



Learner Autonomy in EFL Reading with Digital Technology at Secondary School Level

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Screenagers today may not have any difficulties in using digital technology for everyday social and entertainment purposes, but the extent to which they can make effective use of it for their own learning has not yet been fully explored. The purpose of the study is to investigate secondary school students' autonomous learning and perspectives on the use of digital technology in EFL reading. With a total of 275 middle school students in Gyeongsang-do area of South Korea, the research was carried out in a mixed method. The data was collected through a survey questionnaire, supplemented by interviews. The results identified 60.4% of participants as autonomous learners in reading with digital technology. The level of learner autonomy was also positive for the five categories. The students' perspectives are slightly positive (52.2%) towards the use of digital technology in autonomous reading. While recognizing its usefulness, they were neither interested nor motivated in the use of digital technology in autonomous reading. Grade three responded most negatively in terms of their perspectives on the use of it. It is suggested that teachers should promote the students' enjoyable reading by exposing it to various useful resources and monitoring their progress.

Keywords: learner autonomy, EFL reading, autonomous reading, digital technology

Introduction

Along with the worldwide education reform into the competency-based curriculum, the Korea Ministry of Education has come up with the core competencies for the growing generation. One of the most critical skills suggested here is creativity (MOE, 2015). Still, conventional rote learning and teaching are not even close to cultivating it and autonomous learning has been proposed as an alternative. Known as "the ability to take charge of one's learning" (Holec, 1981, p. 3), learner autonomy is believed to provide the learners with a free choice throughout the learning process. As can be evidenced by the recent utilization of e-textbook and software education in Korean secondary schools, digital technology is very often viewed as one of the most powerful tools to promote the students' autonomous learning (KICE, 2017; MOE, 2015).

English as a Foreign Language (EFL) learning is no exception. In an EFL environment like Korea where the natural contact with the target language is limited, digital technology has opened up new opportunities for the students. The real texts online allow learners not just to absorb more language input but also to understand the cultural elements. The rich-resource environment is expected to create an enjoyable learning environment for the students (C. H. Lee, 2015; Pahomov, 2014). The students would then engage in the learning on their own accord, ultimately resulting in the rise in learner autonomy.

Fueled by the national curriculum revision, the schools have initiated the active use of digital tools (KICE, 2018). Now then, the issue is whether the students are ready to take advantage of these changes for their own learning.

Previous studies so far have shown the importance of digital technology in improving key learner competencies required by future society (Bayat, 2011; Broadbent & Poon, 2015; Cho, 2009; Han, 2017; Hazaea & Alzubi, 2018; Inan, 2013; N. Y. Kim, 2017; Lau, 2014; Seo & Choi, 2014). Some of them even reveal the positive impacts of different types of digital technology on learner autonomy (Bayat, 2011; Hazaea & Alzubi, 2018; Inan, 2013; Lau, 2014; C. H. Lee, 2017; Ryu, 2017). However, they were often concerned with higher education (Inan, 2013; Ryu, 2017) or general education (Cazan, 2014; Lau, 2014), rather than narrowing down its view to a language specific education. Few studies have touched upon EFL students' autonomy in reading with their digital competence at a secondary school level.

This study intends to explore secondary school students' readiness for autonomous learning with the use of digital technology in improving EFL reading comprehension. Korea ranked as the top country for four years (2016-2019) in the information and communications technologies (ICT) Index in terms of ICT access, use, and skills, e.g., household internet access at home (99.69%), household with broadband internet access at home (99.69%), household with mobile broadband internet access at home (99.55%), etc. (<https://stats.oecd.org/>). It is true that teens today are believed to have easy access to smartphones, computers, websites, apps, and many other types of digital technology in Korea. However, it remains unknown how prepared they are to make use of digital technology for their own learning. The widespread use of digital technology among teens makes it a worthwhile attempt to investigate their autonomy using digital technology, and perspectives. Since reading is in which EFL learners of Korea engage the most, and it requires less amount of feedback compared to other language skills such as speaking or writing, the learner autonomy is to be explored in line with the students' engagement in EFL reading with digital technology. Therefore, the study is designed to answer the following research questions: 1) To what extent are the students' autonomy in EFL reading using digital technology?; 2) What are the students' perspectives on the use of digital technology in autonomous reading?; and 3) Are there any grade differences in terms of the above research questions?

Literature Review

Digital Technology in EFL Reading

Digital technology, an overarching term including ICT, is often suggested as a means to facilitate teaching and learning of EFL reading. Along with the concepts of computer-assisted language learning (CALL) and multimedia-assisted language learning (MALL), a variety of approaches using digital technology have been put forth and studied for their potential in teaching and learning of a language (Chun & Plass, 1997; Doering & Beach, 2002; Hsu, 2013; Kern, Ware, & Warschauer, 2004; D. J. Kim, 2002; C. H. Lee, 2015). By digital technology, this study also refers to the use of computer-, multimedia-, and mobile-assisted strategies to support and reinforce students' learning. As for the EFL learners, using digital technology has become an important skill to be equipped with, in that it can bring them closer to the rich environment of the target language. Learners not only find and access reading content that fits individual purposes but also interact with authentic material, therefore, the reading can be an opportunity to connect themselves to the real world (International Literacy Association, 2018). In other words, using digital technology in EFL reading includes development in competencies based on basic reading literacy and information literacy that enables learners to find, read, and think critically about the information. Since a lack of adequate skills in using digital technology can bring about profound effects in the long run in terms of opportunity and employability (European Union, 2016), it should be nurtured at school level.

The activities using digital technology are based on the techniques for teaching and learning of traditional reading classrooms. Still, it contributes largely to improving the reading skills of extensive and

intensive reading, skimming and scanning, speed reading, and even sub-skills-oriented reading (Fox, 1986; C. H. Lee, 2015). The reading comprehension can be practiced easily on a digital device, such as computer, tablet PC, smartphone, and more. Plentiful websites enable students to work on extensive reading exercises with a great deal of language input and high-quality visual inputs (C. H. Lee, 2015). The recent incorporation of e-textbooks for Korean secondary schools allows students to read the same text through the screen and even to highlight, make notes, and save them for later reading (C. H. Lee, 2017). It goes beyond the printed textbook by including audio and video clips such as interviews with authors. In an EFL learning context, these authentic visual aids can serve as valuable exposure to the target language along with the high level of reading comprehension.

The use of new teaching and learning tools in an EFL class should accompany an adequate strategy instruction to promote the students' reading comprehension (Macaro, 2006). By strategy instruction, the researchers mean the explicit instruction on the practice of strategy for improving learners' reading comprehension (Taylor, Stevens, & Asher, 2006). Some of the features introduced by Grabe and Stoller (2011) include encouraging students to practice the strategies, explaining the benefits of using them, exchanging feedback, and modeling expert reading behavior.

Learner Autonomy in EFL Reading with Digital Technology

Despite many attempts to define learner autonomy, agreement to the single concept remains elusive. Holec (1981) defines learner autonomy as "the ability to take charge of one's own learning" and it is the ability to self-direct in learning (p. 3). His definition is one of the most widely used definition of learner autonomy. Autonomy is the capacity of the learner. Dickinson (1987) defines autonomy as the situation in which "the learner is totally responsible for all of the decisions concerned with his learning and the implementation of those decisions" (p. 11). Little (1991) describes it as "a capacity for detachment, critical reflection, decision-making, and independent action" (p. 4). There may be slight differences in defining the term learner autonomy (Benson, 1997; Little, 1991), but the following descriptions of its impact are included in common. First, learners use learning processes, strategies, and feedback in a purposeful way to improve their reading performance. Second, learners use self-directed feedback during their learning. Third, learners describe the cause and method of selection in language learning tools. Last, learners put additional will, time, and effort in their own learning (Benson, 1997; Holec, 1981; Little, 1991). Learner autonomy is often used as an umbrella term to describe self-directed learning, self-instruction, autonomous learning, self-study, self-planning learning, individualized learning, and self-regulated learning (Benson, 1997; Dickinson, 1987; Holec, 1981; Little, 1991).

Learner autonomy makes it a condition that learners actively engage in the learning process. The two key concepts here are metacognition, and motivation (Bravo et al., 2017). Metacognition refers to the ability to take control of one's own cognitive process, including thinking and reflecting before, during, and after reading (Morin, 2014). Metacognition in EFL reading is to process various information and help learners reflect on reading activities for the sake of internalization, understanding, and recalling (Lee, Kim, Kim, & Lee, 2011). Such a self-monitoring process help learners to successfully analyze and evaluate their reading performance. Learners who are well aware of their learning methods are more likely to show higher achievement in reading (Brown, 1994). Motivation can help improving reading comprehension for EFL learners by shaping a positive attitude towards learning and achieving the objectives (Dörnyei & Ushioda, 2013; Yabukoshi, 2020). Unlike English as a second language (ESL) students, who have everyday exposure to the target language texts like street signs and restaurant menu, EFL learners have to be motivated even more in order to independently interact with real texts (Najeeb, 2013). Supported by contemporary motivation theory of self-determination, the term autonomous reading is used to describe students' engagement in reading for their own enjoyment or personal significance (De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012). With the paradigm shift from the teacher- to student-centeredness, some suggestions have been made to turn students' reading motivating and inspiring (Bravo et al., 2017; Lai & Gu, 2011). Digital technology, ranging from computers and

smartphones to software and websites, has become an essential tool for students' reading and this makes teachers consider adopting it to stimulate students' intrinsic motivation in reading (Ushioda, 2011). Once autonomous reading can be achieved by using digital technology, students can enjoy the ample reading resources and harness the connectivity with the target language environment at the same time.

However, as students differ in their ways to assimilate the new resources (Grasha, 2002), the role of teachers as a mediator is crucial for students to perform autonomous reading using digital technology. For instance, teachers should adjust the flow and complexity of reading contents to make sure that they are in line with the learners' needs (Griffith & Ruan, 2005) and restructure the content with visuals that are relevant to the students' personal experience. These efforts are likely to help the reading contents to last longer in their memory, generalize the reasoning process in other contexts, and thereby motivating the students to become an autonomous reader (Schunk & Zimmerman, 2007).

Previous Studies on Learner Autonomy in Reading with Digital Technology

The Fourth Industrial Revolution has increased the pedagogical interest in digital technology to improve learner autonomy, as a pathway to life-long learning. Many researchers in the field of EFL education have recently explored the positive influence of using digital technology for language learning (Alzubi, Singh, & Pandian, 2017; Banditvilai, 2016; Cho, 2009; Hazaea & Alzubi, 2018; N. Y. Kim, 2017; Kim & Kim, 2012; J. I. Lee, 2014; Wan-Er, 2008; etc.)

Hazaea and Alzubi (2018) have examined in their study how students perceive the impact of mobile assisted language learning on learner autonomy in the EFL reading context. The students who participated in the interviews agreed that the use of digital technology extended their reading choices and time and place of reading EFL materials. However, many of the students were not sure whether they are making appropriate reading choices on-line. They were questioning their digital competence in terms of finding authentic reading material. At the same time, they see the need to learn how to do so to truly take advantage of the digital resource out there (Hazaea & Alzubi, 2018).

In Banditvilai's (2016) study on the relationship between students' language skills and the use of supplementary e-learning system, students' reading skills appeared to develop more when aided by the e-learning, compared to in-class-only teaching environment. The results showed that the use of digital technology encouraged students to study independently and to spend extra time in learning. The learners in general had a positive attitude towards using digital technology as a supplementary learning tool outside the classroom (Banditvilai, 2016). Alzubi et al.'s (2017) study on the learner autonomy for EFL students show that preparatory year university students do not possess a satisfactory learner autonomy in the context where teacher-centeredness and rote learning is rampant. Wan-Er's (2008) study shows that greater autonomy can be generated through a positive attitude and learning motivation.

Many previous studies, including the ones reviewed above, have revealed the positive impact of digital technology on EFL learning, and the importance of learner autonomy in EFL learning. In Korea too, many recent studies have revealed the positive impact of computer-, multimedia-, and mobile-assisted mobile learning on EFL education or the learners' perspectives on a specific type of digital technology (Cho, 2009; N. Y. Kim, 2017; Kim & Kim, 2012; J. I. Lee, 2014). So far, however, these studies have focused largely on higher education or the impact of digital technology. Not many studies have concentrated on the students' autonomous use of digital technology in EFL reading, especially at the secondary school level.

Method

Participants

In Korea, whose advancement in ICT is known to rank high at the world level, it would be meaningful

to involve secondary school students in the study. The participants were middle school students in Gyeongsang-do area in South Korea and gathered by cluster sampling. They were all native speakers of Korean, male, age ranging from 13 to 15. They have been studying English as a Foreign Language for at least four years, as part of the regular school curriculum. Initially distributed to 338 students, 281 responded to the survey questionnaire that was designed to measure learner autonomy in reading using digital technology, and perspectives on it. The return rate was 83.1%. With the exemption of six unreliable or non-responses, the final number became 275 (Table 1).

TABLE 1
Survey Participants

Grades	Number of Students
Middle School Grade 1	98 (35.6%)
Middle School Grade 2	70 (25.5%)
Middle School Grade 3	107 (38.9%)
Total	275 (100%)

Among the 275 survey participants, 18 had volunteered to be involved in the interview. They were randomly sorted into either an individual or a group interview. Ten individual and two group interviews took place.

Data Collection Instruments

The quantitative data for the study is collected through a survey questionnaire, which consists of three parts: Part A, B, and C. Part A is designed to identify learner autonomy in reading with digital technology. Part B is designed to inquire into their perspectives on the use of digital technology in autonomous reading. These two parts (Part A and B) of the questionnaire are measured on a four-point Likert scale without a neutral point to avoid any ambiguous responses and encourage the respondents to make a clear decision. The last part, Part C, collects brief biodata of the students. In addition to the survey, individual and group interviews followed to supplement the statistical and descriptive results.

The questionnaire

Part A of the questionnaire is aimed at measuring the learner autonomy in EFL reading with digital technology. The questionnaire items were adopted from the Dixon’s (2011) Short List of learner autonomy. Having reviewed at his earlier works, Dixon strived to construct a reliable quantitative measurement tool to evaluate a language learner’s autonomy level. The Short List identifies six areas of learner autonomy, including linguistic confidence, information literacy, social comparison, a locus of control, metacognition, and self-reliance (Dixon, 2011). Based on the classification, the statements have been modified to suit the age of the participants and the purpose of the study. Rather than placing the items according to the categories, they were randomly placed to prevent any biases. This part consists of 25 statements and the distribution of the items is shown in Table 2. In order to avoid any confusion aroused from the language, the questionnaire had been first established in English. After a slight modification to suit the age group of the participants, it was translated into Korean by the researcher. The final confirmation was made with the help of a professor at the Department of English Education. The reliability of the part B appeared as high as .95 (Cronbach’s alpha).

TABLE 2
Distribution of Learner Autonomy Statements on Categories

Categories	Statements
Linguistic confidence	7, 9, 10, and 17
Information literacy	3, 8, 11, 12, and 13
Social comparison	15, and 24
Locus of control	14, 16, 19, and 23
Metacognition	4, 6, 18, 20, 21, 22, and 25
Self-reliance	1, 2, and 5

Second, part B aims to investigate the students’ perspectives on the use of digital technology in their reading with digital technology, which was modified based on C. H. Lee’s questionnaire (2009). The six types of perspectives examined are interest, motivation, usefulness, comfortableness, confidence, and satisfaction. The reliability of this part turned out to be .87 (Cronbach’s alpha). Last, the participants’ year of middle school is asked for the last, in Part C of the questionnaire. Their willingness to participate in the interview was also asked here.

The interview

Both the individual and group interviews were conducted in a semi-structured format, and the questions for the interviews were developed based on the statistical results of the survey. The purpose of the interviews was to collect detailed answers for each of the four research questions of the study. The group interviews were carried out not just to elicit a more natural response by providing a more comfortable setting but also to wake up the dormant ideas by sharing their answers.

For the first and second research questions, the students were asked to provide specific experiences, difficulties, problems, and benefits with digital technology and its use in autonomous reading. They were also asked to express personal opinions, thoughts, beliefs, and feelings regarding the use of digital technology in autonomous reading. To answer the third question on the grade difference, the interview questions were prepared in line with the statistical significance. The mixed group interviews were aimed at comparing the different responses of the three grades.

Procedures

The research consisted of four stages of planning and preparation, pilot study, actual research, and result analysis. In the planning and preparation stage, previous studies related to the research have been reviewed. Also, some of the potential questionnaire frameworks were collected and compared. Next, the questionnaire was carefully designed based on the precedent frameworks of Dixon’s (2011) Short List and C. H. Lee’s (2009) questionnaire with some modifications to suit the study purpose.

Once all parts of the questionnaire were fully developed, a pilot study preceded with 19 middle school students of the same condition to verify the questionnaire. Minor revisions were applied to the questionnaire based on the comments from the pilot study samples. The items which received frequent questions had been rephrased and clarified. Through this process, small revisions were made on the items for a more precise description. The main study began once these processes had been completed. Individual and group interviews were carried out after completing the survey. The responses of the interviewees were recorded, transcribed, and then translated by the researchers. The entire process took seven months.

Data Analysis

A total of 275 questionnaires were analyzed. All quantifiable data from the survey questionnaire was

analyzed using the Statistical Package for Social Science (SPSS) Statistics ver. 23. The accuracy and precision of the questionnaire items were confirmed through the Cronbach alpha coefficient. The data were analyzed primarily with the frequency and descriptive statistics to show and summarize the patterns of the participants' responses. Tables and bar graphs were used to describe the results and to grasp the level of statistical significance. For research questions 1 and 2, one-way analysis of variance (ANOVA) followed to explore the differences among the interval variables. For research question 2, crosstabulations were also performed for a detailed distribution of the variables. Pearson's Chi-square test was used to find out any statistical significance. The level of significance is set at 95% ($p < .05$).

The qualitative data collected through the interviews were coded and analyzed to enable a further interpretation of the participants' level of learner autonomy in reading with digital technology, and perspectives. The interview responses were quantified and classified according to their relevance to the theme. High-frequency and unexpected responses are illustrated with the excerpts.

Results and discussion

Learner Autonomy in Reading with Digital Technology

Overall learner autonomy in reading with digital technology

The first part of the survey was designed to measure the participants' learner autonomy (LA) in reading using digital technology (DT). It was also composed of 25 statements, with a four-point measurement scale. The calculation for learner autonomy was 0-1.50 = non-autonomous, and 1.51-3 = autonomous learners. Among the 275 participants, 60.4% (166 students) were determined as autonomous learners and 39.6% (109 students) appeared as non-autonomous learners in reading with digital technology (Figure 1). More than half of the students were found to be autonomous readers with the ratio of 6:4.

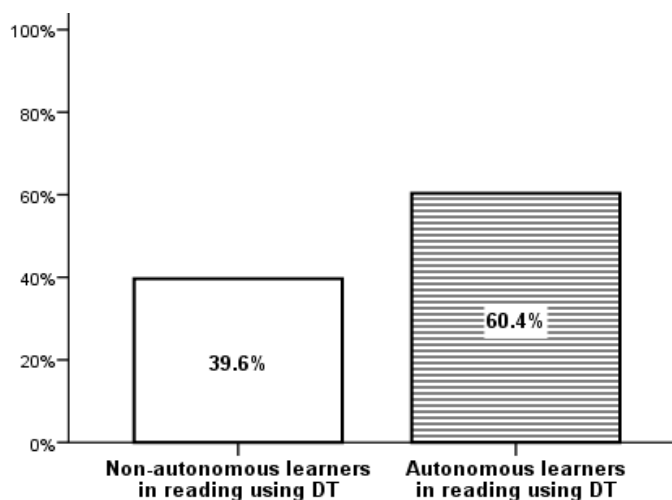


Figure 1. Percentage of autonomous learners and non-autonomous learners in EFL reading with digital technology.

The result may imply that the high level of ICT access and digital literacy does not naturally flow into the use of digital technology in their own reading as mentioned in the introduction. Many students still appear to draw a line between study and fun. Perhaps it is not the students' fault. Schools and parents view the students' use of digital technology as a complete break from studying and that stereotype must have led the students to establish a border between learning and digital technology. It is unfortunate that they are not making enough use of what they possess, digital literacy and accessibility.

The participants' overall autonomy in reading using digital technology was 1.64, with .58 of standard deviation in Table 3. The learner autonomy reached to the positive only by a small chance of .14. The mean value for grade 2 (1.80) came highest, followed by grade 1 (1.67) and then 3 (1.50).

TABLE 3
Learner Autonomy in Reading with Digital Technology

Grade	N	Mean	SD
Middle School Grade 1	98	1.67	.55
Middle School Grade 2	70	1.80	.50
Middle School Grade 3	107	1.50	.61
Total	275	1.64	.58

The pattern for the participants' learner autonomy appears rather sporadic between the students' grades. The result from the one-way ANOVA test also showed that there was a significant difference between the three grades at $p < .05$ level [$F(2, 272) = 6.108, p = .003$] (Table 4).

TABLE 4
The Result of One-way ANOVA on Learner Autonomy in Reading with Digital Technology

Variable	Variance	Sum of squares	df	Mean Square	F	Sig.
Learner autonomy	Between groups	3.895	2	1.947	6.108	.003
	Within groups	86.724	272	.319		
	Total	90.618	274			

Post-hoc tests were conducted to compare means and differences between groups. It was found that there were differences between grade 2 (1.80) and 3 (1.50) ($p = .002, p < .05$). Grade 2 had markedly higher learner autonomy in reading using digital technology. A reason for the difference may be the shift of their study purpose. Many of the third graders who looked ahead began preparing for high school and their priority concern often became achieving high scores on the tests, including graduation exam and placement test. As the burden of test scores increments, they tended to collect only the information that is likely to be on the test. The information they needed was usually in the teachers' hands, not online. In that case, students would pay closer attention to the teachers, at the expense of autonomous learning opportunities. They had the tendency to limit their readings to textbooks and printouts, neglecting the importance of extensive reading.

Learner autonomy in reading with digital technology by categories

The 25 statements fall into six separate categories of linguistic confidence, information literacy, social comparison, locus of control, metacognition, and tic self-reliance (Dixon, 2011). The overall learner autonomy appeared highest in terms of linguistic confidence (1.78). The participants in the study seem to maintain a fair level of confidence in their linguistic skills while using digital tools for their autonomous reading. Information literacy (1.68) ranked the second, metacognition (1.67), the locus of control (1.67), and self-reliance (1.54) followed in order. Although many of the six categories scored higher than the middle value (1.5), the positiveness was made only by a narrow margin. Notably absent was in the social comparison (1.33). The students appear to lose confidence in their reading English with digital technology if put against the other fellow students. It can be said that the students' linguistic confidence does not necessarily mean their confidence in relation to others.

TABLE 5
Learner Autonomy in Reading with Digital Technology by the Six Categories

Categories	Grade	N	Means	SD
Linguistic confidence	Grade 1	98	1.75	.64
	Grade 2	70	1.91	.56
	Grade 3	107	1.72	.66
	Total	275	1.78	.63
Information literacy	Grade 1	98	1.70	.59
	Grade 2	70	1.81	.57
	Grade 3	107	1.58	.67
	Total	275	1.68	.62
Social comparison	Grade 1	98	1.41	.66
	Grade 2	70	1.44	.68
	Grade 3	107	1.18	.78
	Total	275	1.33	.72
Locus of control	Grade 1	98	1.64	.62
	Grade 2	70	1.81	.57
	Grade 3	107	1.45	.72
	Total	275	1.61	.66
Metacognition	Grade 1	98	1.76	.59
	Grade 2	70	1.85	.58
	Grade 3	107	1.47	.66
	Total	275	1.67	.64
Self-reliance	Grade 1	98	1.54	.70
	Grade 2	70	1.73	.65
	Grade 3	107	1.42	.68
	Total	275	1.54	.68
Total		275	1.64	.58

According to the result of one-way ANOVA, the statistical significance of the grade was found in the following four areas of learner autonomy: social comparison [$F(2, 272) = 3.823, p = .023$], locus of control [$F(2, 272) = 6.798, p = .001$], metacognition [$F(2, 272) = 9.454, p = .000$], and self-reliance [$F(2, 272) = 4.477, p = .012$] (Table 6).

TABLE 6
The Result of One-way ANOVA on the Six Categories

Variables	Variance	Sum of Squares	df	Mean Square	F	Sig.
Linguistic confidence	Between groups	1.567	2	.784	1.993	.138
Information literacy	Between groups	2.180	2	1.090	2.862	.059
Social comparison	Between groups	3.907	2	1.953	3.823	.023
Locus of control	Between groups	5.718	2	2.859	6.798	.001
Metacognition	Between groups	7.195	2	3.597	9.454	.000
Self-reliance	Between groups	4.096	2	2.048	4.477	.012

In terms of social comparison, the mean values for all three graders were marked below the middle value, meaning that they generally had little confidence in reading with digital technology in comparison with others. Grade 2 reached the highest with 1.44, grade 1 came next (1.41), and grade 3 scored the lowest with 1.18. Even within the negative results, the results from one-way ANOVA showed .023 [$F(2, 272) = 3.823, p = .023$] of significant difference between the grades. The significance was determined mostly by the different responses of grades 2 and 3, according to the Post-hoc tests result. The statistical significance between the two grades was .048 ($p < .05$). Even though all three graders have a

low tendency for interaction regarding autonomous reading with digital technology, there seems to exist a certain level of interaction happening in grade 2 (Excerpt 1).

Excerpt 1. Response from SJ

... Yes, it's all in English. ... A friend of mine told me about 'Devil's Due Comics'... To be honest, I don't visit there very often, but I like to read some of the popular ones I hear a lot from my friends...

This may be a possible ground for the significant difference between grade 2 and grade 3. Still, the low scores of grades 1 and 2 tell that they did not come across sufficient chances to interact with others by themselves. Therefore, teachers should be able to organize the time during the class to let students discuss their experiences and ideas. The markedly low score of the third graders in social comparison suggests that they tended to hesitate any interaction with other students about their reading with digital technology. Without enough opportunity of sharing their thoughts and ideas during the first and second year of middle school, students must not have spotted any mutual interest by the third grade.

The category of locus of control aimed to figure out whether the participants attribute their good or bad experiences in reading using digital technology to their own abilities. The highest mean value for it was 1.81 from grade 2. Grade 1 was also positive, showing 1.64 for its mean value. However, grade 3 scored negative (1.45). The results from one-way ANOVA showed .001 [$F(2, 272) = 6.798, p = .001$] of significant difference between the grades. It was detected between grade 2 and grade 3 ($p = .001, p < .05$). The participants from grade 3 appear to have a notably low level of belief in their reading using digital technology. It implies that their self-esteem got lower and there can be two possible reasons. First, while second graders still believed that their effort can bring about academic success, the students in grade 3 tend to realize other external factors such as high school admission requirements. Encountered with more uncertainties, they might start to think that their effort is not the only factor that makes or breaks their success. Second, one or two more years of experience with the random level of texts online might result in a decrease in their confidence. If failure experience in reading with digital technology accumulates, it is very likely that they lose confidence in decoding new digital English texts.

Metacognition examined the students' level of consciousness in their reading skills using digital technology or themselves as a reader. The mean values for grades 1, 2, and 3 were 1.76, 1.85, and 1.47. There was a significance in the students' metacognition according to the participants' grade [$F(2, 272) = 9.454, p = .000$]. It indicates that there were two different sources for the above significance: one between grade 1 and 3 ($p = .003, p < .05$), another between grades 2 and 3 ($p = .000, p < .05$). Grade 3 seems responsible for both results. Grades 1 and 2 appear to hold a fair level of metacognition in reading with digital technology. They seem to regard themselves as an active reader to the extent to which they perceive the kinds of techniques they take on in reading. This is probably because they were satisfied with their current reading skills. The third graders, however, might become fed up with the monotonous reading style. As the text they encounter gets complex year after another, the students should be equipped with a variety of reading options to choose from and know how to update their reading strategies. Otherwise, they would keep on doubting themselves as an efficient reader. Thus, it would be the role of the teachers to introduce students to diverse reading techniques and walk them through a new way of reading. Once students become comfortable with the new reading style, they may consider it to be adopted in their autonomous reading as well.

Under the category of self-reliance, students were asked whether they are taking control of their reading using digital technology. While the first years (1.54) and second years (1.73) scored positive, grade 3 came negative (1.42). The statistical significance of the category appeared as $p < .05$ [$F(2, 272) = 4.477, p = .012$]. The significance was spotted to have risen from the scores of grades 2 and 3, as can be evidenced by the result of the post-hoc test ($p = .008, p < .05$). The second graders appear to take control over their reading while using digital technology in comparison with the third graders. The academic burden may be the reason. Right at the gate of the high school, the grade 3 students, if not their parents, anxiety often end up adding workbooks and handouts to their workloads. Their reading list is already too

full to spare time or energy for autonomous reading using digital technology.

Patterns of Autonomous Reading Using Digital Technology

Question 2 in the questionnaire addressed this sub-question. The engagement pattern in EFL reading using digital technology was likely to exert an impact on their perspectives as well as their learner autonomy. This part of the study aimed to explain the participants' use of digital technology in their autonomous reading prior to the analysis of their perspectives. Figure 2 indicates the overall participants' engagement in autonomous reading per week, whether it be with or without digital technology. The average hours spent on it turned out to be 3.69.

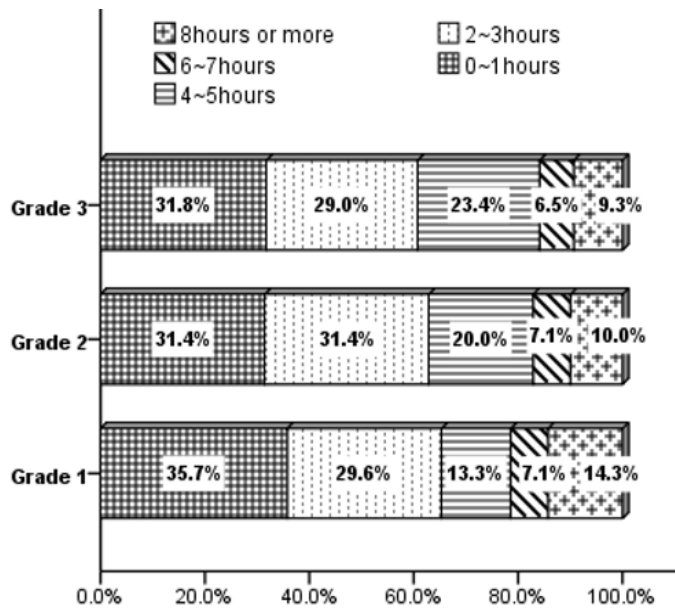


Figure 2. Students' engagement in autonomous reading per week.

The patterns of engagement hours for the three graders appear quite parallel to one another. The largest share of the participants indicated that they spent none or only one hour in reading autonomously per week. A similar number of students spent two to three hours. Fewer students responded for more hours. However, a slight increase in the share of students who read more than 8 hours per week looks interesting. It implies that those who enjoyed reading alone recognized the advantages of it and would continue to read by themselves. Students do not seem to locate an adequate amount of free time reading autonomously. The students probably have lots of other workloads from schools and private tutoring institutions such as tests and assignments, and those naturally limit their autonomous reading opportunities.

Question 4 in the questionnaire addressed this sub-question. The participants appear as if they barely spend any time on autonomous reading with digital technology. Their average time spent on autonomous reading using digital technology was 1.21 hours per week. As seen in Figure 3, more than 70% have stated that they invest none or one hour. Most of the rest went for two to three hours. Only about five percent of each grader have shown that they spend more than 4 hours. The participants appear to spend little time on autonomous reading using digital technology without any special difference between the three graders.

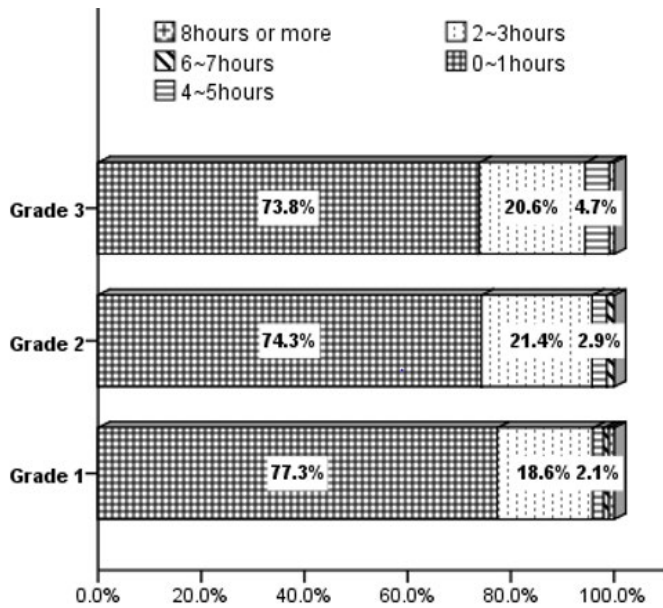


Figure 3. Students' engagement in autonomous reading using digital technology per week.

It can be interpreted as the students were either negative or ignorant of operating autonomous reading using digital technology. Since the students did not allocate much time to engage in any autonomous reading, their use of digital technology in it cannot be any higher. They were not considering digital technology as a friendly tool in autonomous reading. It adds to the idea that their prevalent use of smartphones and computers is somewhat limited to entertainment and communication purposes.

The participants were asked to indicate all digital technology they adopt in their own reading from question 5. A large number of participants used the computer (78.4%) and smartphone (68.3%) for their autonomous reading. Websites (31.7%), application (18.5%), and tablet PC (16.6%) came next in order. Although the students used e-textbook (3.5%) and CD/DVD-ROM (1.9%) in schools, they do not seem to use it as much for their own reading.

As the result describes, the students appear to choose what they feel most comfortable with. They probably have the easiest access to computers and smartphones that they decided to incorporate them as their reading tool. The reason why a relatively low number of students used websites and applications might be because they do not know of many. In that sense, teachers and schools need to introduce them to useful websites and applications so that the students can later at least try them out for their autonomous reading.

Perspectives on the Use of Digital Technology in Autonomous Reading

Questions 6-11 in part B of the questionnaire were analyzed to investigate the students' perspectives on the use of digital technology in autonomous reading. The participants' level of interest, motivation, usefulness, comfortableness, confidence, and satisfaction were measured on a four-point scale. As Table 7 tells, the students' overall perspectives appeared positive only up to 52.2%. While the students' perception on the usefulness (64.7%), comfortableness (63%), satisfaction (56.7%), and confidence (56%) with the use of digital technology in autonomous reading appeared positive, two affective areas of motivation (44%) and interest (29.1%) turned out to be negative.

TABLE 7

Students' Perspectives on the Use of Digital Technology in Autonomous reading

Variable	Very	Fairly	Not particularly	Not at all	Total
Interest	5.5%	23.6%	50.9%	20.0%	100.0%
Motivation	6.5%	37.5%	38.5%	17.5%	100.0%
Usefulness	10.9%	53.8%	26.2%	9.1%	100.0%
Comfortableness	17.5%	45.5%	25.1%	12.0%	100.0%
Confidence	12.4%	43.6%	33.1%	10.9%	100.0%
Satisfaction	11.6%	45.1%	32.0%	11.3%	100.0%
Total	10.7%	41.5%	34.3%	13.4%	100.0%

Interest in the use of digital technology in autonomous reading

The negative response of the students did not yield any significance in its relationship with their graders. The result of Chi-square test indicates that it goes beyond the .05 level of significance ($N = 275$, $\chi^2 = 10.154$, $df = 6$, $Sig. = .118$). The largest number of participants indicated their interest as 'not particularly interested' (50.9%) without significant difference by the grades. It looks like that the high digital literacy has not much to do with raising their interest in their use of digital technology in autonomous reading. If that is the case, education should come into play. Teachers should increase the amount of exposure to media content during English classes so that the students could experience enough and think about its pros and cons. As simple as an online stopwatch and online games can raise the students' interest since these would be less frustrating than to be monitored by their teachers and parents. The students would then consider using those for their independent reading.

Motivation in the use of digital technology in autonomous reading

Low motivation might be a consequence of the schools' policy. Korean schools are still very cautious about allowing students to use digital technology in classes. Many schools even collect smartphones as they come to school and students are often reprimanded for their use of digital devices in school. Under a highly controlled environment like this, students would have to wait until lunchtime, if not until the end of school. But in many cases, the mood for learning often pauses by then or they end up forgetting what they were about to do. A repetitive experience of such may be the reason for the negative response. Even within the negative response, students from different grades seem to have somewhat different perspectives.

There was a significant relationship between the participants' motivation and their grades ($N = 275$, $\chi^2 = 13.654$, $df = 6$, $Sig. = .034$). The result seems obvious due to the negative response of grade 3. The most striking gap can be found between the 'not motivated at all' responses of grade 2 (10.0%) and 3 (27.1%). The 12.2% of 'not motivated at all' in grade 1 went down a little (2.2%) in grade 2. However, the rate rose rapidly again in grade 3 to 17.7%. Grade 3 seems to have lost their motivation in the absence of enough encouragement from their teachers and parents. Under the circumstances of Korea, where students' use of digital technology is often viewed as a hindrance to their learning, the demotivation seems to have taken for granted.

Usefulness of digital technology in autonomous reading

Even though they showed negative attitudes towards interest and motivation in the use of digital technology in autonomous reading, the participants admitted its usefulness up to 64.7% ('very useful,' 10.9% and 'fairly useful,' 53.8%). The remaining 35.3% did not recognize its usefulness ('not useful at all,' 9.1% and 'not particularly useful,' 26.2%). Although the usefulness was positive by 64.7%, the number of those who responded to 'fairly useful' (53.8%) takes up a lot greater share. It may be true that they are sensing the usefulness of digital technology in their own reading. Nevertheless, they might lack the successful experience of using digital technology in autonomous reading.

Considering the mere 0% and 2.9% rate of 'not useful at all' response for the first and the second graders, 21.5% for the third graders was very high. Having tested at the relationship of participants' perceived usefulness

with their grade, Chi-square yielded .000 of statistical significance ($N = 275$, $\chi^2 = 38.914$, $df = 6$, $Sig. = .000$). The grades seem to exert a certain impact on their perception of the usefulness of digital technology. The third graders do not seem to perceive the usefulness of digital technology as much as the first and second graders. It should have a lot to do with their purpose of reading. Although it may be true that the schools hesitate to encourage students to use digital technology in school, they value the students' experience in extensive reading at the middle school level. Students might still have choices in their reading up to this stage. Many schools reward the students who read a lot or even designate a library day as an effort to expand students' reading. In searching for an interesting text, the students would still have the chance to reach for the internet, e-book, etc.

In fact, one of the major advantages of digital technology in reading is the massive amount of reading resources it holds. In that sense, it might be a natural consequence that the third graders find it less useful, as they are left with little space for additional choices in reading. As more and more students begin preparing for high school in grade 3, their range of free choice gets a lot narrower. Even though the texts they come into contact with are from more diversified fields, the contact is not usually made on their own accord. The fact that they are burdened with workbooks and printouts from the school and private lessons forces them to limit their reading choices to textbook and workbook passages. Their negative perspectives towards the usefulness of digital technology might have dropped because they are not making use of digital technology in the first place.

Comfortableness with the use of digital technology in autonomous reading

The students, by large, responded positively to their comfortableness with the use of digital technology in their own reading. The rate of positiveness reached 63% ('very comfortable,' 17.5% and 'fairly comfortable,' 45.5%). However, 25.1% responded 'not particularly comfortable,' and 12% even responded that digital technology was 'not comfortable at all' for their autonomous reading.

The participants perceived the functions of digital technology as useful, as well as comfortable, however, the positiveness (63%) is not up to the expectation in relation to their high level of digital technology access. As can be evidenced by Excerpt 2 and 3 below, they are experiencing physical uncomfotableness with the use of digital technology during reading. Unlike how digital technology is known to facilitate students' learning with fewer constraints of time and space, the students appear to sense a certain level of uneasiness reading out of their desk yet.

Excerpt 2. Response from SA

I remember trying to read English texts in bed, but then my eyes got really tired.

Excerpt 3. Response from BK

I have to hold the device to read through the screen. But my wrist hurts if I hold it like this. I prefer paper.

The result from Chi-square test has also identified a significant relationship between the grades and their comfortableness with the use of digital technology in autonomous reading ($N = 275$, $\chi^2 = 16.341$, $df = 6$, $Sig. = .012$). The responses of grade 1 and 2 students were somewhat parallel. For grade 1, 68.3% responded that they were 'comfortable' ('very comfortable,' 21.4% and 'fairly comfortable,' 46.9%) with it. For grade 2, 72.8% were 'comfortable' ('very comfortable,' 17.1% and 'fairly comfortable,' 55.7%) and a relatively low rate of 27.1% responded as not ('not comfortable at all,' 5.7% and 'not particularly comfortable,' 21.4%). However, it dropped again to 51.4% ('very comfortable,' 14% and 'fairly comfortable,' 37.4%) in grade 3. The positive perspectives of grade 2 might be due to their familiarity with the e-textbook and websites used by their teachers in class. However, in grade 3, they do not seem to find it as comfortable as the previous years possibly due to the length and complexity of the text they read. By the third grade, they often encounter longer texts in reading and might go back to their most comfortable way of reading, which is often print-based. A third-grader interviewee puts that he often even prints out the pages that include a lot of information to digest (Excerpt 4).

Excerpt 4. Response from JG

I use the internet mostly to look up a word for its definition.... I sometimes find interesting articles online, but I usually print them out. It is more comfortable to read that way.

It can be expected from their negative response for interest and motivation that digital technology is not their favorite tool to perform reading. Therefore, reading through the screen can be overwhelming to perform in-depth. The students have rarely been guided to read a large-scale text using digital technology even at a school level. To raise their comfortableness with digital technology, efforts at a school level seem to be the priority.

Confidence in the use of digital technology in autonomous reading

A total of 56% of the students showed confidence in the use of digital technology in autonomous reading ('very confident,' 12.4% and 'fairly confident,' 43.6%). However, 44% were either 'not particularly confident' (33.1%) or 'not confident at all' (10.9%). The participants seem to have confidence albeit by a small chance. It seems like that their evenly high level of digital literacy has somewhat flowed into their level of confidence in the use of digital technology in autonomous reading. The confidence level of different graders did not make a significant association ($N = 275$, $\chi^2 = 10.555$, $df = 6$, $Sig. = .103$). Still, the confidence was barely reaching positive, marking 56%. Even with a fair level of digital literacy and confidence, it would be of no use if the students are not aware of what technologies are out there. As seen in the results of the two affective areas, the limited use of digital technology does no more than to bring down the students' interest and motivation in it. Therefore, the teachers should be able to introduce various websites, applications, and other digital tools, and to guide them through how to use them. In that case, the overall confidence would mean more.

Satisfaction with the use of digital technology in autonomous reading

56.7% of the participants were satisfied with the use of digital technology in autonomous reading. Within the 56.7%, the response rate for 'very satisfied' is 11.6% and 'fairly satisfied' is 45.1%. The rest 43.3% were not satisfied with the use of digital technology in autonomous reading ('not particularly satisfied,' 32% and 'not satisfied at all,' 11.3%)

The result can be interpreted in both a good and bad way. On the bright side, the students are indulging in their free choice of reading with the use of digital technology. But on a darker side, the satisfaction implies their low expectation, meaning that they are not expecting a lot from the use of digital technology in autonomous reading because they are not recognizing the broader functions of it.

The result from Chi-square test reveals that there was also a significant association between the satisfaction level and the grades ($N = 275$, $\chi^2 = 26.854$, $df = 6$, $Sig. = .000$). The contrast between a couples of grades was quite vivid. The level of satisfaction is highest in grade 1 (71.4%) and lowest in grade 3 (38.3%) by a large gap. This time, only about a third of grade 3 expressed their satisfaction with the use of digital technology in reading. Within the 61.7% of the dissatisfied group of grade 3 students, 43.9% have responded that they are 'not particularly satisfied' with the use of digital technology in autonomous reading. Rather than completely denying the benefits of digital technology in reading, they might find it does not fit for their purpose. The websites that was not good enough during their first and second year of middle school might not fit them anymore by the third grade. The chances are that they are either looking for a different level of information or are more concentrated on making an academic achievement that they do not find digital technology as their strategic tool to perform better at school. A third grader's interview response (Excerpt 5) adds to the idea that they are in a stage to fossilize their own strategy in reading. If they get to learn some of the effective ways to read using digital technology, they would at least have a broader range of options to choose from. The role of teachers and schools cannot be emphasized more.

Excerpt 5. Response from JG

I like to highlight and put notes beside the texts. I can't do that on a computer.... Also, I memorize better this way.

Conclusion

This study aimed to examine the middle school students' autonomous reading using digital technology and their perspectives of it. The following findings from the study may serve as a basis for the successful utilization of digital technology in improving learner autonomy for EFL reading.

First, 60.4% of the students turned out to be autonomous learners in reading using digital technology. The learner autonomy appeared highest in grade 2 (1.80). Grade 1 (1.67) came next, and grade 3 sat right on the middle point (1.50). It also resulted in statistically significant differences between the graders (2 and 3) and more than half of the learner autonomy questionnaire items. Their needs not met in a timely matter might have ended up losing interest by the third grade. The learner autonomy appeared positive for the five categories of linguistic confidence (1.78), information literacy (1.68), metacognition (1.67), a locus of control (1.61), and self-reliance (1.54). However, it was negative for social comparison (1.33). The students do not seem to create enough opportunity to share their thoughts and ideas on their experience with digital reading on their own. The efforts should then be made at a classroom level.

Second, the students' perspectives were slightly positive (52.2%) towards the use of digital technology in autonomous reading. While they were positive towards the usefulness (64.7%), comfortableness (63%), confidence (56%), and satisfaction (56.7%), they were neither motivated (44%) nor interested (29.1%) in the use of digital technology for autonomous reading. Chi-square test showed a significant association between the participants' grade and their interests, perceived usefulness, comfortableness, and satisfaction. Last, considering that the students' engagement in autonomous reading using digital technology was somewhat limited to 1.21 hours per week on average and that the two most frequently used types of digital technology for it are computers (78.4%) and smartphones (68.3%), the participants' static engagement pattern could have resulted in their lukewarm perspectives of the use of digital technology in autonomous reading.

There is no denial that digital technology can be a useful tool to build learner autonomy for EFL learners, but digital access and skills alone may not be enough. Korea Ministry of Education is taking initiatives to develop learner autonomy by introducing e-textbook and software education. However, these efforts would end in vain if not properly supported by the students' positive beliefs. Unfortunately, one of the main problems perceived by the study is that the students possess negative perspectives towards the use of digital technology in their autonomous reading of EFL. Promoting students' interest and motivation seems to be the most urgent task for Korean secondary schools. To do so, and to learner autonomy, teachers' guidance is essential.

First, it is imperative that teachers introduce a variety of digital resources in class. In addition to the active use of e-textbook, teachers should be able to employ real texts and other useful websites and apps so that the students can find EFL learning enjoyable. Some of the useful examples can be Breaking News English (<http://breakingnewsenglish.com>), Junior Herald (<http://www.juniorherald.co.kr>), Storynory (<https://www.storynory.com>), RocketReader (<http://www.speedreading.com>), and Storybird (<http://storybird.com>), etc. The students who find any of this fun would give it a try on their own. Still, it is only a slim chance that they find it comfortable or make perfect use of it at first contact. The teachers, therefore, should walk their students through how to make the best use of it and train them until they feel confident enough to use it independently.

Second, constant monitoring of the students' autonomous reading should also follow. It can be done through a Learning Management System (LMS) or using Computer-Mediated Communication (CMC) tools or more simply, through Mobile Instant Messaging (MIM) applications such as Kakaotalk or WhatsApp. Its widespread use among the teens and the fact that it can be used at no cost supports the feasibility even further. For example, as Korean students are well accustomed to Kakaotalk, teachers can have their students share their reading choices and reflect on the reading through the application. It allows the feedback to occur not just between teacher-student, but also between the peers. In that sense, the social comparison sector, which appeared not just negative but also the lowest of all categories in the study, can be enhanced. The positive impact of LMS, CMC, and MIM applications on EFL students has already been proven by many researchers in the country (Andrew, 2019; Cho, 2009; Kelm, 1992; H. S. Kim, 2014; Kim & Kim, 2012; C. H. Lee, 2015, 2017; Olaniran, 1994; Warschauer, 1996). However, as the results of this study have shown, participants' perspectives and autonomy in EFL reading with digital technology have the tendency to drop considerably by the third grade. With that in mind, the above efforts are better to be made during the earlier years of middle school.

Last, teachers can use a questionnaire, the one used in this study, to monitor learner autonomy in reading with digital technology. Having their students complete it every month or two would allow teachers to understand the further needs of the students and confirm whether their guidance is working properly towards building learner autonomy. If provided as a self-assessment tool, the students would be able to monitor their own progress, thus start to take control of their own learning. Based on this methodology, further studies at a different school level might also contribute to the understanding of using digital technology for improving autonomous reading ability.

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Appendix

The Survey Questionnaire

Part A: Learner Autonomy in EFL Reading with Digital Technology

* Strongly agree (SA), Agree (A), Disagree (D), Strongly disagree (SD)

No.	Statements	3 (SA)	2 (A)	1 (D)	0 (SD)
1	I am good at reading digital English text on my own.				
2	I organize my time for reading English using digital technology.				
3	I am good at making reading choices using digital technology.				
4	In reading English with digital technology, I can choose the method that suits me best.				
5	In reading English with digital technology, I am ready to try unfamiliar ways.				
6	In reading English with digital technology, I am an active dynamic person.				
7	I choose the reading exercises I work on using digital technology.				
8	In reading English with digital technology, I change the way I read according to the type of text.				
9	In reading English with digital technology, I know how to use skimming strategy.				
10	In reading English with digital technology, I know how to use scanning strategy.				
11	In reading English, I know how to find the information I need on-line.				
12	In reading English with digital technology, I use real English (i.e. not made for students) texts.				
13	In reading English with digital technology, I look at causes and effects logically.				
14	I am confident I can improve my reading in English using digital technology.				
15	I think I am better at reading English using digital technology compared to others.				
16	I read English texts using digital technology because I have to.				
17	In reading English using digital technology, I have to proceed word by word.				
18	In reading English using digital technology, I can describe the strategies I use.				
19	My way of reading English using digital technology may change.				
20	In reading English with digital technology, I have changed the way I read after thinking about it.				
21	I predict the content before reading digital English texts.				
22	My English reading using digital technology is better now than it was a year ago.				
23	In reading English with digital technology, I know techniques to help me remember vocabulary.				
24	I talk to others about how I feel about reading English using digital technology.				
25	In reading English with digital technology, it is my job to check my work for mistakes.				

Part B: General Questions on Learner Autonomy in EFL Reading with Digital Technology

Please tick (v) your opinion for each statement.

1. How often do you engage in English reading per week?
Always _____ Almost always _____ Sometimes _____ Never _____
2. How many hours do you engage in English reading per week? _____ hours
3. How often do you engage in English reading using digital technology per week?
Always _____ Almost always _____ Sometimes _____ Never _____
4. How many hours do you engage in English reading using digital technology per week? _____ hours
5. What digital technology did you use in English reading? (Please tick ✓ all that apply.)
Personal computers _____ Tablet PC _____ Mobile (/Smart) phone _____
CD/DVD-ROM titles _____ Websites _____ E-textbook _____ Apps _____
SNS _____ Virtual reality (VR) _____ Augment reality (AR) _____
Other (Please specify.) _____
6. How interested are you in English reading using digital technology for yourself?
Very interested _____ Fairly interested _____ Not particularly interested _____ Not interested at all _____
7. How motivated are you in English reading using digital technology for yourself?
Very motivated _____ Fairly motivated _____ Not particularly motivated _____ Not motivated at all _____
8. How useful do you think digital technology is in English reading for yourself?
Very useful _____ Fairly useful _____ Not very useful _____ Not useful at all _____
9. How comfortable are you in English reading using digital technology is for yourself ?
Very comfortable _____ Fairly comfortable _____ Not particularly comfortable _____ Not comfortable at all _____
10. How confident are you in English reading using digital technology for yourself?
Very confident _____ Fairly confident _____ Not particularly confident _____ Not confident at all _____
11. How satisfied are you in English reading using digital technology for yourself?
Very satisfied _____ Fairly satisfied _____ Not particularly satisfied _____ Not satisfied at all _____

Part C: Biodata

Please tick (*v*) or fill in the blanks based on your information.

1. Gender: Male _____ Female _____
2. Grade: 1 _____ 2 _____ 3 _____
3. I am prepared to be included in a short follow up interview sample. Yes _____ No _____
4. Name (optional): _____
5. E-mail (optional): _____
6. Telephone contact (optional): _____