



Quantity and diversity of informal digital learning of English

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Abstract

While research on informal digital learning of English (IDLE) increases in the fields of teaching English to speakers of other languages and computer-assisted language learning, few studies have examined the relationship between quantity and diversity of IDLE practices and different language learning outcomes. To address this gap, data were collected through one questionnaire, six English learning outcomes, and a semi-structured interview from 71 Korean English-as-a-foreign-language (EFL) university students. Hierarchical linear regression analyses showed that IDLE Quantity, Age, and Major were significant predictors of two affective variables (Confidence and Enjoyment), while IDLE Diversity and Major were significantly predictive of productive language outcomes (Speaking and Productive Vocabulary Knowledge), scores in a standardized English test (TOEIC), and one affective variable (Lack of Anxiety). These results revealed how IDLE quantity and diversity can make a unique contribution to EFL learners' English outcomes.

Keywords: *Informal Digital Learning of English, Quantity Versus Diversity, English Learning Outcomes, EFL Korean Students*

Language(s) Learned in This Study: *English*

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Introduction

With the development of digital technologies and Web 2.0, second language (L2) affordance and opportunities have expanded beyond the classroom (Reinders & Benson, 2017). With a changing environment of L2 learning and teaching, as well as its improved potential for out-of-class L2 learning, an increasing number of researchers and practitioners in the fields of teaching English to speakers of other languages (TESOL) and computer-assisted language learning (CALL) has become interested in informal digital learning of English (IDLE) in various English as a foreign language (EFL) contexts¹ (Chik & Ho, 2017; Lai, 2017; Sundqvist & Sylvén, 2016; Richards, 2015).

Many previous studies have discussed quantity of EFL learners' IDLE activities in relation to English learning outcomes, such as vocabulary knowledge, reading and listening, and school grades (Jensen, 2017; Sundqvist & Wikström, 2015). Other studies of IDLE (e.g., Olsson & Sylvén, 2015) have reported mixed evidence for benefits of IDLE quantity, and some recent studies (e.g., Lai, Zhu, & Gong, 2015; Lee & Dressman, 2018) have called for attention to the diversity of IDLE activities that are conducive to achieving English learning outcomes, such as confidence, productive vocabulary knowledge, speaking, and scores on formal testing.

To date, however, it is still inconclusive whether or to what extent the quantity and diversity of IDLE activities used by EFL students relate to English learning outcomes. Therefore, this study attempts to explore this less charted terrain with the goal of advancing our understanding of quantity and diversity of IDLE activities in relation to English learning outcomes. The results of this study offer novel insights into this research issue and help educational stakeholders (e.g., institutions and teachers) make an informed

decision regarding curricula and instructional design.

Literature Review

Informal Digital Learning of English

With the advancement of digital technologies and their potential for out-of-class L2 learning, an increasing number of TESOL and CALL researchers and practitioners have become interested in IDLE-oriented topics in various EFL contexts: for example, in Denmark (Jensen, 2017), Sweden (Sundqvist, 2009; Sundqvist & Sylvén, 2014; Sundqvist & Wikström, 2015), France (Sockett, 2013, 2014; Sockett & Toffoli, 2012), Morocco (Dressman, Lee, & Sabaoui, 2016), Russia (Kozar & Sweller, 2014), Malaysia (Tan, Ng, & Saw, 2010), India (Mitra, Tooley, Inamdar, & Dixon, 2003), China (Chen, 2013; Lai et al., 2015; Sun, Franklin, & Gao, 2017), South Korea (Lee, 2017), Japan (Casanave, 2012), and Brazil (Cole & Vanderplank, 2016).

Given the growing interest in understanding language learning in out-of-class CALL settings (i.e., IDLE), Benson (2011) proposed four dimensions of out-of-class L2 learning in terms of *formality* (whether language learning experience is formally structured and certificate is granted: e.g., formal, non-formal, or informal), *location* (where language learning occurs physically: e.g., in-class, out-of-class, extracurricular, and extramural), *pedagogy* (to what degree formal language learning processes are involved: e.g., instructed, self-instructed, and naturalistic), and *locus of control* (to what extent language learners take control of their own learning; e.g.: self-directed or other-directed). Although Benson himself has admitted that this is “a somewhat rudimentary framework” (p. 15), this conceptualization nevertheless helps us understand English learning in diverse IDLE contexts (Chik, 2014).

Table 1. Classification of IDLE Based on Benson’s (2011) Four Dimensions

	Formal Digital Learning of English	Non-Formal Digital Learning of English	IDLE	
			Extracurricular	Extramural
Formality	Structured; Certification	Structured; No certification	Semi-structured; Certification	Unstructured; No certification
Location	In-class	Out-of-class	Out-of-class	Out-of-class
Pedagogy	Instructed	Instructed	Self-instructed	Naturalistic
Locus of Control	Other-directed	Other-directed	Self-directed	Self-directed

As summarized in Table 1, we can conceptualize IDLE based on Benson’s (2011) four dimensions (see also Reinders & Benson, 2017). In this study, *digital* refers to both digital devices (e.g., smartphones, tablets, personal computers, laptops, etc.) and resources (e.g., MP3s, web apps, social media, YouTube, etc.). Additionally, *certification* refers to a document that verifies a person’s competence or to an official qualification that is granted by an accredited or authorized individual or agency. More importantly, a certification should also be recognized by other agencies or employers. For example, undergraduate students receive a certification granted by a government or other accreditation body for the completion of their educational program. Moreover, such a certification is also recognized (and accepted) by other educational institutions. Therefore, a certification that is issued by Coursera but not recognized by another formal agency is not valid in this study.

IDLE in extracurricular contexts is self-directed, self-instructed, digital learning of English in semi-structured, out-of-class environments that are still linked to a formal language program. For example, students take primary responsibility for completing homework or group projects through self-instruction (e.g., referring to Wikipedia articles or watching YouTube tutorials to get their homework done) outside of the classroom. However, the course is still partially structured by teachers (i.e., semi-structured) who

assess students' performance. In contrast, *IDLE in extramural contexts* is self-directed, naturalistic, digital learning of English in unstructured, out-of-class environments, independent of a formal language program. For example, students, on their own initiative, could chat casually with other English users on Facebook for socializing. However, if that chatting is part of school assignments in out-of-class CALL environments, it is considered to be IDLE in and extracurricular context, because the activity is structured and evaluated by the teacher. This study adopts IDLE in extramural contexts as a guiding principle for exploring the research questions (RQs).

Quantity Versus Diversity of IDLE

Although research on IDLE is still in the early stages, current studies seem to report mixed findings regarding the impacts of IDLE on L2 learning. Burston (2014, 2015) and Sung, Chang, and Yang (2015) have suggested that mobile learning in informal contexts (e.g., outdoors) may not have substantially better effects on listening and reading skills than learning in formal contexts (e.g., traditional classroom). In particular, meta-analysis studies (Sung et al., 2015; Sung, Chang, & Liu, 2016) have provided evidence that mobile learning lasting less than one week usually did not produce a significant effect on language skills.

Conversely, other studies have reported a positive correlation between L2 learning outcomes and IDLE quantity and diversity. During the past decade, several studies have reported a positive relationship between quantity of IDLE activities and L2 learning outcomes such as vocabulary knowledge, reading and listening, and school grades (Jensen, 2017; Olsson, 2011; Sundqvist, 2009; Sundqvist & Sylvén, 2014; Sundqvist & Wikström, 2015; Sylvén & Sundqvist, 2012). These studies have consistently suggested that frequent engagement with IDLE activities (e.g., digital games) is positively correlated with L2 learning outcomes among young EFL learners in Nordic regions. These findings indicate that EFL learners can develop and acquire English knowledge through massive exposure to English as well as interaction with other English users in various IDLE contexts.

Mixed findings for IDLE quantity have been provided recently (e.g., Olsson & Sylvén, 2015), reporting that the quantity of IDLE did not produce the same effect among students in different grade levels in relation to English vocabulary knowledge. Other recent studies (e.g., Lai et al., 2015; Lee, 2017; Lee & Dressman, 2018) have emphasized the importance of diversity of IDLE activities. For example, Lee (2017) and Lee and Dressman (2018) showed that EFL students who involve themselves in diverse IDLE activities and who strike a balance between form- and meaning-focused activities can create a healthy IDLE ecology that leads to positive language learning outcomes. These studies found that varied types of IDLE activities can enhance affective variables (lack of anxiety and confidence), productive language outcomes (speaking and productive vocabulary knowledge), and scores in standardized English tests (TOEIC).

Despite the growing literature in IDLE, it is still inconclusive whether or to what extent the quantity and diversity of IDLE activities are linked with English learning outcomes among EFL students. Therefore, this study attempts to unravel the relationship between quantity and diversity of IDLE practices and six different English learning outcomes, guided by the following RQs:

1. Is the quantity of IDLE associated with English learning outcomes?
2. Is the diversity of IDLE activities associated with English learning outcomes?

Methodology

Settings and Participants

This study is part of a larger research project that investigates IDLE practices among Korean EFL university students. Originally, data were generated from a total of 317 Korean undergraduate students from three separate universities, named here with the pseudonyms Korea Western University (KWU), Korea Eastern University (KEU), and Korea Central University (KCU). A survey instrument was

distributed in the middle of the Fall 2016 semester, followed by semi-structured interviews ($N = 94$). Permission to collect data was obtained from the three educational institutions, nine instructors, and each of the survey participants.

Previous studies (Kang, 2014; Yang & Kim, 2011) have reported that overseas experiences could significantly influence Korean English learners' L2 state of anxiety and English abilities. Therefore, the present study only included students who have not lived or studied abroad in order to reduce any potential confounding variable. Hence, this study drew only on data from 71 Korean EFL learners who lacked any overseas experience from KWU ($n = 33$, 46.5%), KEU ($n = 25$, 35.2%), and KCU ($n = 13$, 18.3%). Their average age was 21.55, with ages ranging from 19 to 26. They consisted of first-year ($n = 25$, 35.2%), second-year ($n = 28$, 39.4%), third-year ($n = 10$, 14.1%), and fourth-year ($n = 8$, 11.3%) students, both male ($n = 24$, 33.8%) and female ($n = 47$, 66.2%). These students constituted a mix of various majors such as English education ($n = 20$, 28.2%), English literature ($n = 14$, 19.7%), the humanities ($n = 19$, 26.8%), engineering ($n = 10$, 14.1%), and others ($n = 8$, 11.3%). Most participants ($n = 64$, 90.2%) had been studying English for more than six years at the time of data collection.

Instruments and Data Collection

One questionnaire, six English learning outcomes, and semi-structured interviews were used for data collection.

Questionnaire

During the Fall 2016 semester, the investigator explained the nature of the study (e.g., goals, procedures, benefits, data security) and distributed the consent letters and questionnaires to students in their classrooms. A questionnaire consisting of three parts was designed to elicit students' demographic information, English learning outcomes, and quantity of IDLE activities. During the pilot stage, a group of SLA researchers judged the content validity of the questionnaire and offered suggestions to improve it. The original English questionnaire items were also translated into Korean for Korean respondents and checked for the instruments' clarity and precision using both forward- and backward-translations. Specifically, the first part (demographic information) asked questions concerning participants' individual backgrounds such as school, grade, gender, major, overseas experiences, and length of time studying English.

The second part (English outcomes) was designed to obtain students' psychological aspects of English levels (confidence, enjoyment, and anxiety) and standardized English ability (TOEIC score). The students answered a confidence item (*I feel confident in using English well*), enjoyment (*I enjoy learning English*), and anxiety (*I feel nervous about communicating in English*) using a 5-point Likert scale, ranging from 1 (*very weak*) to 5 (*very strong*). Although each psychological construct was assessed with a single-item questionnaire (e.g., Lai et al., 2015), a semi-structured interview provided much more detail about their interpretations of each construct. As for standardized English ability, students were instructed to provide TOEIC scores from tests taken within the past two years, as the validity of a TOEIC test score only lasts for two years (Educational Testing Service, 2017). Since it was possible to give inaccurate numbers because of memory constraints or dishonesty, the scores were checked again during the interview.

For the third part (quantity of IDLE activities), participants answered an open-ended question item, (*On average, how many hours each day did you spend in engaging in IDLE activities outside the classroom in the past 6 months?*) that was modified from the study by Lai et al. (2015). The concept of IDLE might have been vague for some participants. Therefore, prior to the survey, participants were explicitly instructed to refer to the term IDLE as *IDLE in extramural contexts* and provided various examples to avoid different interpretations.

English Learning Outcomes

To determine the English learning outcomes, students' psychological aspects of English levels (Confidence, Enjoyment, and Anxiety), standardized English ability (TOEIC Score), and productive

language outcomes (Speaking and Vocabulary) were assessed, allowing for a more holistic understanding of students' language abilities. Data regarding confidence, enjoyment, anxiety, and TOEIC score were obtained from questionnaires. As for speaking, the investigator administered 5-minute English oral tests to each of the participants. Just like the IELTS speaking test, the test was interactive. After being informed of the purpose, instruction, and total duration of the test, the participants were asked to speak about their own personal opinions and recollections on topics such as hobbies, food, and motivation to learn English (e.g., *Tell me about one of your hobbies.* or *What is your motivation for learning English?*). The students' responses were recorded for a later rating. Three English raters (one certified rater and two experienced English teachers) were recruited to evaluate all speaking samples based on modified [TOEFL Speaking Rubrics](#). There was a brief training session (e.g., a practiced scoring meeting and a check for internal reliability) before the actual evaluation. Inter-rater reliability for English speaking was assessed using the intraclass correlation coefficient, which resulted in a score of .83 ($p < .001$), showing a high level of inter-rater reliability among raters (Shrout & Fleiss, 1979).

The productive vocabulary levels test (PVLVT) was used to determine students' vocabulary outcomes and was also used for one of the productive language outcomes. Laufer and Nation (1999) developed this instrument, which has become one of the most reliable, validated, and widely used vocabulary tests in studies on IDLE (Sundqvist, 2009; Sundqvist & Wikström, 2015; Sylvén & Sundqvist, 2012). Park (2012) found that there was a significant relationship between PVLVT scores and one variable (Writing Proficiency) of Korean EFL university students' productive language, although such a relationship could differ depending on word frequency levels. The PVLVT contained 18 questions, which was similar to the C-test, with some initial or terminal letters deleted. Students filled in each blank with the correct letters based on the prompt and a contextual sentence. For example, when students encountered the sentence "Governments often cut budgets in times of financial cri___", they could enter "sis" in the blank, forming the word *crisis*. It was easy to administer because students completed the test within 10 minutes, using their own digital devices in the classroom. The test score, which was automatically viewed upon submission, was reported on the questionnaire under the supervision of the investigator and instructors.

Semi-Structured Interview

The investigator conducted a semi-structured interview with each student ($n = 71$) who had submitted the signed consent form and completed the questionnaire. The purposes of the interview were (a) to verify students' quantitative responses (e.g., TOEIC scores, psychological aspects of English levels, and frequency of IDLE activities), (b) to obtain a deeper understanding of their questionnaire responses, and (c) to elicit the diversity of their IDLE activities (for question items, see [Appendix](#)). Each interview was conducted in Korean extramurally for 30–60 minutes.

Data Analysis

During the data exploration phase, it was found that eight students did not take a vocabulary test, so there were eight missing values for the PVLVT (11.3%). In order to improve statistical power, Little's MCAR test was first conducted to investigate whether the values missing were random. The results ($\chi^2 = 4.01$; $df = 5$; $p = .550$) indicated that the missing values occurred entirely at random. Then, the expectation-maximization technique was undertaken to replace missing values with imputed values (Dempster, Laird, & Rubin, 1977).

To answer RQ1, a Pearson correlation was carried out to analyze the relationship between IDLE quantity and the six English learning outcomes. For the RQ2, the conceptualization of *diversity-learning experiences* used in the study by Lai et al. (2015) was adopted and modified as an appropriate analytic framework to analyze the diversity of IDLE activities. Lai et al. defined this concept as "activities that...struck a balance between focus on form and focus on meaning in the holistic learning experience" (p. 286). At the outset, the investigator transcribed, sorted, coded, and synthesized the interview data. Then, form-focused IDLE (FFI) and meaning-focused IDLE (MFI) activities were counted, respectively, for compiling IDLE diversity. Specifically, FFI referred to an activity with more attention given to

learning or memorizing linguistic forms and structures in IDLE environments, while MFI referred to an activity with more focus on comprehending and using English in IDLE contexts. The participants of this study practiced FFI activities such as looking up vocabulary in an online dictionary and checking grammar using Google Translate. MFI activities included watching entertainment programs (e.g., dramas, movies, or talk shows), using social media (e.g., Facebook, KaKaoTalk, Skype), and talking to others while playing massively multiplayer online role-playing games. Subsequently, the diversity of IDLE was calculated by summing up both FFI and MFI activities. Since *using Google Translate* or *chatting with other English users on Facebook* could be both FFI and MFI activities, the final decisions were made based on individuals' perceptions and intentions identified during the interviews. Further, more effort was made to distinguish between diversity and pseudo-diversity of IDLE. For instance, if a student were involved in an optimal diversity of IDLE experiences (e.g., by striking a balance in both FFI [$n = 7$] and MFI [$n = 9$]), it was regarded as diversity of IDLE. In contrast, if the value of IDLE activities was 10, yet only involved 10 different FFI activities exclusively, it was regarded as pseudo-diversity of IDLE; such cases would not truly manifest the diversity of IDLE experiences. Then, a Pearson correlation was carried out to examine the relationship between IDLE diversity and English outcomes.

To determine which variables would predict six different English learning outcomes, hierarchical linear regression analyses were performed. Tests to check whether the data met the assumption of collinearity demonstrated that multicollinearity was not a concern (Speaking: Tolerance = .63, VIF = 1.60; PVL T Score: Tolerance = .43, VIF = 2.31; TOEIC Score: Tolerance = .53, VIF = 1.91; Confidence: Tolerance = .36, VIF = 2.78; Enjoyment: Tolerance = .35, VIF = 2.84; Anxiety: Tolerance = .77, VIF = 1.29). IDLE quantity and diversity were entered in Step 2 after controlling for the four demographic characteristics (i.e., Age, Gender, Length of Time Studying English, and Major) entered in Step 1. Finally, member checking was also carried out via email correspondence and individual interviews by debriefing and sharing preliminary results from the analysis (LeCompte, 2000; also see Birt, Scott, Cavers, Campbell, & Walter, 2016).

Results

According to the quantity of IDLE experiences, 62.0% ($n = 44$) of the students spent less than one hour on IDLE practices on a daily basis, followed by 22.5% ($n = 16$) who spent between one and two hours, and 15.5% ($n = 11$) who spent more than two hours. Table 2 shows the descriptive information on the diversity of participants' IDLE practices. Overall, the students involved about eight different IDLE activities that combined FFI and MFI activities.

Table 2. Descriptive Data on IDLE Diversity

Variable	Scale	Min.	Max.	<i>M</i>	<i>SD</i>	<i>N</i>
FFI	Number of FFI Activities	1	8	2.79	1.47	71
MFI	Number of MFI Activities	1	18	5.20	4.41	71
IDLE Diversity	Sum of FFI and MFI Activities	2	21	7.99	5.26	71

Table 3 shows participants' descriptive data on English learning outcomes such as psychological aspects of English levels (Confidence, Enjoyment, and Anxiety), productive language outcomes (Speaking and Productive Vocabulary Knowledge) and standardized English ability (TOEIC Score). In general, they gave somewhat positive ratings for Confidence ($M = 3.01$, $SD = 1.12$), Enjoyment ($M = 3.41$, $SD = 1.20$) and Anxiety ($M = 3.18$, $SD = 1.09$), as all the mean scores were higher than 3 (out of the 5-point Likert scale). There were wide distributions among students across TOEIC scores ($M = 679.15$, $SD = 193.60$, ranging from 200 to 980), Speaking ($M = 74.03$, $SD = 12.05$, ranging from 55 to 100), and PVL T Score ($M = 36.29$, $SD = 21.37$, ranging from 8 to 88).

Table 3. *Descriptive Data*

Category	Variable	Scale	Min.	Max.	<i>M</i>	<i>SD</i>
Affective	Confidence	1–5 (5 = <i>Very Strong</i>)	1	5	3.01	1.12
	Enjoyment		1	5	3.41	1.20
	Anxiety		1	5	3.18	1.09
Productive	Speaking	Test Score (out of 100)	55	100	74.03	12.05
	PVLT Score		8	88	36.29	21.37
Standardized Test	TOEIC Score	Test Score (out of 990)	200	980	679.15	193.60

Note. The lower the numerical value of L2 anxiety, the greater the anxiety

Quantity of IDLE and English Learning Outcomes

Based on the results of the correlation analysis (Table 4), the quantity of IDLE was significantly correlated with Confidence ($r = .35, p < .01$) and Enjoyment ($r = .39, p < .01$), but not with the other indicators of language outcomes. This suggests that the quantity of IDLE is significantly associated with two domains of affective variables (Confidence and Enjoyment), but not with productive language outcomes (Speaking and PVLT Score), scores on standardized tests (TOEIC), or Anxiety.

Table 4. *Correlation Between IDLE Quantity and English Learning Outcomes*

Category	Variable	<i>r</i>	<i>p</i>
Affective	Confidence	.35	< .01
	Enjoyment	.39	< .01
	Anxiety	-.21	> .05
Productive	Speaking	.22	> .05
	PVLT Score	.13	> .05
Standardized Test	TOEIC Score	.24	> .05

Diversity of IDLE and English Learning Outcomes

Correlation analysis (Table 5) indicated that the diversity of IDLE activities correlated significantly with Confidence ($r = .34, p < .01$), Speaking ($r = .56, p < .01$), PVLT Score ($r = .54, p < .01$), and TOEIC Score ($r = .47, p < .01$). In particular, there was a high strength of correlation between IDLE diversity and productive language variables such as Speaking and PVLT Score. This finding suggests that the diversity of IDLE activities was more positively associated with productive language outcomes than the other aspects of English learning outcomes.

Table 5. *Correlation Between IDLE Diversity and English Learning Outcomes*

Category	Variable	<i>r</i>	<i>p</i>
Affective	Confidence	.34	< .01
	Enjoyment	.29	< .05
	Anxiety	-.25	< .05
Productive	Speaking	.56	< .01
	PVLT Score	.54	< .01
Standardized Test	TOEIC Score	.47	< .01

Regression Analyses

Table 6 shows the results of the hierarchical regression analyses to predict six English learning outcomes (Confidence, Enjoyment, Anxiety, Speaking, PVL T Score, and TOEIC Score) from IDLE quantity and diversity after controlling the potential influence of the demographic variables (Gender, Age, Length of Time Studying English, and Major). As a result, six different regression models were yielded.

The first model, which explained 24% of the variance ($F_{(6, 64)} = 4.69, p < .01$), showed that IDLE quantity ($B = .23$), Age ($B = -.30$), and Major ($B = -.26$) were significant predictors of Confidence. The second model, which accounted for 30% of the variance ($F_{(6, 64)} = 5.88, p < .01$), revealed that IDLE quantity ($B = .27$), Age ($B = -.24$), and Major ($B = -.35$) were also significant predictors of Enjoyment. The third model, which explained 19% of the variance ($F_{(6, 64)} = 2.52, p < .05$), showed that only IDLE diversity ($B = -.28$) was a significant predictor of Anxiety.

The fourth model, which explained 42% of the variance ($F_{(6, 64)} = 9.36, p < .01$), demonstrated that IDLE diversity ($B = .28$) and Major ($B = -.45$) were significant predictors of TOEIC Score. The fifth model, which accounted for 48% of the variance ($F_{(6, 64)} = 11.95, p < .01$), showed that IDLE diversity ($B = .38$), Length of Time Studying English ($B = .32$), and Major ($B = -.30$) were identified as significant predictors of Speaking. The last model, which explained 48% of the variance ($F_{(6, 64)} = 11.90, p < .01$), showed that IDLE diversity ($B = 0.37$) and Major ($B = -.50$) were significant predictors of PVL T Score.

Table 6. Hierarchical Regression Model Analyses

Variable	Adj. r^2	C of r^2	Step 1				Step 2	
			Gender	Age	Length	Major	Quantity	Diversity
Confidence	.24*	.08	-.08	-.30*	.03	-.26*	.23*	.15
Enjoyment	.30**	.08	.00	-.24*	.08	-.35**	.27*	.05
Anxiety	.19*	.12	.24	.11	.01	-.22	-.18	-.28*
TOEIC Score	.42**	.08	.11	.15	.08	-.45**	.07	.28**
Speaking	.48**	.12	-.01	-.10	.32**	-.30**	.02	.38**
PVL T Score	.48**	.11	.02	.02	.07	-.50**	-.07	.37**

Notes. Values other than Adj. r^2 and C of r^2 are standardized beta coefficients. Adj. r^2 = Adjusted r^2 ; C of r^2 = Change of r^2 ; Length = Length of Time Studying English; Quantity = IDLE quantity; Diversity = IDLE diversity; For Major, 1 = English Major and 2 = Non-English Major

* $p < .05$; ** $p < .01$

Discussion

This study set out to investigate whether the quantity and diversity of IDLE activities were associated with English learning outcomes among Korean EFL university students. Two major findings were identified. First, IDLE quantity, Age, and Major were significant predictors for Confidence and Enjoyment. This indicates that EFL students who were younger, majored in English, and engaged more frequently in IDLE activities had higher level of L2 confidence and enjoyment than those who were older, majored in non-English disciplines, and participated in IDLE activities less frequently.

Interestingly, the quantity of IDLE was positively associated with two aspects of affective domains (Confidence and Enjoyment), but not with Speaking or PVL T Score. Two insights can be drawn from this. First, there is a positive relationship between the quantity of IDLE and Confidence and Enjoyment. This result is consistent with previous studies that have reported on the affective benefits of digital games (Reinders & Wattana, 2014, 2015; Thorne, Black, & Sykes, 2009). On these grounds, it can be implied that IDLE quantity may help Korean EFL learners emotionally. For example, they may enjoy learning

English more and feel more confident using English. However, correlation is not causation. It could be that EFL students who enjoy learning English and feel confident about communicating in English spend more time involved in IDLE activities. Thus, other studies may be required to substantiate this claim. In addition, there is no meaningful relationship between the quantity of IDLE and productive language outcomes. This finding is not consistent with previous research (Jensen, 2017; Olsson, 2011; Sundqvist & Sylvén, 2014; Sundqvist & Wikström, 2015; Sylvén & Sundqvist, 2012) reporting on the correlation between IDLE quantity (e.g., Gaming Play) and English learning outcomes (e.g., PVL T Score). This finding may imply that the IDLE quantity may produce different learning outcomes depending on students' learning contexts (e.g., Korean EFL context and Nordic EFL contexts)—another implication that would merit further investigation.

The second significant finding was that IDLE diversity and Major were significantly predictive of productive language outcomes (Speaking and PVL T Score), a standardized English test (TOEIC Score), and one affective variable (Anxiety). This indicates that IDLE activities can have a significant real-world impact on the speaking, productive vocabulary knowledge, TOEIC scores, and anxiety levels of EFL students, particularly English majors who engage in various types of IDLE activities. This result concurred with previous studies that EFL students who put themselves in an “invisible university of rich and authentic multimodal resources” (Lee & Dressman, 2018, p. 443) and facilitated their L2 learning without formal assistance from teachers tended to have high levels of communicative skills. This result also corroborates the study by Lai et al. (2015), in which the diversity of EFL learners' out-of-class learning had a positive relationship with affective learning (e.g., learning efficacy) and English grades. However, the present study offers new insights into how the diversity of IDLE activities engaged in by Korean EFL learners without any overseas experience is significantly linked with other affective domains (Anxiety), productive language outcomes (Speaking and PVL T Score) and scores on standardized English tests (TOEIC Score). Based on these results, it seems plausible that EFL students who have not studied or traveled abroad but developed or implemented a balance in both FFI and MFI activities could reduce a sense of L2 anxiety and enhance their productive English outcomes such as speaking and productive vocabulary knowledge. Still, substantiating this interpretation requires additional empirical research. Regarding the positive relationship with TOEIC scores, the participants were educated in a Korean educational context that placed greater emphasis on high-stakes English tests such as the college entrance exam and the TOEIC (Choi, 2008). In that regard, the present findings, with respect to such associations with TOEIC scores, may have yielded a meaningful result.

Conclusion

The present study offers empirical evidence that provides a better understanding of IDLE activities among Korean EFL university students. Specifically, this study investigated how the quantity and diversity of IDLE activities were associated with English learning outcomes. The results of this study offer new insights into how IDLE quantity and diversity can make a unique contribution to EFL learners' English outcomes and determine how educational stakeholders such as institutions, teachers, and parents can help. For example, it is of paramount importance for educational stakeholders to recognize that quantity and diversity of IDLE activities should not be regarded as synonymous (Lee, 2017). Stakeholders should be cautious about concluding that learners spending massive amounts of time playing online games or chatting with others on Facebook using an L2 result in affective learning or assuming that frequent engagement in IDLE activities can be conducive to achieving L2 outcomes. Rather, it is important for stakeholders to help L2 learners make informed decisions about which digital devices and resources they should use, how much time they should spend on IDLE activities, and which types of IDLE activities they should engage in.

This study has a few drawbacks. First, there were a number of different IDLE activities with which EFL students engaged. Due to page constraints, the researcher could not provide qualitative findings illustrating how the students practiced various IDLE activities (e.g., social networking sites, fandoms,

massive open online courses). Future research will focus more on what is actually happening in the digital wilds and provide more qualitative aspects of IDLE activities used by Korean EFL learners. Second, students' psychological aspects of English levels (Confidence, Enjoyment, and Anxiety) were obtained through single-item measures. For better comprehension of this phenomenon, more fine-tuned instruments must be used to measure English learning outcomes in future studies. Third, the finding regarding an association between the quantity of IDLE and productive language outcomes seemed to be different from the results that had been previously reported in Nordic regions. This suggests that culturally situated IDLE practices may produce different learning outcomes. In that regard, a cross-cultural comparative study about IDLE practice may merit future research attention. It would be worth investigating how different sociocultural and educational contexts (e.g., Korea and Sweden) might play a role in influencing learners' perception and practice of IDLE activities that are associated with learning outcomes (e.g., productive vocabulary knowledge and speaking). Lastly, in order to help us to empirically substantiate claims about the effect of IDLE activities on L2 learning, an intervention study could be designed and implemented. That is, in the control group, teachers could conduct general language learning in the classroom (a non-IDLE environment). In Experimental Group A, a researcher could include a group of students that engage in IDLE quantity activities, and in Experiment Group B, groups of students who participate in IDLE diversity activities could be included. It would be of interest to examine whether this approach could be effective in developing students' L2 learning attitudes, behaviors, and learning outcomes.

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Notes

1. The terms *extramural English* (Sundqvist, 2009), *online informal learning of English* (Sockett, 2014), *out-of-class English learning* (Lai et al., 2015), and *language learning and teaching beyond the classroom* (Reinders & Benson, 2017) may seem different, but in this study, they are not considered mutually exclusive, as these notions share much in common when regarding their perspectives and principles.

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Appendix. Semi-Structured Interview, Student Interview Guide

1. What is your most recent TOEIC score (within the past two years)?
2. Do you feel confident using English?

3. Do you enjoy learning English?
4. Do you feel nervous about communicating in English?
5. On average during the past 6 months, how many hours each day did you spend in engaging in IDLE activities outside the classroom?
6. Out of 100%, what percentage of your learning of English has come from formal instruction (e.g., school), and what percentage has come from IDLE activities (e.g., Internet, watching English movies, or other media)?
7. What types of IDLE activities do you engage in? Can you describe how you engage in those? What factors affect the different types of IDLE activities you use?

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