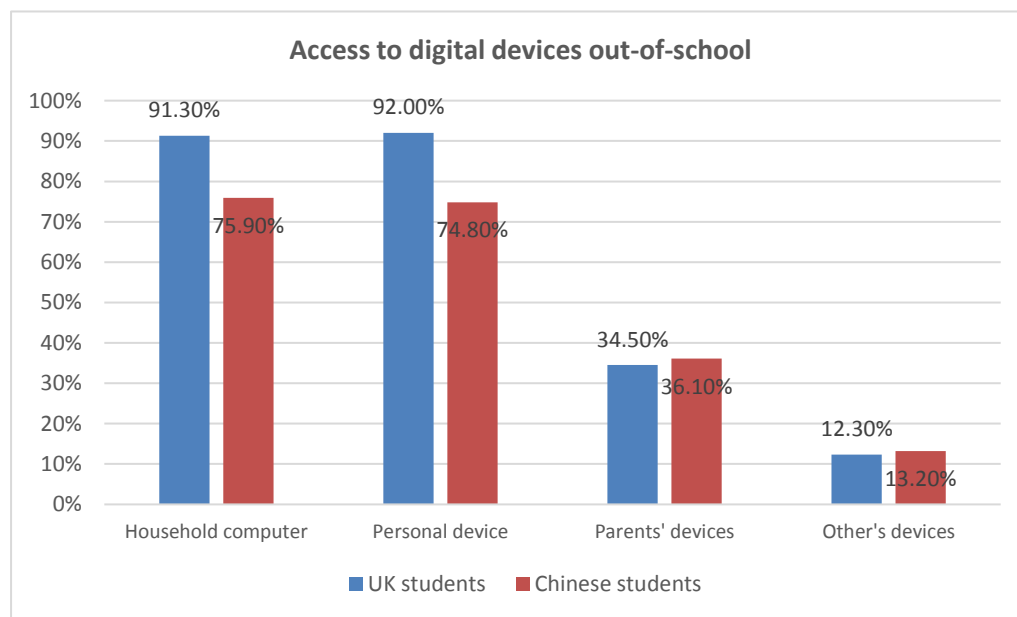
Figure 4.3: Percentage of the UK and Chinese student with access to others’ digital devices in school



Regarding reading outside of school, both the UK and Chinese students had more

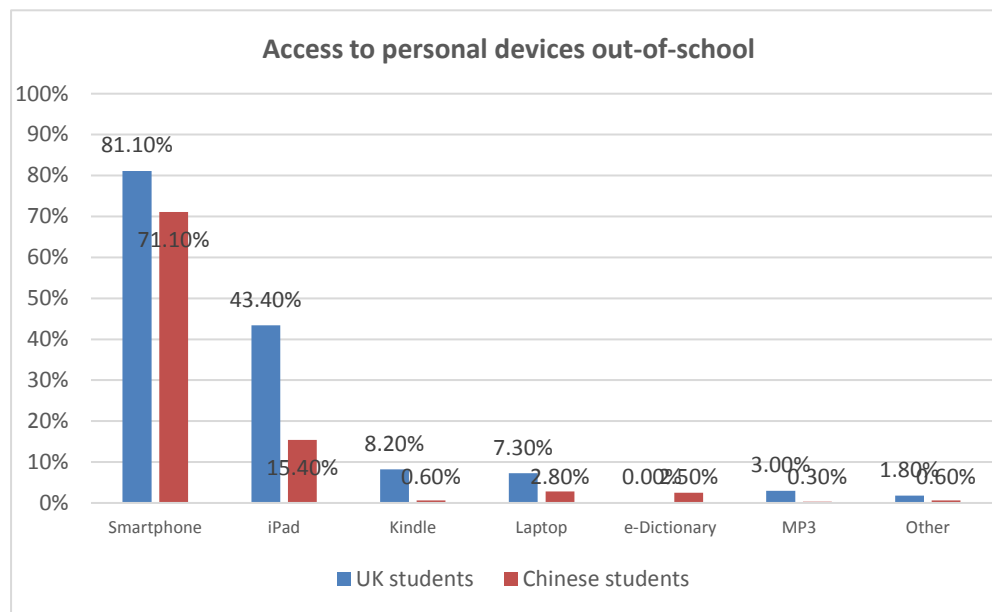
access to digital texts (See Figure 4.4). The two most accessible forms of digital texts were derived from using household computers and personal devices among the UK and Chinese students. Both the UK and Chinese students had access to personal devices outside of school, but they would not bring them to school. Similar percentages of participants in the two countries used devices borrowed from parents or friends.

Figure 4.4: Percentage of the UK and Chinese students with access to types of digital devices out-of-school



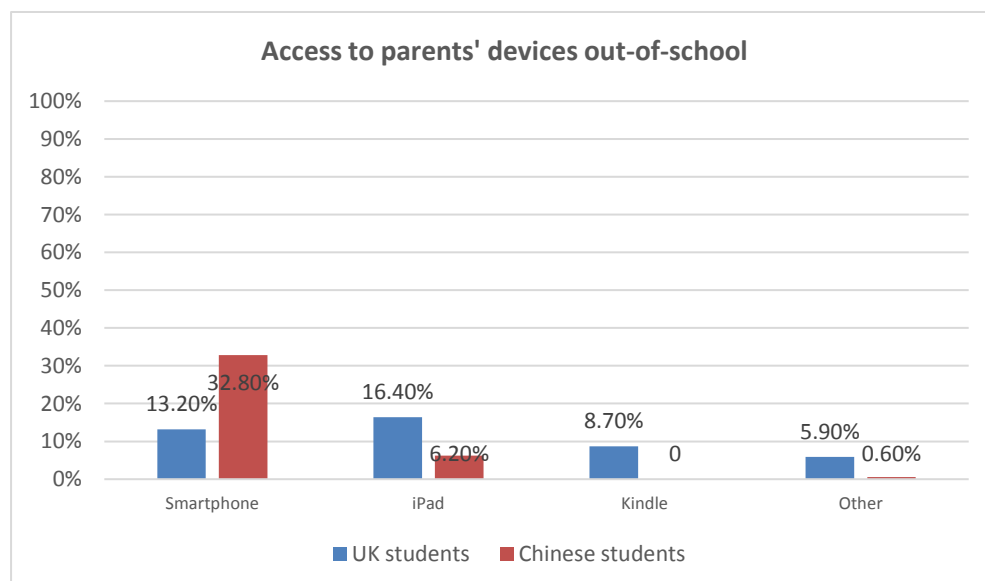
Participants claimed to use various types of digital devices to access digital texts in terms of personally-owned devices and those borrowed from parents. As shown in Figure 4.5, the students had access to various personally-own digital devices. Smartphones were more highly used than other devices, followed by iPads for both the UK and Chinese students. However, three times the number of UK students had access to personal iPads than Chinese for reading digital texts.

Figure 4.5: Percentage of UK and Chinese students with access to types of personally-owned digital devices out-of-school



Regarding using devices borrowed from parents (See Figure 4.6), more of the Chinese students would borrow smartphones from parents (more than twice the level of UK students). However, for the UK students, the iPad was the most frequently borrowed device for digital texts, more than twice that of Chinese students. None of the Chinese students claimed to borrow Kindle from parents.

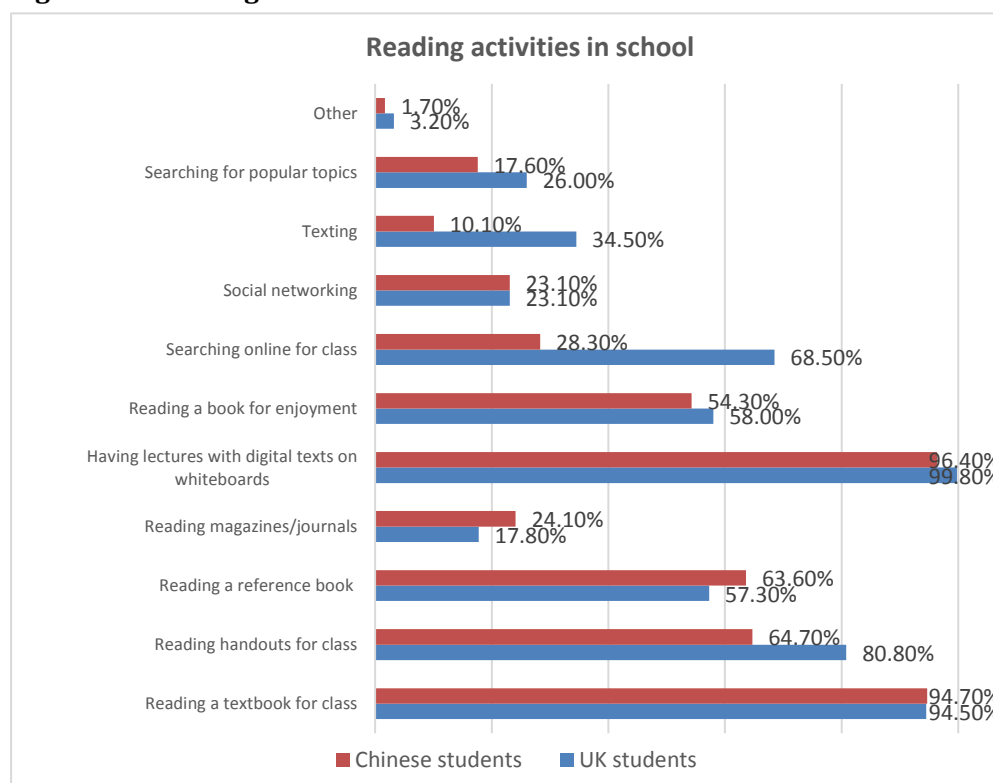
Figure 4.6: Percentage of UK and Chinese students with access to types of digital devices borrowed from parents out-of-school



Reading activities

Both the UK and Chinese students had a range of reading activities with digital and printed texts for various purposes. According to Figure 4.7, in school settings a similar percentage of the UK and Chinese students had reading activities including having lectures with digital texts on screen and reading text book in class. Reading hand-outs were quite common for UK and Chinese students with 80.8% and 64.7% respectively. Searching online for class was the top four reading activity for the UK students with 68.5%, which was more than twice the level for the Chinese students. Texting in school was more popular among the UK participants at three times the level of Chinese students. More of the Chinese students read from reference books in school than the UK students.

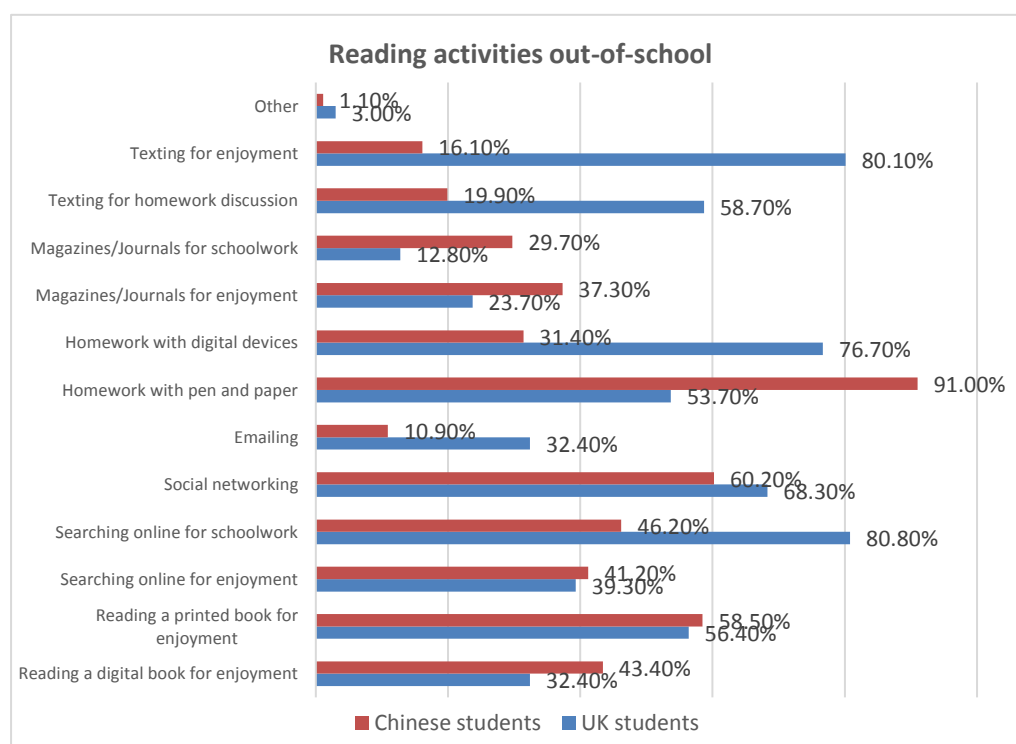
Figure 4.7: Reading activities that the UK and Chinese students carried out in school



Out school, more reading activities were carried out among two groups of the students. For the UK students the most frequent reading activities were searching online for school work, texting for enjoyment and doing homework with digital devices. For the Chinese students, doing homework with pen and

paper, social networking and reading a printed book for enjoyment were the top three reading activities. It can be seen from Figure 4.8 that more of the UK students would have reading activities for schoolwork and homework with digital texts than the Chinese students. Around twice the number of UK participants claimed to be searching online for schoolwork and doing homework with digital devices than the Chinese students. Accordingly, doing homework with pen and paper was very common for Chinese students at almost twice the level of UK students. Texting was found to be much more popular for the UK students for both enjoyment and discussion for homework purposes than among the Chinese students. Regarding texting for enjoyment, nearly six times as many of the UK students claimed such reading activities imparted to Chinese students. And three times as many UK students were texting for discussion of homework.

Figure 4.8: Reading activities UK and Chinese students carried out out-of-school



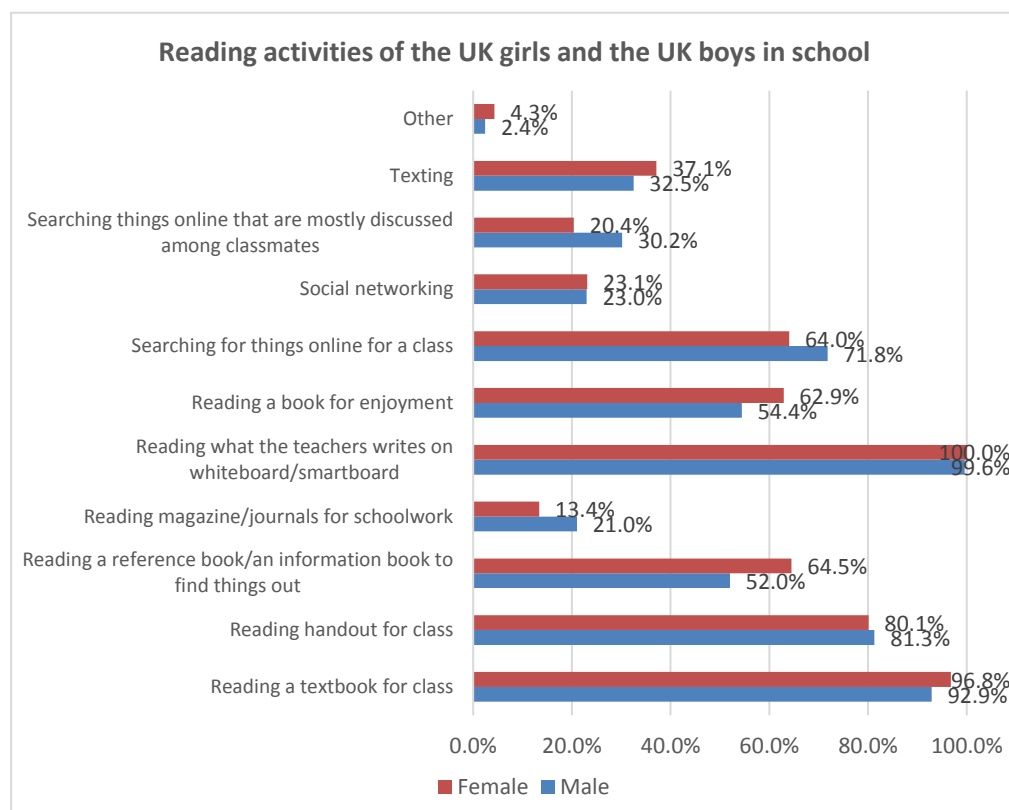
Gender differences in practices

Both the girls and boys in this study claimed various reading activities in school and out-of-school. Gender differences in their practices of reading were found

among two groups of students.

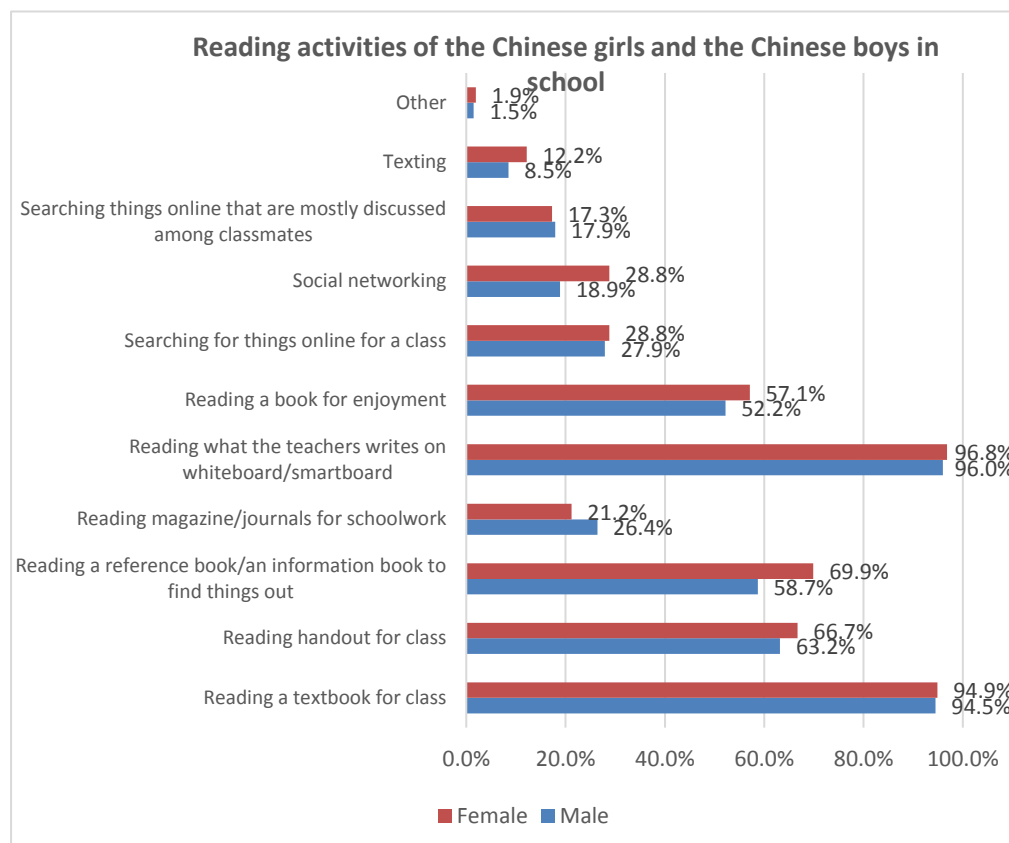
According to Figure 4.9, more of the UK girls claimed reading activities of ‘reading a reference book/an information book to find things out’ and ‘reading a (printed) book for enjoyment’ than the UK boys. However, more boys suggested ‘reading magazines for school work’, ‘searching online for hot topics among classmates’ and ‘searching online for a class’ than the girls. It seemed that the UK girls read a little more in print.

Figure 4.9: Reading activities of UK girls and the UK boys in school



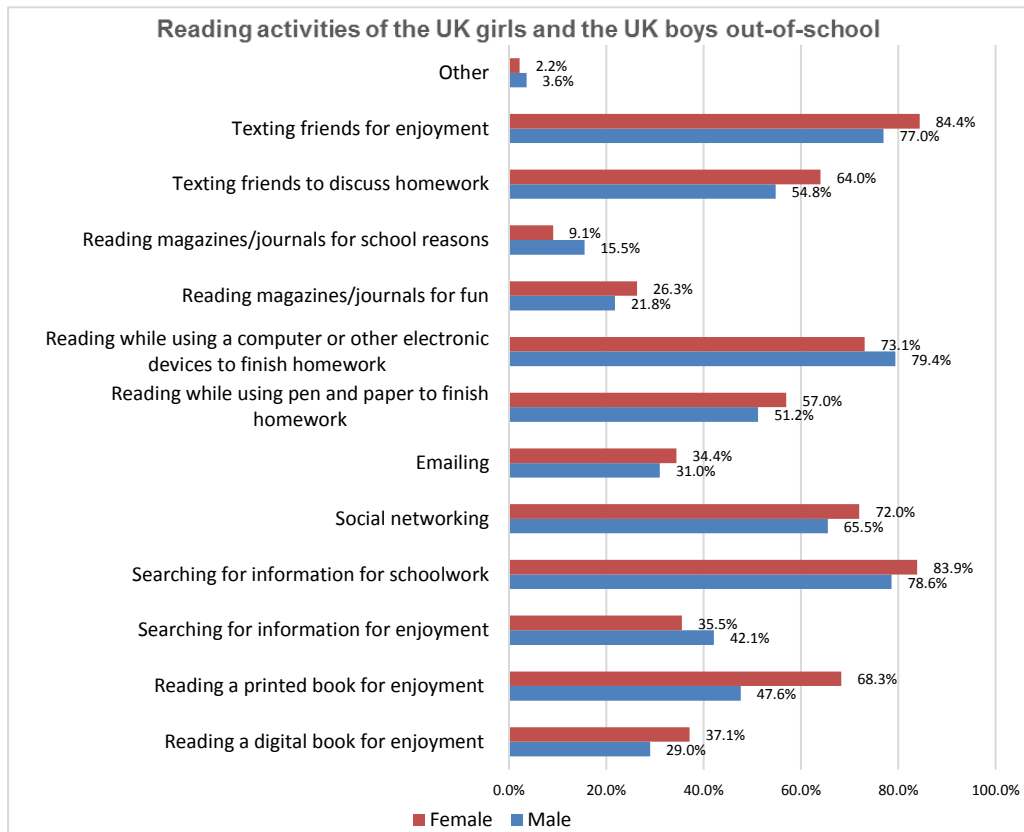
For the Chinese students (see Figure 4.10), more girls claimed they read printed books to find things out and reading a (printed) book for enjoyment’ than boys, which was similar finding as for UK students. Similarly, more of the Chinese boys claimed the use of magazine/journal for schoolwork than their counterparts. More of the Chinese girls than Chinese boys suggested the practice of social networking. However, there was no such a difference among the UK students.

Figure 4.10 Reading activities of the Chinese girls and the Chinese boys in school



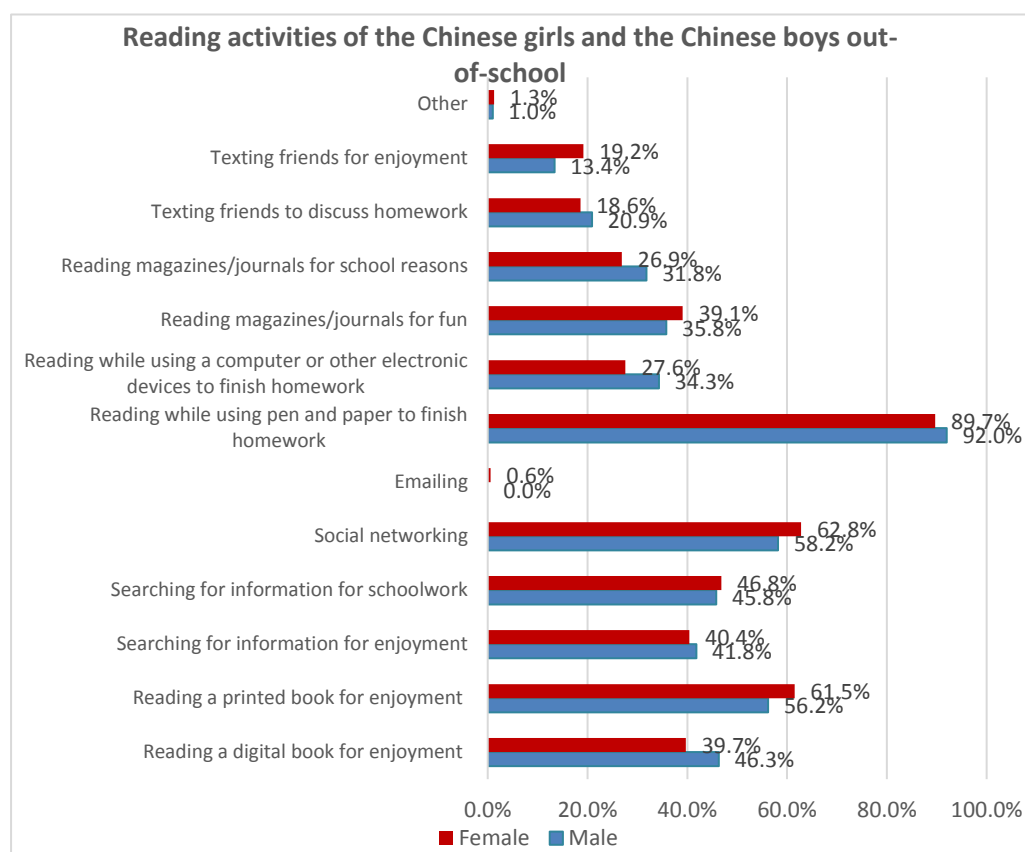
In out-of-school reading, more of the UK girls read printed and digital books than the UK boys for enjoyment. Practices of texting, social networking and searching information for schoolwork were found to be more popular among the UK girls compared to the UK boys. However, it was found that the UK boys read more online for enjoyment than the girls. Meanwhile, more of the UK boys used computers to finish homework than their counterparts. (See Figure 4.11)

Figure 4.11 Reading activities of the UK girls and the UK boys out-of-school



Among the Chinese students (See Figure 4.12), more of the Chinese girls read printed books for enjoyment, compared to the Chinese boys. But more of the Chinese boys read digitally for enjoyment than the girls. Similar to the UK students, using digital devices to finish homework was more popular among the Chinese boys.

Figure 4.12 Reading activities of the Chinese girls and the Chinese boys out-of-school



Based on the students' claims, texting was more popular among the girls than the boys. Meanwhile, the girls read more in print than the boys in both countries. The boys tended to undertake more online searching for enjoyment than the girls. But more of the girls searched online for schoolwork than the boys, in the out-of-school setting. It might be speculated that the girls had more academic-related practices than the boys in their free time. But the gaps regarding differences discussed above were wider among the UK students than among the Chinese students.

4.2.2 Preferences for text formats

As suggested in the focus groups and previous studies, individuals would have preferences for certain text formats based on their reading purposes. In this section, findings of the UK and Chinese students' preferences for printed and digital texts were presented in terms of differences between the views of two

groups of the students, together with the investigations of gender differences.

Text formats for getting information for school lessons

This section presents results of the certain text formats that the participants preferred in terms of getting information for school lessons across the UK and China.

Printed texts to get information for school lessons

A majority of students were not convinced about this, with 41.1% being not certain and 16.8% in disagreement. 42% of students either Agree or Strongly Agree that they preferred using printed texts for school lessons forgetting information.

As can be seen in Table 4.1, however, there were differences between the preferences of the Chinese and UK students. More of the Chinese students tended to prefer printed texts to obtain information for school lessons than the UK students. 54.9% of the Chinese respondents agreed or strongly agreed that they preferred the printed text format for school lessons, compared to the UK students, of whom only 31.5% agreed or strongly agreed with this. The differences between the views of the two groups in their responses to this question were statistically significant ($p < 0.01$ using Mann-Whitney U test).

Table 4.1: Breakdown of the students' responses to preference for printed texts to get information for school lessons

		I prefer printed texts to get information for school lessons				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		3.6%	13.2%	41.1%	31.6%	10.4%
UK students		5.0%	16.4%	47.0%	22.1%	9.4%
Gender	Female	7.9%	20.2%	44.8%	18.7%	8.3%
	Male	7.9%	20.2%	44.8%	18.7%	8.3%
Chinese students		2.0%	9.2%	33.9%	43.1%	11.8%
Gender	Female	1.3%	5.8%	36.5%	45.5%	10.9%
	Male	2.5%	11.9%	31.8%	41.3%	12.4%

A Chi-Square test indicated that among the UK students, there was an association between gender and their preference for printed texts to find information for school lessons ($p < 0.01$). The girls were more likely to agree with the usefulness of using printed texts to get information for school lessons than boys. For the Chinese students, however, there was no statistically significant difference between the preferences of males and females on this question.

Digital texts to get information for school lessons

Reading on screen by using the internet for information for school lessons was designed with the comparison to that of reading printed texts. 60.4% of all respondents claimed that they preferred digital texts from the internet to get information for school lessons with either Agree or Strongly Agree. Only a small number, 15.5%, asserted that they did not have a preference for using the internet to get school lesson related information, while 23.1% of them showed uncertainty.

From Table 4.2, it can be seen that there was a difference with regard to the preference for using the internet for school lessons between the UK and the Chinese students. More of the UK students tended to have a preference for using digital texts from the internet to help with school lessons than the Chinese students. 77.6% of the UK students suggested that they agreed or strongly agreed that they preferred using the internet to get information for school lessons. However, only 39.3% of the Chinese respondents agreed or strongly agreed with this. Based on the result of the Mann-Whitney U test, it was significant enough to suggest a statistically significant difference in ranked distributions between the UK and the Chinese students ($p < 0.01$) in their responses to the question.

Table 4.2: Breakdown of the students' responses to preference for digital texts to get information for school lessons

		I prefer using the internet to get information for school lessons				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		1.9%	13.6%	24.2%	39.6%	20.8%
UK students		1.8%	5.3%	15.3%	49.5%	28.1%
Gender	Female	1.6%	6.5%	22.0%	54.3%	15.6%
	Male	2.0%	4.4%	10.3%	46.0%	37.3%
Chinese students		20%	23.8%	35%	27.5%	11.8%
Gender	Female	0.6%	24.4%	38.5%	28.8%	7.7%
	Male	3.0%	23.4%	32.3%	26.4%	14.9%

The association between gender and students' preference of digital texts from the internet for school lessons was examined by using a Chi-Square test for independence (with Pearson Chi-Square). The result indicated that among the UK students, gender was significantly associated with the attribute 'I prefer using the internet to get information for school lessons' ($p < 0.01$). The boys were more likely to agree with the usefulness of using the internet to find digital texts to get information for school lessons than girls. However, for the Chinese students there was no statistically significant difference between the preferences of males and females on this question ($p = 0.11 > 0.05$).

Reading in a class

This section describes students' responses to what kind of text formats they preferred when they were having a class.

Reading printed texts in a class

57.2% of all respondents asserted their agreement with either Agree or Strongly Agree that they had a preference for printed texts in a class. However, there were a substantial number of students (which accounted for 30.7%) who demonstrated that they were not sure if they had such a preference.

As can be seen in Table 4.3, there were differences in preferences for printed reading in a class between the UK and the Chinese students. The Chinese students in a class were more likely to have a preference for print reading. 68% of the Chinese students chose Agree (44.8%) and Strongly Agree (23.2%) on this question. Only 8.1% of the Chinese students did not show agreement on this. Among the UK students, 48.4% of them said that they preferred print reading in a class. However, there were 30.9% of the UK students who reported not sure of their preference for text format to read in a class. The differences in terms of preferences for print printed when having a class between the two groups were tested statistically significant with $p < 0.01$ by using the Mann-Whitney U test.

Table 4.3: Breakdown of the students' responses to preference for printed texts in a class

		I prefer print reading in a class				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		2.3%	9.8%	30.7%	41.6%	15.6%
UK students		2.7%	12.6%	36.3%	39.0%	9.4%
Gender	Female	1.6%	7.5%	35.5%	44.6%	10.8%
	Male	3.6%	16.3%	36.9%	34.9%	8.3%
Chinese students		1.7%	6.4%	23.8%	44.8%	23.2%
Gender	Female	1.3%	5.1%	23.1%	46.8%	23.7%
	Male	2.0%	7.5%	24.4%	43.3%	22.9%

A Chi-Square test indicated that among the UK students, there was an association between gender and their preference for printed texts in a class ($p < 0.05$). The girls were more likely to agree with the preference for print texts for reading in a class than boys. However, among the Chinese students gender was found to be independent of preference for printed format of reading in a class.

Reading digital texts in a class

26.8% of students claimed that they preferred reading digitally when they were having a class, with 21.3% of Agree and 5.5% of Strongly Agree. A similar number of all respondents (30.6%) demonstrated their disagreement (including

Disagreement and Strongly Disagreement). There were a large number of students, however, who did not claim such preference which led them to choose Not Sure (42.6%).

It can be seen from Table 4.4 that there were no large differences between the UK and the Chinese students in preference for digital reading in a class. There was a similar amount of students from the UK and China who demonstrated their uncertainty about such preferences, with 39% and 47.1% respectively. Slightly more of the UK students (30.4%) tended to have a preference for a class with digital texts than the Chinese students (22.4%). However, there was no significant differences between the preference for digital texts in a class of the UK and the Chinese students (with the U test, $p>0.05$).

Table 4.4: Breakdown of the students' responses to preference for digital texts in a class

		I prefer digital reading in a class				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		3.3%	27.3%	42.6%	21.3%	5.5%
UK students		3.7%	26.9%	39.0%	24.2%	6.2%
Gender	Female	3.8%	32.3%	39.8%	21.5%	2.7%
	Male	3.6%	23.0%	38.5%	26.2%	8.7%
Chinese students		2.8%	27.2%	47.1%	17.6%	4.8%
Gender	Female	2.6%	33.3%	42.9%	17.9%	3.2%
	Male	3.0%	23.4%	50.2%	17.4%	6.0%

A Chi-Square test was conducted to explore the association between gender and preferences among the UK and the Chinese students. For the UK students, there was a significant association between gender and the preference for digital reading in a class ($p=0.02<0.05$). The girls were more likely to have the preference than the boys. However, the association among the Chinese students was not found to be at a significant level.

Reading for enjoyment

This section shows students' preference for certain text formats for the purposes of reading for enjoyment/pleasure.

Reading digital texts for enjoyment

44% of all respondents claimed that they preferred digital reading for the purpose of enjoyment (32.1% chose Agree and 11.9% Strongly Agree). More than half of the students showed their uncertainty about preferences for digital texts for enjoyment/pleasure reading. There were a similar number of students between the disagreement (including Disagree and Strongly Disagree) and uncertainty on this question, with 27.5% and 28.6% respectively.

From Table 4.5, it shows, however, that there were differences in the preference among the UK and the Chinese students. More of the Chinese students tended to preferred digital texts to read for enjoyment than the UK students. 47.9% of the Chinese students said that they preferred reading digitally for enjoyment compared to the UK students of whom 40.9% agreed or strongly agreed. With regard to the claim of disagreement, fewer of the Chinese students (23.3%) chose Disagree and Strongly Disagree than the UK students (30.9%). The differences in the views of preference for digital reading for enjoyment were found to be statistically significant ($p=0.01<0.05$, using Mann-Whitney U test) among two groups of the students.

Table 4.5: Breakdown of the students' responses to preference for digital texts for reading for enjoyment

		I prefer digital reading for enjoyment				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		5.7%	21.8%	28.6%	32.1%	11.9%
UK students		7.8%	23.1%	28.3%	29.5%	11.4%
Gender	Female	9.7%	24.7%	27.4%	28.0%	10.2%
	Male	6.3%	21.8%	29.0%	30.6%	12.3%
Chinese students		3.1%	20.2%	28.9%	35.3%	12.6%
Gender	Female	3.8%	21.8%	29.5%	34.6%	10.3%
	Male	2.5%	18.9%	28.4%	35.8%	14.4%

It was indicated by A Chi-Square test that among both the UK students and the Chinese students, gender was independent of the preference for digital texts for enjoyment reading.

Reading printed texts for enjoyment

53.1% of students claimed that they preferred printed texts for enjoyment. A large number of students were found not to be convinced, and a substantial of them were not sure about how they felt about this.

As can be seen from Table 4.6, there were differences between the UK and the Chinese students based on their responses to this preference. More of the UK students tended to have the preference for normal print for enjoyment reading than the Chinese students. 60% of the UK students agreed or strongly agreed that they had such a preference, compared to the Chinese students, of whom only 42.5% agreed or strongly agreed. The result of the Mann-Whitney U test suggested that the differences between the preferences of the UK and Chinese students was statistically significant ($p < 0.01$).

Table 4.6: Breakdown of the students' responses to preference for printed texts for reading for enjoyment/pleasure

		I prefer printed books, magazines/journals for enjoyment				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		3.0%	12.8%	31.1%	34.7%	18.4%
UK students		4.1%	9.8%	26.0%	38.8%	21.2%
Gender	Female	1.6%	4.8%	19.9%	46.2%	27.4%
	Male	6.0%	13.5%	30.6%	33.3%	16.7%
Chinese students		1.7%	19.5%	37.3%	26.7%	14.8%
Gender	Female	1.9%	12.8%	35.9%	32.1%	17.3%
	Male	1.5%	19.4%	38.3%	27.9%	12.9%

A Chi-Square test indicated that, among the UK students, there was an association between gender and the preference for normal print for enjoyment ($p < 0.01$). The girls were more likely to agree with the preference of using printed texts for the purpose of enjoyment than boys. However, for the Chinese students, no significant statistical difference in the preference for printed texts for enjoyment across gender was found.

4.2.3 Self as a reader

This section will present the outcome of students' feelings about reading different text formats and reading behaviour with both printed and digital reading materials.

Deep thinking and text formats

52.3% of students asserted either Agreed or Strongly Agreed that they think more deeply with printed texts than with digital texts. A large number, however, did not have clear ideas of what they felt about this (31.2%).

As can be seen from Table 4.7, there were differences in the perception of deep thinking and reading formats between the UK and Chinese students. More of the Chinese students tended to believe that they were more likely to think deeply when they read with print reading rather than with digital texts. 62.7% of the

Chinese respondents chose Agree and Strongly Agree compared to the UK students, of whom only 43.8% said that they were in agreement with this preference. There was a statistically significant difference between the UK and Chinese students in response to this ($p < 0.01$, with Mann-Whitney U test).

Table 4.7: Breakdown of the students' responses to their feelings about thinking deeply with printed and digital texts

Print reading tends to make me think more deeply than digital reading

		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		3.4%	13.1%	31.2%	35.6%	16.7%
UK students		4.8%	16.9%	34.5%	31.5%	12.3%
Gender	Female	1.6%	16.1%	30.6%	36.0%	15.6%
	Male	7.1%	17.5%	37.3%	28.2%	9.9%
Chinese students		1.7%	8.4%	27.2%	40.6%	22.1%
Gender	Female	1.9%	5.8%	25.0%	41.7%	25.6%
	Male	1.5%	10.4%	28.9%	39.8%	19.4%

As the results of a Chi-Square test showed, among the UK students the attribute 'Print reading tends to make me think more deeply than digital reading' was not independent of gender ($p = 0.01 < 0.05$). The girls were more likely to agree that they would tend to think deeply with print reading instead of digital reading than the boys were. For the Chinese students, however, gender was found not to be associated with the attribute.

Feeling of relaxation and text formats

57.8% of all respondents asserted their agreement to the view that they found it more relaxing when they were reading printed texts rather than digital texts. Only 14.6% of them demonstrated their disagreement with this point, a substantial number of them were not sure about this issue.

From Table 4.8, it can be seen that there were a substantial number of both the UK and the Chinese students who agreed and strongly agreed that they tended to feel more relaxed with printed texts than digital texts, with 60% and 56.2%

respectively. It was not statistically significant enough to see the difference in the views between the two groups ($p > 0.05$, with the use of a Mann-Whitney U test).

Table 4.8: Breakdown of the students' responses to their feeling of being relaxed with printed and digital texts

		<i>I find it more relaxing to read printed texts than digital texts</i>				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		3.3%	11.3%	27.5%	38.2%	19.6%
UK students		3.4%	13.5%	23.1%	42.0%	18.0%
Gender	Female	1.1%	11.3%	21.5%	44.1%	22.0%
	Male	5.2%	15.1%	24.2%	40.5%	15.1%
Chinese students		3.1%	8.7%	33.1%	33.6%	22.6%
Gender	Female	3.2%	6.4%	32.1%	37.2%	21.2%
	Male	3.0%	10.4%	33.8%	30.8%	21.9%

A Chi-Square test indicated that among the UK students, the association between gender and their feeling of relaxation with different text formats was shown to have a statistically significant dependence upon each other ($p < 0.05$). The girls were more likely to agree to the feelings of relaxation with printed texts than the boys. However, for the Chinese students, the association between gender and the attribution of this feeling was not statistically significant.

Skim reading with digital texts

More than half of the students were found not to be convinced by the statement, with 27.6% in disagreement and 27.8% being uncertain. 44.6% of students claimed that they agreed or strongly agreed that they tended to skim read when they were looking for information online.

As can be seen from Table 4.9, however, there were differences between the views of skim reading with digital texts between the Chinese and the UK students. More of the Chinese students had the tendency to skim read when they were reading online for the purpose of information. 53.7% of the Chinese respondents

agreed (including Agree and Strongly Agree) that they had such tendencies to skim read with digital texts for information online, compared to the UK students, of whom only 37.2% agreed and strongly agreed with this. The differences between how they felt about this between the two groups were statistically significant ($p < 0.01$, using a Mann-Whitney U test).

Table 4.9: Breakdown of the students' responses to skim reading with online texts for information

I tend to skim read when I am reading digitally online for information

		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		6.3%	21.3%	27.8%	36.2%	8.4%
UK students		8.0%	24.4%	30.4%	30.6%	6.6%
Gender	Female	3.2%	23.1%	28.5%	38.2%	7.0%
	Male	11.5%	25.4%	31.7%	25.0%	6.3%
Chinese students		4.2%	17.4%	24.6%	43.1%	10.6%
Gender	Female	5.1%	16.7%	29.5%	39.7%	9.0%
	Male	3.5%	17.9%	20.9%	45.8%	11.9%

As a Chi-Square test indicated, among the UK students, there was a statistically significant association between gender and the views about skim reading for information with digital texts ($p = 0.03 < 0.05$). The girls were more likely to agree that they had this tendency than the boys. For the Chinese students, however, there was no significant difference between the views of males and females on this question ($p = 0.32 > 0.05$).

Discussion of digital texts

Around two thirds of students were not convinced that they would discuss what they read online with friends in free time in school. Only 37% of all respondents claimed either Agree or Strongly agree.

It can be seen from Table 4.10 that, however, there were differences between the feelings of discussion of online/digital texts in school between the two groups of

students. More of the Chinese students tended to discuss with friends what they had read online when they had free time in school than the UK students. 53.3% of the Chinese respondents agreed and strongly agreed that they had discussion of online texts they read with friends in school in free time, compared to the UK students, of whom only 23.7% agreed with the views. More than half (53.5%) of the UK students demonstrated their disagreement to the question. The differences between the views of the two groups in their responses to this question were statistically significant ($p < 0.01$ using a Mann-Whitney U test).

Table 4.10: Breakdown of the students' responses to online discussion of online texts
In free time in school, I like to discuss with my friends what I have read online

		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		9.3%	25.8%	27.9%	31.2%	5.8%
UK students		15.1%	38.4%	22.8%	20.5%	3.2%
Gender	Female	8.6%	44.1%	23.7%	21.5%	2.2%
	Male	19.8%	34.1%	22.2%	19.8%	4.0%
Chinese students		2.2%	10.4%	34.2%	44.3%	9.0%
Gender	Female	1.9%	8.3%	37.8%	45.5%	6.4%
	Male	2.5%	11.9%	31.3%	43.3%	10.9%

A Chi-Square test indicated that among the UK students, there was a significant association between gender and their views to the question ($p = 0.01 < 0.05$). The girls were more likely to agree that they discussed what they read online in free time in school with friends than boys. However, for the Chinese students, the association between the views and gender was not statistically significant on this question.

Digital texts for homework

60% of respondents asserted that they would tend to think about using the internet to deal with homework problems (40.3% chose Agree and 19.7% chose Strongly Agree). Only 17.6% of them said that they disagreed and strongly disagreed to the question.

As can be seen Table 4.11, however, there were differences between the usage of online texts for homework between the UK and the Chinese students. More of the UK students tended to think about using online texts for homework problems than the Chinese students. 87.2% of the UK students said that they always think about usage of digital texts online to deal with problems in homework. However, only 26.3% of the Chinese students asserted their agreement with the question. The differences between two groups of the students' despondences to this question were found to be statistically significant (with the use of a Mann-Whitney U test), $p < 0.01$.

Table 4.11: Breakdown of the students' responses to the idea of searching the Internet for homework

		<i>I always think about searching the internet when I have some problems in my homework</i>				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		3.0%	14.6%	21.8%	40.3%	19.7%
UK students		0.9%	3.4%	8.2%	55.9%	31.3%
Gender	Female	0.0%	5.9%	8.1%	54.3%	31.7%
	Male	1.6%	1.6%	8.3%	57.1%	31.3%
Chinese students		7.0%	28.3%	38.4%	21.0%	5.3%
Gender	Female	6.4%	30.8%	34.6%	24.4%	3.8%
	Male	7.5%	26.4%	41.3%	18.4%	6.5%

A Chi-Square test indicated that there was no significant association between gender and students' responses to the question, neither among the UK students nor the Chinese students.

Text formats and way of finishing homework

Around two thirds of students claimed that they were not convinced that they liked to have projects as homework that required a use of the internet, with 36.3% in disagreement and 28.7% describing uncertainty. Only slightly more than one third of students asserted either Agree or Strongly Agree.

As shown in Table 4.12, however, there were differences between the beliefs of the UK and the Chinese students. More of the UK students tended to be in favour

of having projects as homework that involved working with others with digital texts through the internet than the Chinese students. 48.6% of the UK students asserted that they agreed and strongly agreed that they liked working with others via the internet with digital texts by having projects as homework, compared to the Chinese students, of whom only 18.5% agreed or strongly agreed. Differences between the views across year groups were found statistically significant among both the UK and the Chinese students ($p < 0.01$, with the use of Mann-Whitney U test).

Table 4.12: Breakdown of the students' responses to the idea of having projects as homework with the use of the Internet

		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		6.7%	29.6%	28.7%	25.0%	10.0%
UK students		4.8%	14.4%	32.2%	34.7%	13.9%
Gender	Female	2.7%	17.2%	35.5%	36.0%	8.6%
	Male	6.3%	12.3%	29.8%	33.7%	17.9%
Chinese students		9.0%	48.2%	24.4%	13.2%	5.3%
Gender	Female	7.7%	50.6%	24.4%	14.7%	2.6%
	Male	10.0%	46.3%	24.4%	11.9%	7.5%

A Chi-Square test indicated that among the UK students there was a statistically significant association between gender and their views as to this question ($p < 0.01$). The boys were more likely to agree with working with others online for projects as homework. For the Chinese students, however, gender was found to be independent of their responses to the question ($p > 0.05$).

Behaviour of sharing digital texts

A large number of students were convinced that they were more likely to share online reading than sharing printed books, even though only 23% claimed disagreement. 38.6% of students asserted either Agree or Strongly Agree.

As can be seen Table 4.13, there were some differences between the views of the

UK and the Chinese students. 42% of the UK students agreed that they would share what they read online rather than sharing printed books, which was slightly higher than among the Chinese students (36.5%). However, there was a similar percentage of the UK and the Chinese students in their response of uncertainty, with 36.5% and 40.6% respectively. The differences between these two groups in terms of the questions were found not to be statistically significant.

Table 4.13: Breakdown of the students' response to sharing with friends reading from printed and digital texts

		<i>I am more likely to share with my friends what I have read online than in printed books</i>				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		5.9%	17.1%	38.4%	29.4%	9.2%
UK students		6.6%	14.8%	36.5%	32.4%	9.6%
Gender	Female	5.9%	19.4%	33.3%	38.2%	3.2%
	Male	7.1%	11.5%	38.9%	28.2%	14.3%
Chinese students		5.0%	19.9%	40.6%	25.8%	8.7%
Gender	Female	5.8%	19.9%	46.8%	21.8%	5.8%
	Male	4.5%	19.9%	35.8%	28.9%	10.9%

As the result of the Chi-Square test showed, among the UK students there was an association between gender and the habit of sharing certain text formats ($p < 0.01$). The boys were more likely to agree with the behaviour of sharing digital texts they read compared to printed texts than the girls. However, for the Chinese students, no association was found between the views of males and females on this question.

4.2.4 Online reading comprehension

Reading texts in digital format is different from reading printed texts. Students in focus groups had mentioned that they needed to do a great deal more in terms of comprehension of what they read digitally online, such as searching and getting related information, choosing the right texts and using texts for their own

thinking. Based on focus groups participants, both reading skills or strategies and technology skills were involved in their online reading and these skills are expected and required when individuals are faced with reading online with various digital formats of texts (Coiro, 2011). In this section, therefore, skills, abilities and beliefs about reading online for comprehension were investigated to understand how students felt about their comprehension of online texts with certain skills.

Understanding of digital texts in class

70.8% of all respondents claimed their agreement either with Agree or Strongly Agree that they understood the teacher's demonstration with the use of digital texts in class. Only around one third of students asserted their disagreement or uncertainty, with 3% and 26.2% respectively.

From Table 4.14 it can be seen that there were a large number among both the UK and the Chinese students who suggested their agreement with the perceived ability of understanding the teacher's use of digital texts in class, with 71.2% and 71.3% respectively. Meanwhile, 25.3% of the UK students were not sure about how they felt about this, compared to the Chinese students, with a similar percentage of 27.2%. Based on the result of a Mann-Whitney U test, the differences in students' self-perceived ability to understand what the teacher demonstrated on whiteboards/smartboards were explored but were not statistically significant between the two groups ($p > 0.05$).

Table 4.14: Breakdown of the students' responses to understanding of digital texts used in the teaching

		<i>I understand what the teacher demonstrates using digital texts in class</i>				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		0.4%	2.6%	26.2%	57.7%	13.1%
UK students		0.2%	3.2%	25.3%	60.0%	11.2%
Gender	Female	0.0%	3.2%	36.0%	53.8%	7.0%
	Male	0.4%	3.2%	17.5%	64.7%	14.3%
Chinese students		0.6%	2.0%	27.2%	54.9%	15.4%
Gender	Female	1.3%	3.2%	29.5%	53.2%	12.8%
	Male	0.0%	1.0%	25.4%	56.2%	17.4%

A Chi-Square test indicated that among the UK students, there was an association between gender and students' perceived ability to understand the teacher's use of digital texts for class ($p < 0.01$). The boys were more likely to agree with their ability of understanding of texts on screen in class than the girls. For the Chinese students, however, the association between gender and their responses to the question was not found to be statistically significant.

Ability to locate information

72.7% of respondents with either Agree or Strongly Agree claimed that they knew how to locate information for a specific topic. Only 17.4% of them demonstrated that they did not have such agreement toward whether they knew their ability to locate information.

As can be seen in Table 4.15, however, there were differences between the perceived ability to locate information among the UK and the Chinese students. More of the UK students tended to agree that they were able to locate related information online than the Chinese students. 92.7% of the UK students agreed or strongly agreed with the question, compared to the Chinese students, of whom only 71.2% of them asserted their agreement. For the Chinese students, there were 23.8% of them who were not certain about their location ability when reading online. The differences of the views in their responses to the question

between the two groups were statistically significant ($p < 0.01$, with a Mann-Whitney U test).

Table 4.15: Breakdown of the students' responses to their ability to locate online information

		<i>I know how to locate information when I search the internet for a specific topic</i>				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		0.9%	2.3%	14.2%	58.5%	24.2%
UK students		0.5%	0.7%	6.4%	62.6%	29.9%
Gender	Female	0.0%	0.5%	4.3%	72.6%	22.6%
	Male	0.8%	0.8%	7.9%	55.2%	35.3%
Chinese students		1.4%	4.2%	23.8%	53.5%	17.7%
Gender	Female	2.6%	3.8%	22.4%	54.5%	16.7%
	Male	0.5%	4.5%	24.9%	52.7%	17.4%

A Chi-Square test indicated that among the UK students, gender was found significantly associated with their responses to the question ($p < 0.01$). The boys were more likely to agree with their ability of finding information online lessons than the girls. For the Chinese students, however, there was no statistically significant difference between the views on location ability of males and females on this question.

Importance of information evaluation

76% of students claimed that they understood the importance of evaluating online information. There were, however, a number of 22.4% of them who were not sure about how they thought about this. Very few students claimed disagreement.

It can be seen from Table 4.16, that there were, however, differences between the views about the importance of online information evaluation between UK and Chinese students. More of the Chinese students agreed or strongly agreed that they understood the importance of evaluating online information than the UK

students. Even though there was a similar percentage of the students who agreed or strongly agreed with the question between the UK and the Chinese students, with 75.8% and 76.2% respectively, only 13.7% of the UK students chose Strongly Agree, compared to the Chinese students, of whom 26.6% of them chose Strongly Agree. A Mann-Whitney U test indicated that the differences in this question between the two groups were statistically significant ($p < 0.05$).

Table 4.16: Breakdown of the students' responses to importance of online information evaluation

		<i>I know it is important to evaluate information online</i>				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		0.0%	1.6%	22.4%	56.5%	19.5%
UK students		0.0%	0.9%	23.3%	62.1%	13.7%
Gender	Female	0.0%	0.5%	25.8%	62.9%	10.8%
	Male	0.0%	1.2%	21.4%	61.5%	15.9%
Chinese students		0.0%	0.0%	21.3%	49.6%	26.6%
Gender	Female	0.0%	1.9%	23.1%	48.1%	26.9%
	Male	0.0%	3.0%	19.9%	50.7%	26.4%

According to the result of a Chi-Square test, there was no association between gender and their understanding of the importance of information evaluation neither among the UK students nor the Chinese students.

Online information comparison

54.6% of all students asserted that they agreed or strongly agreed that they would compare opinions online. However, almost half of students were either not sure or disagreed that they would compare what they read online.

It can be seen from Table 4.17, there were, however, differences between the behaviour of opinion comparison of the UK and the Chinese students. More of the Chinese students tended to compare opinions that they came across than the UK students. 56.6% of the Chinese students agreed or strongly agreed that they compared what they read on the internet, compared to the UK students, of whom

only 44% of them had such agreement to the question. With the use of a Mann-Whitney U test, the differences between the views of the two groups in their responses to this question were statistically significant ($p < 0.05$).

Table 4.17: Breakdown of the students' responses to the idea of comparing opinions online

		<i>I often compare opinions I read on the internet</i>				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		2.0%	11.1%	32.3%	43.5%	11.1%
UK students		3.0%	14.8%	29.2%	34.4%	9.6%
Gender	Female	2.7%	18.8%	26.9%	42.5%	9.1%
	Male	3.2%	11.9%	31.0%	44.0%	9.9%
Chinese students		0.8%	6.4%	36.1%	43.7%	12.9%
Gender	Female	1.3%	8.3%	38.5%	42.3%	9.6%
	Male	0.5%	5.0%	34.3%	44.8%	15.4%

A Chi-Square test indicated that there was no statistically significant difference between the online information comparison of males and females on this question neither among the UK nor the Chinese students. Both the girls and the boys from the two groups had similar tendencies to compare what they read online.

Usefulness of online texts-broadening scope of knowledge

58.5% of respondents claimed that they agreed or strongly agreed that using online texts could broaden their knowledge for a topic more quickly than printed texts. There were 29.9% of them who demonstrated their uncertainty to the question and 11.5% of students asserted disagreement.

It can be seen from Table 4.18 however, that there were difference of views between the UK and the Chinese students. More of the UK students tended to believe the usefulness of online texts in terms of broadening knowledge compared to printed texts than the Chinese students. 67.8% of the UK students suggested their agreement with the question, compared to the Chinese students,

of whom only 47% of them agreed or strongly agreed with this. The result of a Mann-Whitney U test indicated the statistical significance between the two groups ($p < 0.01$).

Table 4.18: Breakdown of the students' responses to broadening knowledge by using online texts

I believe that I can broaden my knowledge for a topic more quickly by using the internet than using printed books

		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		1.1%	10.4%	29.9%	41.4%	17.1%
UK students		0.7%	6.2%	25.3%	45.4%	22.4%
Gender	Female	0.0%	7.5%	26.3%	51.6%	14.5%
	Male	1.2%	5.2%	24.6%	40.9%	28.2%
Chinese students		1.7%	15.7%	35.6%	36.4%	10.6%
Gender	Female	1.9%	17.9%	38.5%	33.3%	8.3%
	Male	1.5%	13.9%	33.3%	38.8%	12.4%

According to the result of a Chi-Square test, the association between gender and students' views of the question was found to be statistically significant among the UK students ($p < 0.01$). The boys were more likely to agree with the usefulness of online texts compared to printed texts with regard to broadening knowledge than the girls. For the Chinese students, however, there was no statistically significant difference between the preferences of males and females on this question.

Usefulness of online texts-better understanding

More than half of students claimed that they were not sure or disagreed that online texts were useful for gaining a better understanding of a topic compared to the use of printed texts. 44.7% of students claimed that they either agreed or strongly agreed with this.

From Table 4.19, it can be seen that there were, however, differences between the views of the usefulness of online texts in terms of better understanding for

academic work of the UK and the Chinese students. More of the UK students tended to believe that they could have better understanding with online texts for academic purpose compared to the use of printed reading than the Chinese students. 55.7% of the UK students agreed or strongly agreed with the question, compared to the Chinese students, of whom only 31.1% asserted that they had agreement with the question. The result of a Mann-Whitney U test revealed that the differences between two groups of the students' responses to the question were found statistically significant ($p < 0.01$).

Table 4.19: Breakdown of the students' responses to the usefulness of online texts

I can understand better by searching information on the internet on my own for academic work than by looking at printed reference books

		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		2.6%	15.6%	37.1%	34.0%	10.7%
UK students		1.8%	7.5%	34.9%	41.8%	13.9%
Gender	Female	2.7%	7.5%	41.9%	39.2%	8.6%
	Male	1.2%	7.5%	29.8%	43.7%	17.9%
Chinese students		3.6%	25.5%	39.8%	24.4%	6.7%
Gender	Female	3.2%	26.9%	43.6%	19.9%	6.4%
	Male	4.0%	24.4%	36.8%	27.9%	7.0%

Gender differences in the views among the UK students ($p < 0.05$) were found to be statistically significant according to the result of a Chi-Square test. The boys were more likely to agree with the usefulness of online texts for academic purpose in terms of understanding compared to printed texts than the girls. However, for the Chinese students, there was no association between the views of males and females on this question.

Synthesis of online texts

Slightly more than half of students claimed that they were not certain or disagreed/strongly disagreed whether they were able to synthesise online information for their own thinking. 47% of respondents asserted their agreement (either Agree or Strongly Agree) with their ability to integrate

separate online information for a topic.

As can be seen from Table 4.20, however, there were differences between the perceived ability of online information integration of the UK and the Chinese students. More of the UK students tended to agree that they were able to synthesise various online information for a topic than the Chinese students. 49.1% of the UK students agreed or strongly agreed with their integration ability, compared to the Chinese students, of whom 44.5% of them claimed the agreement to the question. However, 15.9% of the Chinese students chose disagreement, and only 5.2% of the UK students demonstrated disagreement to this. The differences between the two groups of the views to the questions were found to be statistically significant with a Mann-Whitney U test ($p < 0.05$).

Table 4.20: Breakdown of the students' responses to their ability to synthesise online texts

		<i>I am able to synthesise different information online that I need for a specific topic</i>				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		1.1%	8.9%	42.9%	40.0%	7.0%
UK students		1.1%	4.1%	45.7%	42.0%	7.1%
Gender	Female	1.1%	2.7%	46.8%	46.2%	3.2%
	Male	1.2%	5.2%	44.8%	38.9%	9.9%
Chinese students		1.1%	14.8%	39.5%	37.5%	7.0%
Gender	Female	1.9%	14.7%	42.3%	36.5%	4.5%
	Male	0.5%	14.9%	37.3%	38.3%	9.0%

It was indicated by the result of a Chi-Square test that among the UK students, there was a statistically significant association found between genders and their views towards the question ($p < 0.05$). The boys were more likely to believe that they were able to integrate online information to form their own thinking than the girls. For the Chinese students however, no significant association was found between gender and their views about the ability to synthesis online information

Digital texts and distractions

Half of the students asserted that they either Agreed or Strongly Agreed that distraction happened more often with digital texts than with the use of printed text. Another half of them asserted their either disagreement or uncertainty.

It can be seen from Table 4.21 that there was a similar percentage of students who agreed that they would get distracted more easily when they read digitally compared to print reading between the UK and the Chinese students. 57.7% of the UK students claimed that they got distracted with digital texts compared to reading normal print. And 52.6% of the Chinese students asserted their agreement to the questions. The result of a Mann-Whitney U suggested that the differences between the two groups were not significant statistically ($p>0.05$).

Table 4.21: Breakdown of the students' responses to distraction of online compared to print reading

		<i>I get distracted more easily when I am reading digital texts than when reading printed texts</i>				
		Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
Overall students		5.5%	16.2%	28.3%	37.0%	13.0%
UK students		6.4%	18.9%	26.9%	34.5%	13.2%
Gender	Female	2.7%	15.6%	28.5%	37.6%	15.6%
	Male	9.1%	21.4%	25.8%	32.1%	11.5%
Chinese students		4.5%	12.9%	30%	40.1%	12.6%
Gender	Female	4.5%	12.8%	28.2%	42.3%	12.2%
	Male	4.5%	12.9%	31.3%	38.3%	12.9%

A Chi-Square test indicated that among the UK students, there was an association between gender and their perceived distraction with digital texts based on comparison to printed texts ($p<0.05$). The girls were more likely to agree with their distraction with the use of digital texts compared to printed texts than boys. For the Chinese students, however, there was no statistically significant difference between the views about the distractions of reading digitally among males and females on this question.

4.3 Findings of individual interviews

Individual interviews were conducted to elaborate what came up in questionnaire responses to gain a deeper understanding of perceptions that the adolescents had regarding digital reading in the UK and China. The following section presents findings of interviews by themes.

4.3.1 Literacy practices

Both the UK and Chinese students claimed that they were aware that they had been growing up with digital technologies, which shaped their engagements with texts in living and learning. According to the students' claims, they had access to digital texts in both in-school and out-of-school settings. Meanwhile, they claimed that due to the availability of printed and digital texts, they had a range of literacy practices of reading print and digitally. They shared various literacy practices relating to their social and cultural contexts, which may help understand the situated nature of literacy and reading literacy. This section, therefore, will present the students' literacy practices including their access to digital texts and activities of accessing both printed and digital texts.

Access to digital texts

Both the UK and Chinese students claimed that they were exposed to digital texts presented through various devices in school and outside of school. However, students' experiences of access to digital texts suggested that the Chinese students tended to have less opportunity to access digital text than the UK students.

All the students claimed that in school everyone read from the teacher's demonstration on projectors or whiteboards every day. It was claimed that they had access to digital texts if there were ICT classes. Apart from reading on screen in a class, most of the UK students said that they often used computers in the library to do homework or to search things for educational purposes. Many

students experienced doing Maths homework that was set online through MyMaths. For the Chinese students, it was said that there was little opportunity for them to read words on screen unless 'the teachers use the computer and projector in classroom to teach' (said ICN1). They claimed that they usually stayed in the fixed classroom that they were assigned to at the beginning of every academic year in which they spent most of their time in a day on a variety of learning activities. They were busy with homework, preview and review for classes which made them 'have no time to walk outside of classroom' to explore opportunities that were provided by the school for access to digital texts. Only one student mentioned the use of computers in the library. Some students claimed they felt guilty about using digital devices. One student (ICN2) said that 'I feel guilty when seeing others doing hundreds of problem sets or reading subject books'. Few of them suggested they would not use the computer in the classroom because they were afraid that they 'would be scolded by the teacher' although the computer was available.

Regarding using personal devices to access digital texts, a big difference in school policy was found. The Chinese students had more strict regulation of bringing personal devices to school than the UK students. Most of the UK students indicated that they were allowed to bring any personal digital device to the school and some students use iPad or Kindle to read in English class. Very few of the Chinese students claimed to bring personal devices to school. A majority of them indicated that they were told by the teacher not to bring any digital device to school. ICN5 said that 'otherwise the teacher would take it away'. Three UK students claimed that they could borrow the teacher's iPad to 'search for something' if needed. The Chinese students however claimed that it was common to ask for help from the teacher, 'but not asking for borrowing digital devices'. One Chinese student (ICN2) explained that 'there is no difference from asking for trouble if we try to borrow digital devices from the teacher'.

When outside of school, most of the students claimed that there were more digital devices available than in school. Most of the UK students claimed that they had more than one digital device and they used the devices based on personal habits. They suggested that they read digitally from their devices including mobile phones, personal laptop, household computer, e-reader and iPad. For most of the Chinese students however, the mobile phone was claimed to be the main way to access digital texts for everything they needed including for enjoyment and educational purposes. Many said they could use the household computer and one student (IUK4) claimed that 'it is kind of alternative for mobile phone'. He described that 'the difference is just the size of screen'. Meanwhile, more than half of the Chinese students claimed that they were inspected by parents when using digital devices, either personally-owned or parents' devices. It was claimed that some parents sat beside them. ICN4 said that 'parents would like to make sure we read the right thing'. Using parents' devices was quite common among the UK students. Half of the UK students demonstrated that they could access digital devices by using parents' devices as long as they had good reasons. This happened to a few of the Chinese students as well. But they claimed that they were allowed to use digital devices 'only for learning purpose, and (they) could not keep it long, around one hour', explained one student (ICN7).

Practices of reading activities

The students claimed a wide range of reading through different media in daily living and learning in the changed textual landscapes. Findings of literacy practices of reading from paper and on screen in school and in out-of-school will be presented. It was found that the Chinese students tended to have more curriculum-based and paper-based practices than the UK students in both in school and outside of school settings.

Literacy practices in school

All the students mentioned that they read both printed and digital texts in school.

The most common reading activities for students were reading on screen when they had a class, reading teacher-prepared hand-outs and reading textbooks or other physical books for reference and information.

Reading textbooks did not refer to the same thing in two countries. In the UK especially for English or Arts, students were told to bring their own books to school. IUK9 said that 'you have to 'have a reading book at the start of the English lesson to read for around 15 minutes before the lesson starts'. And in lessons they claimed that they did not read from textbooks 'unless the teacher (gave) one' to them. In China, students were also allocated around one hour as a separate session to read before lessons called 'Morning reading session (ChenDu/晨读)'. In this session, they were usually required to read aloud so as to memorise what they read and they could read any subject book based on their arrangement. In lessons, textbooks that they read were well structured with various units and topics. All the Chinese students claimed that they read textbooks in every class because there was a textbook for each subject. Chinese students were expected to reach the desired level when courses ended with no special reading session. Every class was carefully designed and instructed by the teacher according to the textbook. ICN8 said 'it (was) rare to have extra reading materials for classes'. Some students agreed to ICN7 that 'in order not to be left behind you to study hard with reading and memorising textbooks and do problem sets in matched problem books for core subjects'. However, schools in the UK tended to provide support to students who were not very good at reading. Students were offered tablets to help with understanding of words, pronunciation and so on. Meanwhile, there were reading activities designed based on students' reading levels. Students who could read better had English Plus with books of a higher level of difficulty.

Regarding reading for information to help with subject learning, many of the UK students suggested that they borrowed library books relating to the subject. They

claimed these books as 'information books' or 'reference books'. For the Chinese students, reference books were well structured based on textbooks in which sets of questions could be used to enhance students' mastery of what they learnt in class. The Chinese students claimed that every student would buy a reference book for each subject. Meanwhile, it was claimed that many students would buy a lot of question books for core subjects in order to grasp curriculum topics. The Chinese students claimed that they brought printed books, subject-related magazines, and other printed materials that were designed depending on the content of textbooks rather than digital devices to school.

Both the UK and Chinese students demonstrated that they read on whiteboards or projectors in multiple modes, including written texts, images, video clips and so on. Apart from reading activities with digital texts in class, more than half of the UK students claimed the practice of doing homework online by using either the internet or school-purchased learning software such as 'MyMaths'. Meanwhile a majority of the UK students suggested that they had entertainment-based digital practices such as social networking, texting or searching for some news they would like to know by using their own devices or school computer. For the Chinese students, they barely had the chance to do homework on the computer. One student (ICN6) claimed that 'I am not sure if I could do it as well as doing it in a traditional way that I had been doing with pen and paper'. Regarding entertainment-based reading practices, one student said that 'it was impossible to use digital devices' (ICN7) because they were not allowed to. But a few mentioned that 'some students bring digital devices without letting the teacher know and use those devices secretly' (ICN7). More importantly it was explained that 'most of us want to spend more time on learning and doing problem sets' than 'spend too much time on reading on screen' (ICN5).

Practices of reading in out-of-school

Based on the students' claimed, it was found that practices of reading included both print and digital reading and there were a wider range of practices in out-of-school than in school. Practices of reading ranged from reading printed/digital books, searching online to social networking and gaming and so on.

The most common reading activity was claimed to be reading for homework and reading homework materials for both the UK and Chinese students. All the Chinese students suggested that it was a 'kind of daily routine' (ICN7) to read from sheets of homework during the 'evening self-learning session' in school. They claimed that they were not supposed to finish homework with the use of digital texts because of the limited access to digital texts in school. After school when they went home or back to the school dormitory, some students managed to read digitally for enjoyment and academic purpose for a short period of time, such as reading articles on the internet. During weekdays, they spent 'no more than one hour a day' (ICN5) and 'around two or three hours in weekends' (ICN4) to read digitally, said half of the Chinese students. Much more of the time was spent on reading from paper. Although the Chinese students did not have much time to use digital devices, they tried to use them for curriculum/subject learning if they managed to access them. They claimed that they had entertainment practices such as texting, social networking or watching videos, but they usually spent more than half of the time on curriculum-driven practices such as doing a lot of quizzes for subject learning with the use of Apps. Most of the Chinese students mentioned that they had many Apps or software designed according to curriculum and textbooks. They explored a series of literacy practices with the use of Apps or online forum to help with homework and other curriculum tasks. They mentioned that they usually had extra quizzes on different Apps for core subjects such as English, Mathematics, Chemistry and Physics after they finished teacher-set homework. Such practices were considered helpful as one student

(ICN9) explained that 'they are good ways to help we students get well prepared for the exams especially when we consecutively have thousands of quizzes several nights before the examination'. Except for the use of Apps for curriculum based quizzes, three Chinese students suggested that they quite enjoyed surfing the internet. One (ICN9) of them said that 'I like wandering around within online forum groups'. They either joined online group discussions for core subjects or provided help to other members in groups by providing answers to questions of homework.

More than half of the UK students spent their time around 'half half' (IUK1) on reading print and digitally. Many claimed that had quite a lot of time online. One UK girl (IUK2) said that 'then I go home, two hours I do it, and then I have a tea and then go on again for another hour. And I do it in the morning sometimes before school. So like four hours a day I think.' Some students demonstrated that the time online was mainly for homework or school work. Unlike the Chinese students, the UK students usually used search engine to solve problems that they came across in homework. A few students were aware of getting quick answers by loading captions or pictures. More than half of them shared similar opinions with one student (ICN5) that 'I would be more willing to know what the problem is rather than getting the answer without any thoughts by uploading captions of questions through software applications'. Some students used Apps to translate for foreign language learning. The time for the UK students to do quizzes online or through software such as 'MyMaths'. Meanwhile, students would usually have reading online such as watching videos or reading articles for what they were doing in school beyond core subjects such as music, swimming and drama. The use of social media was frequently mentioned by most of the UK students. They claimed that they used social media 'to communicate and to know the outside world' and 'most of the time for enjoyment, kind of cool as well' (IUK2).

4.3.2 Preferences for text formats

Investigations of preferences for certain text formats worked as an important part in this study to understand what the adolescents thought about digital reading and the relationship between their interpretations of text formats and the textual interactions. Results of the questionnaires showed differences in the patterns of preferences of text formation between the UK and the Chinese students. It was found that the UK students tended to prefer digital texts to get information for school work, while more of the Chinese students preferred printed texts for school work related reading. Regarding pleasure/enjoyment reading, more of the Chinese students were found to prefer digital texts over printed texts than the UK students. Therefore, individual interviews were conducted to explore what was behind these patterns and to investigate potential factors that influenced the students' choices of text formats.

Results of interviews suggested that the students' preferences for text formats were mainly influenced by reading purposes: academic reading and enjoyment/pleasure reading. However, the students also considered various factors such as characteristics of texts, reading purposes and reading habits when they chose certain text formats, which reflected the influences of social and cultural contexts. Outcomes on the basis of reading purposes (i.e. academic reading and enjoyment reading) will be presented in the following section.

Academic reading

Both the UK and Chinese adolescents claimed that there were two main types of reading they had as students: school work related reading (academic reading) and reading out of personal interest for enjoyment (pleasure/enjoyment reading). Regarding academic reading, several studies have claimed that students prefer paper over electronic texts (Woody et al., 2010). However, in this study students' preferences for text formats in the case of academic reading varied when they involved different activities such as subject research, getting detailed

facts and doing revision.

Preference for digital texts for subject research

A majority of the students claimed that they preferred digital texts over printed reading materials to do research for their subjects. They explained printed learning materials such as textbooks and hand-outs could only provide limited information for certain topics and limited information could not meet their demands for a deeper understanding of certain topics. Therefore it was common for them to research for subjects which included practices of going beyond physical books. These students believed that the characteristics of digital texts in terms of availability, multimodality and updated information would support practices of research well.

The availability of texts was considered as the first reason for the preference of digital texts to do research for subject learning. Most of the UK students agreed with this and as one student (IUK5) put it 'we usually don't have textbooks for every subject' and 'we usually don't bring school books home' (IUK5). They therefore found it important to 'go for digital texts online' as one student (IUK5) said. The availability here referred to the convenient access to information for research. Meanwhile, four UK students mentioned that they could get related information quickly and could have extra information that was not covered in printed texts. These were the reasons why around half of the students claimed that they would go for digital texts even if they had physical books for doing subject-related research.

Apart from extra information from the open space of the digital texts online, most of the students claimed that information presented through the use of digital texts was updated and subject to change in terms of the use of words, images or audio. One UK student (IUK3) was very unhappy about an inappropriate image used in the French language book which had been there for a long time without

being changed. Half of the UK students believed that compared to fixed information on printed materials, updated information on the open space of the internet could provide them various perspectives and resources to support a deeper understanding of certain topics.

The multimodal feature of digital texts was well recognised among the UK students. One student (IUK1) said that 'it was kind of cool experiences' of using texts presented through various modes. Most of them mentioned that reading digital texts was interesting. One boy (IUK3) said that 'it is not boring because you don't get bored with stuff which have sound, image and movement'. Around half of the UK students believed that they could engage more with multimodal texts than with printed texts. It was claimed that the multimodal feature of digital texts would be helpful for reluctant readers. One UK boy explained that reluctant readers would not easily giving up reading if they could get various modes of supports rather than getting explanations in written words.

The Chinese students had a textbook for every subject and they usually brought textbooks and subject-related reference/information books home. Therefore, the availability of texts was not their concern. Although printed texts were available at home for subject learning, all of them believed that it was very convenient to get information by using digital texts. One Chinese girl (ICN1) explained that 'it is easy to locate what I am looking for with online texts and it seems that I have kind of some control of it' rather than 'going to the content to find the page and then read through the whole page'.

Apart from enjoying the convenience of using digital texts, the Chinese students acknowledged the 'extra information' when reading digital texts online for subject research. Around half of the Chinese students shared similar ideas with one student who said that 'printed books sometimes provide key points without good and full explanations of certain topics' (ICN2) which to some extent made

them not really absorb knowledge. One student used the phrase ‘a smattering of knowledge (一知半解/YiZhiBanJie)’ (ICN11) to describe the consequence of the limited information presented on printed books. It was claimed that online texts offered them ‘different perspectives and backgrounds of phenomenon’ said one Chinese student (ICN12) which helps to bring up new ideas and cultivate critical thinking’. Another student (ICN1) also mentioned that various perspectives offered online ‘could then deepen our understanding of certain topics rather than just memorising texts for examinations’.

However, the idea of broadening the scope of one’s knowledge with digital texts for subject research did not apply to every subject as the Chinese students claimed. Around half of the Chinese students agreed that digital texts could ‘expand knowledge for’ (ICN12) arts and humanities-related subjects including Chinese, English, History, Geography and Politics. One student (ICN7) explained that ‘the studying of these subjects was concerned with ideas, perspectives and how much you know about the phenomenon and how you apply what you learn to understand social issues’. But the rest of them had opposite opinions. One student (ICN5) said that ‘there is no need to bother with extra information from internet resources because well-structured textbooks cover everything needs for examinations’. These students barely used digital texts for subjects mentioned above and one student (ICN1) said that ‘memorise texts for humanity related subjects and it is the secret of studying these subjects’. Regarding science-related subjects, slightly more than half of the Chinese students claimed that they preferred using digital texts because as one student (ICN12) said ‘extra information on the internet helped with the understanding of the theory and various methods of certain topics’. These students acknowledge the multimodal features of digital texts for subject research. It was believed that multiple modes deepened their understanding in an interesting way and they engaged more in this way. However, four Chinese students agreed to one student (ICN3) who said that that ‘doing thousands of problems relating to science subjects is the best

way to achieve mastery of the subject'. This student explained that 'it is important to solve problems for examinations than knowing what is behind those problems'.

Preferences for printed texts for having a class and revision

Although the students showed a tendency to prefer digital texts over printed ones when researching subjects, for having a class and revision more of the students claimed to have a preference for printed texts.

Regarding having a class, reasons for the preferences for printed text between the two groups of the students were found to be different. Most of the Chinese students claimed that they preferred printed texts when in lessons because one student (ICN4) explained 'it is a habit of using printed texts since we are very young', although the teacher used digital texts for lecturing. They said that they were so used to using well-structured textbooks and could not imagine what they could do if not using physical books. Around half of the UK students also suggested similar preferences for having a class. They claimed that they would like to have paper-based materials because the teacher was not skilled in using technologies. Meanwhile, having paper-based materials would be helpful for revision. One student (IUK9) said that 'I sometimes cannot take all in in class. But I can do revision if I had on paper'.

More than half of the UK students and all the Chinese students claimed that they tended to choose printed texts for revision activities. These students suggested that they tended to have more personalised reading experiences, such as making notes, memos and keeping records of reading procedures. These UK students claimed that they found personalised reading experience valuable when revising schoolwork. One student (IUK7) said 'it's very helpful to remember what I've been taught to memorise for exams with actions like circles, highlights or anything I want to do right next to the texts'. This student said that 'I quite enjoy

looking at those things coming out when reading'. More than one UK student said that they had another piece of paper with them when they used digital texts for revision to write down important things and they used what they had written to revise. Writing things down was regarded as 'reaffirming' and helped them to remember things well. All the Chinese students also addressed the importance of personalised reading activities, and one student (ICN8) believed that 'it is their own way to engage in reading and learning'.

More importantly, it was found that such activities that those students claimed could be seen as personal sense-making practices of reading materials. Two UK students suggested that practices of making notes or highlighting were good ways to figure out their thoughts. The other UK (IUK7) boy said that when he looked back to these notes, he could 'think of all the moments of reading. And it is kind of the records of reasoning, thinking and learning, very interesting and sometimes challenging'. More than half of the Chinese students shared similar ideas and they felt that they were not reading or the outcome of reading was not good until they could successfully make notes which showed their own reading habits or personal style.

Another reason for choosing printed texts for revision was that more than half of the students felt that their reading was 'kind of disturbed when (they) click(ed) buttons to find out the right tools' and it was time-consuming to make notes on screen compared to using printed texts. More than half of the Chinese students claimed that it happened quite often that they forgot what they wanted to write next for the texts. One UK student (IUK10) said 'I need to find out the right button or option for the note'. Three other UK students suggested similar thoughts. It seemed that the students' thinking was delayed or somehow hindered in order to place their notes into the right place. This then could explain why they usually had another piece of paper with them when they were reading on screen for 'smooth thoughts and personalised ways' (ICN6) of sense-making.

Additionally, it was claimed that they would be more able to remember texts on paper because as one Chinese student (ICN2) explained 'texts are fixed within in a page'. But for digital texts, they appeared on a webpage without the explicit clues of spatial characteristics.

Enjoyment/pleasure reading

Both the UK and Chinese students claimed a range of practices for enjoyment reading involving both printed and digital texts. The results of questionnaires suggested that the Chinese students tended to have preferences for digital texts for enjoyment/pleasure reading. However, the interview results suggested that the students read print and digitally for enjoyment and their uses of certain text formats were shaped by the text types. It was found that more of the students preferred printed texts when reading fictional texts and showed preferences for digital texts when reading informational texts.

Preferences for printed texts for reading fictional texts

Around half of the UK students claimed that they usually spent one to two hours holding a paperback book, sitting in the corner at home and lost in the world that the book created. Three students agreed with one student (IUK1) who said that I try to squeeze out some time to read fiction on paper, for around two or three hours a week'. These students claimed that compared to reading for pleasure on screen, they enjoyed it more when they were reading from paper. It was acknowledged that keeping hundreds of books on digital devices was 'convenient especially when travelling' (IUK4). However, they suggested that technical issues such as glitch and power-off reduced their enjoyment of reading the story. Therefore, reading from paper was seen as a pure way of reading, based on one UK student (IUK10) mentioned that 'my mind is for the sake of reading, and I would not think of others. Only reading and enjoy the story. It is meant to be reading.' Whereas with texts on screen, one student described that it's kind of scrolling downing or wiping quickly' (IUK9) and she barely read again once she

finished it. Most of the Chinese students also claimed the feeling of ‘pure reading of the story’ (ICN6) when reading from paper-based books.

The students who claimed more enjoyment of reading from paper than on screen explained that the smell, the weight and the touch of printed books made them get more into the reading naturally compared to reading on screen. One Chinese student (ICN10) said that ‘it is easier for me to embrace the story and understand different characters’ when reading print. Another Chinese student (ICN9) claimed that the action of opening a book ‘is putting the curtain aside and let the play start. All characters are playing in front of you’. It was claimed that digital texts on screen were regarded as ‘cold and dead, and blocked by a layer of glass’ (IUK11) which made readers feel that ‘you are to some extent pushed to picture the scenes rather than having it naturally’. Based on such comparisons, three UK students said that they would buy printed books for favourite fictional books although they would be more expensive than digital ones. Most of the Chinese claimed that they often went to bookshops near the school to buy their favourite fictions.

However, for the Chinese students, their preferences for printed texts when reading fictional texts were associated with social and cultural backgrounds. As discussed earlier, the Chinese students were not allowed to use digital devices in schools. Therefore, three Chinese students had similar ideas to one student (ICN1) who said that ‘bringing printed books to school is the safest way’. Meanwhile, it was claimed that reading books together for enjoyment was popular among Chinese students and it was believed that it was ‘more convenient to share printed books with others than using a mobile phone’, said one Chinese student.

Another big concern for most of the Chinese was reduced vision if they read on screen for long time, which affected their choice of printed texts although this was not related to what type of texts they read. Most of the students claimed that

it was a common idea in China that radiation from digital devices harmed eye sight. They therefore tried not to read long passages or a book on screen. These students explained that their eyes were very tired after they spent very long time reading for subjects in school. One student explained that (ICN4) 'reading for a long time on screen after school if we had the opportunity would make our eyes very tired, but it would be better if we read from paper'.

It seemed that more of the students preferred printed texts for fictional texts to read for pleasure/enjoyment, although these students discussed different reasons to explain their choices of using printed texts.

Preferences for digital texts to read informational texts

Apart from reading fictional texts for enjoyment, the students claimed that they had a range of practices of reading informational texts as enjoyment/pleasure reading. According to the students, informational texts included various modes of texts such as written texts, images, sound and video clips and they used these texts to support practices for enjoyment purpose. It was found that more of the students preferred digital texts for informational texts.

More than half of the students suggested that they read on screen to know more about things related to their hobbies and things that interested them. Most of the students claimed that digital texts were the easiest way to know more about their favourite bands, people and to learn more about their hobbies. More importantly, digital texts were claimed to be related to the features of updated and sufficient information, which was one of the reasons for using digital texts. One UK boy was very interested in cars and wanted to be an engineer, and he suggested that knowledge about cars were updated with the development of technology and a book could barely be updated once it was printed off. Meanwhile, he claimed that books provided basic knowledge of things but texts online offered sufficient information which promoted a good picture of things. Half of the Chinese

students also claimed similar ideas. However, these students agreed to one student (ICN8) who demonstrated that using digital texts 'saves quite a lot of time' compared to print reading, which was another important reason to choose digital texts. It was claimed that the saved time could be used for learning.

The students who claimed the preference for digital texts suggested that having the chance to communicate with others was another reason for choosing digital texts. They demonstrated that it was easier to find someone to talk to. One Chinese student (ICN11) explained 'that's someone who shares the same or similar hobbies, someone who can understand what you are talking about'. It was claimed that a sense of being connected could be promoted by using online texts. One UK student (IUK9) explained that when she talked about one thing online she could get responses from people who knew that thing, which made her feel that there was 'something like what you can relate to'. One Chinese boy (ICN11) who liked making Flash clips found it very encouraging and everything got paid when he had comments from others on his Flash clips. He claimed that 'advice, compliments and some simple words make it such a great experience'. More importantly he felt as though he was not alone because he could be 'seen and heard' and could 'exchange ideas and opinions with others'.

4.3.3 Online reading comprehension

The students claimed to have a range of practices for reading online such as subject research and reading for enjoyment. It was claimed that they understood quite well that online texts were different from static printed texts. They suggested that various reading strategies to comprehend online texts were important for successful online reading experiences. Meanwhile, several challenges of reading online were mentioned. The following sections therefore will present the students' beliefs about online reading, strategies for online reading comprehension as well as some challenges that readers confront.

Beliefs-‘It’s different and I know it’

Students from two groups claimed that the digital texts on their school’s projector or whiteboard were not simply converted from static print format. According to them digital texts used in class were presented through various modes to enhance their understanding of some complicated topics rather than for the sake of integrating technologies in teaching and learning.

Apart from the multimodal feature of digital texts, most of the students suggested that when they had online reading they inevitably were exposed to a relatively open space where there were different resources and various perspectives. One UK student (IUK4) said that ‘reading online is kind of like put yourself into an open space that all sorts of resources are available’. Around half of the UK students demonstrated when they had inquiry-based practices that they tended to be very careful with ‘exploded information’, which barely happened when reading static and linear printed texts. It was believed that being able to understand all these differences ‘would to some extent make online reading a successful experience rather than bothering being immersed in endless information and getting lost in the open space of the internet’ said one Chinese student (ICN11).

Strategies for online reading comprehension

Most of the interviewees claimed that they realised that strategies for comprehending printed texts may not be sufficient to support successful online reading. Strategies such as information location, evaluation and creation were emphasised as being important for a good reader to read online among the UK and students.

Information location

Most of the students claimed that online reading included ‘loads of information’ and they had to read selectively, especially when they were doing research for

certain topics. It was claimed that information location was far more than going onto the computer, opening a search engine and typing out questions. Some skills such as composing questions and narrowing information down to their Year groups were regarded as being helpful to locate information.

Composing good questions was regarded as the first step to get the right information for topics they wanted to research and it was highly valued by most of the students. Based on practices claimed by these students, there were two types of ways of composing questions: a basic and an advanced level. Regarding the basic level of composing questions, all the students said that they just simply type words they did not understand into a search engine to wait for answers. They demonstrated that such a strategy of composing questions was useful 'if the question is kind of quite narrow' (IUK9) or when they just searched for small facts such as definitions, dates of historical events or simple formulas.

However, it was found that using search results was usually 'too broad and sometimes too superficial' reported one Chinese student (ICN11) with the use of the basic level of composing questions, which was not helpful for inquiry-based practices such as researching for subject learning. Therefore, an advanced level of questioning was believed to be an efficient and useful way to locate information for 'proper research'. Around half of the Chinese students said that they needed to 'polish (their) questions before typing' into a search engine by considering the use of different words. One student (ICN11) explained that 'in order to get what you want it is important not to stick to using certain words' and it is best to have some general ideas or prior knowledge of the topic'. It seemed that having a brief understanding of the topic could lead to better composed questions to search. More than half of the UK students claimed that they also reshaped questions in search engines if they could not find information that they wanted. For example, one student (IUK10) described that 'I, like, rephrase what I'm going to ask'. Three students recognised it was critical to choose words they put into the search

engine because 'the change of any words' (IUK10) would lead to information that may not be related to the topic they researched.

Another issue was concerned with narrowing down the search scope by defining their reading level. Most of the students mentioned that it happened 'quite often' that when they typed in something there was information coming up that was beyond their reading ability. Four UK students claimed to have had the experience where they came across things they could not understand when they searched some Physics questions because the information was designed for university students. They then defined what they put in to the search engine by typing 'GCSE or A-level' to make sure the result was designed for their Year group. Around half of the Chinese students also shared similar ideas and one student said that (ICN12) 'put some other words to limit search area'. This strategy was regarded as a filter to help to find the most relevant information.

Regarding locating information in chosen webpages, most of the students claimed that they could either use the navigational menus or the function of 'Ctrl+f'. These students suggested that some webpages had well-structured content tables to locate certain parts of the information and there was not a great difference in using the navigational menus compared to that of printed texts. About half of the students mentioned that it was convenient to use 'Ctrl+f' to locate specific words on 'a messy webpage' (ICN11).

It appeared that 'locating information is more than typing in some words' (ICN9) and it somehow showed the map of 'how individuals thought about the topic'.

Evaluation

The importance of evaluating online information was well recognised among the students, which was also suggested through the focus groups and the survey. In the interviews, both the UK and Chinese students claimed to have several

strategies that they used to evaluate information.

The source of information or the contributor of information was another important aspect to evaluate whether or not the information was reliable. More than half of the students claimed the trustworthiness of the source. For example, one student (IUK6) said that there's a really good website called BBC Bitesize which is really useful cuz it's supported by BBC'. Another student (IUK9) explained that 'I think usually good source would do good content'. This was regarded as an effective way to evaluate online information. More than half of the UK students mentioned the use of BBC Bitesize for learning or revision purposes because they believed that information created by big organisations and professionals was of a high quality. One student (IUK3) explained that 'I prefer to use something else like teacher made one'. The Chinese students did not mention specific websites that they used for learning, but they also confirmed the importance of the source. More than half of the students agreed with one student (ICN11) who said that I usually visit webpages created by big and popular organisations'. And it was claimed that many Chinese students usually visited websites where 'famous teachers show up by posting some good materials for learning' (ICN2).

However, it was claimed that they commonly came across information created by unknown internet users. Around half of the students shared a similar idea to one student (ICN4) who said that 'if the information searched was created by general users I would choose information accepted by most people'. Therefore the popularity of information or websites was another important strategy for evaluation. But three UK students and two Chinese students claimed that they would check the widely-accepted information. For example one student (IUK8) said that 'I would jump from website to website to see if it was correct'. They believed that it was wise to check the content rather than just considering the source or contributors of information or the popularity of information. Apart

from comparing information in different webpages, these students claimed that they also used prior knowledge of the topic to see if the information was accurate and reliable. One UK girl (IUK11) who described herself as a big reader claimed that she would call on what she had already known about the topic to see if the information was 'useful and reliable'. Another UK girl (IUK1) also demonstrated that her experience or what the teacher talked about could be 'kind of hints' to help them to evaluate the information. Similarly one Chinese student (ICN4) suggested that 'if you are suspicious about the information then use what you have learnt, evaluate it, rather than believing what you are told'.

Creation

Around half of the interviewees who regarded themselves as good readers of online reading claimed that the hardest task was creating their own ideas for some specific topics. According to these students, creation was concerned with synthesising 'good content' in a logical way to meet the purposes and aims of reading. It was claimed that practices involved in the creation could to some extent reflect how individuals made sense of the reading and made their own meaning out of the reading.

Four UK students and three Chinese students suggested that 'good content' could be found through the evaluation of online information. It was claimed that 'good content' had to be relevant, accurate, reliable and non-biased. These students mentioned strategies used for evaluating online information to get 'the right information' (IUK1), which were discussed earlier. Meanwhile, they addressed the importance of keeping reading goals in mind when choosing the 'good content' or the 'right information' for the creation of their own ideas. It was believed that keeping reading goals in mind would support the practice of 'sorting information out in a logic way' (ICN9).

In order to sort out chosen information, the strategy of having a separate file was

used by four UK students. They said that they did not simply 'copy and paste' online information. These four students claimed that when they researched for certain topics for subject learning they put key points that they found useful and relevant to the topics in a word document. And they wrote down their own ideas regarding the key points as well as pasting chosen online information. One UK student (IUK9) described that 'I would start over the evaluation or type in search engine whatever again', if the chosen information could not fit the reading goals. Although the practice of having a separate document to sort out information was not mentioned by the Chinese students, they suggested their awareness of the importance of putting information in a logical way for the practice of creation for comprehending online reading. Two Chinese students who volunteered to answer online questions in an online forum suggested that information should be sorted. For example one (ICN9) said 'I usually sort it out in logical ways so that others could understand it rather than copying information from other websites'. They would provide the website addresses as references to support their ideas and they regarded it as a 'kind of creation' (ICN12). For most of the Chinese students, their practices of creation happened when they wrote compositions in examinations. They claimed that they used chosen online materials to support their Chinese compositions. One Chinese girl (ICN4) said that 'using what you got online to clarify your opinions is an example of creation'. This also showed their ability to make sense of what they read.

Based on the process of creation discussed above, strategies for comprehending online reading were not applied in a linear sequence. Strategies were used and adjusted based on the students' communication with online texts and reading goals.

Challenges

Results of the focus groups and the survey suggested that many of the students had distractions when reading online, which were big challenges for them. It was

however found in the interviews that apart from distractions there were other challenges when they read online. The following sections will present detailed challenges of online reading that the students claimed to experience.

Distractions

All the students claimed that they came across a series of distractions when reading on screen, especially when reading online. Distractions were claimed to be caused by 'all types of pop-ups' described one UK student (IUK2) as adverts, some software notification or system update notification. Another student said that 'If it's got something like pop-up adverts or stuff, then that can be annoying. My concentration gives in always'. More than half of the UK students had similar ideas toward 'pop-ups' when reading online. Although more than half of the students claimed that they tried not to click those 'pop-ups', they felt that their reading was then interrupted and some concentration on reading was lost to those distractions.

Five UK students and seven Chinese students demonstrated that eye fatigue caused by looking at screen for a long time also caused distractions and affected reading the process. One UK student (IUK2) said that eye fatigue might also affect the mood of continuous learning because readers might need to stop to handle eyestrain. One Chinese student (ICN5) suggested that physical discomfort caused by technologies affected readers' patience. He said 'sometimes reduced my patience to read carefully'. Technical issues such as running out of battery and glitches were also seen to cause distractions.

Meanwhile, around half of the students claimed that their unfamiliarity to some functions of note-making affected their flow of reading. For instance, one Chinese student (ICN5) explained that 'I sometimes spend a big chunk of time figuring out which button to click or how to take information as notes'.

It was claimed that they had to pay attention to both reading content and all the

distractions at the same time, which had negative influences on their reading performance.

More than reading

More than half of the students claimed that when reading online, there was something far more than reading they could do. Three UK students suggested that 'home button' was a big distraction for him when he read on iPad. For example, one UK student (IUK8) said that 'I sometimes could not help thinking about clicking on other websites or watching video clips'. Four other students claimed that they found they had less concentration on reading when reading online or reading on screen compared to reading from paper. It seemed that their mind was not just set for reading due to the availability of 'easily accessed Apps' (ICN9) and internet access.

However, only a few of the students claimed that they knew how to deal with such a situation of 'more than reading'. One UK boy (IUK2) describe that 'usually if you go online I think they now have that a little button on top hand corner 'just view the text with no picture or anything. So I can see all there's no distractions like images and other stuff'. A UK girl said that she blocked things like YouTube or Instagram that might distract her when reading online. Similarly, two Chinese students also claimed similar strategies. One Chinese boy (ICN9) said that 'I use software to block entertaining apps or software'. He found such software 'quite useful to concentrate on the learning task' because a notification would come up if they clicked on apps and software in the blocked list.

Another challenge claimed by around half of the students was that they read more than they expected when reading online. They claimed that they sometimes just clicked links of related articles of the topic. It was claimed that links were a 'kind of magnet' (ICN1) which sometimes made them forget about their planned reading tasks.

Varied reading environment

The students claimed that being exposed to an open-access space where information required them to be able to 'find the right content' from 'endless information' created by varied contributors, was regarded as a challenge for them.

Most of the UK and Chinese students claimed that when reading online there was a greater chance of encountering terminologies that they did not understand compared to print reading. It was explained that most of the physical books they usually used for learning or pleasure were selected by teachers or recommended by authors to fit their reading ability. However, online information was created for everyone not just designed for certain groups of people. Although a majority of the UK students claimed the use of BBC Bitesize that was designed for secondary school students, they usually came across difficult words and terminology that was beyond their reading levels. Eight Chinese students claimed similar experience of being exposed to an open space online. One student explained that 'the internet is like an open reading environment where words are not specifically designed for any age group unless they are using of specific websites'.

Meanwhile, these students claimed that online information was created by a range of contributors with different educational backgrounds. They were concerned that some information may be false or not accurate because as one Chinese student (ICN6) said that 'some people did not pay much attention when they created the content'. Most of the students agreed to one student (ICN4) who said that 'you have to be very careful with online information'. One Chinese student (ICN9) explained that 'creators might simply copy from others or they create it in a rush without serious thought'. Therefore most of the students claimed it would be better to use information created by professionals or trustworthy organisations.

4.3.4 Being a reader

Both the UK and Chinese students understand their role as a reader in the digital age where printed and digital texts existed in living and learning. It was found that the students had expanded ideas of what counted as reading on the basis of their reading experiences, both print and digital. Their ideas of being a reader were also reflected in their general habits of print and digital reading. Therefore, the following sections will discuss their notions of reading and habits of reading from paper and on screen.

Expanded notions of reading

Both the UK and Chinese students claimed a range of literacy practices of print and digital reading. According to them, reading was considered as complicated meaning-making practices by engaging with multiple modes of texts. Changes of medium, the acts of meaning-making and various textual engagements were claimed by the students as important aspects of their ideas of reading.

As discussed earlier, the students claimed reading practices through different media, from paper and on screen in both in-school and in out-of-school settings. Most of the UK students demonstrated that reading in the digital age was more than reading from paper. They clearly claimed that the medium used to present texts could not affect the very nature of reading. A majority of the Chinese students suggested similar ideas. One of them (ICN9) said that 'practices of reading have been expanded to screen and I think it's a new way of reading and learning'. A range of practices through digital devices including checking social media, doing homework and searching for things online were regarded as reading by most of the students.

It was claimed that reading covered several aspects: 'taking in', 'processing' and 'producing'. One UK girl (IUK11) suggested that reading included the ability of

processing knowledge gained from ‘whatever paper or screen’ and the ability to use own words to present what was read. Three other UK students shared similar ideas of what counts as reading. These students further suggested that if someone just took information and had no action of their thoughts of reading materials, then such activities could not be regarded as reading. More than half of the Chinese students shared similar claimed to the above mentioned UK students. One Chinese student (ICN11) said that ‘reading on screen is definitely reading as long as you don’t just simply take in information without thinking about the content’. Based on what they claimed, not all activities of ‘reading texts’ could be called reading and reading included practices of meaning-making.

Meanwhile, half of the students mentioned that reading happened when they engaged in practices such as using social media, making video clips and doing research online for learning. One UK boy (IUK4) demonstrated that when he made videos with friends, he had to discuss with friends to figure out ‘what is the best for the video’ said the boy. He described how they also read a lot of information online regarding video making instructions, topic related information and feedback from friends, and then ‘put everything together for it’. It seemed that reading had been expanded to individuals’ social practices of meaning-making.

Reading print and digitally: several aspects of general reading habits

The students claimed the understanding of digital environment of reading where reading happened within a range of practices through different media. They suggested that they used variable behaviours between print and digital reading in terms of reading patterns, reading speed and reading strategies used for different text forma. The following sections will discuss how the students dealt with printed and digital texts.

Reading patterns

According to the students, reading pattern referred to how they distributed time for certain text formats and the length of printed and digital reading materials they chose to read.

Regarding time spent for text formats, more of the UK students claimed that they spent relatively longer time on reading on screen than the Chinese students in daily routines. For most of the UK students, it was common to have around two hours on digital devices continuously after school. Some students spent even more than two hours. One UK girl explained that 'I go home, two hours I do onscreen, and then I have a tea and then go on again for another hour. And I do it in the morning sometimes before school. So like four hours a day I think'. More than half of the Chinese students shared similar habits regarding time spent on screen. One student (ICN5) said that 'it is impossible to read online continuously for more than one hour or even half an hour at a time'. It was claimed that time for digital reading was split into small chunks. Two Chinese students said that on weekdays they usually read online for small facts or check answers for homework which could 'be done within ten minutes'. One of them (ICN4) explained that 'apart from doing some question-sets online, it is kind of difficult to get a relatively long period of time to read on screen because we have loads of homework to do'.

Meanwhile, the length of what the students read on screen was found to be different between the UK and Chinese students, which to some extent reflected the reading pattern. The Chinese students were found to tend to have small pieces for digital reading.

Around half of the UK students said that they read online with 'long passages'. It was claimed that reading length could be 'depending on what you read for' (IUK5). One student (IUK8) explained that 'it could be a mixture cause

sometimes when you go on and look for small facts online cause it are small research when you are reading. Whereas when you are reading websites and stuff like that, you often read a lot longer ones and sections. So that is no just shorter pieces'. Four UK students claimed that they always read long articles when they researched for learning-related or interest-based purposes. For a large majority of the Chinese students, it is rare to read long pieces on screen. One boy explained (ICN5) that 'we don't have a relatively long period of time to read long texts online'. More than half of the Chinese students indicated that their digital reading happened discontinuously at any time of the day as long as they had access to digital texts 'But usually for no more than 10 minutes. Therefore I tend to choose to read short pieces and most of them are for entertainment purposes' reported one student (ICN4). One boy (ICN5) suggested that 'online reading was fragmented' and he usually did some online reading when he had breaks from homework. He explained that he was told by media reports and some teachers about the fragmented features of digital texts.

It could be seen that the students' view of digital reading was shaped by their practices in their social and cultural contexts.

Skim reading

It was claimed by some of the students in focus groups and the questionnaire that they tended to skim read online, especially for information. However the individual interviews suggested that the way the students read was on the basis of their reading task, such as small facts, reading favourite materials and general reading for pleasure.

Regarding reading for small facts, most of the UK students claimed that they would read quickly to get an overview of facts rather than reading word by word. Similarly, a majority of the Chinese students demonstrated that they read fast when they searched for quick answers for questions. While for reading online for

homework or subject research, half of the students said that they would read thoroughly to make sure they did not miss something. Five Chinese students demonstrated that they would read through their online inquiry for questions or some topic to meet their purpose of using digital texts.

In terms of reading for pleasure, four UK students claimed that they would read through website or all texts for 'favourite stuff' because they wanted to 'take all in' (IUK8). For general reading for pleasure, these four students demonstrated that they would read quickly just to know what was going on and some trends. It was not obvious among the Chinese students that online reading speed for pleasure reading would be varied. Only one student (ICN9) mentioned that 'I would 'read through if that was something I liked'. Seven other Chinese students claimed that they read faster with digital texts even though the content was the same as that on paper. One Chinese boy (ICN5) explained that 'reading could be much faster in the contexts of fragmented periods of time'.

Reading strategies

It has been discussed that reading strategies for online texts and printed texts were considered to be different (Anderson, 2003; Taki, 2016). In individual interviews, most of the UK and half of the Chinese students claimed that they usually applied strategies that they used for print reading onto digital/online reading. Apart from strategies used to locate, evaluate and synthesise online information, these students suggested no big differences in reading strategies between print and digital reading. The following section will discuss similar strategies for print and digital reading for academic purposes.

Six UK students claimed that for comprehension reading or any reading for academic purposes they would firstly set themselves in a learning mood. One student (IUK5) suggested that he would 'get myself ready for doing homework, reading educational stuff or doing revision, whatever' so that he could be able to

have a relatively higher level of reading comprehension. Similarly, creating a mind-set for reading tasks was regarded as the first step by most of the Chinese students. One boy (ICN6) explained that ‘all the nerves and cells for reading and learning would wake up if the mind was told to read’.

Getting a general idea of what they read by reading key parts of texts was another strategy they usually used. Three UK students claimed that they read through the first part of texts to understand what it was about in general so that they would have an idea of what they should do to deal with texts. Meanwhile, reading key parts was considered useful for readers to ‘see if it had knowledge about the topic’ (ICN11). One UK student and one Chinese student mentioned reading questions before reading was a good way to get key ideas of reading materials. This Chinese boy (ICN4) believed that ‘there is no point to set questions if they were not important parts of reading’.

Regarding difficulties they came across during the reading process, around half of the students paid closer attention to the parts of texts using strategies such as ‘rereading, backtracking and reading further’ (IUK11). Meanwhile they would see if any prior knowledge they had could help solve the problems. They claimed that it was common to get extra reading materials from either information books or online if they could not sort out the problems. With regard to getting extra reading materials to support reading comprehension, these students claimed the tendency of using online resources to get sufficient and useful information for various information resources on the Internet.

Meanwhile, note-making was claimed to be a frequently used strategy especially for most of the students. Note-making included highlights, using sketches, simply copying down original texts and writing annotations to reflect their thinking. It was claimed that they were not very familiar with note-making on screen, and they would use another documents on paper or as a word document. But they

believed that note-making was a good way to ‘sort out key points and their own thoughts’.

Based on these students’ claim of having no significant differences in reading strategies for reading comprehension between printed and digital texts, it seemed that reading strategies for print reading could to some extent transfer to digital reading. Five UK students and four Chinese students believed that reading outcomes regarding comprehension were ‘kind of the same’ between reading from paper and on screen. A Chinese girl (ICN8) argued that ‘as long as you could focus on reading tasks and apply strategies mentioned above ‘whenever needed’.

4.3.5 Reading environment

The students in the UK and China claimed the use of printed and digital texts in school and outside of school. However, the reading environment in the two countries was distinct regarding attitudes of teachers and parents toward text formats that the students perceived. Even though attitudes of teachers and parents were not the aim of this study, the students mentioned this issue frequently when they talked about their practices of reading. Investigations of what the UK and Chinese students claimed about adults’ attitudes toward reading could be useful to provide insights into how students’ perceptions of reading were shaped by the cultural and social influences. In-school and at-home reading environments will be presented by discussing teachers’ and parents’ attitudes toward print and digital reading.

In-school: teachers’ attitudes

Teacher’s attitudes were found including regulations that the teacher made toward students’ use of personal digital devices in school, the use of resources used for teaching and learning, and instructional ideas of learning and reading with digital texts.

Most of the UK students claimed that they did not know about any written school policy or unwritten regulations that banned them from bringing and using personal digital devices in school. However, the students could not use them in class unless they were allowed to do things related to reading or learning. It was explained that 'if they know what you are doing, they will allow it' (IUK7). This student then said that 'at the moment, there's nothing that against reading on like phone or iPad for educational purposes'. Two students mentioned that it happened several times that the teacher asked them to use mobile phones in class under the teacher's instructions to help with understanding of some specific topics. However, for the Chinese students, they claimed that most of the teachers had strict regulations about bringing digital devices to school. Four Chinese students suggested that the class teacher made clear regulations about not bringing any digital devices to school. One student (ICN1) said 'it would be forfeited for sure'. It was explained that 'the school and some teachers think devices would have negative impacts on learning' according to one student (ICN4).

Regarding resources that the teacher used for teaching, around half of the UK and Chinese students claimed that they had several chances to get digital resources for learning in school and after school such as learning websites to use and extra online information for learning. Resources here excluded the teacher's use of digital texts on projectors or whiteboards in class. Half of the UK students claimed that they had school-purchased software for mathematics that they could use everywhere 'for example for homework if the teacher set homework online'. Meanwhile, it was claimed that the teacher also gave them some website addresses so that they could use them to help with homework. Most of the Chinese students claimed that they could get online learning materials sent from the teacher through online groups of the class. They mentioned that an online group was set up by using QQ (popular instant messaging software in China) in the first year of primary or secondary schooling. The students said that teachers

of core subjects usually uploaded PowerPoint that they used in class to make sure all students would pick up everything taught in each session. In addition, it was demonstrated that 'some teachers upload some articles as extra reading materials for humanity subjects, but very occasionally' (ICN9).

Instructional ideas of learning with digital texts referred to some instructions that teachers provided to students for out-of-school learning by recommending or introducing some educational software or some other online reading materials. Four UK students claimed that some teachers told them some software for learning. One student (IUK11) usually checked her phone to use the software for homework when she was 'told about it in school' by her teacher. More than half of the Chinese students claimed that they were told to use some software or go online for learning outside of school by some teachers. Two students said that their Mathematics teacher told them to get learning material through digital devices. For instance, one student (ICN9) said 'I have an app to get video clips, question sets and flash, all sorts of materials for self-learning and revision'. However, these students claimed that even though they were told about some educational software or apps, they were not allowed to access them in school. It was said that those software are only for the use after school'.

It seemed that some teachers in China were embracing the use of digital texts and devices for teaching and learning and acknowledged the use for students' self-learning, but not in the contexts of school or formal class teaching.

At-home: parents' attitudes

Parents' attitudes toward reading print and digitally were perceived based on the students' claims of experience of family literacy practices, parents' reading activities and parents' direct attitudes toward the students' literacy practices with digital texts.

Around half of the UK students claimed that they had family reading activities as one of their daily routines. One girl (IUK8) said that she quite enjoyed that her father read to her. She said 'normally it's a printed book. But he reads us a whole series one then it was on his Kindle or his iPad'. Another boy (IUK5) said that he and his father would send links of some interesting articles to each other because his father was 'quite similar with (him)' in interesting articles. For the Chinese students, none of them mentioned about current reading activities with parents. It was claimed that parents 'would not want to bother their studying' (ICN6).

Both the UK and Chinese students noticed that their parents had printed and digital reading activities. More than half of the UK students noticed that their parents had a lot of digital reading together with reading physical books. Three UK students described their parents as 'big reader(s)'. Four students claimed that their parents were 'more digital than' themselves. For instance, one student said (IUK6) that 'they do read quite a lot. Mostly digital. I think they use more digital than me.' Seven Chinese students shared parents' reading activities that they noticed. They claimed that parents read quite a lot on smartphones but usually small articles through social media software. One student mentioned (ICN4) 'my parents tend to read more on screen for news than from newspaper'. They barely saw parents reading a print book. Only one student said that his parents purchased some printed books online. But half of the Chinese students claimed that they did not know much about parents' reading activities. One girl (ICN8) explained that 'I don't usually spend a lot of time with parents due to loads of homework'. These students further explained that parents usually spent free time helping them out with their studying. For instance, one student argued that it which meant parents had 'no time to read'. Some other students also claimed that their parents asked them to read more from paper rather than reading on screen.

Regarding parents' attitudes toward the students reading on screen, a distinction was found between the two groups of the students. Most of the UK students claimed that they did not get negative ideas from parents regarding their reading on screen. For example, one student (IUK7) said that 'So they don't mind whether I read digitally or physically cuz a lot of time, there's more variety.' It was argued that reading more rather than how to read was of greater concern among the parents. For instance, one girl (IUK8) said 'They encourage me to read books on whole. So whether they're in actual book form or digital, as long as I'm reading the book. They don't really mind'. It was believed that parents' preferences for certain text formats would not affect her choice. For the Chinese students, they found that parents tended to have negative ideas of digital reading. Eight students claimed that parents would not be very happy with their digital reading activities or practices especially for the purpose of learning. These students suggested that they could have digital reading for enjoyment 'but under parents' inspection' and 'only for a while'. Around half of the students claimed that parents had hesitations and were suspicious of their use of digital texts for learning purpose. One girl (ICN1) complained that she was not allowed to use digital devices during weekdays. Very occasionally, she was allowed to download a few e-books. She said that her parents would scold her every time she used a computer even though they were told that she used it for learning such as searching for reading materials or getting online question sets. When she argued back, her parents would tell her that reading from the book was the formal and decent way of reading and learning. An old Chinese idiom 'trifling destroys the will (玩物丧志/wanwusangzhi) was always used to describe parents' ideas of learning activities by using digital devices, said this girl. It was claimed that for parents the proper way of getting knowledge was reading from paper. But four Chinese students argued back. One student (ICN8) argued that 'knowledge is not fixed in books and could be gained as long as you studied with will and hard work, regardless of the medium'. These students said that they used digital devices to read and learn 'no matter what parents would say' (ICN9). One reason

was that reading on screen would hurt students' eyes. Another reason that parents addressed more often was that reading from paper was the most effective and traditional way of learning. They were told by parents with an old saying that 'big fortune and fine ladies could be found in books (书中自有颜如玉, 书中自有黄金屋)'. Some students however saw it the other way. Another student (ICN9) said that he would read digitally if his parents were out of sight because he believed that he could 'get knowledge or anything that parents claimed with digital texts on devices and reading digitally had become part of learning and maybe lifestyle'. Based on these claims, the younger generation in China like the Chinese interviewees, were holding different ideas about ways of reading and learning which were not rooted in Chinese tradition and culture.

4.4 Summary of key findings

1 Access to digital texts and literacy practices

1.1 Both the UK and Chinese students reported a range of access to digital texts, including school whiteboard, computer or personal devices in school. But much fewer of the Chinese students reported the use of school computer and personal devices compared to the British counterparts. Out-of-school, the students reported a wider range of access to digital texts than in school. Mobile phones were reported as the most frequently used device for digital reading. Using parents' mobile phone was reported more frequently by the Chinese students than by the UK students.

1.2 Both the UK and Chinese students reported that they read both printed and digital texts in school and outside of school. The Chinese students tended to have more paper-based literacy practices than the UK students.

In school, the most common literacy practices include reading printed books for subject learning, searching online information for learning and enjoyment and doing homework. The Chinese students reported reading structured printed

textbooks for all subjects, while the UK students reported bringing their own printed books, or books on tablets, in certain English classes. Few of the Chinese students reported reading digitally for learning purposes. Around half of the UK students reported using digital reading for homework tasks.

Out-of-school, literacy practices were reported to include reading printed and digital books for pleasure, searching online for learning and enjoyment, social networking and doing homework by using computer and pen and paper. More than half of the students claimed doing sets of online quizzes for learning purpose.

2 Preference for text formats

The students' preference for text formats was related to reading purposes and features of the certain texts. In general, the UK students tended to prefer digital texts for learning purposes especially for searching of information for learning. The Chinese students reported a preference for digital texts for reading for pleasure.

2.1 The preference for digital reading was affected by the availability of digital texts, features of digital texts and the subjects that the students studied. For the UK students, digital texts enabled convenience and ease of use. However, the availability of digital texts was not seen as an issue to the Chinese students as they reported that they were exposed to a more paper-based learning environment. Both the UK and Chinese students reported on the usefulness of access to updated information on the internet. The multimodal feature of digital texts was reported helpful for research related practices. Some Chinese students preferred digital texts for Science related subjects, while others for Social Science related ones.

2.2 The tendency to prefer printed texts was affected by reading habits, context,

learning purposes and expected learning outcomes. Most of the students reported that enjoyed the touch, smell and feel of turning pages when reading from paper. Printed texts were preferred when doing revision and in lessons. It was claimed that the use of printed texts gave more opportunities and ease for personal reading experiences. Compared to reading digital texts, it was claimed that printed texts caused less physical discomfort, which was seen as an obvious reason for the preferences for printed text. Most reported that they would prefer to access printed texts if they really liked the topic.

3 Online reading comprehension

All the students claimed that they understood that reading online texts was different from printed texts. An ability to locate, search, evaluate and synthesis of online texts were reported useful for the successful practices of meaning-making. Challenges of online reading comprehension included distraction, number of contributors and the open-space reading environment. It was found that the UK students reported themselves better at information location, evaluation and synthesis of online texts than that of the Chinese students.

3.1 Both the UK and Chinese students reported that they understood that online texts were different from printed texts. The multimodal features of online texts were well recognised.

3.2 It was reported that it was important to locate, search, evaluate and synthesise online texts for successful online reading experience. However, not all of the students perceived themselves as good readers when reading online.

3.3 A number of challenges were reported. Distractions such as pop-ups and open space of reading environment were claimed as main challenges.

4 General reading habits of reading print and digital

Both the UK and Chinese students reported a range of reading activities, both

print and digitally based. Their general habits were investigated regarding print and digital reading.

4.1 All the students claimed that they had experience of using multiple modes of texts for meaning-making practices. They understood that the ability to decode printed texts was not enough for reading in the electronic environment. It was claimed that reading also included practices such as video making and social networking.

4.2 It was reported that more of the UK students tended to spend more time reading on screen compared to the Chinese students. Meanwhile, more than half of the UK students claimed continuous reading on screen. Most of the Chinese students claimed the reading in shorter period of time on screen. Digital reading was seen as 'fragmented reading'.

4.3 Reading speed was affected by reading purposes. More than half of the students claimed that they read fast on screen when reading for small facts and enjoyment. In terms of reading for learning, they reported that they would read through what they had on screen.

4.4 According to the students, good readers applied general reading strategies to support reading comprehension, regardless of reading on screen or off paper. Strategies reported included being a learning mood, paying extra attention, applying prior knowledge and note-taking.

5 Understanding of growing up with digital devices

Both the UK and Chinese students were aware that they were surrounded by digital devices. They understood the reading environment of reading based on the availability of digital devices, their literacy practices, both digital and print and the skills needed for successful online reading experience.

6 Gender difference

The gender differences in reading were described by looking at several aspects such as types of reading paper and screen based reading practices through different media.

6.1 It was reported that in general girls tended to read more than boys in print. Girls tended to read magazines for enjoyment more than the boys. Boys read more magazines for learning purposes. Regarding digital reading, both the boys and girls engaged in digital practices. The boys tended to search for text for enjoyment online more than the girls. The girls had more social networking practices than the boys. The gender differences in digital and print literacy practices among the Chinese students were smaller than that of the UK students.

6.2 Regarding reading for pleasure, the UK girls showed a stronger preference for both screen and printed texts than the UK boys. No significance was found between the Chinese boys and girls regarding reading for pleasure in either format.

6.3 Some perceived skills for online reading comprehension were gendered among the UK students. The UK boys tended to see themselves as more skilled in information location and ability to synthesise. Gender difference was not found among the Chinese students.

7 Reading environment

The UK students were exposed to a reading environment with looser regulations of the use of digital devices. The Chinese students tended to be exposed to the reading environment with strict regulations regarding their use of digital technologies. The reading environment was investigated based on the students' reporting of teacher and parents' literacy practices and their ideas concerning

children's use of digital devices.

7.1 Both the UK and Chinese students reported teachers' use of technology and instructional ideas to support students' learning with the use of technology in class. However, the Chinese students experienced stricter regulations than the UK students regarding their use of digital devices in school.

7.2 Some of the UK students reported sharing literacy practices in the family, both print and digitally based. However, none of the Chinese students reported such practices. According to the students, UK parents read more than Chinese parents. Regarding regulation of children's use of digital devices, the UK parents tended to support students' reading, regardless of the medium used for reading. However, the Chinese parents showed the tendency to encourage students to read from paper than on screen.

The above issues emerged in this study will be discussed in the following chapter.

Chapter Five Discussion

Introduction

This study set out to explore the perceptions of digital reading held by groups of UK and Chinese adolescents concerning literacy practices in both in-school and out-of-school settings. The overarching research question: whether reading is changing because many texts are being accessed online and whether this is causing learners problems and opportunities, or both indeed drives this study. It has been suggested that more research into teenagers' literacy practices would help us to understand the dynamic nature of literacies related to continuous and fast changing digital innovation (Leu et al., 2011). This study therefore has aimed to help expand the understanding of digital reading in contemporary contexts. Regarding the socio-cultural aspect of literacy/literacies (Street, 2008), differences and similarities between these groups of UK and Chinese students were explored through a focus on the dynamic changes in reading in different social and cultural contexts.

The mixed methodological approach applied in this study used focus groups, survey and individual interviews to help gather a rich set of data. In focus groups similarities were examined regarding adolescents' understandings of being in the digital reading environment with both printed and digital texts, their awareness of newly required skills for online reading and their preferences for certain text formats and physical features in reading. Differences regarding preferences for text formats, digital literacy practices and acceptance of digital textbooks were explored. Similarities and differences investigated through focus groups were used to design the questionnaire to see the perceptions of a broader range of adolescents concerning aspects of accessibility, reading activities, preferences for text formats, reading behaviour as a reader and online reading comprehension. Distinctive responses of the questionnaires were then further explored through individual interviews to investigate the potential reasons behind responses.

All issues raised from the findings have indicated social, cultural and educational differences in adolescents' perceptions of digital reading. The chapter will address essential issues to answer the research questions developed earlier:

1. What access do UK and Chinese adolescents have to digital reading; what types of reading with both digital and printed texts do they come across in school and after class; and are there any differences in these things across the two countries?
2. How do adolescents perceive reading using different media (print and digital) in both the UK and China; and how are their purposes for reading different across text formats and across the two countries?
3. What skills do adolescents perceive that they need to read online? Is there any difference regarding perceived online reading comprehension across the two countries?
4. Do adolescents' perceptions of and reported practices in digital reading differ by gender, and are these differences similar across the two countries?

Issues related to these research questions will be discussed. Important factors such as reading environment, reading strategies and ideas of what reading is in the digital age will be addressed and discussed to get a better understanding of digital reading across the UK and China.

5.1 Access to digital texts and literacy practices

The students in this study reported various degrees of access to digital texts in school and out-of-school. This is consistent with a large number of studies concerning the pervasive use of technology in class within recent decades (Bitter & Pierson, 2002; Firmin & Genesi, 2013; Cuban, 2001; Williams et al., 2000). There has been recognition that literacy practices in the digital age have been mediated and shaped by the pervasive use of digital technology in different contexts with a focus on various aspects such as textual practices and practices in

cultural contexts (Cassidy & Grote-Gracia, 2012; Street, 2003; Mills, 2010). Such recognition was reflected in this study in that the students claimed a range of literacy practices, both print and digital, in the digital age where printed and digital texts co-existed. Therefore, the following sections will discuss the UK and Chinese students' access to digital texts and their literacy practices. Attention will also be given to the differences across the two groups of students in terms of access to digital texts and literacy practices in school and in out-of-school settings.

5.1.1 Access to digital texts and literacy practices in school

In this study both the UK and Chinese students reported that digital texts were accessible in class through the teacher's use of the classroom projector or whiteboard. Such a finding could be an explicit example to show the integration of new technologies into teaching and learning (Burnett, 2014). Governmental support in terms of huge investment in facilities and related networks (BESA, 2016; FT, 2015; MoE PRC, 2010) seems to be a universal concept in the digital age in order to help students be competent in the current digital-rich society. Meanwhile, the students' claims of having access to digital texts by using personally-owned devices or others' devices (the teachers or friends) could also to some extent suggest that new technologies may have been embraced for teaching and learning and technologies may have shaped the way to learn.

Due to the availability of digital texts in school, a range of digital literacy practices were claimed together with various literacy practices of print. This reflects the fact that literacy practices nowadays have been moving beyond the scope of interactions with printed texts or paper-based materials (Greenhow & Robelia, 2009; Mills, 2010; Walsh, 2008). The concept of changed 'textual landscapes' (Carrington, 2005) has been proposed to explain the changed and changing literacy environment in which print is no longer dominant in either

formal or informal learning settings. The availability of various technologies in schools therefore promotes the possibility that ‘humans interact with technologies in new ways with innovative purposes’ (Gillen & Barton, 2010, p.4). The idea of interactions with technologies is supported in this study as some of the UK and Chinese students claimed that they used interactive media to communicate or to generate some meanings, such as texting, social networking and searching online for school lessons.

Regarding the students’ interactions with texts through practices like texting, social networking and online searching, the concept of multimodality could not be ignored (Marsh, 2007; Jewitt, 2008; Walsh, 2008). Practices that the students claimed in this study involved composing written texts, images, sounds and movements in various modes. Such practices require individuals to process all sorts of modes to make sense of what they are doing in the global and networked society rather than simply using new technical skills to use digital devices (Rosewell & Walsh, 2011). It can be seen that widely held assumptions about the cognitive abilities required for reading and writing no longer meet the ‘basics’ of literacy (Walsh, 2008) because the use and interpretation of various forms of texts have to be taken into account, which shapes these textual interactions (Jewitt, 2005; Jewitt et al., 2016).

Although the integration of technology in education seems to be a universal trend, this does not necessarily suggest that students’ access to digital texts and their practices would be similar. In this study, the UK students tended to have more autonomy in using digital devices in school for various digital literacy practices than the Chinese students. More of the UK students claimed the use of computers in school, their own devices and other’s devices to access to digital texts. Meanwhile, the Chinese students were found to have more paper-based literacy practices compared to their UK counterparts. Some of the Chinese students claimed that they were not allowed to use digital devices. They also suggested

that they did not want to spend too much time on digital devices otherwise they would not have enough time for schoolwork and homework. There are some possible reasons that underpin such a difference. The first one could be that integration of technology in education was introduced in the UK with successive government supports (Buckingham, 2007) much earlier than in China (Ge et al., 2012). Accordingly, changes caused by educational technology integration would have had a relatively longer term influence on curriculum, pedagogy, students' ways of learning and teachers' belief and teaching practices in the UK than in China. With a longer term influences of technologies on teaching and learning, it might have become common for UK students to have various access to digital texts in school for a number of digital literacy practices.

Another reason then could be related to the social, cultural and educational differences across the UK and China. Regarding cultures of learning, in Chinese culture, knowledge is learnt from books and written words are highly valued for the acquisition of knowledge (Cortazzi & Jin, 1996a; Hu, 2002, Wang, 2001). This may explain why in China there is a well-structured textbook and a matching problem book for each subject and every student uses textbooks that they get at the beginning of each academic year. It might then be true that learning from new media like digital devices is something new to the Chinese culture of ways to learn. Therefore, such a culture of learning might have affected Chinese students' ways to gain knowledge. In the context of western countries, knowledge is seen as more embedded in individuals' interactions and activities (Cortazzi & Jin, 1996a). It then could be assumed that perhaps for UK students using digital devices instead of physical books for learning activities might not cause big differences in knowledge acquisition. The difference in cultures of learning across the China and UK could explain the different patterns of the students' access to digital texts and literacy practices claimed in this study.

Apart from cultures of learning, different social situations in education may also

contribute to the different patterns of students' digital texts access and literacy practices across the UK and China. In this study, the Chinese students claimed that they were very busy with schoolwork and homework and that they used a number of well-structured printed books to do problem sets in order not to be left behind. The claimed literacy practices of the Chinese students are associated with the examination-based environment (Lau & Chen, 2013). Secondary students like these would be facing big examinations like the GaoKao (National College Entrance Examinations) and these examinations are based on textbooks. Therefore, students make full use of printed textbooks and do problem sets that are matched with the textbooks in order to get high marks in big examinations. The fierce competition and examination-oriented assessment lead the Chinese students to sacrifice time they may otherwise devote to their personal interests, especially in schools, for the sake of learning (Hu, 2002). The idea of high-stakes competitions in China was reflected in this study in that many of the students claimed that they wanted to spend more time on learning and doing problem sets. The UK students in this study did not mention their stress from examinations, which suggests a less examination-based environment for UK students. It could be assumed that printed textbooks and matched problem books are not as popular as in China. Therefore, different approaches to competition in education could also help us understand why the Chinese students appeared to be exposed to a more paper-based reading environment than the UK students, although digital texts were accessible to both the UK and Chinese students.

A similar percentage of the UK and Chinese students claimed in the questionnaires that they read textbooks in school, which was one of top reading activities, although the concepts of textbooks should be understood in their situated contexts. It has been found that the textbook has a major influence on students' learning and teachers' teaching (Cai et al., 2011; Fan, 2013). In China, textbooks are a very important part of compulsory education and senior high school learning. Textbooks are well structured by a group of professionals in

related areas to implement the national curriculum (Park & Leung, 2006). Compared to Western countries, textbooks in China are structured to serve uniform curricula at a national level. All most all schools in China have to use textbooks (for every each subject) published by the government officially appointed publisher. In the UK, publishers have a much less strict approval process to publish textbooks commercially. Schools in the UK can choose textbooks from a wide range of publishers. Teachers have freedom to choose their own ways of using textbooks in class rather than having instructions based on textbooks in the way teachers have in China. Different ways of publishing and using textbooks across the UK and China reflect cultural values and social contexts with respect to learning.

Additionally, it is interesting to find that some Chinese students in this study claimed the 'secret use' of digital devices to support digital literacy practices in school. It is not hard to see on the one hand the changing practices of Chinese learners with exposure to digital technologies and their eagerness for interactions with digital technologies as a new way for meaning making (Street, 2003; Gee, 2008; Lankshear & Knobel, 2011). On the other hand, it might suggest conflicts between the impacts of technologies on individuals' textual engagements and the values about how to acquire knowledge influenced by their Confucian heritages.

Even though the Chinese students tended to have more paper-based literacy practices, it is undeniable that lots of schools and universities in China are embracing the advantages of new technologies by providing facilities and working on using technologies in teaching and learning (He & Wray, 2017; Lei, 2010) like those in Western countries to assist students become competent in the digital age. While changes are taking places regarding integration in education universally, the social contexts and cultural values which uphold differences in literacy practices from country to country should be understood for deep

insights into nature of literacy at both technological and cultural levels.

5.1.2 Access to digital texts and literacy practices in out-of-school

It was found that in this study in general more of the UK students claimed to have access to digital texts than the Chinese students in out-of-school settings, similarly to those in school. Some might argue that such a difference may be associated with the number of digital devices that students own and their socioeconomic status (Lenhart et al., 2010). Perhaps it might be true if we judge from the findings that many of the UK students claimed that digital texts were accessible through mobile phones, laptops or tablets, but most of the Chinese students suggested that they usually had access to digital texts through mobile phones. However, data in this study appeared insufficient to support such an association. Instead, one possible reason relating to such a difference could be the varying length of a school day across the UK and China. In the UK, the average length of a school day is around 7 hours (Telegraph, 2014). While in China, the average length of school days in most cities in secondary schools is around 12 hours or more (BBC, 200; Ferreras & Olson, 2009). It could be speculated that Chinese students may have less free time and fewer opportunities to get access to digital texts compared to UK students because they are spending more time in formal learning situations. The aforementioned pattern of students' access to digital texts out-of-school between the UK and China is likely to be linked to differences in the education system and in the cultural values underpinning education between the two countries.

Meanwhile, as shown in the questionnaires, mobile phones were the most frequently accessed devices in terms of personal devices among the UK and Chinese students (both personally owned and borrowed from parents) both in school and in out-of-school. This supports previous studies that showed the high values that teenagers put on smartphones (Clark, 2013; CNNIC, 2017; Lenhart et

al., 2010; Ofcom, 2016). The portable feature of smartphones to enable Internet connection leads adolescents to 'embrace it as the centrepiece of their communication strategies with friends' (Lenhart et al., 2010). The favoured role of smartphones regarding accessing personally owned devices was similar across the two groups of the students.

It is worth noticing that more of the Chinese students claimed their access to digital texts was by using parents' devices than the UK students. However, Chinese students claimed that they were inspected when they used digital devices either personally-owned ones or parents' devices. None of the UK students however mentioned inspection from parents when using digital devices. Differences in claimed parental practices in terms of inspecting children's use between the UK and China may be associated with values and beliefs transmitted culturally (Chen, 2001) regarding parents' involvement in education and their support for technologies for learning. In the existing literature, Chinese parents are known for placing a high value on education within the Chinese culture shaped by Confucianism (Francis & Archer, 2005; Huang & Gove, 2012). Parents in China tend to actively involve themselves in their children's learning practices to assist them to be academically successful. From a historical perspective, education has been regarded as a family business that promotes the possibilities of children being highly respected by becoming intellectual scholars (Huang & Gove, 2012; Chen, 2001). Within this family business, parental supports and involvement have been seen as a major responsibility in parenting in China (Chao, 1994). In this study, the Chinese parents' practices of inspecting their children's use of technology by 'sitting beside' reflects parental involvement in children's learning as confirmed in the literature (Cheung & Pomerantz, 2011). Meanwhile, the practices of monitoring children's usage of mobile phones by sitting beside conveys their concerns with the use of technology to support learning, which is a new idea in the Chinese culture of learning. It was claimed that some Chinese parents lent mobile phones to children but monitored children's uses of these

devices. Such practices are consistent with the findings in a study regarding ‘a combination of restrictive, instructive and co-using approaches’ that Chinese parents tend to guide their children’s digital technology use (Wu et al., 2014). Inspection by sitting beside their children might suggest the relatively reserved views that Chinese parents hold regarding the integration of technology in education. It could not be ignored that potential changes caused by digital technologies in parental support for children’s learning might have taken place in China when they lent digital devices to children or allowed them to use devices even for a short period of time.

None of the UK students claimed inspection from parents when they used digital devices, which may suggest a higher level of autonomous use of digital devices. Autonomous use of digital devices among the UK students however does not necessarily mean an absence of parental regulations and involvement regarding the use of technologies. Research has explored the dilemmas of parents in the context of Western societies as they balance their anxieties with respect to the possible harms and risks found online and their provision and management of digital devices for their children (Davies, 2011; Livingstone & Helsper, 2008). Parental involvement has been found evident in terms of children’s use of digital devices or online resources at home through the setting up of parental regulations with three broad categories: active, co-use and restrictive mediation (Livingstone & Helsper, 2008; Nathanson, 2001a, 2001b). In this study, some of the UK students mentioned that their parents would allow them to use digital devices as long as parents had a general idea of what they did with these devices. It could be seen that UK parents ‘move freely between one approach and another’ regarding children’s use of digital devices (Davies, 2011). It seems that the differences across the two countries in patterns of students’ access to digital texts may well be related to culturally transmitted values regarding the way education is valued in its social contexts.

Regarding literacy practices shaped by changed 'textual landscapes' (Carrington, 2005), both the UK and Chinese students claimed that they engaged in both printed and digital literacy practices. From a general look at the similar responses to questions about social networking in the questionnaires among the UK and Chinese students, a conclusion might be drawn that social mediated practices for example using social media are happening at a universal level and shaped by new technologies. In the New Literacy Studies framework, social networking or the use of social media is a social mediated process using 'a multiplicity of modes' (Kress, 2003) to elaborate power relations (Brown & Ruthkosky, 2012; Street, 2003). It has been discussed that the vast use of social networking suggests the 'significant dimension' (Buckingham, 2007) of new media in the younger generation's lives, which is remaking or to some extent reforming relationships of young people more 'in the domain of popular culture' than that of schools (ibid., p.vii). It has been argued that the use of social media embodies the idea of power relations such as relations building and maintenance (boyd & Ellison, 2007; Thurlow et al., 2004), which echoes the concepts of literacy as social practices proposed by NLS researchers (e.g., Street, 2003; Lankshear & Knobel, 2011). The students' aims in using social media as claimed in this study, such as communicating with friends in school, joining in online groups and helping others online, suggest changes in the power relations embedded in digital literacy practices.

Similar to the in-school picture, the Chinese students were found to have more paper-based literacy practices out of school too. A lot more of the Chinese students claimed to use pen and paper to finish work at home than the UK students. This is associated with the book-centred environment of China (e.g., Hu, 2002), which was discussed in the previous section. Meanwhile, although digital literacy practices were also claimed among the Chinese students, these practices were more for learning purposes. From the fact that a big majority of the Chinese students claimed that they had practices of doing hundreds of problems for the

preparation of examinations by using digital devices or through specific software, the 'disciplined' characteristic of the Chinese learner seems clear (Shi, 2006). The characteristic of being disciplined is an explicit reflection of the effects of a high value placed upon education culturally and socially (Jin & Coratzi, 2006; Li, 2002). From their Confucian heritages, it was believed that learners would be rewarded if they worked diligently. Therefore, learners were expected to be responsible for their own 'self-development' by diligence. This type of practice was also one of consequences of the competition for education in China, especially for students under the pressure of the GaoKao (National University Entrance Examinations). However, what cannot be ignored through such practices were students' interactions with digital texts and the potential impacts caused by using online resources for learning purposes on the concept of ways of learning and sources of knowledge. It could be speculated that the use of technologies for learning might have to some extent had subtle influences on Chinese students' ideas of how to learn and to get knowledge.

The tendency of the Chinese students' literacy practices to be more paper-based than those of the UK students was also shown in their reported use of texting. Texting was found much more popular among the UK students than among the Chinese students. Such a difference could be related to the need for social networking, for example the need to maintain relations. However, such needs could also be variable across the UK and China. As discussed in the previous section, schools in the UK and China have different length of schooldays. UK students who have shorter schooldays than Chinese students might thereby have greater opportunities to maintain social relationships by adopting new technologies of communication. Meanwhile, the fact that very few of the Chinese students claimed to use texting outside of school could be caused by their limited access to digital devices as discussed previously. On the other hand, this reflects the social situation of Chinese students where they are expected to focus heavily on learning even if this meant sacrificing some pursuits in their personal lives

(Hu, 2002). Apart from the perspective of power relations in New Literacy Studies (Gee, 2008; Street, 2003, 2005) reflected in the study, texting for discussion of homework that was claimed as a popular practice among the UK students suggests that texting was being used in social life as well as in academic learning (Ahn, 2011; Lenhart et al., 2012).

It is not hard to see that differences in the patterns of the students' access to digital texts and their literacy practices are associated with social and cultural situations. Culturally transmitted values on education and how to get knowledge may have caused various interactions in each country to both printed and digital texts and to interpretations of practices of reading.

5.2 Preferences for text formats

Reading on screens as well as reading from paper has become very common, which suggests possible changes in reading habits and choices of text formats (Woody et al., 2010; Daniel & Woody, 2013). It is hard to deny that digital technologies have become 'an integral part of the education system' (Porion et al., 2016). Research on students' practices with both digital and printed texts seems consistent with changes in reading shaped by the proliferation of digital technologies in terms of choice of text formats, use of medium and perceived reading performance with various media (Farinosi et al., 2016; Mangen et al., 2013; Norman & Furnes, 2016; Noyes & Garland, 2008). In this study students' preferences for text formats were examined on the basis of distinguishing reading purposes (academic reading and enjoyment reading). Results suggested that preferences for text formats were not merely dependent on dichotomous purposes of reading. The students' decisions on choosing certain text formats were made by taking various factors into account rather than simply considering reading purposes. A range of reasons were explored to understand students' choices of certain text formats. It was found that reasons were concerned with

the affordances of texts, physical and technological aspects of a medium and health issues together with social and cultural factors. Reasons together with reading purposes underpinning preferences of text formats across students in two countries will be discussed to expand understanding of digital reading within socio-cultural contexts.

5.2.1 Preferences for digital texts

The evidence from this study suggested that digital texts were pervasive in the lives of the participating UK and Chinese students for a range of practices for both learning and personal entertainment. It was found that reading purposes, features of digital texts, availability of texts and subject disciplines worked together and influenced students' choices in using digital texts.

It was claimed by the students that digital texts were preferred in terms of getting information for small facts and systematic research for subject learning and personal interests. Some reasons underlying such preferences were found to be consistent with some of the findings in previous studies regarding availability, convenience and ease of use of digital texts (Briddon et al., 2009; Shelburne, 2009; Singer & Alexander, 2017). For the UK students, the availability of digital texts supported their learning activities after school because they did not usually have printed books for subject learning with them at home. The availability of digital texts was not a big concern for the Chinese students as they usually had textbooks and problems books with them when they were at home. However, the ease of use that digital texts especially online texts afforded was acknowledged by both of the UK and Chinese students. The affordances of digital texts regarding convenience and ease of use may have encouraged the tendency to read for academic purposes by using digital texts among the younger generation in the UK and China.

However, affordances of availability, convenience and ease of use to get information could not fully explain adolescents' preferences for digital texts, especially when they were searching for information to do subject-related research. Most of the UK and Chinese students claimed that digital texts provided updated information with multimodal features and helped get extra information that was not presented in printed reading materials. These were regarded as more important reasons for their preferences for digital texts to do research for subject learning. Updated information online is seen as one of dynamic features of digital texts (Coiro et al., 2008; Lankshear & Knobel, 2011) compared to static texts printed out in physical books. Information presented in physical books without regular changes might cause confusions and to some extent hamper understanding as some of the students claimed in the individual interviews.

For more than half of the Chinese students believed that the nonlinear and hyperlinked features of digital texts provided a good chance to cultivate critical thinking. These students sticking to fixed and static content in textbooks may not support their full understanding and absorbing of some topics. They believed their critical thinking could be promoted when they moved beyond printed textbooks and were exposed to various ideas and perspectives about certain topics. It appears in this study that the changing nature of digital texts may have to some extent been transforming the way Chinese students learn especially when they have self-determined learning and reading activities for example researching for subjects. Accordingly views about the characteristics of Chinese learners perhaps need to be reshaped. It was surprising that the Chinese students used the phrase 'critical thinking' straight away when talking about their use of digital texts to get information for subject research when done for their own reasons rather than simply as a task. This has not generally emerged from other studies. Critical thinking has been regarded as a form of higher order processing involving evaluating and generating information (Carrison et al., 2000). It has also been considered as a strategy to support self-regulated

learning (Neber et al., 2008) by ‘applying prior knowledge in new situations’ (Garcia & Pintrich, 1997). There have been a number of debates over the characteristics of Chinese learners under the influence of a Confucian heritage (Shi, 2006; Skyrme, 2014). In several studies, Chinese students have been portrayed as passive learners lacking in critical and creative thinking (Clark & Gieve, 2006; Heng, 2016; Paton, 2005) due to the use of standardised assessment and exercise-based teaching methods. It has been claimed that the notion of critical thinking was not rooted in the norms of Chinese culture, i.e. the values of Confucianism (Atkinson, 1997). However, recent studies have suggested that critical thinking is not incompatible within Chinese cultural beliefs and there has been more attention paid to promoting critical thinking in schools in China (Liu et al., 2015). Critical thinking has been found not to be absent in Chinese students and critical thinking could be developed in traditional instructed classes in China (ibid.). In this study, the Chinese students were found open to embracing new ideas and perspectives for critical thinking which suggests that the notion of critical thinking could be compatible with Chinese cultural values. However, such compatibility could be more obvious with the intervention of digital texts and technologies.

The multimodal feature of digital texts was claimed as another reason for the choice of digital texts for research related practices. According to the students the multimodal feature referred to the way they used various media in the process of meaning-making practices, which also supports key ideas of multimodality (Bearne, 2009; Kress, 2000, 2003a, 2003b). In this study, both the UK and Chinese students found they were more engaged in the literacy practices when they were reading ‘beyond the linguistic’ (Jewitt, 2005, p.315). Such results could be inferred from the literature regarding the multimodal supports of digital texts for engagement with a range of modes in learning (Jewitt, 2005). It has been suggested that various modes and the new ways of presenting texts could introduce positive effects on active engagement in ‘thinking, feeling and acting’

(Zammit, 2012, p.205). The positive effects of the multimodalities of digital texts regarding engagement were reflected in this study in that some of the UK students claimed the usefulness of multimodalities for supporting reluctant readers.

It is interesting to notice that some of the Chinese students claimed preferences for digital texts for science related subjects while other preferred digital texts for social science related subjects, even though it was claimed they were exposed to a more paper-based reading and learning environment. Such findings may suggest that these students may have changed their ideas of where to get knowledge and how knowledge is presented (Gu, 2012). However, some of the Chinese students' claims that 'memorising texts for humanity related subjects (was) the secret of studying these subjects in order to get good marks in examinations' also suggests that their ways of learning were strongly associated with their social and cultural contexts. It appears clear that these Chinese students were attempting both to embrace the influences of technologies on teaching and learning together as well as acknowledging the importance of exam-based assessments and social and parental expectations (Chen, 2010).

Another important reason for preferences for digital texts over printed materials was found related to being able to get connected and have interactions socially. Results concerning getting connected support the expanding landscape and dynamic nature of literacy in the digital age in terms of moving beyond reading and writing and developing a set of technological skills with a sociocultural perspective (Lankshear & Knobel, 2011; Scribner & Cole, 1981; Street, 2003). In the theory of literacy as social practices, individuals put together integral elements such as reading, writing and the process of meaning making into 'coherent configurations' (Barton & Hamilton 1998, p.9) within the groups they belong to (Barton et al., 2000). Identifying and being identified in a group is also described as related to Discourse (Gee, 2004, 2015) which suggests that people

are using rationally 'distinctive ways of speaking/listening and often, too, writing/reading coupled with distinctive ways of acting, interacting, valuing, feeling, dressing, thinking and believing' (Gee, 2012, p.152) in order to engage in an affinity space (Gee, 2012; Lammers et al., 2012) with similar interests or identifications. In this study more than half of the UK and Chinese students were found to have online literacy practices to connect to others who had similar hobbies. This is consistent with the concepts of 'Discourse' and 'affinity space'.

The students' preferences for digital texts in this study were complex and affected by reading purposes, practical issues like availability and convenience, as well as the affordances of digital texts to meet the expectation of tasks. Meanwhile, their preferences for certain text formats embodied the variations of social and cultural values that could not be ignored when discussing the differences across countries.

5.2.2 Preferences for printed texts

There has been an ongoing debate over whether e-books will ever completely replace printed books especially since several reports have shown that sales of digital books had overtaken those of physical books (Miller & Bowman, 2011; PwC, 2014; Sweney, 2014). However, a large number of studies suggest that paper is still favoured by examining the effects of text formats and adoption of media on reading performances, learning outcomes and comprehension (Armitage et al., 2004; Woody et al., 2010; Worden & Collinson, 2011). Similar to the aforementioned preferences for digital texts, the choice of printed texts is also a complicated process involving interactions between reading purposes, personal reading behaviour, perceived learning outcomes and other factors to meet reading tasks.

Some of the Chinese students in this study claimed that reading print was a habit because they tended to have more paper-based literacy practices. It could be

assumed that reading print as a habit could be related to the Chinese students' experiences of being immersed more in paper-based learning environments shaped by the 'high-stake public examination' (Lau & Chen, 2013, p.1096). Apart from the possible link between preferences for certain text formats and previous experience, preferences for reading from paper may suggest 'a kind of nostalgic link with old technologies' as a potential interpretation (Fortunati & Vincent, 2014, p.48). Even though some of the UK and Chinese students claimed that they started with the use of pencil and paper when they were very young, the habit of reading from paper may not be the fundamental reason for the preferences for reading printed texts.

According to most of the Chinese students and around half of the UK students, printed texts were preferred over digital texts when they were having a class. Apart from the 'habit' of reading printed material discussed above, one of the reasons, the students claimed, was related to the teacher's practices of using digital texts. These students said that the teachers were not skilled in using technologies to teach. Such a reason to some extent confirms some findings in the existing literature regarding teachers' competencies for integrating technologies in teaching (Ertmer, 1999; Guzman & Nussbaum, 2009; Lawless & Pellegrino, 2007). Teachers are expected to use technology sufficiently to promote students' learning in the digital age, however the fast developing technologies to some extent hamper sufficient technology integration. Based on the students' claim, it could be speculated that the students' perceptions of certain text formats would be influenced by teachers' teaching practices. A relatively closed reading framework created by printed texts or paper-based learning materials was claimed as another reason for the preference for print reading in class. According to the students, printed materials offered them a chance to stick to what they were taught rather than 'getting lost'. The limited resources on paper provided a framework for students to know the specific learning tasks. Thus, it could be seen that preferences for certain text formats were complex and

influenced by internal and external factors. Teachers' practices and habits of using digital texts could be external factors influencing preferences for text formats in situations where practices evolved interpersonally.

The extent to which certain text formats could meet the very nature of a task was found to play a vital role in students' use of text formats. According to the students, they could have better outcomes with the use of paper-based materials for the practice of revision for learning, compared to the use of digital texts. Such findings are consistent with some studies suggesting that concentration and engagement in reading would be better accomplished with the adoption of printed texts rather than through reading on screens (Gerlach & Buxmann, 2011; Mangen, 2013; Mueller & Oppenheimer, 2014; Noyes & Garland, 2003). Some suggest that human brains respond to texts onscreen and paper in a different way (Nakamura et al., 2012) in terms of cognitive load and construction of mental representations (Ackerman & Goldsmith, 2011; DeStefano & LeFevre, 2007; Norman & Furnes, 2016; Winter et al., 2009). It has been found that when reading printed texts, more attention is found to be paid to the content because printed texts are static. There is no need to think about any changes caused by actions done to digital texts like scrolling and zooming. Whereas when reading on screens, individuals need to deal with the content as well as the speed of scrolling that matches with the reading procedure. Extra attention paid to deal with the tension between content and technical issues might trigger the sense of incoherence, which would negatively affect expected reading outcomes. This is also why many e-reader manufacturers are trying to make sure that e-ink produces the feelings that print reading promotes (Jabr, 2013). Such sense of high cognitive load and incoherence perhaps contributes to the finding that many of the UK and Chinese students claimed that they were more engaged with print reading for revision compared with reading on screens.

Better learning outcomes with the use of printed texts were also found in this

study related to the use of handwriting. Benefits like better memorisations and more absorption of knowledge that learners can derive with the use of handwriting have been realised as important reasons for the use of paper-based reading materials and technologies of using pen and paper (Medwell & Wray, 2007, 2014; Mueller & Oppenheimer, 2014; Porion et al., 2016; Vincent, 2016). Although an examination of writing was not the aim of this study, more than half of the UK and Chinese student participants claimed that personalised reading experiences through taking notes from reading materials supported better memorisation. Very few of them, however, mentioned the activity of making notes when reading from screens. It seems that the students had different ways to deal with printed and digital texts. Exploring the ways they interacted with different formats of texts could be another perspective to understand individuals' preferences for certain text formats. Therefore, it would be useful to extend research a bit more into the area of writing.

Paper-based resources offer readers more opportunities and ease for actions for example note-making to support better learning outcomes (Taipale, 2014). It has been found that learner had more information retention when making notes with pen and paper compared to when using digital devices (Mueller & Oppenheimer, 2014; Vincent, 2016). Writing texts down by hand produces a sense of reaffirmation which might help to store knowledge in the brain a bit longer than when writing/reading on screen. The finding in this study concerning the function of 'reaffirming knowledge' for better memorisation supports the advantage of using pen and paper for note-making.

Compared to working on screens, learners tend to have more flexibility to write based on personal preferences and habits. Such flexibility that using pen and paper affords has been recognised as another factor for absorption and retaining knowledge (Mueller & Oppenheimer, 2014; Vincent, 2016). When dealing with digital texts, learners have to follow the formality that digital technologies

demand by clicking certain buttons and typing in what they want to annotate, for example. The action of being formalised with the use of digital devices for note making might produce the sense of inconsistency and then reduce the concentration of thinking and retention. Some students' claim that 'thinking was delayed in order to place their notes into the right place' was borne out by Vincent's (2016) research where it found out that 'computer mediation...can fragment thinking' (p.102).

Apart from the aid to retention of knowledge gained by the affirmation of using pen and paper, spatial factors have been recognised as important in helping learners recall what they have read (Johnson et al., 2009; Mangen et al., 2013; Vincent, 2016). The literature suggests that static and fixed texts printed on paper impose a sense of spatial stability that promotes a good spatial mental representation which would enable learner to refer to related information for retention and reading comprehension (Baccino & Pynte, 1994; Cataldo & Oakhill, 2000; Mangen et al., 2013; Noyes & Garland, 2003). In this sense, readers are able to relocate texts on paper more easily than reading on screens because of static spatial cues, which would reinforce memory and recall. Such sense of spatial mental representation could be possible explanation to understand why some UK and Chinese students in this study claimed better memorisation with printed texts. It should also be noticed that digital texts have different spatial cues to those of printed reading and individuals may not be familiar with the spatial cues of digital texts. It could be speculated that readers are more likely to be able to deal with spatial cues when reading from paper compared to in digital reading. Note-making is a process that learners use in various ways and may involve personalised annotations, drawings and words to make sense of what they are learning, which inevitably produces special cognitive representations. Writing by hand can maximised the 'personalised use of spatial layout' compared to reading on screens (Vincent, 2016, p.102). The students' claim in this study of personalised reading experiences as 'records of reasoning, thinking and learning'

with different sorts of note-making strategies such as annotations, highlighting or writing their own ideas for better memorisation supports the findings around spatial factors. More importantly, it should be noticed that spatial layout created by personalised experiences works better for comprehension and knowledge retention compared to simply looking at spatial representation produced by contexts presented with printed texts. It appears obvious that personalised spatial layout contains learners' active interactions with texts and how they respond to the content, which is important for successful reading experiences. Personal ways of recording one's ideas such as drawings and colouring would help people to engage in learning with legibility (Vincent, 2016). Judging from the above, it might be the case that individuals' choices of printed texts are to some extent associated with their familiarity of the way they deal with the spatial mental representation of texts.

Another commonly discussed issue regarding the preferences for text formats is the physical discomfort which can be caused by the use of digital devices (Bremer, 2005). Eyestrain or fatigue has been known as a negative effect that reduces enjoyment of the reading experience no matter whether it is reading for academic or enjoyment purposes (Mizrachi, 2010; 2015). Discomfort such as that arising from eyestrains was also discovered in this study which was claimed to affect pleasure of reading and reduced eye vision when reading long texts on screen. This therefore becomes a transparent reason for individuals to go for printed texts for pleasure reading.

Some might argue that reading for pleasure might include less complicated process comparing to academic reading because what readers need is to get enjoyment of stories by reading what is presented in reading materials instead of retaining the content. Here I am not proposing that individuals need to experience a complicated process to decide which kind of text format they are going to choose. It is more concerned with how text formats and the way people

interact with texts affect enjoyment of reading. In the literature, touching, smelling, turning pages and having something in one's hand are important features created by paper-based reading as sensory experiences (Fortunati & Vincent, 2014; Mangen, 2008, 2010). Such sensory features have been seen to positively affect readers' emotions for reading (Vincent, 2016). It seems that enjoyment or pleasure can be more easily achieved if readers were able to have something in their hands. This was also reflected in this study in that some of the UK and Chinese students did not feel comfortable with 'hard and cold' screens compared to holding a physical book in their hands. Physical and tactile experiences, meanwhile, serve as vital factors to stimulate the aesthetic aspect of reading. This aesthetic aspect has been discovered as 'a deciding factor' (Vincent, 2016, p.101) for the choice of using pen and paper in writing due to the unique experience of handwriting. The aesthetic aspect was found in this study in terms of the feelings of engaging in the story by opening the books and turning pages. 'Putting the curtain aside and let the play start' described in this study was in fact the individuals' interactions with physical aspects of books. Such interactions physically and emotionally may help individuals to 'embrace the story and understand characters'. Together with the cognitive representation, sensory experiences and the aesthetic of paper based reading, when reading from paper the mind seems to be set for reading to actively interact with the content rather than bothering with issues that are not intrinsically related to reading.

Meanwhile, in this study, the Chinese students claimed they generally used printed books to share with each other in their free time in school rather than reading with others on screens. The reason for 'bringing printed books to school (was) the safest way', claimed these students, which was related to the current social situation of a more paper-based reading environment in China. It could then be assumed that the Chinese students' choices of certain text formats to some extent reflects the social and cultural values underpinning the access to digital texts and literacy practices, as discussed earlier.

Thus, it could be seen that underpinning learners' use of certain text formats is a complex mixture of factors, taking into account the nature of tasks to deal with the effects of interactions with texts for good reading experiences. It is clear that adolescents are embracing new technologies in both educational and social settings by having a range of printed and digital literacy practices. Meanwhile, adolescents as heavy users of new technologies are continuing the use of pen and paper for academic and pleasure purposes in the digital age. The changing habits of literacy are updated with and mediated by emerging technologies. The investigation and discussion of preferences for text formats and reading purposes in this study could enrich the understanding of the notion of literacy in the digital age in terms of how people read, which will also benefit future research.

5.3 Online reading comprehension

It has been recognised that reading online is more complicated than print reading (Coiro, 2011, 2012) since individuals are exposed to various modes of texts in the open access spaces on the internet, which is different from fixed and linear printed reading materials (Rowell & Walsh, 2011; Walsh, 2011). Therefore, strategies used for effectively comprehending online texts are required to deal with challenges in the internet reading environment. The following sections will discuss the changing nature of online texts and strategies for successful online reading that the students claimed in this study. Challenges of online reading will also be discussed for better understanding of the supports needed by all readers in the digital age. In addition, differences regarding strategies for online reading comprehension across the UK and Chinese students will be discussed.

5.3.1 Online reading - 'It's different and I know it'

The changed 'textual landscapes' (Carrington, 2005) under the influence of fast

developing and pervasive proliferation of technologies has inevitably led to the digitalisation of reading (Mangen, 2016) as well as changes of three dimensions of reading comprehension: the text, the reader, and the activities that are involved in the process of meaning-making in reading (Snow, 2002). To successfully comprehend reading materials, a reader is expected to bring a range of abilities and capabilities to their interactions with texts. In the context of reading online, the abilities and capabilities of a reader include skills together with an array of cognitive capabilities including ability to decode, knowledge of and dispositional awareness of the changed nature of texts and reading activities (Carrington, 2009; Gilster, 1997; Johns & Hafner, 2012; Martin, 2008; Snow, 2002). In this sense, a reader reading online is expected to understand the nature of online texts and characteristics of online reading as well as to have skills to successfully comprehend online texts.

In this study, the students recognised the multimodal feature of online texts when they read online for various reading activities such as doing research for subject learning and interest-based research. They saw that they were exposed to an open space in the reading environment when reading online. It seems that the nature of online texts and the online reading environment may have been acknowledged among young people (Gillen, 2006; Lankshear & Knobel, 2011; Street, 2003). Such awareness of the nature of online reading to some extent reflects the change of the interaction between the reader and the text and also suggests the need to understand the skills and strategies required to have successful online reading comprehension.

The students claimed a range of interactions with online texts such as researching for subject learning or for personal interests. Judging from the claimed online reading experiences in this study, it appears that the young generation may have achieved some skills and knowledge to deal with online texts through their online reading experiences. However, as has been argued,

online reading is more complicated than print reading and strategies for print reading comprehension may not be sufficient for online reading comprehension (e.g., Afflerbach & Cho, 2013; Corio, 2011). Therefore, being aware of the nature of online texts and online reading is not enough for successful online reading experiences especially when readers have self-directed online reading practices. In this study, many of the students claimed practices of online research at home which were self-directed, for learning and enjoyment. Hence, it is important to understand skills and strategies for successful online reading practices.

5.3.2 Strategies for online reading comprehension

Recent studies have helped our understanding of skills and capabilities for comprehending online texts because the skills used for comprehending printed texts might not be sufficient for online reading comprehension (Afflerbach & Cho, 2009; Coiro, 2011; Coiro & Dobler, 2007; Hartman et al., 2010). Therefore, the following section will discuss strategies demanded by inquiry-based online reading activities. Meanwhile, challenges in the complex reading environment of the internet that affect online reading comprehension will also be discussed.

Information Location

It has been suggested that the reading process operating with online texts is different to reading from paper in terms of the way to get access to texts by using search engines, composing questions and looking through multilevel websites (Afflerbach & Cho, 2009; Henry, 2006). According to research (e.g., Coiro, 2011; Coiro & Castek, 2011), locating online information is a process of individuals' negotiation with online texts to meet reading goals. Many (Cho & Afflerbach, 2015; Coiro & Castek, 2011; Kindsley & Tancock, 2013; Leu et al., 2013) argue that individuals tend to be responsive to access online texts with strategic approaches to identify, evaluate and use texts in the complex online environment, if they bear their reading goals in mind. In this sense, location of online

information is a key stage in which readers set the reading scope by identifying useful online information based on reading goals.

The process of identifying texts on the internet involves strategies to construct questions/phrases for a search engine for the problem and to narrow down the reading scope from the 'endless information' and resources on the internet. Regarding constructing questions for reading task, it is quite common that readers generate questions, for example, 'What is something?', 'How is something so famous?', (Kingsley & Tancock, 2014) to briefly set a vague reading scope for reading tasks. This strategy was claimed by students in this study as the basic level in the process of question-generating and such a strategy was often used for searching for small facts. However, using such a basic strategy to construct questions does not necessarily mean that students interact less with the text in digital reading. It is in fact just the first step to get the right resources and information on the internet if readers would like to further research into certain topic rather than just searching for small facts.

Advanced strategies for online information location are usually stimulated if readers are not satisfied with what they have found which might not meet their reading aims (Cho & Afflerbach, 2015). Here, advanced strategies refer to actions responding to what has been explored, for example composing questions based on explored online information in order to get more specific material. In this sense, readers are negotiating with online texts by taking account of reading goals and the reading space explored for better accomplishment of their reading tasks. The students' practices of 'rephrasing sentences' when 'information was too broad and too superficial' found in this study support the concept that readers in the non-linear online environment are negotiating with online texts by amending various strategies to create their own reading paths. It should be noticed that such a strategy of amending does not just happen in information location. Rather it is continuously happening over the 'course of a reading task'

(Cho & Afflerbach, 2015, p.505). Meanwhile, negotiations with texts resulting in a series of decision making and changes of strategies during reading activities are aimed to assist better reading experiences at expected levels to meet the reading task. This was reflected in the actions of the students as they narrowed down to areas that fitted the level of year group or areas they wanted.

Apart from the strategies of constructing questions to explore related online information space in an inquiry, some strategies used for offline reading also support online reading comprehension (Coiro, 2011). Although readers are exposed to an unbounded online environment (Lawless & Schrader, 2008), there are still many opportunities that require readers to locate information by using navigational menus (Coiro, 2011). The students in this study claimed the use of navigational menus to locate information, in a similar way to when using the navigation systems of printed reading (index, contents). They also used 'Ctrl+f' to locate information. It could be assumed that strategies for online reading include skills designed for online reading together with those transferred from offline reading.

Evaluation

After exploring information relevant to reading tasks, readers would have close looks at those resources and then decide what to read. Reading online requires the ability to deal with multiple texts (Cho & Afflerbach, 2015), which are quite different from paper-based single texts (Goldman et al., 2012). Abilities to read multiple texts online are related to the notion of evaluation and how individuals evaluate information with different perspectives and from various contributors (Coiro, 2011; Leu et al., 2013). It is recognised that the need for evaluation of multiple texts on the internet (Coiro & Dobler, 2007; Goldman et al., 2012) is mainly due to the possibility for everyone to be contributors on the internet (Fabos, 2008). The importance of online information evaluation was addressed by most of the students in this study.

Regarding strategies to evaluate online information, relevance, accuracy, reliability and judgements about biased information appear to be important (Coiro, 2011). Some might argue that the relevance of information to reading tasks tends to be judged in the process of information location (Cho & Afflerbach, 2015) rather than in the stage of information evaluation. It seems pointless to discuss strategies for online reading separately in separated stages because decisions made when reading online are the consequences of negotiations with online texts. It has been realised that being able to judge the reliability of online information is vital for the process of evaluation (Coiro, 2011; Goldman et al., 2012). Reliability of online information is concerned with who creates online information, or the information sources (Coiro, 2011; Goldman et al., 2012; Leu et al., 2004; Shanahan & Shanahan, 2008). Contributors online can be anonymous and the procedure of posting things online is much easier than getting things published traditionally, which can leave readers confused about whether what they read is reliable. Evaluating online information by judging the status of contributors was claimed as a useful strategy in this study as many of the students suggested that they would go for websites created by big organisations that had been recognised as trustworthy. In this sense, finding an authoritative website seems to be a direct and useful way to get trustworthy information (Zhang & Duke, 2008).

However, readers do not always encounter reading materials which give clear information about the contributors. Therefore, knowing who creates the information is not enough for the appraisal of online information. Paying attention to the content has been explored as one of strategies that responsive readers would use when comprehending online texts (Afflerbach & Cho, 2013). It has been found that strategic readers would apply prior knowledge to locate, search and evaluate online texts and then decide what to read next (Coiro, 2011; Zhang & Duke, 2008). There are some contradictory ideas regarding the role of prior knowledge in online reading comprehension, which suggests little

relationship between prior domain knowledge and the comprehension of online texts because readers could search related information right away if they did not have such knowledge inventory (Willoughby et al., 2009). In this study, some UK and Chinese students claimed that they applied prior knowledge of a specific topic to judge the accuracy and trustworthiness of the content by looking at, for example, the logical flow of the information. Such findings concerning the use of prior knowledge to evaluate online information suggests that the skills and strategies used in offline comprehension might have impacts on online reading behaviour and comprehension (Coiro, 2011; Willoughby et al., 2009).

Here, it seems that even though some offline reading strategies can be applied to online reading, there are strategies unique to online reading comprehension which still might be under-researched. In this study, many UK and Chinese students appeared to feel that the popularity of a web site or other piece of online information was a key indicator of content accuracy. It can be seen that with the experience of online reading, new strategies to read multiple texts might be developed.

Creation

Good readers are expected to be able to put together relevant information from multiple websites and hypertexts to achieve their reading goals (Coiro, 2011; Coiro & Dobler, 2007; Leu et al., 2013; Zhang & Duke, 2008). Such ability is discussed as the synthesis of online information. However, according to the students' claims in this study, they did not simply put various pieces of information together. Some of the students suggested they would have their own ideas of online reading materials by sorting relevant information out in a logical way. The claimed activity of synthesising different information was found to be associated with the practices of sense-making of reading materials and meaning-making for the whole reading activity. Therefore, putting online information together could be seen as an ability to create, rather than synthesise.

Being able to create for comprehending online texts includes the strategies used in the phase of evaluation with regard to trustworthiness, accuracy and relevance, as well as strategies for information location (Afflerbach et al., 2013; Coiro, 2011; Cho & Afflerbach, 2015; Zhang & Duke, 2008). Some students in the individual interviews claimed that when they put things together they always moved in and out through different websites and multiple texts during the whole reading experience to get the most appropriate or needed information for reading goals. In this sense, the students may need to begin new phases of information location and evaluation if they did not manage to find 'good content' to support their thoughts about the reading materials. It seems clear that individuals keep negotiating with online texts by adjusting strategies to achieve their reading goals rather than being static and fixed in response to the text (Cho & Afflerbach, 2015; Zhang & Duke, 2008).

Meanwhile, it has been argued that successful readers tend to bear reading goals in mind throughout the procedure of online reading (Zhang & Duke, 2008) to make sure their practices of meaning-making are based on these goals. The notion of having reading goals in mind was reflected in this study. More than half of the UK and Chinese students kept a separate document where they made notes of relevant information and sorted out key points related to the reading materials to support their understanding when engaged in inquiry and reading tasks.

The students who claimed successful online reading experiences in this study applied new strategies for online reading comprehension. Their strategies were adjusted tentatively by negotiating with information throughout the whole reading activity to meet reading goals (Cho & Afflerbach, 2015). Strategies for printed reading, for example employing prior knowledge, were usually applied to support the judgement of information. It appeared that these students were sophisticated readers with online reading by applying both 'new' and 'old' strategies. Based on what they claimed, they were heavy readers of print and

spent quite a lot of time on the internet using various academic and entertainment practices. Thus, it could be speculated that reading experiences with print and digital reading might help to promote strategies and cultivate abilities to achieve reading goals. Further, younger generations might have been taught how to be good readers with online texts because it had been noticed that the strategies used for printed texts were not sufficient for comprehending online texts (Coiro, 2007) which had been applied with some programmes in schools, for example, Internet Reciprocal Teaching (Castek, 2013; Huang & Yang, 2015). It should be noticed that successful print reading experiences do not necessarily suggest successful online reading. To have a better understanding of what makes successful readers in the digital age, further research needs to be done in terms of exploring reading experiences with both printed and digital reading together with strategies in literacy practices.

5.3.3 Challenges

When exposed to the open-access reading environment of the internet, readers always need to steer clear of irrelevant information and other factors that would affect comprehension and reading experiences (Afflerbach & Cho, 2009; Coiro, 2011; Cho & Afflerbach, 2015). The challenges of distractions, a mind-set of more than reading and the varied reading environments found in this study suggested the impact of the use of media for reading on comprehension (Porion et al., 2016).

Reading on screen may well be more difficult than print reading (Mange et al., 2013) partially because of distractions from new technologies and the changing nature of online texts (Coiro, 2011). Such ideas were supported in the finding from the questionnaires that more than half of the UK and Chinese students claimed to be distracted more easily when reading digitally than while reading print. In the individual interviews, it was claimed that their reading process

could be easily interrupted by a range of issues such as technical problems, adverts or readers' unfamiliarity with certain functions. These issues were discussed in the previous section with reference to preferences for text formats. They could be factors that influenced individuals' choice of text format and use of medium. Meanwhile, they could subtly affect reading in terms of coherence of comprehension (Noyes & Garland, 2005). For example, in this study some students' unfamiliarity with technologies interrupted their reading process. It has been argued that more training to help readers get familiar with technologies would support better reading comprehension (Chen et al., 2014).

Most of students in this study suggested that they could not fully concentrate on reading materials if they came across issues mentioned above. It seemed that some cognitive resources that were supposed to be dedicated to reading were taken up by dealing with unexpected pop-ups or advertisements on the sidebar. According to cognitive load theory presented by Sweller (1994), high element interactivity tends to cause high cognitive load, which results in less working memory devoting to learning tasks. It could be seen that the cognitive load of online reading was higher than that of reading from paper (Wästlund et al., 2005) due to the need to deal with the content of reading as well as other elements irrelevant to reading. Meanwhile, because of the nature of the online reading environment where everything is open access and free to access (Coiro, 2011), dispositions of reading would be affected if reading information went beyond the scope of immediate reading goals, which might lead to the feeling of 'more than reading' claimed in the study. The activities of 'clicking other websites' or 'watching video clips' which appeared to go beyond the scope of immediate reading tasks suggested some complexities of online reading and the need for effective self-regulation (Goldman et al., 2012) especially for students with self-directed reading practices. Similar to the activities of going off reading, reading too far by reading related webpages of the topic also suggested a more complicated online reading procedure.

Additionally, some of the students in this study claimed that when reading online they had greater chances to encounter online information that contained complicated terminologies or theories beyond their reading ability, compared to print reading. Such a challenge could be related to the nature of online reading environments (Huffaker, 2005; Leu et al., 2009; McVerry, 2007; Zawilinski et al., 2007). Coming across information beyond one's reading ability is not something unique to online reading. However, within the online reading environments, young people are exposed to a broader range of information created by different individuals. It would be not easy for these young people to identify information that is tailored for them from loads of information in the open-accessed online reading environments. In this sense, the ability to get the most relevant information that fits their knowledge level seems to be important for effective and successful online reading. Meanwhile, the students' discussion of 'being careful with online information' in this study suggests the need for tentative judgement of reliability and credibility (Coiro, 2011; Coiro & Dobler, 2007; Cho & Afflerbach, 2015; Fabos, 2008).

In the light of the challenges discussed above, it seems clear that online reading is more complicated than reading on paper especially when readers are self-directed with exposure to the broad open space of the Internet. More attention and cognitive resources need to be devoted to constructing strategies of locating and searching information and to investigate trustworthiness of information by evaluating issues such as sources, and how the information is used and written.

Differences in online reading comprehension across the two countries

The students' elaborations in individual interviews of the strategies used to comprehend online texts for subject research and knowledge acquisition for personal interests could indicate that good readers are able to employ new and

old strategies and to adjust these strategies to meet their reading aims (Cho & Afflerbach, 2015; Zhang & Duke, 2008). Even though similar strategies for online reading were mentioned by the UK and Chinese students, it did not necessarily support the conclusion that there were few differences between the UK and Chinese students regarding perceptions of online reading comprehension. Therefore, it would be worthwhile to step back a bit to look at the students' responses to the questionnaires to see if these varied by country.

According to the finding of the questionnaires significant differences were found in the students' perception of information location, comparison of opinions, the importance of evaluation and synthesis of online information. The UK students claimed higher levels of use of these strategies than the Chinese students. Judging from the differences in the access to online texts and literacy practices in both in school and out of school settings, the UK students tended to have more experiences of reading digitally than the Chinese students. It could be speculated that differences across the UK and Chinese students in their perceptions of some strategies for online reading were related to differences in their experiences of literacy practices with online texts. In this sense, with less time spent on reading digitally and less opportunities to experience digital literacy practices, the Chinese students then might have had smaller chances to gain new strategies for online reading comprehension. In addition, the Chinese students might be less familiar with technologies or software compared to the UK students, which could have a negative effect on their comprehension of online texts (Chen et al., 2014). More importantly, from the discussion of preferences for text formats, the way of learning common among the Chinese students was deeply influenced by the social and cultural context in which they lived, even though there had been some changes in this with the proliferation of digital technologies in living and learning (He & Wray, 2017). Therefore, it could be very possible that the notion of learning embedded in the Chinese sociocultural situations, for example getting knowledge from static printed books for the examination-oriented assessment,

would affect individuals' abilities and willingness to use strategies for online reading comprehension.

As discussed earlier, many students in individual interviews appeared to be sophisticated readers in online reading. Possible reasons were discussed for this. It was also suggested that not all the students claimed themselves as sophisticated readers with respect to abilities of location, comparison, evaluation and synthesis. In this sense, there appears to be a need to support programmes that help those who are lacking in strategies for successful online reading as reading on screens with internet access has been an essential part of daily life (Chen et al., 2014; Huang & Yang, 2012). Meanwhile, supports for both good and poor readers to deal with challenges and to build up with self-regulation (Goldman et al., 2012) for the new literacies of the internet (Coiro, 2011; Lankshear & Knobel, 2012; Leu et al., 2013) are also important and might be expected to appear in class teaching.

5.4 Being a reader: general reading habits in the digital age

In the changing textual landscapes (Carrington, 2005), there have been debates over the differences between reading printed and digital texts regarding preferences for text formats, reading comprehension and reading speed (Afflerbach & Cho, 2011; Cho & Afflerbach, 2013; Coiro, 2011; Coiro & Dobler, 2007; Dillon, 1992; Eden & Eshet-Alkalai, 2013; Leu et al., 2011, 2013; Mangen, 2013, 2015; Prion et al., 2015; Woody & Daniel, 2013; Woody et al., 2011). It has been argued that reading nowadays must be perceived as more than paperbound (Mangen, 2013). Meanwhile, individuals in the digital environments of reading have varied habits to deal with different text presentations with respect to issues such as the length of the text and habits of skim reading or deep reading (Poole, 2014; Rosenwald, 2014). Investigating how individuals perceive that they deal with texts in various formats can also contribute to the understanding of literacy

updating with changing technological, social and cultural contexts. The following section will discuss the UK and Chinese students' notions of and habits of reading print and digital texts.

5.4.1 Expanded notions of reading

It has been argued that 'the paradigm of reading, in particular for young people, is increasingly screen-based rather than paperbound' (Mangen et al., 2013) because young people have been found the most affected by profound changes of technologies (Coleman, 2011). Such ideas were reflected in the individual interviews in which many of the UK and Chinese students claimed that they read on screens for various activities. It appears that screens as media for reading have been seen as a normal way of reading just like reading from paper and it may be that the nature of reading would not be greatly affected by the use of screens for reading.

It is interesting to notice that even though the students in this study claimed a wide range of reading activities with the use of digital devices, some of them did not count some activities as reading, for example searching for small facts. It could be that individuals do not simply pick up easily accessed digital devices to get some texts for the sake of convenience. Thoughts and beliefs about reading on screens would be developed and shaped throughout activities. According to the students' claims in the individual interviews, reading with digital texts requires more than the ability to read especially when they were engaged in online inquiry-based practices. It appears to be the case that successful readers in the digital age tend to be able to make meaning with the technical skills of using digital devices. Such an idea of reading as has emerged in this study is consistent with the expanding concepts of literacy within which abilities to read and write have been realised to be insufficient to understanding the dynamic nature of literacy in the context of changing technologies (Hamilton, 2008;

Lankshear & Knobel, 2011; Leu et al., 2013; Martin, 2008; Street, 1984, 2003).

5.4.2 Reading patterns

Due to the pervasive use of technologies in living and learning, young people are reading a range of digital and print materials (Lankshear & Knobel, 2012; Walsh, 2011; Vincent, 2016), which has previously been discussed in terms of changing 'textual landscapes' (Carrington, 2005). The students' demonstrations in this study of their exposure to paper materials and digital resources in school and outside of school is consistent with the notion of changing literacy in the digital age, which has been discussed throughout the study. It should however be noticed that students from different social and cultural situations do not necessarily spend similar amounts of time on digital reading. Meanwhile, the way that students distribute time across different text formats for reading could also be variable.

In this study, most of the UK students claimed that reading digitally was within their daily routine and around half of them said they read digitally, both small pieces and long articles. While the Chinese students tended to read small pieces and their time for digital reading was split into small chunks. Such a difference in reading habits across the two groups could be related to the students' sociocultural situations. It seemed that the Chinese students tried to squeeze time out to read digitally from the time allocated for 'loads of homework'. The Chinese students' habits of choosing small pieces to read digitally within a very short period of time were in response to high-stake competitions and Confucian cultures of learning in China (He & Wray, 2017; Rau & Chen, 2012). The social situation of the intensive schoolwork in a busy and long school day in China shaped by the high-stake examinations led to the Chinese students' habit of digital reading in terms of claimed distribution of time and choices of the length of digital texts.

Another interesting point of the ‘fragmented’ feature of digital reading with relatively discontinuous digital reading processes claimed by many of the Chinese students should be noticed. Based on the views of the Chinese students, the idea of ‘fragmented’ to describe digital reading was obtained from public media and teachers, which may suggest proliferation of digital reading in educational and social settings. The ‘fragmented’ feature described in public media in China seems to conflict with the Confucian culture of learning. Moreover, fierce competition due to the examination-orientated education system in China reinforces the tendency of short and discontinued digital reading activities and then the notions of digital reading. Therefore, it seems evident that reading habits are situated in certain social and cultural contexts even though they are updated and mediated by changing technological changes.

5.4.3 Skim or not

Skimming has been found to be one of common techniques for online reading (Coiro, 2011; Rosenwald, 2014) as a strategy to get an overview of the content. The students in this study supported the use of such a technique especially for information and small facts. The issue of the fading status of deep reading with online texts has been debated in the literature because of skimming as a commonly used technique as well as scanning for online reading (Poole, 2014). The students who claimed they searched for small facts or answers tended to stop reading as long as they found what they wanted, which might show no sign of deep reading.

However, it has been suggested that individuals do not stick to certain reading techniques during online reading practices (Nielsen, 1997). As elaborated in the individual interviews, many students read through online texts for homework and learning related topics unless searching for small facts. It then suggests that the use of reading techniques could be varied by reading tasks and needs.

According to the findings of reading techniques with online texts for pleasure reading, the students tended to skim for general inquires and use careful reading to inquire into particular interests, which suggested that techniques between skimming or scanning and reading-thoroughly were easily switched and adjusted. It is then arbitrary to conclude that online reading tends to be shallow reading without taking into account reading purposes and adjusted reading techniques.

Moreover, it is worthwhile to pick up the claim of many Chinese students that they read faster on screens for the same content than from paper, which is in contrast to some claims in the literature that individuals read slower on screen compared to printed texts (Evans et al., 2009; Nielson, 1997). However, this does not necessarily mean that reading speed works as a predictor for online reading performance among the Chinese students. Such tendency to read faster on screen than from paper could be another reflection of the Chinese students' use of 'fragmented time' with online texts during long school days, for example, making quick checks of social media during break time. Meanwhile, the Chinese students might get the sense of speed reading with digital texts due to their lack of advanced experiences with reading on screen for a wider range of literacy practices rather than being more focused on subject-based practices for example doing loads of problem sets with software.

It could be assumed that reading habits such as time distribution, choices of reading materials' length and reading techniques could be mediated by individuals' reading purposes and aims. Moreover, reading habits could be updated with literacy practices rather than being static or fixed while responding to the social and cultural contexts. The investigation of reading habits of the UK and Chinese students would contribute to the understanding of the nature of literacy in situated contexts.

5.4.4 Reading strategies

It has been recognised that individuals employ different strategies for reading printed and digital texts (Ackerman & Goldsmith, 2011; Coiro, 2009; Mangen et al., 2013; Taki, 2016; Zhang & Duke, 2008). Meanwhile, it seems to be evident that strategies for printed reading cannot sufficiently support successful online reading experiences (Afflerbach & Cho, 2009; Castek & Coiro, 2015; Coiro, 2011; Coiro & Dobler, 2007; Cho & Afflerbach, 2013). However, it would be worthwhile to take a look at general reading strategies of reading both printed and digital texts to achieve some knowledge of how individuals respond to the changing reading environments. Therefore, this section will discuss reading strategies of print and digital reading for academic purposes claimed in this study and perceived reading performances between reading in different media.

The students from both countries claimed that there was no big difference in strategies between reading from paper and on screens. It has been argued that 'once a technology becomes commonplace, people tend not to think of it as technological (Lankshear et al., 2000, p.238). In this sense, the wide range of literacy practices with digital texts in daily living and learning found in this study, which were discussed previously, may be contributing to naturalising reading on screens as a normal way of reading just like reading print. Such ideas could be possible explanations to support the speculation that young people nowadays may be able to read without even noticing the medium through which the texts are presented.

The perceptions that there were no differences in reading strategies were found obvious when the students in this study transferred strategies used for print reading to digital reading. It should be clear that strategies in this section were explored based on the students' responses to the same texts for educational purposes presented on different media. It should be clear that reading strategies

in this section were explored based on the students' responses to the same texts for educational purposes presented on different media. Apart from strategies such as information location or evaluation used in the process of inquiry-based online practices, many of the students claimed similar strategies for reading comprehension for both digital and printed texts. Strategies found in this study included getting key points, rereading, note-making and so on. According to research (Schugar et al., 2011), individuals tend not to apply note-making skills used with printed texts to practices of digital reading. The findings of this study concerning the students' transferable reading skills from print reading to reading mentioned above do not support such an idea. One of the possible explanations could be that individuals may have actively adjusted reading skills and strategies for digital reading to support successful reading experiences. Further, that the reducing sense of technological complexity in the use of digital technologies (Lewis & Fabos, 2005), which was discussed earlier in this section, might contribute to the use of skills for reading in a natural way regardless of the medium.

Judging from the discussion above, it could be speculated that the naturalisation of reading on screen appears to be evident among the young people in this study. The sense of naturalisation of reading refers to a natural and normal way of picking up texts without thinking about the medium. Individuals may include both digital texts and printed texts in a single reading task to assist effective meaning-making through texts. This supports some of the findings in the literature which suggest that the influence of medium on reading is not noticeable (Noyes & Garland, 2008; Prion et al., 2016). However, it should be aware that the students' claims of no differences in reading comprehension between the two could be quick responses to questions about differences between reading print and reading digitally. It might not fully reflect their actual reading performances and reading comprehension because many of the students in this study demonstrated their preferences for printed texts for some reading

for learning purposes, for instance revision.

Judging from the students' claims concerning reading strategies and perceived reading performances between reading on screens and from paper in this study, it seems that individuals may have been adjusting their reading strategies for both digital and printed texts to ensure effective and successful reading experiences. This might be closely related to individuals' interactions with various text formats by using different media, which contributes to the naturalisation of digital reading. The naturalisation of digital reading could not be a simple and straightforward issue and there is a need for more studies to understand how to achieve equivalent learning outcomes in reading through different media.

5.5 Understanding of growing up with digital devices

Both the UK and Chinese students in this study claimed an awareness of being immersed in digital technology in their daily living and learning. They described themselves as the 'generation of technology'. It was claimed that digital devices had become 'part of (their life)'. The students in this study also elaborated such ideas by sharing a range of digital literacy practices for living and learning. Judging from the terms that the students described, it seems that these young people had recognised that they were exposed to digital environments for reading in both formal and informal learning settings.

The digital environments for reading here refer to the availability of digital devices provided in school and at home and the text formats available to the students. As the UK and Chinese students claimed, technologies were everywhere for personal usage or in watching others using them for various purposes for both learning and living. With the benefits from the positive effects of ICTs and the penetration of technologies, many countries have been paying attention

increasingly to the investment in technology in education. It was reported by BESA (2015; 2016) that in the UK there was increasing amount of budget being devoted to educational technology and the use of technology in teaching and learning had increased accordingly. The amount of money put into educational technology in the UK school every year was assumed as 900 million pounds (FT, 2015). The research report (BESA, 2015) suggested that UK pupils would be exposed to more teaching time involving the use of ICTs. In the meantime, initial training and continuous support for teachers in order to make successful use of technology in the classroom have been addressed (Robertson et al., 2012) in several studies. The UK students claimed in this study that they were surrounded by all forms of digital devices in school such as projectors, whiteboards, computers and sometimes tablets to support their learning. Their claims regarding the availability of digital devices reflect quite well that digital technologies have been penetrating into their lives and learning.

In China, the central government has been advocating the use of technologies or ICTs in schools, colleges and universities since the 1990s (Ge et al., 2012). A large amount of money has been invested in computers, smart boards, projectors and broadband to make sure the basic needs of technology integration in education could be met (Lei, 2010). Almost all of the students in this study demonstrated that they had had computers and projectors in their classrooms since primary school. Apart from the investment in facilities, teacher training had been emphasised so as to promote teaching and learning outcomes with technology. A series of follow-up plans about educational technology integration had been issued. For example, the Ministry of Education of China implemented the 'Education and Information Technology Ten-Year Development Plan' (2011-2020) to advance ICT development in education.

In daily living outside of school, the students claimed that practices including learning and other personal activities were intertwined with digital devices.

Many of the UK and Chinese students would use either personal or parents' digital devices for various purposes. They were, therefore, exposed to a technology-rich environment at home as well. According to one survey, by 2015 the average British household had 7.4 internet devices including smartphone, computers and other portable devices (YouGov, 2015). The ONS report (Office of National Statistics, 2016) showed that in the UK by 2016 more than 80 per cent of households used the internet daily or almost daily. In China also, students were immersed in internet-connected households especially in urban areas. The annual report of Internet development in China (CNNIC, 2017) suggested that by December 2016, 53.2% of the population were internet users. Meanwhile, internet users below 19 years old accounted for 23.4% of the whole of internet users.

The findings concerning the understanding and awareness of growing up with technologies reflect the pervasive penetration of digital technologies in daily living and learning in both in-school and outside-school settings regardless of social and cultural backgrounds. However, the availability of digital technologies in both in-school and outside-school settings in the UK and China does not necessarily suggest similar patterns of students' access to digital texts and literacy practices together with students' interpretations of reading in the digital environments of reading.

5.6 Gender differences

The impact of gender differences has been investigated for decades in reading research in terms of time spent on reading, reading choices, reading test results, reading motivations, and reading attitudes (Clark, 2012; Cole & Hull, 2002; Ma, 2008; McGeown, 2015; McGeown et al., 2012). With widespread use of digital technologies in daily living and learning, more attention has been given to seeing gender differences in the context of digital reading environments with respect to

online reading behaviour, reading practices with various text formats, use of digital technologies and reading attitudes toward print and digital reading (Fairlie, 2016; Karim & Hasan, 2007; Liu, 2005; Liu & Huang, 2008; McKenna et al., 2010). These issues to some extent help an understanding of changes of reading in the digital age to better support successful reading experiences with both print and digital texts. This study has expanded the understanding of gender differences in literacy practices, preferences of the use of medium and perceived online reading comprehension in the digital age as well as comparisons across the UK and China. These issues as they emerged in this study will be discussed in the following sections.

5.6.1 Gender differences in literacy practices/reading activities

According to the notion of digital literacies and New Literacy Studies emerging within changing technological and social situations (Gee, 2008; Gilster, 1997; Kress, 2000; Lankshear & Knobel, 2011; Leu et al., 2013; Martin, 2008; Mills, 2010; Street, 2003, 2005), reading from paper cannot fully cover the notion of reading, which promotes investigations of gender differences in a wide range of literacy practices with old and new technologies (Lankshear & Knobel, 2012; Liu & Huang, 2008; Ünlüsoy et al., 2010).

In terms of literacy practices of reading print, girls overall appear to read more than boys (Clark, 2012, 2014; Coles & Hall, 2002). In this study, the girls from the two countries claimed to read more in print than the boys, which is consistent with the idea mentioned above. It should be noticed that girls tend not to read more than boys in every type of reading material. It has been found that girls read more in some types for example in magazines (OECD, 2010), which is contrast to the finding in the study where it emerged that more of the UK and Chinese boys engaged in reading magazines for schoolwork or school reasons. It is interesting to find that for the purpose of pleasure reading, girls in this study

read more than boys in magazines. From this point, it also suggests that gender differences or identification with gender/sex traits could be the result of reading behaviours, purposes, and motivations (Huang et al., 2013; Liu & Huang, 2008; McGeown et al., 2012, McGeown, 2015).

Regarding reading digitally, gender gaps in technology use or ICT use, for example the amount of time investment in using technologies, have been observed to possibly be closing or disappearing (Fairlie, 2016; Nasah et al., 2010; Tsai & Tsai, 2010; Ünlüsoy et al., 2010). However, gender differences in patterns of literacy practices through technology use still remain and tend to develop in various ways during the process of meaning making with digital texts (Liu & Huang, 2008; McKenna et al., 2012). In this study based on the students' claims, more of the girls had practices of texting and social networking than the boys. The boys searched more online for enjoyment purposes than the girls. These findings in this study support the idea that boys and girls in the digital reading environments engage in various type of literacy practices. This does not necessarily suggest which group read more and which read less. It is more concerned with the patterns of how different gender groups interact with digital texts. However, it should be noticed that the gender gap in certain literacy practices in digital environments might be smaller than or at least not as obvious as that in print reading environments because in this research a similar amount of the boys and girls claimed digital literacy practices for learning purposes in the individual interviews. It could be seen that current studies regarding gender differences in literacy practices with digital texts still portray a rather incomplete picture, which requires more attention in order to support successful reading experiences with both digital and printed texts.

Although some online reading activities in this study appeared to be gendered in both countries, the gender gaps among the UK students in some practices were wider than those among the Chinese students. This difference across the UK and

Chinese students could be closely related to distinctive different social and cultural contexts. It has been recognised that the use of technologies regarding practices and beliefs tends to be linked to signs of social and cultural phenomenon and the situations it is encompassed in (Davies, 1988; Gee, 2012; Lankshear & Knobel, 2011; Street, 2005). Such an idea could help to explain the differences regarding gender differences across the UK and China. As discussed in the previous section on literacy practices, the Chinese students tended to have subject learning-based digital literacy practices due to fierce competition under the exam-orientated education system in China. Such a tendency could lead to relatively smaller multiple digital literacy practices than the UK students, which might minimise the gender gaps. Meanwhile, with long school days in China, students have less time to read for pleasure than UK students, which could possibly contribute to more condensed practices among Chinese students.

Gender differences in literacy practices in both print and digital reading seem to be an international issue (Fairlie, 2016; McGeown, 2015). However, the size of such differences in digital reading could be smaller than that in print reading. In digital environments, gender might not work as a strong predictor as it is in print reading environments with respect to time consumption. More importantly, social and cultural situations should be noticed as sensitive and crucial aspects of an understanding of gender differences especially in digital literacy practices across countries. While some of the findings concerning gender differences in literacy practices are consistent with the previous studies, this study contributes to the existing literature by providing evidence from the comparison between the UK and China.

5.6.2 Gender differences in preferences for text formats

In speaking of gender differences related to technology and computer, many studies tend to look at differences in digital competences, attitudes toward

technology abilities (Hagittai & Shafer, 2006) or ways of using computers (Fairlie, 2016; Li & Kirkup, 2007) rather than focusing on the use of various media for reading. However, understanding gender differences in text format preferences could also promote understanding of literacy in the digital age.

According to research (e.g., Liu & Huang, 2008), females tend to have a stronger preference for paper-based reading materials than male readers. This is supported by the result of this study in which the UK girls showed a stronger tendency to prefer paper-based reading than the UK boys when searching information for school work and reading for pleasure. As discussed previously, preferences for certain text formats could be affected by reading purposes and reading tasks, therefore it should be noticed that preference for printed texts tended to be gendered but not for all types of print reading, which could also suggest that gender could be a predictive factor in reading attainment but not the only predictor.

In terms of digital texts, gender differences in preferences might not be as obvious as in print reading or even not gendered (Woody et al., 2010). Such tendency is also reflected in this study in that the UK girls claimed stronger preferences for both printed and digital texts when having a class. No significant difference was discovered in the preferences for digital texts for enjoyment reading. However, the questionnaire results were not supported in the students' elaborations in the individual interviews where many of the boys and girls claimed satisfaction with digital reading. One possible reason could be that the vast adoption of digital technologies in daily living and learning enables individuals to read digitally in daily routine instead of bothering about which medium to use (Woody et al., 2010).

It is interesting to notice that gender differences in terms of preferences for text formats discussed above are concerned with the UK students because there were

no statistical differences claimed by the Chinese students in the questionnaires in this study together with lack of tendency of gender differences spotted in the individual interviews. It is not surprising to have such a difference across the UK and Chinese students because of a smaller gap among the Chinese students than the UK students in terms of gender differences in literacy practices. It could be explained that with less time spent on personal literacy practices, both the Chinese girls and boys might tend to use the medium to read for the sake of convenience or for specific purposes which was discussed in the section of literacy practices, based on the fact claimed by the students that time for personal reading activities seemed to be fragmented in order to have more time on studying. It seems that social and cultural situations are reflected in the difference in gender differences of text format preferences across the UK and China.

5.6.3 Gender differences in online reading comprehension

It has been widely investigated and recognised that girls tend to have advantages over boys in terms of reading attainments such as reading skills and reading comprehension in print reading (Browns, 2015; Clark, 2012; OECD; 2007). With the proliferation of digital technologies, the ability to read both printed and digital texts is required for reading literacy in the digital age. As reading digitally tends to be more complicated than print reading, which was discussed in the section of online reading comprehension, gender difference in reading skills for digital reading might be different to those of print reading.

According to research (e.g., Wu, 2014), navigation skills as one of essential skills for online reading comprehension tend not to be gendered across many countries. Findings of the questionnaires in this research showed that in areas of information location, ability to synthesise, beliefs about the usefulness of online texts were in favour of the UK boys. Such findings are, however, not consistent with studies mentioned above. Some might argue that the fact that UK boys

outperformed their female counterparts, as found in this study, may reflect that the boys are more confident in some searching strategies for online activities, for example problem-solving, than girls (Tsai, 2009). However, when taking a look at beliefs about information evaluation and ability in information comparison in the results of the questionnaires, no significant difference between the boys and girls was found. Meanwhile, elaborations in the individual interviews showed no differences in many aspects such as locating, strategies for evaluation and creation. It therefore could be seen that readers might develop skills for digital reading in multiple ways to support better reading outcomes beyond those required for comprehending printed texts. Additionally, as interactions with digital texts tend to be updated and mediated by changing technologies, gender differences in skills and abilities for online reading could be affected by these dynamic interactions. Further, individuals would be able to gain skills through their negotiations with digital texts in online reading experiences, which might also minimise gender differences in online reading comprehension.

The gender differences in online reading comprehension were found to be different across the UK and Chinese students. The possible reason for this could be that the Chinese students spent less time on a wide range of digital literacy practices, which to some extent reflects the social and cultural situations in China. The Chinese students' tendency for more subject-learning based digital literacy practices might decrease the role of gender as a predictor for online reading skills.

Based on the discussion above, it seems that girls show a stronger tendency to prefer printed texts compared to boys, but with digital texts, gender differences in online reading comprehension and preferences might be smaller. The predictive role of gender should be evaluated carefully when talking about digital reading in such areas as practices, preferences and skills. Further, gender differences in general reading skills could be an international issue (Mullis et al.,

2007) but can be closely influenced by certain cultural and social contexts. Gender differences as found in this study contribute to a better knowledge of the changing nature of digital literacies within different social and cultural contexts. More research on gender differences in reading behaviour and skills in digital reading is clearly needed.

5.7 Reading environment

According to the students' elaborations of their access to digital devices and literacy practices, the reading environments in school and at home were also described in terms of digital learning resources and the perceived attitudes of teachers and parents regarding the use of certain text formats for reading. Such unexpected findings concerning the reading environment across the UK and China contributed to enhance our understanding of the dynamic nature of literacy in changing technological, social and cultural contexts. The differences in these two aspects across the UK and China will be discussed.

5.7.1 In-school: teachers' attitudes

In this study, when the students talked about literacy practices in school with the use of either school or personal devices, they inevitably mentioned their teachers' beliefs and instructional teaching practices in using digital devices. Based on what the students claimed, three aspects were included in the teachers' attitudes: regulations for using digital devices, resources used for teaching and instructional ideas to support students' learning practices. These three parts reflect teachers' attitudes toward and acceptances of educational technologies integration (Chen, 2008; Inan & Lowther, 2010; Teo et al., 2008).

It has been recognised that teachers play an important role in effective implementation of educational technology in the classroom (Bitner & Bitner, 2002; Chen, 2008; Teo, 2008), which could affect practices in teaching and

learning.

It has been argued that teachers' use of technology in teaching varies (Inan & Lowther, 2010) due to contextual factors, for example, culture (Davies et al., 2009; Zhao & Frank, 2003). The idea of the varied use of technology integration was reflected in the findings in terms of the students' claims regarding the teachers' regulations for using digital devices in class. Such regulations seem to be less discussed in the literature. However, it should be noticed that teachers' regulations could on the one hand to some extent reflect their acceptance of technology integration. On the other hand, any kind of regulation regarding employing technologies could affect students' ideas about the reading environment in school. It was claimed by the students that both the UK and Chinese teachers set rules and regulations for using personal devices in school. The practices of setting regulations for using digital devices suggested teachers' potential concerns with the negative effects of inappropriate use of digital devices for learning. Meanwhile, this may indicate the need for more research into effective instructions in directing students' use of digital devices to augment learning outcomes in school.

However, it is noticeable that there were differences in the regulations for bringing and using digital devices across the teachers in the UK and China. The Chinese teachers were perceived to have stricter regulations than the UK teachers. Some UK students claimed to be allowed to use personal devices in class as long as their teachers were certain the purpose was learning. The Chinese students claimed to have little opportunity to bring smart phones to school. As discussed in the section on the students' access to digital texts, contextual factors such as pressure from the examination-orientated education system (Rau & Chen, 2013) in China could affect teachers' practices of technology integration in class. Due to pressure from this examination-orientated assessment, the Chinese teachers might not be willing to take the risk of

employing activities with students' use of personal devices in an intensive teaching task in 45 minutes of each class session especially with the uncertainty of increased test scores after technology integration in class (Inan & Lowther, 2010). It seems that the critical roles of social and culture contexts in varied technology integration practices across nations and culture appear to be true.

Some might argue that the Chinese teachers may have lower level of acceptance of technology integration than the UK teachers due to rather strict regulations for bringing and using digital devices in school. However, it is very interesting to notice that the Chinese teachers were, their students claimed, providing digital resources to students, which was similar to the UK teachers, to support learning outside of school rather than in formal school settings. From this point, it could indicate changing teaching practices in response to the pervasiveness of technologies in education (Inan & Lowther, 2010) even though the teachers from the UK and China used different methods to deliver ideas of using technologies to support learning. Further, it seems that the teachers in the UK and China agreed about the usefulness of technology for engaged learning (Kim & Hannafin, 2011; Sadik, 2008; Teo, 2009) judging from the claims of the UK and Chinese students that the teachers introduced sorts of educational software and online materials to assist their studying outside of school. It is worthwhile, however, noticing that the Chinese teachers were claimed to be open to the ideas of students' use of technology out of school rather than in formal school settings. But some UK teachers were claimed to allow the students' use of educational software in class. This difference across the UK and Chinese teachers may suggest the Chinese teachers encountered a more conflicting relationship between their beliefs and practices of technology integration in class. Social and cultural factors such as the pressure from examination-based assessment may affect the technology integration in education in China. The point should be clear that technology integration in class is a slow process (Ertmer et al. 2001; He & Wray, 2017) with various factors which could be potential obstacles (Ertmer et al., 2012; Hew &

Brush, 2007) across nations. More importantly, the process would be affected by social and culture situations. Therefore, further research taking into account social and cultural contexts would be needed to get better insights into the effective deployment of technologies in education.

Although teachers' attitudes were not within the scope of this study, it could be seen from the issues discussed above that the students to some extent showed how they responded to the reading environment in which the teachers' attitudes toward the use of digital devices played an important role. Such findings also reinforced the ideas of literacy as social practices within New Literacy Studies (Gee, 2012; Leu et al., 2008; Street, 2003).

5.7.2 At home-parents' attitudes

Judging from the students' elaborations of literacy practices and access to digital texts in out-of-school settings, the students in this study pictured the reading environment at home in terms of family literacy practices, parents' reading activities and parental attitudes toward digital literacies.

Family literacy practices have been found to include varied types of interactions with both printed and digital texts due to various factors such as parents' attitudes toward technologies (Marsh et al., 2017; Plowman, et al., 2008). In this study, the UK and Chinese students claimed different interaction patterns within their families regarding literacy practices, which supported the findings in the literature mentioned above. It is noticeable that the UK students tended to be exposed to a wider range of interactions within their families than did the Chinese students. Parents' reading to children was claimed by some UK students to be a common family literacy practice in many UK families (Formby, 2014), which however was absent from the Chinese students' claims. It has been suggested that a changing focus from 'family literacy to digital family literacy' is

needed (Marsh et al., 2017, p.47) as the availability of various technologies to families increases. The notion of emerging 'digital family literacy' is supported in this study in that one UK student and his father shared links with each other for reading, whereas none of the Chinese students mentioned a similar practice. The difference in interaction patterns within family literacy across the UK and China could be closely related to parents' experiences of and attitudes toward technologies (Plowman et al., 2008). Further, social and cultural situations may also contribute to such a difference. The long schooldays in secondary school in China described previously tend to be a reflection of the fierce competitions in the examination-orientated assessment, which reduce the opportunity for interactions within family literacy practices.

In speaking of parents' experiences of technologies, parents from both countries in this study were claimed by the student participants to have rich experiences in reading with digital devices such as smartphones, iPads and Kindles. This could suggest that the generational gap in terms of the use of digital devices for reading might not be as big as suggested by the notion of the gap between 'digital natives' and 'digital immigrants' (Prensky, 2000). Individuals who were labelled as 'digital immigrants' could be as tech-savvy as 'digital natives' due to experiences of digital reading in their daily living and working. However, it is worthwhile to look at the patterns of parents' reading activities claimed in the study as it may affect the students' perceptions of reading with digital devices. The UK parents were claimed to engage in digital reading with lots of books on digital devices. Whereas it was claimed that the Chinese parents read small articles from smartphones through social media. It appears that the Chinese parents tended to read shorter pieces with digital texts. This might to some extent explain why the Chinese parents were claimed to be less open to digital reading than the UK parents.

Regarding attitudes toward children's use of technology, most of the UK students

demonstrated that they were encouraged to read with both digital and printed texts. The UK parents were claimed to be concerned more with reading than the medium of reading. The Chinese parents were claimed to be stricter about the use of technology for reading and learning. Apart from parents' experiences of digital reading as a potential factor, social and cultural situations could also be factors affecting parental attitudes toward the use of technology in reading and learning. As discussed in the section of access to digital texts and literacy practices, the concepts of learning across the UK and China appear to be different (e.g., Jin & Cortazzi, 2006; Hu, 2002; Wang, 2001). The Confucian-heritaged culture of learning (Li, 2001; Hu, 2002) is reflected in this study in that some Chinese students reported that they were told to read print because parents believed that knowledge was learnt through books. It is interesting to notice that some Chinese students in the study believed that they had opposite opinions to their parents in terms of how knowledge was learnt. Many Chinese students in this study claimed the need to be open to technology to support learning. Together with the findings of digital literacy practices for subject learning within the Chinese students, it seems that generational gaps might be more obvious in the notion of learning with technologies than in the experiences and skills of using technologies in the Chinese contexts, which might also apply to other contexts. The point should be clear that I am not saying that the generational gaps in terms of use of technology for reading and learning in the UK do not exist. Such gaps however seem to be bigger or more obvious in China. Therefore, more research into family literacy practices with both printed and digital texts would contribute to expand the understanding of changes of literacy in the technology rich age and how social relations are reshaped (Selwyn, 2010) within changing technological, social and cultural situations.

It is noticeable that students nowadays are immersed in technology rich environments (Marsh et al., 2017) in school and at home. However, the availability of digital technology does not necessarily refer to literacy practices

(Bennett & Maton, 2010). The social and cultural situation could be affecting factors for the conflicting relationships between beliefs about technology for learning and the actual implication of technologies in school and outside of school. Studies of literacy practices in the digital age with emphasis on social and cultural contexts would also support insights into the situated nature of literacy (Hamilton, 2010).

Conclusion

The issues arising from this research, as discussed above, have contributed to the understanding of the dynamic nature of literacy within changing technological, social and cultural contexts. The pervasive adoption of digital technologies in daily living and learning has enabled individuals to be exposed to and interact with the shifting textual landscapes (Carrington, 2005), which has led to the expanding notion of literacy updated and mediated by changing technologies.

The expanded ideas of reading that the students claimed in the current study are a good reflection of the expanding notion of literacy. Such notions and conceptions of the nature of literacy have been reflected in this study in that both the UK and Chinese students were found to have access to digital texts in school and outside of school and a wide range of literacy practices with printed and digital texts. The preferences for certain text formats varying by reading purposes, as found in this study, support some studies (Ackerman & Goldsmith, 2011; Woody et al., 2010) and contradict others (Noyes & Garland, 2008; Rockinson-Szapkiw et al., 2013), which suggest various impacts of text formats and the use of medium on learning performance and reading habits in the digital age (Liu, 2005; Liu & Zhang, 2008; Mangen et al., 2013; Prion et al., 2016). It has emerged in this study that online reading tends to be more complicated than print reading because some reading strategies are unique to online reading comprehension (e.g., Coiro, 2009). Most of the students in this study claimed

several challenges when reading online. While not many of them claimed to be sophisticated readers with digital texts. This therefore could suggest the need for more training regarding reading strategies for successful online reading.

It should be noticed that the individuals' experiences and perceptions of various literacy practices with the use of technologies are embedded in social and cultural situations together with the technological changes. Understanding the contextual factors as the affecting and underpinning factors for differences in the students' perceptions of reading in the digital age appears to contribute to seeing how literacy is situated in various contexts rather than just looking at the impact of technologies. Judging from differences found in this study across the UK and Chinese students, it appears to be evident that individuals tend to have literacy practices and thoughts of shifting reading environments through experiences and exposure to changing technological situations by coordinating the concurrent contexts. The differences discussed in previous sections have been found closely related to varied assessment methods and beliefs about teaching and learning in the cultures of the UK and China. The UK students were found to be more likely to have more digital texts access with a wider range of literacy practices in school and outside of school than their Chinese counterparts, which indicates varied reading environments across the UK and China. The Chinese students tended to live and learn in more paper-based reading environments in which strict regulations about using technology in learning are proposed and conducted by teachers and parents. It seems that technological changes have been intertwined with social and cultural contexts. Therefore, the technological, social and cultural situations should be taken into account at the same time to get a relative complete picture of the nature of literacy. In this sense, it is not hard to understand that the Chinese students recognised the changing notion of learning with new technologies even though they had relatively limited access to digital texts and narrower digital literacy practices.

The discussion concerning similarities across the UK and China suggests a picture of changing literacy practices updated in both countries due to the pervasive use of technologies. Meanwhile, social and cultural contexts appear to be as crucial as technological changes in gaining a better understanding of adolescents' ways of making meaning, as they interact with technologies in their current situations.

Chapter Six Conclusion

Introduction

This research has provided a picture of the perceptions of a group of UK and a group of Chinese adolescents regarding reading literacy in the digital age, based on their literacy practices with both printed and digital texts in school and outside of school. The findings of this research enrich the understanding of the dynamic nature of literacy against the background of the pervasive penetration of digital technologies in individuals' daily living and learning. Meanwhile, the comparative perspective employed in this research contributes to new knowledge about how literacy is mediated by and updated with the changing technological, social and cultural contexts. This chapter will outline the significance of this research on the basis of a brief overview of key findings, some discussion of the implications of these in actual practices and of the contributions of this research theoretically and empirically, concluded by a discussion of the limitations of the research and possibilities for future research to build upon its contributions.

6.1 The significance of this research on the basis of key findings

An increasing number of studies of the development of literacy and literacy practices in the digital age have demonstrated the impact of the emergence of digital technologies on individuals' practices of social living and learning. The 'social' (Lankshear & Knobel, 2011; Gee, 2012; Street, 1984, 2003, 2008) and 'digital' (Gilster, 1997; Littlejohn et al., 2012; Martin, 2008; Mills, 2010) turns of literacy studies have revealed a wide range of literacy practices with various text formats and have justified the expanded 'notion of what counts as literacy' (McKenna et la., 2012, p.285) from being able to read and write to the communication and generation of meaning. Reviewing these studies provided an understanding of the relationship between the nature of literacy and the changing situation in the digital age in terms of technological, social and cultural

aspects. However, some questions emerged from this review regarding adolescent literacy, due to the lack of investigations into what adolescents themselves think about reading literacy in the electronic reading environment where printed and digital texts coexist. Many studies have documented adolescents' literacy practices 'relating to popular culture, media and new technologies' (Marsh et al., 2005, p.5) in school and out-of-school settings (Ito et al., 2009). Little however is known about students' dispositions, beliefs and thoughts about reading in an electronic environment. Further, no research has been done into the perceptions of adolescents across the UK and China even though digital technologies have hugely penetrated learning and living. Therefore this research was designed to add new knowledge of literacy, especially digital reading literacy, in different social and cultural contexts. The findings of this study contribute in terms of empirical evidence and enrichment in theories of literacy studies across cultures and nations.

This research suggests that both the UK and Chinese adolescents had a range of access to digital reading in school and at home with various digital technology devices. It seems evident that the students were exposed to technologies for both learning and living with some support from schools and parents. However as described in Chapter 4 the Chinese students tended to have less autonomy in using digital devices in school and at home. Different reading environments regarding school and parents' regulations for the use of digital devices and their beliefs about and attitudes towards integrating technology in learning were found to be closely related to such a difference.

With varied access to digital technologies for reading digitally between the UK and Chinese students, different patterns of literacy practices across the UK and Chinese adolescents emerged in my study. It was not surprising to find a variety of literacy practices (print and digital) in school and at home with different technologies due to the electronic reading environment. My study has shown

differences in the patterns of literacy practices between UK and Chinese adolescents. In general the Chinese students tended to have more paper-based literacy practices than the UK students. The Chinese students had fewer digital literacy practices, however, they were more likely to have curriculum-based/subject-related digital literacy practices. Apart from varied access to digital devices, different teaching and learning practices were influenced by various cultures of learning, as presented in Chapter 5, such as the use of textbooks in the UK and China, which appeared to be related to distinct literacy practices across the two countries. Social and cultural differences underpinned such differences. Therefore, I would like to suggest that examining literacy practices should go beyond the national dimension. Rather, cultural and social dimensions should also be explored in order to understand how literacy is mediated by contextual situations together with technological changes.

My research suggests that preferences for certain text formats or the medium of presentation were not simple and straightforward issues, but were found to be closely related to reading purposes, experiences of using certain technologies and the values that students held about ways of learning. Some reasons, such as the haptic experiences of printed texts and the awareness of the multimodal character of digital texts, were similar to those found in other studies. However, possible explanations regarding the impact of contextual factors in terms of the value of education, parenting and parental involvement (Hu, 2002) across the UK and Chinese culture make this research one of very few to address adolescents' interactions with and response to various text formats within certain social and cultural situations. It is interesting to find that the study provided empirical evidences of on-going transformations in the characteristics of the Chinese students in the digital age in terms of ways of learning and notions of getting knowledge, which is contrary to the stereotyped characteristics of Chinese students who tend to be perceived as rote or passive learners (Watkins & Biggs, 1995).

The approaches to online reading comprehension as reported in this study suggest that many of the UK and Chinese students believed that, as good readers, they managed to use strategies unique to online reading to communicate and construct meaning in the open space of the internet. Abilities of information location, evaluation and creation were used when the students read online for both academic and personal purposes. This study actually looked beyond the contexts of the laboratory or the school in terms of students' online reading comprehension. Therefore, I believe that findings regarding online reading comprehension in this study can promote a deeper understanding of adolescents' reading comprehension with online texts used for various social practices other than reading for academic purposes. Meanwhile, the strategies that these good readers claimed to use for successful online reading experiences and the challenges that they perceived as hampering their comprehension when reading online may prove useful in the instruction of comprehending online texts in class teaching. Differences in applying abilities of using online reading comprehension strategies were found across the UK and Chinese students, even though good online readers from both countries showed similar strategies. The UK students in this study were found to be more capable of applying strategies for successful online reading. Several explanations have been offered in this study for such differences, such as past experiences of accessing digital texts and familiarity with digital devices.

It was discussed in Chapter 5 that these possible explanations are embedded in social and cultural contexts, which suggests the need to examine the impact of interplay between contextual factors and changing technological and economic situations on adolescents' literacy in the digital age. Such explanations were found to some extent to be related to differences in general reading habits such as reading time, the length of digital texts and skimming. I believe that such findings and the explorations of possible explanations provide more evidence for the concept that literacy is situated within the social and cultural contexts and

updates to reflect changing situations.

My research has also offered a picture of gender differences in reading with both printed and digital texts. This exploration of gender differences with digital reading among groups of UK and Chinese adolescents in terms of access to digital texts, literacy practices, preferences of certain text formats and online reading comprehension adds to the understanding of gender gaps in digital reading in various contexts. I suggested the importance of looking at gender differences in reading with digital texts because of the expanded notions and dynamic nature of literacy. The smaller gaps in reading digitally between boys and girls discovered in my research suggest the changing interactions between readers, texts and practices mediated by technological changes. Regarding gender differences in reading in the electronic environment across the UK and China among adolescents, there was a smaller gender gap among the Chinese students than among the UK students. Possible reasons were explored such as the experiences of literacy practices as influenced by certain cultural and social contexts, which to some extent confirm the importance of investigating gender differences in reading across cultural levels as well as national levels. These findings also suggest gender differences in reading could vary across social and cultural contexts rather than simply being mediated by experiences of being exposed to digital technologies in living and learning.

Findings in this study concerning the awareness of growing up with technologies and an expanded notion of what reading is in the digital age have provided some empirical evidence regarding the changing nature of literacy. Both the UK and Chinese students claimed that reading in the digital age went well beyond reading in print. Reading in the electronic environment is in fact related to the construction of meaning, which involves far more than the ability to read. This finding emerged strongly from an investigation with a cross-cultural perspective, which to some extent enhances the theory that, just as literacy varies across

multiple social and cultural contexts, so does the enactment of literacy in the digital age.

My research has offered a general picture of the reading environments (in school and at home) in which these groups of UK and Chinese students were living, which in many ways go beyond the original aims of this research. These findings provide insights into the practices and attitudes of teachers and parents according to the claims of the students in the UK and China regarding the use of digital technologies in daily living especially for academic reading and learning. Regarding the overall reading environment both in school and at home, teachers and parents in these two countries were reported to have noticed the impact of technologies on classroom teaching and parental involvement on their children's learning together with attitudes toward the integration of educational technologies. It is interesting to find that both teachers and parents in the two countries were claimed to be in conflicting situations regarding the tension between practices such as regulation of children's use of technologies and their awareness of the penetration of digital technologies. The students claimed that they had experienced no major transformation in the pedagogies employed by their teachers, even though they were surrounded by technologies, which may suggest that according to the adolescents the promised transformation in pedagogies is a long way ahead. Meanwhile, parents in the UK and China were found to have several concerns, such as safety issues, along with provision of digital devices to children. However, teachers and parents in China seem to be in more conflicting situations compared to the UK teachers and parents. The social and cultural differences were explored in the discussion chapter to understand the differences across two countries, which support the understanding of the changing concept of Chinese culture of learning mediated by global changes of the economy and technologies. More importantly, the generational gaps in terms of ways of learning and how knowledge is gained have been explored in this research and these findings offer dynamic insights into characteristics of a

group of Chinese learners in the digital age.

The exploration of different reading strategies used for print and digital reading in this study has enhanced the understanding of individuals' responses to the changing reading environments. Most of the UK and Chinese students in this study claimed in general no differences in their reading strategies between print and digital reading. It seems that reading digitally has been seen as just another way of reading print rather than being hugely different due to the technological aspects of digital devices. However I suggest the need to explore the differences in students' actual reading performances/comprehension between reading from paper and from screens rather than simply relying on the claims they make about differences in their general reading strategies between reading from paper and from screens. Even though the students said there were 'no differences' in their general reading strategies between reading printed and digital texts, they did claim that various strategies would be needed for successful online reading experiences. It appears that the students may have been dealing with online texts in a different way to printed texts. Therefore, more research into students' reading performances in reading printed and digital texts in real situations would be useful to gain a deeper understanding of digital reading literacy among young people.

Similarities between the UK and Chinese students emerging in this research suggest the impacts of technological changes on current literacy research at a national level. Meanwhile, results of my research have corroborated the social and cultural differences across the UK and China as underpinnings, in terms of varied patterns of access, literacy practices and variation in online reading comprehension, gender differences and reading environments between the UK and Chinese students. In this sense, this research indicates that the dynamic nature of literacy is situated in social and cultural contexts, which include technological changes. This research, as the first study comparing the UK and

Chinese students' perceptions of reading literacy in the digital age, has raised various useful points which suggest a number of implications.

6.2 The implications of this research

This research appears to have confirmed the idea that the nature of literacy and literacy practices are updated with, and mediated by, the change of technologies as well as in response to the social and cultural contexts. A wide range of literacy practices that the students reported in school and outside of school explored in this study suggest that adolescents nowadays are engaging in the use of technologies for living and learning, in a broader way than we have noticed. This therefore raises some thoughts of implications regarding methods of assessment and curriculum and instructions for example classroom practices with teaching and learning.

The assessment of students' literacy in the digital age needs to involve far more than assessing their ability to read and write, which has been recognised through the expanded notions of literacy (Gee, 2012; Lankshear & Knobel, 2011; Leu et al., 2013; Street, 2003). Results of this research regarding the students' engagement in various literacy practices with digital competencies and abilities in meaning construction have to some extent offered evidence for the need to take the abilities gained through digital literacy practices into account when assessing students' literacy. It appears that with penetration of technologies in teaching and learning some methods to assess abilities for meaning making with digital texts need to be introduced to fully understand students' capabilities (Leu et al., 2013). This research therefore provides some potential directions for the reform of assessment to fit with the changing contexts of technological penetration in living and learning.

Meanwhile, these results could have implications for the curriculum

improvement of classroom teaching practices. The challenges of reading online texts that the students claimed in this study lead to the consideration of how teaching practices in schools can support students to get skills and abilities for successful digital literacy practices, especially for self-directed practices in out-of-school settings. Teachers then are expected to be able to design specific activities to improve online reading skills with the understanding of students' challenges of reading online. Although both the UK and Chinese students in this research were found to be exposed to technological changes and technological integration, social and cultural contexts should be taken into account for the reform of assessment and improvement of curriculum and instruction.

Apart from implications for assessment and pedagogy, my research also suggests the importance of teachers' professional development for teaching students who have much experience of using digital technologies. It has been found in this study that the students from both countries claimed to be confident with and competent in using digital technologies for living and learning purposes. Integrating technologies in daily living and learning seems to be common for today's adolescents. Therefore, it would be critical for teachers to be able to integrate educational technologies in teaching practices with skilled digital competencies to support some practices that could engage students in learning. According to the students from both countries in this study, their practices of using technologies were to some extent influenced by the teachers' attitudes, especially for the Chinese students. Therefore, going beyond the aspect of technical skills for integrating education technologies may be important for teachers' professional development. Rather, what also needs to be addressed are teachers' beliefs and attitudes of technology integration in teaching and learning. Meanwhile, in this research the teachers' attitudes, judging from the claims of the students, across the UK and China were found to be varied by social and cultural contexts, which suggests the need to take the social and cultural underpinnings into account for the teachers' professional development of educational

technology integration.

Findings of the students' perceptions of parents' literacy practices and attitudes toward their use of technologies in learning to some extent suggest the generational gaps between parents and children regarding integration technologies in daily living and living. My research suggests that adolescents nowadays might have different ways and perceptions of gaining knowledge. Such findings may imply that parental supports for children' use of technologies could be critical to help children nowadays prepare to be literate in the digital age. More importantly, parental support in helping children gain strategies for successful experiences of digital literacy practices seem necessary rather than simply assuring the availability of technology devices.

The students of the two countries claimed a range of reasons for preferences for certain text formats in study, which could be useful information for the responsive service of library resources in both schools and universities, for example the provision of digital reading resources. Meanwhile, understanding issues of students' preferences for text formats and their choices regarding particular media may enable teachers and librarians to more effectively support students in the electronic reading environment, for example in terms of reading in certain text formats.

My research has offered some empirical evidence which may suggest the changing characteristics of Chinese learners in the digital age in terms of the awareness of critical thinking and the use of strategies to make meaning instead of rote learning. Such findings therefore suggest that it is crucial for researchers to have multiple perspectives when examining the characteristics of Chinese learners to understand how they respond to the interplay between technological changes and social and cultural situations.

6.3 The contributions of this study

Recent studies of literacy practices (e.g., Lankshear & Knobel, 2011) with the use of digital technologies have been offering insights into the transitional reading environments in the digital age from printed reading to reading on screens. Little however is known about what young people who were born in the 21st century and growing up with various digital technologies think about reading in the digital age where both printed and digital texts coexist. This research, with its exploration of the adolescents' perceptions of reading from paper and on screens, adds more knowledge of adolescent literacy in terms of literacy practices, preferences for certain text formats and online reading comprehension.

Apart from new knowledge added to the area of adolescent literacy, the investigation of literacy practices and the students' perceptions of experiences of printed and digital literacy practices in the digital age could be viewed as supporting the concept of the dynamic nature of literacy, which is updating with changing technologies.

In the broad literature of literacy research, very little attention has been paid beyond the contexts of western countries. The examination of the Chinese students' literacy practices and their perceptions therefore to some extent expands the scope of literacy research from focusing on the western countries to a broader context. A few sources regarding Chinese students' use of technologies in living and learning (e.g., Chen et al., 2014; Rau & Chen, 2012) seem to be insufficient to help with the understanding of literacy research in China. It is hoped that this research has enriched the knowledge of adolescent literacy research in China.

The comparative perspective employed in this study has made it the first study for the exploration of similarities and differences across the UK and China. More

importantly, findings through the comparison between the two countries have offered insights into the interplay between technological changes and social and cultural contexts, which suggests that the nature of literacy is mediated by social and cultural contexts as well as by changing technologies. Meanwhile, it has been found in this research that the way that the students responded to pervasiveness and penetrations of technologies in living and learning was situated in their social and cultural situations. Such findings therefore have enhanced the sociocultural perspective of literacy research which describes the situated nature of literacy (e.g., Lankshear & Knobel, 2011; Street, 1984, 2008).

The changing characteristics of Chinese learners explored in this research regarding the changing notions of ways of learning and critical thinking with the use of digital technologies have challenged some stereotyped beliefs of characteristics of Chinese learners. These Chinese students appeared to go beyond the characteristics influenced by the Confucian-heritaged culture, which suggests Chinese students may have critical thinking and would be able to apply critical thinking within their use of technologies especially for learning purposes. This research therefore has enriched the understanding of the changing characteristics of Chinese learners in the digital age.

6.4 Limitations of this research

This research is a comparative study of adolescents' perceptions of reading in the digital age across the UK and China with focus groups, questionnaires and individual interviews. Several limitations must be examined. The first limitation is the generalisability of findings. Mixed methods employed in this study helped to gather data with depth and breadth for the understanding of similarities and differences across the UK and Chinese adolescents of reading literacy in the digital age. Rich data collected in this study have been presented with transparency, which provides validity for this research. Therefore, it could be

seen that the validity of this research is not based on the generalising of findings, which was not the aim of this study. This study offers social and cultural underpinnings to understand the patterns in similarities and differences of the UK and Chinese adolescents regarding digital literacy, which may not be able to be generalised to the perceptions of the whole population of UK and Chinese students.

As much data in depth and breadth were collected with the use of mixed methods, however, the weaknesses of each method should not be ignored. Regarding focus groups, on one hand for the UK focus groups, students might not be willing to fully express themselves when teachers were present. On the other hand, some interactions which could be useful might be missed when conducting online focus groups of the Chinese students. For the questionnaires, some limitations cannot be completely eliminated. For example, limited time allocated for the completion of questionnaires may make students read the questionnaires fast and not pick their answers carefully. It is possible that some answers to the questionnaires given under such conditions might not be true. With regard to individual interviews, every interviewee from the UK and China did not have much time for the interview. Hence they might not be able to fully express their beliefs and opinions of their experiences of reading with both printed and digital texts in school and at home. Meanwhile, some students were interviewed in the presence of teachers, which might lead to interviewees' reluctance in expressing themselves.

Another limitation is concerned with the issue of translation. Even though the questionnaire has been double-blind translated and cross checked, it is not possible to have it translated with completeness. In addition, translating one language into another directly could be delicate because some meanings could be bound to their contexts.

Further, data from this research represents a relatively short period of time of adolescents' perceptions of digital literacy. They cannot be used to predict a younger generation's digital literacy practices, behaviour and beliefs because the nature of literacy is mediated by and negotiated with the changing technological, social and cultural contexts.

6.5 Recommendations for future research

Findings of this research suggest that the nature of literacy is updated with and mediated by the changing situations of technologies along with social and cultural contexts. According to the findings, it appears to be evident that what adolescents think about reading in the electronic environment is responding to such changes. Therefore, future research focusing on the individuals' on-going interactions with technologies in daily living and learning could be done to obtain a picture of the influences of the interplays between technologies and social and cultural contexts on individual literacy practices and the nature of literacy.

Practices, beliefs and attitudes of teachers and parents appear, to judge from the responses of students participating in this research, to have a relatively close relationship to adolescents' practices and perceptions of literacy, even though these were not designed in this research. Some questions emerging from this research relating to teachers and parents in terms of the exploration of literacy in the digital age could be addressed and answered in future research. Many students claimed in this research that they encountered several challenges to achieving successful online reading experiences, which raised the questions: is there enough support that students can obtain to become good readers for reading on screen and in what way could teachers support online reading skills and strategies through class teaching practices. Answering such questions would to some extent contribute to a better understanding of adolescent literacy as well

as to the improvement of curriculum instructions. Such questions connect to teachers' relationships with educational technologies, because teaching practices could be affected by how teachers deal with technologies in class. Therefore some attention could be paid to the examination of teachers' relationships with technologies within certain social and cultural contexts.

Regarding the issue of parents, conflicting beliefs and practices of the use of technologies have been found between the adolescents and their parents based on what the students claimed in this research, especially for the Chinese counterparts. It would be valuable if more research on parents' responses to the integration of technologies in children's learning could be carried out and more research on the influence of parents on family reading. It would be interesting to find out whether children's interactions with technologies for living and learning would also shape family reading environments. More importantly, it would be worthwhile investigating potential factors such as socioeconomic status and parental education background that influence family reading environment rather than simply apply a general frame of social and cultural contexts.

Research on digital reading literacy is a relatively newly developed area compared to print reading literacy. Investigations of gender differences in reading digital texts are correspondingly under researched. My research has suggested that gender differences regarding reading performances with digital texts may be smaller than those regarding print reading among the UK students whereas such differences were not obvious among the Chinese students. This then raises some questions which need to be answered in future research, firstly, how does the changing landscape of texts influence reading behaviours, attitudes and performances of reading in the digital age across girls/females and boys/males? Second, it would contribute to the understanding of gender differences in reading across cultures by taking social and cultural contexts into consideration when investigating the gap in reading between girls and boys,

rather than simply considering impacts of technologies.

The Chinese students in this research appeared to be employing critical thinking through their practices of making meaning with the use of technologies, which is contradictory to the stereotypes of being passive with rote learning. Therefore, more research on examining Chinese students' literacy practices especially for personal and interest purpose would promote a more complete picture of Chinese learners. Meanwhile, future research focusing on examining the students' literacy practices that teachers and parents do not know about would contribute to a general understanding of how characteristics of learners across nations are shaped and reshaped due to the adoption of technologies into daily life. Meanwhile, the question of how learners negotiate with changing technologies within certain social and cultural contexts could be answered in further research for a better understanding of learners in the digital age.

This research has investigated what the UK and Chinese adolescents think about reading in the digital age. Their perceptions however could be different from their practices in real life. Therefore, experimental tests could be employed in future research to see what the differences are between reading on screen and from paper in real practices. Additionally, comparisons between their perceptions and real practices could be made. For example the investigation of online reading comprehension could be done with some tests after the acknowledgement of individuals' perceptions of their strategies of comprehending online texts (Leu et al., 2011). More future research to explore reasons for differences between perceptions and real practices could be done, which could also promote our knowledge for the understanding of literacy in the digital age.

To conclude, this research has provided a picture of patterns of how two groups of UK and Chinese students perceived reading in the digital age based on their

daily literacy practices of using printed and digital texts. Similarities and differences explored through the patterns emerging from this study have enriched our understanding of the nature of literacy mediated in the changing technological, social and cultural situations.

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Appendix

Appendix 1 Interview guide for focus groups

Issues to discuss before focus groups interview

- Participant's age and Year group
- Purpose of the interview
- Asking for permission for voice recording
- Confidentiality and participant's right to withdraw

Interview questions:

1. Could you talk about your experiences of reading, print reading and digital reading in school?
2. What about your reading experiences, both print and digital reading outside of school?
3. What kinds of technologies do you use which involve reading?
4. What do you think when you read on screen/print?
5. Is reading different with the new technologies?
6. What differences do you see between print reading and digital reading?
7. What do you think about digital reading compared to print reading?
8. Which do you prefer – reading in the traditional way or on some kind of screen?
9. Could you talk about some reasons why do you prefer this?
10. Anything you would like to say about today's conversation?

Appendix 2 Interview guide for focus groups (Chinese)

中国学生焦点小组采访纲要

采访前之相关事宜：

- 受访者的年龄和所在年级
- 本次采访之目的
- 征询对采访内容录音的许可
- 告知受访者的中途推出之权利以及对本次采访的保密

采访问题：

1. 请说说你在学校的阅读情况，纸质阅读和数字化阅读？
2. 在校外的阅读情况呢，包含纸质阅读和数字化阅读？
3. 你使用什么进行阅读呢？
4. 在屏幕上/纸张上阅读时你有什么感受？
5. 使用新的阅读方式进行阅读是否会不一样呢？
6. 纸质阅读和数字化阅读有什么不一样？
7. 和纸质阅读相比，你对于数字化阅读有什么看法？
8. 你更喜欢那种阅读方式呢？
9. 可以说说你为什么更喜欢这种阅读方式呢？
10. 关于这个访谈还有其他你想说的吗？

Appendix 3 Web link of the questionnaire of this study

https://wbs.qualtrics.com/SE/?SID=SV_8CvAaUyItbwTSKN

Appendix 4 The questionnaire of this study



The purpose of the survey is only to gather information for my PhD research. There are no right or wrong answers. All your information will remain confidential.

CENTRE FOR
EDUCATION STUDIES

Thinking about Digital Reading

A. Your access

Please think about your recent substantial experiences of digital reading. Tick the appropriate boxes.

1. In school, I have the chance to read digitally with:

<input type="checkbox"/> Smart board/whiteboard in class when the teacher demonstrates material	<input type="checkbox"/> Computers in school
<input type="checkbox"/> Personal digital devices (e.g., smartphone, tablets, e-readers), and please tick devices you have used. If you had other devices, please list out: _____	<input type="checkbox"/> Others' devices (i.e. classmates' smartphone, tablets)-

2. After school, I have the chance to read digitally with:

<input type="checkbox"/> Computers in my house	<input type="checkbox"/> Personal devices (i.e. smartphones, tablets, e-readers), please tick devices you have used. If you had other devices, please write here: _____
<input type="checkbox"/> Parents' digital devices (i.e. smartphones, tablets, e-readers), please tick devices you have used. If you had other devices, please write here: _____	<input type="checkbox"/> Friends' digital devices (i.e. smartphones, tablets, e-readers), please tick devices you have used. If you had other devices, please write here: _____

B. Your reading activities

Look at the list of reading activities below and think about your own reading activities. Tick the appropriate boxes that fit your experience.

1. In school, my reading activities include:

<input type="checkbox"/> Reading a textbook for class	<input type="checkbox"/> Reading handouts for class
<input type="checkbox"/> Reading a reference book/ an information book to find things out	<input type="checkbox"/> Reading magazines/journals for school work
<input type="checkbox"/> Reading what the teacher writes on the whiteboard/smart board	<input type="checkbox"/> Reading a book during break time for enjoyment
<input type="checkbox"/> Searching for things online for a class	<input type="checkbox"/> Social networking (e.g., Facebook, Twitter,), please specify: _____
<input type="checkbox"/> Searching things online that are mostly discussed among classmates	<input type="checkbox"/> Texting
<input type="checkbox"/> Other, Please write here: _____	

2. After school, my reading activities include:

<input type="checkbox"/> Reading a digital book for enjoyment	<input type="checkbox"/> Reading a printed book for enjoyment
<input type="checkbox"/> Searching for information for enjoyment	<input type="checkbox"/> Searching for information for school work
<input type="checkbox"/> Social networking (e.g., Facebook, Twitter,), please specify: _____	<input type="checkbox"/> E-mailing
<input type="checkbox"/> Reading while using pen and paper to finish homework	<input type="checkbox"/> Reading while using a computer or other electronic device to finish homework
<input type="checkbox"/> Reading magazines/journals for fun	<input type="checkbox"/> Reading magazines/journals for school reasons
<input type="checkbox"/> Texting friends to discuss homework	<input type="checkbox"/> Texting friends for enjoyment
<input type="checkbox"/> Other, please write here _____	

C. Reading with different technologies

Please think about your reading preferences with different reading media. Tick the box that best matches how you feel about the questions below.

1. I prefer using printed reference books or printed textbooks to find information for school lessons.

Strongly Disagree Disagree Not sure Agree Strongly Agree

-
2. I prefer using the internet to find information for school lessons.
 Strongly Disagree Disagree Not sure Agree Strongly Agree
3. I prefer print reading in a class.
 Strongly Disagree Disagree Not sure Agree Strongly Agree
4. I prefer digital reading in a class.
 Strongly Disagree Disagree Not sure Agree Strongly Agree
5. I prefer digital reading for enjoyment.
 Strongly Disagree Disagree Not sure Agree Strongly Agree
6. I prefer printed books, magazines/journals for enjoyment.
 Strongly Disagree Disagree Not sure Agree Strongly Agree

D. Yourself as a reader

Please think about how you feel about yourself as a reader. Tick the box that best tells how you feel about the questions below.

1. Print reading tends to make me think more deeply than digital reading.
 Strongly Disagree Disagree Neutral Agree Strongly Agree
2. I find it more relaxing to read printed texts than digital texts.
 Strongly Disagree Disagree Neutral Agree Strongly Agree
3. I tend to skim read when I am reading digitally online for enjoyment.
 Strongly Disagree Disagree Not sure Agree Strongly Agree
4. In free time in school, I like to discuss with my friends what I have read online.
 Strongly Disagree Disagree Not sure Agree Strongly Agree
5. I always think about searching the internet when I have some problems in my homework.
 Strongly Disagree Disagree Not sure Agree Strongly Agree
6. I like doing projects as homework with my classmates by using the internet.
 Strongly Disagree Disagree Not sure Agree Strongly Agree
7. I am more likely to share with my friends what I have read online than in printed books.
 Strongly Disagree Disagree Not sure Agree Strongly Agree

E. Online reading comprehension

Please think about how you feel when you read digitally. Tick the box that best fits your feeling about the questions below.

1. I understand what the teacher demonstrates using digital texts in class.

Strongly Disagree Disagree Not sure Agree Strongly Agree

2. I know how to locate information when I search the internet for a specific topic.

Strongly Disagree Disagree Not sure Agree Strongly Agree

3. I know it is important to evaluate information online.

Strongly Disagree Disagree Not sure Agree Strongly Agree

4. I often compare opinions I read on the internet.

Strongly Disagree Disagree Not sure Agree Strongly Agree

5. I believe that I can broaden my knowledge for a topic more quickly by using the internet than using printed books.

Strongly Disagree Disagree Not sure Agree Strongly Agree

6. I can understand better by searching information on the internet on my own for academic work than by looking at printed reference books.

Strongly Disagree Disagree Not sure Agree Strongly Agree

7. I am able to synthesise different information online that I need for a specific topic.

Strongly Disagree Disagree Not sure Agree Strongly Agree

8. I get distracted more easily when I am reading digital texts than when reading printed texts.

Strongly Disagree Disagree Not sure Agree Strongly Agree

F. About yourself

Gender:

Year/Grade:

Age:

Please leave your name and personal contact, **ONLY** if you would be willing to participate in the follow-up individual interviews.

Name:

E-mail address:

Please be assured that all your information will be kept confidentially.

Thank you very much for your participation. 😊

Appendix 5 The questionnaire of this study (Chinese)

本问卷旨在为本人博士的研究工作收集信息。所有选项答案都没有对错之分。问卷及填写者的所有信息都会采取保密处理。感谢你的参与和支持。



想一想你的数字/电子阅读

A. 你的数字/电子阅读设备

请回忆你最近的数字/电子阅读经历，并给你认为是恰当的选项打√（可多选）。

1. 在学校，我有以下方式进行数字/电子阅读：

<input type="checkbox"/> 课堂上演示课件的投影仪	<input type="checkbox"/> 学校的电脑
<input type="checkbox"/> 自己的电子设备（如手机、电子词典、平板电脑等）。请写出你经常使用的电子设备：_____	<input type="checkbox"/> 同学的电子设备（如手机、电子词典、平板电脑等）。请写出你经常使用的电子设备：_____

2. 在校外，我有以下方式进行数字/电子阅读：

<input type="checkbox"/> 家里的电脑	<input type="checkbox"/> 自己的电子设备（如手机、电子词典、平板电脑等）。请写出你经常使用的电子设备：_____
<input type="checkbox"/> 父母的电子设备（如手机、电子词典、平板电脑等）。请写出你经常使用的电子设备：_____	<input type="checkbox"/> 朋友的电子设备（如手机、电子词典、平板电脑等）。请写出你经常使用的电子设备：_____

B. 你的阅读活动

请回忆你最近常进行的阅读活动并打√（可多选）。

1. 在学校，我的阅读活动包括：

<input type="checkbox"/> 看教科书	<input type="checkbox"/> 看老师打印出来的课件
<input type="checkbox"/> 查阅参考书	<input type="checkbox"/> 为功课查阅报纸/杂志
<input type="checkbox"/> 看投影仪上的讲义	<input type="checkbox"/> 在课间为放松看纸质课外书
<input type="checkbox"/> 为某学科查阅网上资料	<input type="checkbox"/> 请写出常用的社交网络（如微信 QQ）：_____
<input type="checkbox"/> 上网查阅在同学间常被谈论的事情	<input type="checkbox"/> 发短信
<input type="checkbox"/> 其他，请写出：_____	

2. 在校外, 我的阅读活动包括:

- | | |
|--|---|
| <input type="checkbox"/> 为消遣读课外电子书 | <input type="checkbox"/> 为消遣读纸质课外书 |
| <input type="checkbox"/> 为消遣上网查找信息 | <input type="checkbox"/> 为学校功课上网查找信息 |
| <input type="checkbox"/> 请写出常用的社交网络 (如微信, QQ): _____ | <input type="checkbox"/> 发电子邮件 |
| <input type="checkbox"/> 用纸和笔完成家庭作业时的阅读 | <input type="checkbox"/> 用电脑或其他电子设备完成家庭作业时的阅读 |
| <input type="checkbox"/> 为消遣阅读报纸/杂志 | <input type="checkbox"/> 为学校功课阅读报纸/杂志 |
| <input type="checkbox"/> 和朋友发短信讨论家庭作业 | <input type="checkbox"/> 为消遣和朋友发短信 |
| <input type="checkbox"/> 其他, 请写出: _____ | |

C. 你的阅读方式 📖

请回忆你对于不同阅读方式的喜好并在最符合你感受的选项下打✓ (单选)。

1. 在为学校功课查找信息时, 我更喜欢使用纸质参考书或百科全书。

- 非常不同意 不同意 中立 同意 非常同意

2. 在为学校功课查找信息时, 我更喜欢使用网络。

- 非常不同意 不同意 中立 同意 非常同意

3. 在课堂上, 我更喜欢阅读纸质文字。

- 非常不同意 不同意 中立 同意 非常同意

4. 在课堂上, 我更喜欢阅读数字/电子文字。

- 非常不同意 不同意 中立 同意 非常同意

5. 在休闲消遣时, 我更喜欢数字/电子阅读。

- 非常不同意 不同意 中立 同意 非常同意

6. 在休闲消遣时, 我更喜欢纸质阅读。

- 非常不同意 不同意 中立 同意 非常同意

D. 作为一个读者 📖

请回忆在阅读时的感受, 并在最符合你感受的选项下打✓ (单选)。

1. 与数字/电子阅读相比, 纸质阅读能让我有更深入思考。

- 非常不同意 不同意 中立 同意 非常同意

2. 我觉得读纸质文字比读数字/电子文字更让我觉得放松。

- 非常不同意 不同意 中立 同意 非常同意

3. 当我在网上阅读消遣时，我往往浏览大意。

非常不同意 不同意 中立 同意 非常同意

4. 在课间时，我喜欢和朋友讨论我在网上读到的东西。

非常不同意 不同意 中立 同意 非常同意

5. 当完成作业遇到问题时，我总是想到去网上查。

非常不同意 不同意 中立 同意 非常同意

6. 我喜欢通过网络和电脑和同学合作完成我的作业。

非常不同意 不同意 中立 同意 非常同意

7. 比起分享读过的纸质书，我更喜欢和朋友分享在网上读到的东西。

非常不同意 不同意 中立 同意 非常同意

E. 你的在线阅读理解能力

请回忆你在线阅读时的感受并在最符合你感受的选项下打√ (单选)。

1. 我理解老师在课上用投影仪演示的电子文字。

非常不同意 不同意 中立 同意 非常同意

2. 我知道怎样使用网络来找某个知识点的相关信息。

非常不同意 不同意 中立 同意 非常同意

3. 我知道鉴别/筛选网上的信息很重要。

非常不同意 不同意 中立 同意 非常同意

4. 我经常会比较我在网上看到的不同观点。

非常不同意 不同意 中立 同意 非常同意

5. 为了解某个知识点，我觉得使用网络比查阅纸质书能更快地拓展我的认识。

非常不同意 不同意 中立 同意 非常同意

6. 为学校作业查找信息时，我觉得使用网络查询比使用纸质书有更好的理解。

非常不同意 不同意 中立 同意 非常同意

7. 我能够整合网上与之相关的信息并用来学习某个知识点

非常不同意 不同意 中立 同意 非常同意

8. 与纸质阅读相比，数字/电子阅读更容易让我分心。

非常不同意 不同意 中立 同意 非常同意

F. 关于你的一些个人信息 📄

性别： 男 女
年级： _____
年龄： _____

☺感谢你的参与☺

问卷结束👋

如果你愿意参与后续的个人采访，请留下你的姓名和联系方式。

姓名： _____
电子邮件： _____
或其他联系方式： _____

请放心，你的所有信息都将保密。

Appendix 6 Interview guide for individual interviews

Issues to discuss before interview:

- Participant's age and Year group
- Purpose of the interview
- Asking for permission for voice recording
- Confidentiality and participant's right to withdraw

Interview questions:

Literacy practices	<ol style="list-style-type: none"> 1. Could you tell me any practices that you think are reading you have in school, print and digital? 2. What kind of digital devices can you use to get access to digital texts in school?
Preferences for text formats	<ol style="list-style-type: none"> 3. How about your practices of reading at home? 4. How much time do you usually read digitally a day? 5. How do you find read from whiteboard for a class? 6. Is there any difference between reading from whiteboard and reading printed texts for a class? 7. What makes you prefer printed/digital texts over the other text format for a class? 8. Apart from reading in a class, in terms of reading for academic purpose, what kind of text format do you prefer? Why? 9. For reading for pleasure, what text formats do you usually use? Why?
Reading performance	<ol style="list-style-type: none"> 10. Does the text format affect your reading performance? 11. How does it affect your reading performance? 12. What do you like when you finish homework with pen and paper? How about finishing homework digitally?

Online reading comprehension	<p>13. It is difficult for you to comprehend online texts for example for your academic reading?</p> <p>14. What do you usually do to deal with online information to meet your reading purposes?</p> <p>15. In what way does text format affect your reading performance?</p>
Reading strategies	<p>16. What kind of strategies do you use when you read digitally for academic purposes?</p> <p>17. Are these strategies different from those used for print reading?</p> <p>18. How do you pick up these reading strategies?</p>
Other	<p>19. What do your parents and teachers know about your out-of-school literacy practices? And your digital literacy practices?</p> <p>20. What do they think about your digital reading practices?</p>

Appendix 7 Interview guide for individual interviews (Chinese)

中国学生个人采访纲要

采访前之相关事宜：

- 受访者的年龄和所在年级
- 本次采访的目的
- 征询对采访内容录音的许可
- 告知受访者的中途推出之权利以及对本次采访的保密

采访问题

阅读活动	1. 请列举任何在学校你认为是阅读的活动，数字化的和纸质化的？ 2. 在学校，你能够使用什么设备进行数字化阅读呢？
	3. 你在家阅读活动有哪些？ 4. 一天中你有多少时间进行数字化阅读？
阅读形式 及喜好	5. 你对于上课时从屏幕上阅读有什么想法？ 6. 在课上从屏幕上进行阅读和在纸质书上阅读有什么区别？ 7. 是什么原因导致你更喜欢在课上喜欢使用某种阅读形式？ 8. 除了在课上的阅读，你更喜欢用那种阅读方式进行与学习有关的阅读活动？为什么？ 9. 对于消遣娱乐的阅读你更喜欢哪一种阅读形式呢？为什么？
阅读效果	10. 阅读形式会影响你的阅读效果吗？ 11. 阅读形式是怎么影响你的阅读效果的？

	12. 阅读形式在那些方面影响了你的阅读效果？
网络阅读理解	13. 对你来说，理解理与学习有关的网络上文字会困难吗？ 14. 在进行网络阅读时，你一般如何处理网络信息以达到你的阅读目的？ 15. 你认为进行网络阅读最难的一部分是什么？
阅读技巧	16. 在进行数字化阅读时，你一般有哪些阅读技巧？ 17. 这些技巧和你平时进行纸质阅读使用的技巧有什么区别？ 18. 你是怎么获得这些技巧的？
其他	19. 你的老师和父母知道你的这些校外的阅读活动吗？你的校外数字化阅读活动？ 20. 他们对于你的数字化阅读活动有什么看法呢？ 21. 你一天中怎么安排数字化阅读和纸质阅读呢？

Appendix 8 Example of email sent to schools/head teachers

I am a PhD student in Education at the University of Warwick, and my name is Xiaofan He. I am currently doing my PhD project about teenagers' literacy in the new media age.

My research topic is: A comparative study of the UK and Chinese adolescents' perceptions of digital reading. I would like to get knowledge of how students perceived digital reading when they are exposed to both printed and digital texts in daily living and learning.

I am wondering if there is any possibility that I visit your school and invite students to participate in this research.

My research will include the collection of following data:

Student interview (focus groups)

Student self-completion questionnaire

Student individual interview

I can visit your school at any time to meet you to discuss my research and the time management for the data collection. In addition, I have got the DBS (CRB) check and the ethical approval from my department. I will bring them over when we have the meeting.

Thank you so much for your time, patience and kindness.

Kind regards,

Xiaofan HE

Appendix 9 Example of email sent to schools/head teachers (Chinese)

我是英国华威大学教育学在读博士，我的名字是何晓繁。目前我正在研究有关青少年在数字化时代阅读情况。

我的研究课题是：中英两国中学生关于数字化阅读看法的比较研究。

是否有可能我到访你的学校并邀请学生们参加到此研究中来？

我的研究包括以下内容：

学生问卷调查

学生访谈（个人形式）

我可以在任何时间到访贵校并与老师讨论与此研究相关事宜。

非常感谢你的时间与帮助。

此致，

敬礼

何晓繁

Appendix 10 Rationale for choosing Mann-Whitney U test

In order to explore difference between the UK and the Chinese students in terms of students' perceptions of reading on screen and normal print including preferences, self as a reader and online reading comprehension, Mann-Whitney U Test was adopted. The technique Mann-Whitney U test is used to compare 'difference between two independent groups' (Pallant, 2007, p.220) when the dependent variables are non-parametric data. This technique is regarded as the alternative to the t-test for independent samples, when data is not normally distributed.

In order to use Mann-Whitney U test, four assumptions should not be violated. The first assumption focuses on the nature of variable. To be tested variables should be either at a continuous level or on an ordinal measure. In the study, students' perceptions were measured by using 5-point Likert scale (from Strongly Disagree to Strongly Agree) and the data of perceptions were coded into five categories according to the 5-points scale. The ordinal level of dependent variables in the study met this assumption.

The second assumption requires that two categorical and independent groups should be involved in the independent variables. The study contained data from the UK and the Chinese students, and they were two different groups. All the participants in the study only completed the questionnaire once and they had no participation in another group. This is another assumption, which seems more to be considered at the research design stage.

The final assumption is more related to the choice of Means or Medians to compare two groups. In the case of the t-test, comparing means is what researchers usually do. The Mann-Whitley U test, instead of comparing means, compares medians (Pallant, 2013). However, it is argued that whether to compare means or medians depends on shapes (distribution score of different variables in each group) of variables. If shapes are identical or similar, then medians should be used. When the shapes are not similar or very different from

between two groups, mean ranks of the Mann-Whitney U test should be used to compare rather than medians (Laerd Statistics, 2013). In order to know the shapes of each dependent variable of two groups, the researcher checked the bar chart by analysing Frequencies. It showed that there was no identical or similar shape of each dependent variable in the UK and the Chinese students. Therefore, mean ranks were used when adopting the Mann-Whitney U test result in the study. However, as Pallant (2013) discusses that 'it would be better to report the median value for each group', medians of each group in each dependent variable was also computed in the study.

The effect size can be calculated by using the formula $r = z/\text{square root of } N$ (where N = the total number of cases). According to Cohen (1995, cited from Pallant, 2007) criteria of effect size, 0.1 = small effect, 0.3 = medium effect, 0.5 = large effect. The study used this formula to get effect of Mann-Whitney U test and interpret the effect size based on Cohen's criteria.

Appendix 11 The example of coding of focus groups (UK student)

The screenshot displays the NVivo software interface. On the left, a 'Nodes' list shows various categories with their respective source and referential counts. The main window shows a transcript of a focus group discussion with several paragraphs of text. On the right, a 'Coding Density' chart visualizes the distribution of codes across the text.

Name	Sources	Referer
Acade	0	
Activiti	0	
Attitud	0	
Experien	1	
Gender	0	
Owner	0	
Prefere	0	
Purpos	0	
Readin	0	
Time o	0	

Transcript Text:

R: So, here we go? Could you tell me your experience about reading on screens? Any screen.

P1: I would read pocket books.

P2: People read on Kindle, just like a lot of books in one, but it's digital.

P3: It could be quite annoying, like blowing on your faces. It's probably much more comfortable sitting there with a natural book handed, the natural one.

P1: Yes, I don't really like Kindle, it looks wired, sometimes.

P2: It's hard to imagine what's going on and you just have a really bright screen on you face, sort of.

P1 (laugh). P1: Yes, it doesn't feel the same how it does in an actual book. You can't really see the progress if you are on a Kindle or something. It's percentage but you can't really see it.

P2: It might be less time wasting time you know going to store, might be cheaper. But it's better just to have the book cuz well Kindles tiny, easy to lose, and books are quite nice. You can use it to read again and again without bored. Cuz, well, you know, you understand what the book about. But you understand it on the Kindle easy to be distracted.

Coding Density Chart:

- More Practical
- Experience of digital reading
- In class
- Negative
- Searching up things on the internet
- Experience of reading in school
- Comprehension of printed paper
- Positive
- Prefere printed paper
- Preference of books
- Hard
- Dist

Appendix 12: The example of coding of focus groups (Chinese student)

The screenshot displays the NVivo software interface. On the left, a 'Nodes' list shows various categories with their source counts. The main window shows a transcript with three paragraphs (R, P3, P4) discussing the differences between paper and digital reading. On the right, a 'Coding Density' chart visualizes the codes applied to the text, with labels such as 'Cause physical unconfidence', 'Academic work', 'Reading news', 'Mobile phone', 'Watching for fun', 'OO', 'Negative', 'Prefer digital texts', 'Imagination', 'More accessible', 'Prefer printed texts', 'Decorative', and 'Travelling around'.

Name	Sources	Re
Acade	0	
Activiti	0	
Attitud	0	
Digital	0	
Experie	0	
Gender	0	
Owner	0	
Prefer	0	
Purpos	1	
Readin	0	
Time	0	

R: 看纸质的和电子的有什么不一样呢?

P3: 感觉是不一样的。如果说要读长篇的东西, 我就需要在纸上看。因为看电子的东西我总是不够集中, 容易分心, 很容易快速的读过那些东西。那些短点的文章, 就比较适合看电子的。在电子产品上看新闻的话, 我就完全没有问题, 不过看长的文章尤其是很厚的书, 我就必须用传统的方法阅读, 就是看纸质的。其实也是因为看纸质的东西理解起来比较好一些, 更能够看的进去。

P2: 看屏幕上的东西我总感觉是少了什么。就是感觉少了一个维度, 那种第三维度的缺失。纸质书的话可以翻开, 翻动的时候它的厚度也在不断地变化, 这就是我觉得的第三维度。抱着书的时候你可以感受到重量, 还有长和宽。纸质书同时还很有美感, 一方面设计总是很精美, 不像有的电子书就是一个很简单的书名。另一方面, 看书的时候我比较能够想象出一些画面, 也不知道是不是因为习惯问题。不过呢, 数字阅读的话非常方便, 随时都能看, 只要你有设备。

P4: 是看你需要读什么吧。如果是看动态的东西, 那肯定就是要电子产品上看。我经常在手机上上看一些视频, 很方便, 随时都能看。一个小小的东西能够存储很多的资源, 或者是无穷尽的资源, 所以说电子的东西能够支持随时随地的阅读和学习。但是, 电子的东西看久了经常眼睛很痛, 因为屏幕特别小, 这对我的视力不好。纸

Appendix 13 The example of coding of individual interviews (UK student)

The screenshot displays a software interface for qualitative data analysis. On the left, a 'Nodes' list shows categories like 'Attitud', 'Compa', 'Differe', 'Idea of', 'Literac', 'Perceiv', 'Prefere', 'Readin', and 'Writing' with associated source counts. The main window shows a text transcript with two paragraphs. The first paragraph is highlighted in yellow and contains the text: 'get on my phone or my computer or whatever and read a few books. So I got quite a few books on there. I like audiobooks as well coz I think it's quite good. Yes, so. But when I am at home, mostly, printed books.' The second paragraph is highlighted in purple and contains the text: 'P: Umm, for me personally, the whole kind of having a book physically, turning the pages, the smell of books, the whole kind of ceremony of reading a book. I really enjoy that. And online, it's not quite the same. But as I've already said before, you know I can find extra information from the text or I can look up words quicker or yep, I think sometimes you can change the size, the fonts if it's difficult for me to read. I really like the fact that you can change the font, the size, the colour, the brightness and I quite like how you can adapt to that.'

On the right side of the interface, a coding scheme is visible, listing various codes such as 'Virted level demanded', 'Distraction', 'Teacher's use of technology', 'Perceived understanding of digital texts', 'Online reading comprehension', 'Reading or chatting with app', 'Performance', 'Literacy practices with digital texts', 'Feeling of digital reading', 'Comparison between print and digital reading', 'Literacy practices', 'General preference', 'Preferences of texts', 'Preference for digital texts', and 'Preference for print texts'. The text in the main window is annotated with colored lines corresponding to these codes: a yellow line for 'Literacy practices with digital texts', a purple line for 'Preferences of texts', and a red line for 'Preference for digital texts'.

Appendix 14 The example of coding of individual interviews (Chinese student)

The screenshot displays a coding software interface. On the left, a 'Nodes' panel lists various categories with their respective counts: Attitud (1), Compa (1), Differe (1), Idea of (1), Literac (2), Perceiv (2), Prefere (2), Readin (2), Readin (1), and Writing (1). The main window shows a transcript of an interview with the following text:

R: 那个能说说在学校的话, 你喜欢电子的多过于纸质的?

P: 额, 嗯, 这不一定。如果是时间比较多的话, 就是比较用书的。如果是看一些碎片化的话, 就会选择用电子的。电子阅读的东西很多都是短小的, 很适合在细碎的时间上看。如果是时间集中在一起的话, 看书本的感觉会比较好。

R: 是给你一个什么样的感觉呢?

P: 就是, 碎片话时间的话, 你用电子的去, 就是你会比较快, 你不会忘记到底看到了哪一页。但是如果是整段时间去看的话, 电子的话我怕我会分心去做一些其他的事情。如果用书本的话就会看那本, 就会一直往下看。(看纸质的话)如果是碎片化的话, 经常会忘记看到那一页, 就不会再想去看了。不知道自己看到哪里了。还有一种感觉是在你看纸质东西的是会比较沉浸其中, 就是只有阅读这一件事没有其他。有的时候慢慢享受不是很快的一扫而过也未尝不是一件好事。

R: 那你说用电子设备你容易分心。

P: 就是长时间做一件事情的话, 因为连着网的时候经常会挑出一些乱七八糟的东西, 如果你不小心点到了的话那就悲剧了。

On the right side of the interface, a 'Coding Densities' panel shows a list of codes with horizontal bars indicating their frequency or density. The codes include: Easy to access, Digital books in school, Literacy practices with digital texts, Gender differences, Feeling of digital reading, Boundaries of reading, Literacy practices, Idea of what reading is, Negative, Parents' attitude to digital text format, Curriculum based, Reasons for preferences of printed texts, General preference, Preferences for digital texts, and Coding Density.