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Extramural English Engagement as a Multidimensional Predictor of Language Proficiency: An Activity-Based Analysis in Digital Learning Environments

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Abstract: This study examines the role of Extramural English (EE) engagement as a predictor of language proficiency in digitally mediated learning environments. While previous research has consistently highlighted the benefits of out-of-class exposure, Extramural English is often treated as a uniform construct, with limited attention to how different activity types contribute differentially to language development. This study aims to analyze the extent to which various dimensions of EE engagement predict English proficiency. A quantitative correlational design was employed involving 215 learners in a vocational higher education context. Data were collected through a structured EE questionnaire, a standardized English proficiency test, and a process-based participant workbook capturing engagement patterns over time. Statistical analyses included descriptive statistics, Pearson correlation, multiple regression, and one-way ANOVA. The results reveal a significant positive relationship between EE engagement and proficiency, with productive and interactive activities emerging as the strongest predictors, while passive engagement shows a comparatively weaker effect. The findings suggest that active, consistent engagement plays a critical role in language development. This study contributes by proposing an activity-based model of Extramural English, emphasizing the importance of engagement quality over mere exposure.

Keywords: *activity-based engagement; EFL learners; Extramural English; informal digital learning; language proficiency*

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INTRODUCTION

In recent years, there have been significant changes in the way people interact with language, largely due to the rapid progress of technology. English, as a global lingua franca, is no longer confined to formal educational environments, such as schools, and is increasingly present in people's lives in informal and digitally mediated settings. English is encountered by learners in a variety of contexts: watching and listening to videos; listening to music; using social media for communication and joining online communities through the Internet; playing online games; and consuming a wide variety of other material through the digital medium. Thus, the process of studying a second language has changed dramatically. Learners are regularly exposed to English in natural contexts and in some motivating situations. Much of the English learners encounter outside the classroom is outside teachers' control and is, therefore, learner-independent (De Wilde et al., 2020; Kusyk et al., 2025; Reinders & Benson, 2017).

There is growing interest in researching how young speakers of other languages use English to communicate outside of formal study. A great deal of recent research on aspects of the uses of English by learners outside of formal study (or so-called 'Extramural English' or EE) concludes that in the future the study of learners' use of English in their free time will be a highly significant area of research into contemporary language use by speakers of other languages. As learners use English outside of formal study, they have the opportunity to use real English, to act autonomously, to take English with them wherever and whenever they like, and be continuously surrounded by English, all made possible by modern technology (De Wilde et al., 2020; J. S. Lee & Dressman, 2021). Unlike traditional classroom instruction, EE allows learners to interact with English in meaningful, personally relevant contexts, increasing opportunities for incidental learning, communicative practice, and learner agency in authentic settings (Kaatari et al., 2023; Kusyk et al., 2025).

Moreover, growing evidence suggests that the effects of EE are multidimensional and activity-specific rather than uniform across all forms of engagement. Corpus-based data showed that different extramural activities contributed differently to students' written production, with some supporting lexical diversity while others enhanced syntactic complexity (Kaatari et al., 2023). Similarly, motivational variables, particularly

linguistic self-confidence, mediated the relationship between Extramural English exposure and vocabulary development (Leona et al., 2021). These findings suggest that the benefits of EE are shaped not only by exposure frequency but also by the type of engagement, contextual relevance, and learner-related psychological factors (Kaatari et al., 2023; Leona et al., 2021). Collectively, this body of research reinforces the view that Extramural English should be conceptualized as a multidimensional and context-sensitive phenomenon that plays an increasingly important role in second language acquisition within digital learning environments (Kusyk et al., 2025; Reinders & Benson, 2017).

Digital learning ecosystems have also exploded over the last few years. English can now be accessed through apps, streaming media, AI-supported learning tools, chatbots, global learning communities, and professional networks. So, in addition to formal education, learners can access English in extramural situations through a variety of means, at times and locations the learner chooses. Recent meta-analytic studies on chatbot-supported language learning have revealed moderate to positive effects on language learning outcomes. As such, chatbot-supported conversational learning can be an effective informal learning tool for English (X. Yang, 2025). Digital tools in vocational education can not only improve students' motivation but also improve students' language use in real-life situations (Rossydi et al., 2026). Most research on digital tools for language learning is fragmented. In this research, the writer tries to explain an integrated model of digital tools for language learning.

However, as EE becomes more important, the field of second language acquisition is of greater relevance, particularly for topics such as incidental learning and self-directed learning. Such studies, however, show that students who, in addition to studying English in school or at college, also use English outside the classroom substantially improve in four important areas of language use: vocabulary, listening, reading, and communication (J. S. Lee & Dressman, 2021; Namaziandost, 2025). These benefits are largely attributed to sustained exposure to meaningful input through real-world media and digital interaction. Unlike textbook-based learning, digital environments expose learners to contextualized, dynamic language use, supporting deeper comprehension and lexical development.

From a theoretical perspective, second-language acquisition (SLA) perspectives can be used to explain EE. The Input Hypothesis (Krashen, 1985) is one SLA model and maintains that comprehensible input is necessary for acquisition. Another perspective is output-oriented, in which learners' fluency and grammatical control of EE can be facilitated through language use (Wu & Schunn, 2023). Furthermore, from a sociocultural perspective, interaction plays a very important role in learners' development of EE, and collaborative meaning-making within interaction is crucial for learning (Vygotsky, 1978). SLA in digital environments has also been a topic of many recent studies, including the roles of digital participation, peer interaction, and out-of-class language use by learners in their SLA (Y.-J. Lee, 2025; Pyo & Lee, 2025).

Recent studies on Effective Engagement also reveal that EE can develop learners' productive and interactive competencies as well as their receptive ones. A range of online activities, including online gaming, participation in global fan communities, making videos, and using social media for communication, involve students using English productively in real situations. Through such engagement, speakers have reported increased confidence, increased use of pragmatics, and increased motivation to communicate in English (Brown, 2015; Y.-J. Lee, 2025; Soyoof et al., 2025)**.** In digitally connected spaces, learners are not merely recipients of language input but active participants in multilingual discourse communities. In digitally connected spaces, learners are not merely recipients of language input but active participants in multilingual discourse communities. Through continuous interaction, learners are exposed to authentic linguistic expressions, cultural nuances, and real-time communicative exchanges that encourage spontaneous language use and negotiation of meaning. Such environments also give learners opportunities to develop digital literacy, communicative adaptability, and interactional competence, all of which are increasingly important in contemporary global communication. Furthermore, the participatory nature of digital EE activities allows learners to construct their identities as language users while simultaneously strengthening their confidence and engagement in English-mediated communication contexts (Kusyk et al., 2025; Y.-J. Lee, 2025).

While learners' and students' formal and informal English study practices outside the classroom are influenced by a range of contextual factors, the range of Extramural English (EE) activities that are engaged in regularly and the frequency with which these are undertaken by learners and students can also be determined by several factors. The most significant of these are the digital resources available to support learners' and students' English study, both formally and informally, and the motivation learners have to participate in as wide a variety of EE activities as possible. Other factors that can determine the EE practices of learners and students include their learner and student characteristics, including their socio-economic status, and their perspectives on the use of English in a variety of different academic and vocational contexts, including those that are of an academic, vocational, and professionally oriented nature, and are designed to help learners to develop some essential other employability skills, through the use of English, in order to prepare them for several different workplaces, for several different jobs, in order to aid their career development and to aid their progress in their chosen careers in several different ways. English is perceived by many learners as a highly strategic and very useful skill, and learners use it in several different contexts at different times. Previous research has established

that there are times when learners are more likely to engage in several EE activities formally and informally, outside the classroom, when they are studying English formally and informally in other sites of English use, and perceive the use of English in these activities in several different ways (Rossydi et al., 2026; Zhang et al., 2025). Learner agency or action within a digital learning environment is a recently highlighted factor that determines learners' engagement in learning when they identify opportunities and manage constraints to achieve their learning goals. While there is some evidence to suggest that learners are aware of resources available online to support their learning, there is a lack of awareness of the relevant resources as well as online constraints that would affect their actions in order to achieve their learning goals in technology-mediated language learning environments (Lin & Huang, 2025). Thus, developing learner agency in informal language learning environments, which are contextualized and therefore relevant to learners, can become a powerful motivator for learners to engage in informal language learning on an ongoing basis

Although research on EE in language learning is achieving promising results, an important conceptual problem that has not yet been resolved is that EE is discussed in most studies as if it were a homogeneous variable. In fact, however, most research on EE so far has treated the quantity of exposure to a language as if it were the only relevant variable, rather than different types of language use. Thus, watching videos in a second language, for example, would be seen as roughly comparable in value to playing in a second language with native speakers of that language in a computer game, or to producing web pages in a second language. In fact, however, there is only very recent research on the topic of EE in language learning, in the form of some very promising research on engagement in language learning and the different qualities of language use that are in fact in participants' repertoires and thus can be utilized in learning a new language (Mercer & Dörnyei, 2020).

EE can be studied from several angles. In terms of passive EE supported by EE, this includes vocabulary acquisition and text comprehension. In terms of interactive EE supported by EE, this involves response, meaning negotiation, and text discourse management during interaction. In terms of productive EE supported by EE, this involves language production, accuracy monitoring, and interaction with others, modified according to purpose and audience. Studies of digital engagement supported by EE are increasingly numerous and offer a more refined model, now including a range of behavioral, cognitive, and social participation models (Huang, 2026; Inayati et al., 2025). A third transformation is the explosive development of digital learning ecosystems. English language learners can now access English whenever and wherever they like. In addition to a wide variety of mobile and streaming English content, learners can now use many different AI-supported learning tools. By participating in global learning communities and professional networks, English language learners are able to develop English-using capacity in a wide variety of situations. All of these developments, beyond the traditional classroom, provide learners with the flexible, individually tailored, and ongoing learning opportunities that are now demanded. Using digitally supported systems in vocational education has, for example, been found to increase learners' motivation and develop higher levels of practical English using capacity (Rossydi et al., 2023). However, thus far, the great majority of studies of this kind are fragmentary. They focus on a single learning platform or a single learning activity without developing an integrated explanatory model.

New evidence concerns the influence of Extramural English exposure on different types of learners, specifically those with different motivational orientations. For example, Leona et al. (2021) found that learners' linguistic self-confidence in English mediated the relationship between the amount of EE exposure and vocabulary use in young learners. Several limitations need to be addressed in EE research. For the most part, EE studies have relied on a variety of self-report measures (e.g., questionnaires and surveys), which are not always able to capture learners' English use in the long term. New methodological critiques have appeared lately, suggesting that questionnaires should be supplemented with other data sources (e.g., learning logs, diaries, data analytics, as well as learners' behavioral records) (Huang, 2026; Smith & González-Lloret, 2021). Few studies have attempted to examine all of the EE dimensions in one study and model them as predictors of learners' English proficiency.

A range of other contextual factors, including access to digital resources to support EE, learners' motivation, learners' and students' backgrounds, and how learners perceive English in relation to their future careers, also affect EE participation. English is a skill that can be developed to improve employability; therefore, it is a particularly salient issue in a range of vocational and professionally oriented educational contexts. A recent study of EE in three countries found that when English was linked to specific professional outcomes for learners, they engaged more consistently in a range of interactive and productive EE activities. These activities provided learners with authentic communicative experiences and opportunities for practical language use to prepare for their future careers and, more broadly, to gain academic mobility and professional communication skills that would enhance their chances of career advancement through English. EE can therefore be more successfully implemented in a range of vocational contexts where English is perceived by learners in this way (Rossydi et al., 2023, 2026; Zhang et al., 2025).

In addition, growing scholarship indicates that the effects of Extramural English are activity-specific rather than uniform across all forms of engagement. Using corpus-based data (Kaatari et al., 2023; Rød & Calafato, 2023), researchers investigated activity-specific effects of learners' Extramural English (EE). The studies found that different EE activities predicted different dimensions of the students' written output. For

example, reading in English was found to increase the use of adjectival modification, whereas conversing in English and watching English TV programs were found to increase learners' lexical diversity in writing. These findings illustrate how different EE activities can foster different aspects of a learner's language use, and that using a broad measure of EE may conceal important qualitative differences regarding how learners can use their EE for linguistic development. While research on Extramural English is growing rapidly and becoming a more mainstream area of study, it is still largely fragmented and characterized by a variety of approaches to conceptualizing, measuring, and analyzing the phenomenon. This fragmentation is mainly caused by differences in how 'informal language learning' is defined and operationalized (Kusyk et al., 2025). Thus, more integrated research on Extramural English from a multidimensional perspective is needed.

Despite a rapidly growing body of research into Extramural English (EE), several significant limitations remain from conceptual, methodological, and contextual perspectives. For the majority of studies to date, EE has been studied as a singular entity, rather than as a multidimensional, activity-based construct that can facilitate a variety of language development processes and be used in a variety of contexts. Thus, whilst there is a considerable body of research which examines the role of a variety of different EE activities as they are utilized in order to facilitate a variety of different aspects of language development, there remains a dearth of research which systematically establishes how different forms of EE engagement can facilitate different processes of language development. This gap is what the current study aims to address by adopting an activity-based perspective to investigate the role of EE in predicting language proficiency. In order to achieve this aim, this study will 1) investigate levels of engagement in a variety of EE activities; 2) explore the relationship between participants' EE engagement and their language proficiency; 3) identify the strongest predictive dimensions of EE; and 4) compare findings from two participant groups. In doing so, the study seeks to produce evidence-based research on informal digital language learning that takes place outside the classroom daily to address several current gaps in the second language acquisition research paradigm.

METHODS

The study is a quantitative correlational research study. The research therefore investigates relationships between variables, including the degree and direction of those relationships. Since no interventions were conducted in this study, and the researcher is a non-participant, the research setting and participants were not controlled or manipulated by the researcher (Creswell & Creswell, 2018; Fraenkel et al., 2012). The study also employed comparative analysis and predictive modeling to investigate differences between participants and how different EE dimensions could predict language-related outcomes. Thus, all data from the participants were collected at one point in time, allowing for a cross-sectional study in which participants' current use of EE and their English language proficiency could be measured (Setia, 2016; X. Wang & Cheng, 2020).

The participants consisted of 215 students enrolled in vocational high school education programs (Kaatari et al., 2023; Setia, 2016). They were selected using purposive sampling based on the following criteria: (1) currently enrolled in a vocational education program, (2) having prior experience in learning English, and (3) actively using digital media. The participants represented three different academic domains characterized by varying communication demands. All participants provided informed consent prior to data collection. To accurately measure all variables in this study, three different tools were designed and used in the study. These tools are an Extramural English Questionnaire, an English Proficiency Test, and a Participant Workbook. All data collected from these tools are perceptual, performance-based, and process-oriented. By using three different tools, data triangulation has been achieved in this study.

The Extramural English (EE) Questionnaire was adapted from established instruments in prior EE research and further contextualized to suit the characteristics of the present participants and research settings (Kaatari et al., 2023; Rød & Calafato, 2023). Given the nature of this study and the participants' varied learning contexts, this EE Questionnaire was adapted to better fit the study and its participants. The questionnaire consisted of several categories of items, which were combined into four dimensions for measuring the study variables. EE Frequency measured how often the participants engaged in EE in general. Passive engagement measured how often participants engaged in EE that consisted of receptive activities such as watching English movies, TV shows, and videos, and listening to English-speaking individuals, such as music and podcasts, etc. Interactive Engagement measured how often participants engaged in socially mediated EE, allowing for communication and participation by the learner. This type of EE included online gaming in English, chatting in English, using social media in English, and so on. The last dimension, Productive Engagement, consisted of various items that measured output-oriented ways in which learners participated in EE, such as writing in English, creating English-language content of any sort, and speaking English in general. All items from the various categories were rated by participants on a 5-point Likert scale from 1 (never) to 5 (very often). The results from the various dimensions of the EE Questionnaire would provide insight into the types of EE that the learners in this study participated in and their relationship to English language proficiency.

To assess the English language ability of the participants, a test of English language proficiency was administered. The test consisted of several multiple-choice questions and was intended to test the reading skills

as well as vocabulary and grammar of the participants. In this way, the core language skills of the participants were tested, and two basic levels of English language proficiency could be distinguished: academic and functional. The scores of the participants on this test were treated as continuous data (i.e. interval-scale data) and were used as the dependent variable in the subsequent analysis. The results of this English language proficiency test can be compared to the results of the questionnaire in which the participants reported their language use.

In addition to the questionnaire and the learners' proficiency test, a process-oriented Participant Workbook was used to monitor the participants' use of Extramural English in real life. By filling in the workbook daily over a set period, participants recorded all instances in which they were exposed to English and all instances in which they used English. Their entries were then analyzed and documented by frequency, duration, and type of use. Unlike a questionnaire, in which learners merely claim how they use English, the Participant Workbook provided solid evidence for the participants' real use of English. The results of using the workbooks, moreover, provided a more authentic and comprehensive view of the learners' use of Extramural English than would have been the case without the workbooks, and they increased the methodological rigor of the study.

This study uses valid and reliable data in terms of content and construct validity, as well as reliability. Three English-language experts provided input on the relevance, clarity, and representation of items on the questionnaire. The instrument's construct validity was supported through an Exploratory Factor Analysis (EFA). The reliability of the questionnaire was assessed by calculating Cronbach's Alpha for the various scales. The reliability of the English proficiency test was calculated using the Kuder–Richardson Formula 20 (KR-20) for the dichotomously scored items. The reliability of the English proficiency test was calculated using the Kuder–Richardson Formula 20 (KR-20) for dichotomously scored items, while the reliability of the questionnaire was calculated using Cronbach's Alpha. A minimum of .70 was used as the acceptable reliability level for both instruments. In using these measurement tools, reliability was checked using Cronbach's Alpha.

Table 1. Reliability Analysis

Instrument	Number of Items	Cronbach's Alpha (α)	Interpretation
EE Questionnaire	19	0.89	Excellent
Participant Workbook	—	0.91	Excellent
Motivation Scale (optional)	—	0.85	Good

As shown in Table 1, all instruments demonstrated satisfactory to excellent reliability with Cronbach's alpha Values exceeding the acceptable threshold of 0.70. Data for this study were collected in several stages. Firstly, the online Extramural English (EE) Questionnaires were completed by participants via an online survey facility that is hosted on a secure server. Participants were provided with information about the purpose of the study and the ethical considerations involved, including the right to voluntary participation, anonymity, and confidentiality. In administering the tests, all participants were given the tests either online or in class by a qualified test administrator. The online and classroom versions of the tests were administered fairly and accurately. Participants reading the same tests had the same amount of time to complete them and were given the same method for scoring and reporting results. In addition to administering the Extramural English (EE) Questionnaire to all participants, all students recorded their EE activity for 30 days. They recorded their EE activity in their workbooks. Students engaged in EE in normal learning circumstances across a variety of settings. Therefore, process data were collected on how students used EE. The collected data were checked for completeness and then organized and prepared for the database. The data were then decoded, operationalized, and analyzed using appropriate statistical methods with the help of corresponding software packages.

For the quantitative data analysis, SPSS software was used to generate descriptive statistics and test hypotheses. The findings from the research objectives were investigated by presenting statistics for the two participant groups across the EEE areas of Explanatory, Evaluative, and Environmental. In addition, Pearson product-moment correlation was used to investigate the indicators of EE engagement and English learners' English proficiency (EP) scores. The aim was to determine whether there were any positive correlations between the indicators of EE engagement and EP scores. Multiple regression was also used to examine the relative contributions of the four dimensions of EE (i.e., frequency, passive engagement, interactive engagement, and productive engagement) to English learners' English proficiency while other relevant predictor variables were controlled for. One-way ANOVA was used to investigate whether significant differences existed between three groups of participants in terms of their EE engagement and EP scores. The results of the ANOVA were subsequently subjected to post-hoc comparisons to identify any significant differences. Prior to the analyses, several key assumptions were tested, including normality, linearity, multicollinearity, and homogeneity of variance. All tests were carried out at the .05 level of significance. This study was carried out in compliance with the ethical guidelines for good research practice. All participants in this study were volunteers and informed about the purpose of the study. All data obtained from the participants were treated confidentially and anonymously. All participants were advised that they could withdraw from the study at any stage.

RESULT AND DISCUSSION

Overall, participants reported moderate to high levels of engagement with all aspects of EE. Across the different types of EE engagement, the mean scores for interactive and productive aspects (such as writing blogs, using social media in English, and speaking with other learners of English) were higher than those for passive engagement with English outside the classroom. These initial findings support the claim that learners are doing more than just being exposed to English when they are engaging in EE. Descriptive statistics of learners' EE engagement and their English proficiency were calculated.

Table 2. Descriptive Statistics

Variable	N	Mean	SD	Interpretation
EE Frequency	215	3.62	0.68	Moderate–High
Passive Engagement	215	3.75	0.70	High
Interactive Engagement	215	3.89	0.65	High
Productive Engagement	215	3.54	0.72	Moderate–High
EE Overall	215	3.70	0.60	High
English Proficiency	215	72.45	8.90	Moderate

Table 2 illustrates the degree of engagement learners have with Extramural English across all aspects. Learners have high levels of Interactive engagement with EE, higher than both their passive and Productive engagement. The learners' Productive engagement figures indicate that the learners are involved in output-based language use in most instances. This suggests that, rather than merely being passive recipients of English, the learners are involved in a variety of communication using English through digital media. However, the English language learning ability of the learners in question is only average. There is clearly a large gap between the learners' engagement with EE and their English language ability; an investigation into how different types of EE can facilitate English language learning is thus warranted.

While many studies on EE focus on the quantity of EE that students receive outside the classroom, this study examines how students in vocational higher education engage in EE as receivers (passive), participants (interactive), and producers (productive). The results show that, besides many other types of EE activities, students most frequently engage in interactive EE. Online environments form the platform for this type of EE activity, which differs from passive EE reception. The results of this study provide more specific insight into how students actually use EE than the sum of their EE exposure in general.

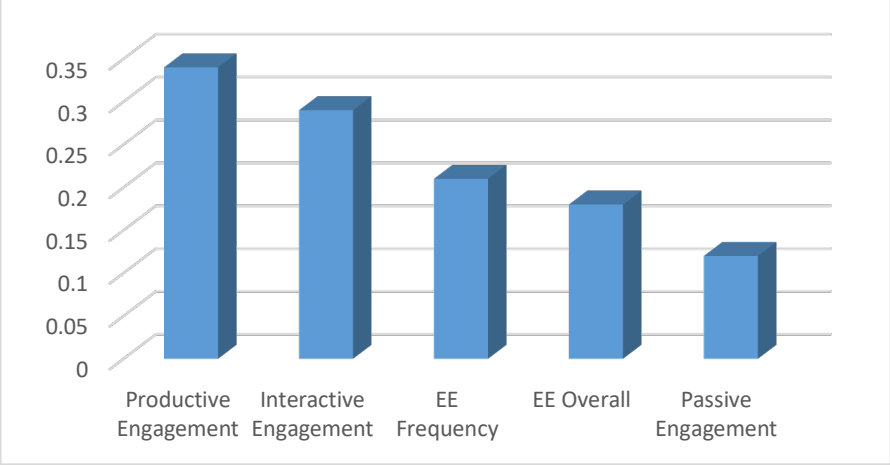


Figure 1. Standardized Beta Coefficients of EE Dimensions Predicting English Proficiency

Figure 1 illustrates the proportions of English language learning outcomes that are explained by the three EE dimensions for different groups of learners of English as a Second Language. First of all, note that all three EE dimensions are significantly correlated with English proficiency and therefore all three contribute to the English learning outcomes of ESL learners. Of the three EE dimensions, however, Productive is the most predictive, followed by the Interactive dimension. The sum of the Positive and Creative aspects of both the Productive and the Interactive dimensions of EE accounts for more than the sum of the Positive aspects of both the Passive and the Interactive dimensions of EE. The latter account for a single instance of English use – the passive reception of English by others in a variety of contexts. The former, on the other hand, accounts for a variety of instances of active use of English – writing, reading, speaking and listening to English in several contexts. Table 3 presents the correlation analysis between various EE dimensions and English proficiency.

Pearson Product Moment Correlation was used to investigate the relationships between various EE dimensions and English proficiency. Results revealed significant positive correlations between overall EE engagement and English proficiency (r =0.58, p <0.01), productive EE engagement and English proficiency (r =0.58, p <0.01), and interactive EE engagement and English proficiency (r = .56, p < .01). Thus, various EE forms and practices are correlated with English proficiency, and several EE dimensions are correlated with English proficiency. The findings also indicate that EE frequency is moderately correlated with English proficiency (r = 0.49, p < 0.01). Thus, more EE over time appears to support the language development of these learners. As was mentioned earlier, however, the main finding of this study is that while increased EE in general is an important component of learners' instructional time, the type and quality of that EE is more important in accounting for variability in learners' language proficiency. Thus, it is not simply more EE that is needed, but rather interactive and productive uses of EE that can predict learners' language development. These findings will be explored in greater detail in the upcoming regression analysis.

Table 3. Pearson Correlation Matrix

Variable	1	2	3	4	5	6
1. EE Frequency	1					
2. Passive	0.42**	1				
3. Interactive	0.55**	0.48**	1			
4. Productive	0.51**	0.39**	0.62**	1		
5. EE Overall	0.71**	0.68**	0.79**	0.76**	1	
6. Proficiency	0.49**	0.31**	0.56**	0.58**	0.58**	1

Note: p < 0.01

As presented in Table 3, all dimensions of Extramural English (EE) engagement are positively and significantly correlated with English proficiency (p < 0.01), indicating that increased engagement is consistently associated with higher language competence. Among the dimensions, productive engagement (r = 0.58) and interactive engagement (r = 0.56) demonstrate the strongest relationships with proficiency, suggesting that activities involving active language use and real-time communication are more strongly linked to language development. In contrast, passive engagement shows a weaker correlation (r = 0.31), suggesting that exposure alone may contribute less to higher-level proficiency. Additionally, EE frequency (r = 0.49) shows a moderate relationship with proficiency, highlighting the role of sustained engagement intensity. The strong intercorrelations among EE dimensions also suggest that these variables are related but not identical, supporting their inclusion as separate predictors in subsequent analyses. Overall, these findings indicate that while general exposure to English is beneficial, the type and quality of engagement play a more critical role in shaping language outcomes, providing a foundation for further analysis through regression modeling. Previous studies that investigated the relationship between students' use of Extramural English and their overall English language proficiency found positive correlations. However, the current study outlines specific differences regarding the various dimensions of EE engagement and their respective relationships with English proficiency. While correlations for productive and interactive EE engagement are substantially higher than those for passive EE engagement, this study pinpoints the quality of learners' participation in Extramural English contexts as more relevant to learners' language development than mere exposure to English.

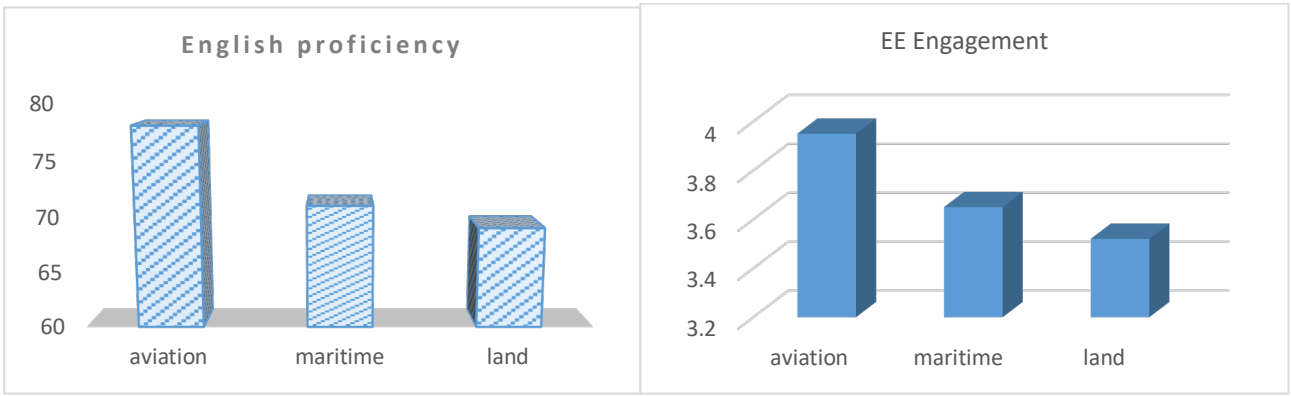


Figure 2. Differences in Extramural English Engagement and English Proficiency across Operational Domains

In Figure 2, aviation participants clearly display higher levels of EE use and higher English proficiency than participants from the maritime and land domains. The trends for EE use and English proficiency among the three groups from the maritime and land domains are more or less similar. The results in Figure 2 clearly indicate that communication requirements in professional contexts within domains affect the degree and type of EE use, as well as speakers' acquisition and application of English for professional purposes.

The model as a whole was found to be significant (p <0.001). The model explained 42% of the variance in the criterion variable, English proficiency. The two strongest predictors of English proficiency were found to be productive engagement and the second strongest predictor of English proficiency was found to be interactive engagement. The other EE engagement dimensions, EE frequency and overall engagement, also contributed to English proficiency. Passive engagement, however, contributed very little to English proficiency. The correlation results provided in the previous section were used as the basis for the multiple regression analysis reported in the section below. The analysis included all 5 Engagement dimensions as predictors of English proficiency, and the results show a statistically significant model, $F(5,209) = 30.12$, $p < 0.001$. The model explained 42% of the variance in English proficiency ($R^2 = 0.42$). The results of the Multiple Regression Analysis are presented in Table 4.

Table 4. Multiple Regression Analysis

Predictor	β	t	Sig.
EE Frequency	0.21	3.45	0.001
Passive Engagement	0.12	1.98	0.049
Interactive Engagement	0.29	4.62	0.000
Productive Engagement	0.34	5.10	0.000
EE Overall	0.18	2.90	0.004

Model Summary: $R^2 = 0.42$, Adjusted $R^2 = 0.40$, $F(5, 209) = 30.12$, $p < .001$

Table 4 revealed the significant relationship between different dimensions of Extramural English (EE) and English proficiency of respondents. The model was statistically significant, $F(5, 209) = 30.12$, $p < 0.001$. The model explained 42% of the variance in English proficiency of respondents, i.e., $R^2 = 0.42$. Out of all the EE engagement dimensions, productive engagement ($\beta = 0.34$, $p < 0.001$) followed by interaction ($\beta = 0.29$, $p < 0.001$) explained the most variance in English proficiency of respondents. The results revealed that the frequency of EE ($\beta = 0.21$, $p = 0.001$) and general engagement ($\beta = 0.18$, $p = 0.004$) also had a significant effect on participants' English proficiency. However, passive engagement ($\beta = 0.12$, $p = 0.049$) had the weakest relationship with English proficiency of the participants. These findings are consistent with previous correlation findings, which indicated that only the active engagement dimensions were significantly related to English proficiency of the participants. Hence, it can be concluded that EE will be effective only if it has quality engagement.

No variable other than passive engagement reached significance at $p < 0.05$. Thus, whereas being exposed to EE does not appear to be as important as it may have been in the past, processing the language from EE in order to learn from it (i.e., through several different cognitive processes) appears to be the major determinant of the effectiveness of EE for enhancing learners' English proficiency. All of these findings support the view that the type and quality of engagement in EE, not merely exposure to it, is a major determinant of its effectiveness. These findings are further corroborated by the correlations between the engagement dimensions and the EPT scores, where the active engagement dimensions are found to have a stronger correlation with the EPT scores than the passive exposure dimension.

The findings in Table 4 also indicate that not all EE dimensions have the same positive effects on language proficiency. Productive and Interactive EE have the most predictive power on English proficiency. This indicates that to acquire higher levels of language proficiency, learners need to engage in activities that help them use English productively and interact with native speakers of other languages. Such engagements help learners retrieve, organize, and use their current language stock while they process given information and achieve given goals in English. These types of engagement require deeper levels of cognitive processing than passive engagement. Consequently, the findings support the assertion that passive EE has the weakest effect on English proficiency. This is because passive engagement exposes learners to information and thus does not require processing.

EE frequency, as well as overall engagement, significantly predicts language proficiency. Therefore, both the quality and quantity of EE facilitate language learning. From an activity-based perspective on Extramural English, this study proves that different dimensions of EE have different degrees of predictive power on English language proficiency. Thus, rather than treating EE as a single variable, this study ascertains the relative weights of different types of EE. The major contribution of the present study, therefore, is to provide empirical evidence for an activity-based conceptualization of EE and to highlight the significance of active language production and interaction, as opposed to mere passive exposure to a foreign language, in informal language learning. A one-way analysis of variance (ANOVA) was conducted to examine differences in Extramural English (EE) engagement and English proficiency across participant groups. The results indicate statistically significant differences in both EE engagement ($F = 4.87$, $p = .009$) and English proficiency ($F = 5.32$, $p = .006$). These findings suggest that group membership is associated with variation in both engagement and language outcomes. The ANOVA results are presented in Table 5.

Table 5. One-Way ANOVA Results

Variable	F	Sig.
EE Engagement	4.87	0.009
English Proficiency	5.32	0.006

Table 6. Post Hoc Test (Tukey HSD)

Comparison	Mean Difference	Sig.
Aviation vs Maritime	Significant	< 0.05
Aviation vs Land	Significant	< 0.05
Maritime vs Land	Not Significant	> 0.05

Post-hoc comparisons among the three groups, as presented in Table 6, revealed significant differences between the aviation group and the two other groups. The results indicated that the aviation group had greater EE engagement and English proficiency than the maritime and land groups. However, there were no significant differences between the two latter groups, and therefore, it can be concluded that the participants in these groups had similar levels of EE engagement and English proficiency. Therefore, differences in learning environments and participants' communication in the different contexts in which they study may affect their degree of engagement in EE activities as well as the extent of their language development. As suggested by previous research (Leona et al. 2021), the effectiveness of EE for different learners is variable and is affected by several motivational variables. The findings of the present study, therefore, emphasize the importance of the context in which EE activities take place and indicate that EE is not just an aspect of individual learning but is also influenced by the learning environment.

Most EE research so far has been carried out within a single educational setting (e.g. a school, college or university) and has involved studying the EE of learners in one or more of the vocational programs offered within that setting. The research reported upon here, however, was carried out in three different single settings but involved three different institutions, three different professions, and so, whilst there were found to be many similarities between how the learners' EE engagement and their English were affected by the settings in which they were studying, there were also many differences and so the findings of this research suggest that, as well as being affected by the learners' individual learning and studying as a solo activity, their EE can also be affected by the nature of their 'vocational operations' and the contexts of their work and the nature of their particular occupations. The results of this study can be discussed in terms of assessment of language learning outside the classroom. As mentioned before, EE is a multidimensional construct and cannot be measured by one variable that measures English exposure. The results from descriptive statistics, correlations, regression analyses, and comparative statistics all indicated that the two major dimensions of EE, i.e., productive EE and interactive EE, are the most relevant variables that affect learners' EF. Results from cross-domain studies also indicated that contexts in which EE takes place, i.e., within and outside institutions and workplaces, differ from one another. Thus, activity-based and context-sensitive approaches are required to assess EF within the framework of this study, i.e., vocational higher education.

This study was conducted to gather evidence about the effect of EE (Extramural English) engagement on learners' language proficiency in digitally mediated environments. It was hypothesized, and later found to be true, that EE engagement in general predicts English proficiency. In other words, learners are more likely to develop better English language abilities the more they engage in EE in and out of the classroom. Many studies (De Wilde et al., 2020; Pyo & Lee, 2025) found that EE exposure to English, in particular through digital media, entertainment, and online interaction at all times outside of class, would facilitate learners' acquisition of vocabulary and improvement of their listening skills as well as overall communicative competence. In today's English learning environment, exposure to English is much more prevalent and constantly available through various media and online environments than what learners receive in the classroom.

This study contributes to current research on EE in various ways. Firstly, it highlights differences in language development resulting from different types of EE engagement. The results of the regression analysis reveal that the most productive and interactive types of engagement are the strongest predictors of language proficiency, outperforming all passive types of engagement. While it has in recent years become clear to several researchers that exposure alone is not as important as the quality of the EE engagement, the most productive forms of EE engagement—such as producing content, taking part in a discussion forum, digital co-authoring, online communication of any kind—lead to greater gains in terms of fluency, lexical quality and, above all, discourse control than a purely receptive EE engagement (Al-khresheh, 2024; Soyoof et al., 2025). These findings reinforce the argument that active language use requires deeper processing, which strengthens long-term retention and functional competence.

The findings of this study have implications for the design of language learning environments. It has been shown that output engagement in EE leads to greater gains in language use than the same amount of receptive EE. In terms of specific language learning tasks, a range of productive writing tasks, such as writing

comments on others' work, creating captions or subtitles for videos, recording spoken responses to a given task, and verbal interaction with others, can elicit a range of key language processing abilities. Such output-oriented engagement in language learning can facilitate the transformation of learners' largely receptive knowledge of supplementary EE into effective communicative competence (Hong & Tai, 2025). Therefore, the present findings provide further evidence that productive Extramural English is not merely supplementary but central to language development.

Interacting with others to learn EE (a 'social' aspect of language) in language learning through interactive online environments is important, and recently several types of online interactive environments have been found to elicit willingness to communicate, pragmatic awareness, and ability to engage in effective spoken interactions through meaningful communication, rather than completing mechanically scored drill exercises (Johnson & Lee, 2022; Y.-J. Lee, 2025). Through the Ecosystem for language learning, learners can be included in real language communities and use EE in those environments to develop their language learning competence or to use language for communication within a wide array of socially situated interactions in learning environments. The relationship between passive engagement and language development was not as strong as expected. Although watching videos, listening to music, and browsing in English provided learners of English with useful input for language development, merely receiving input or studying English does not lead to language development. Attention to the input received, reflection on it, and subsequent use of it are necessary for language development to take place. A very recent meta-analytic study of input in second language learning reported results across a variety of environments, including several described as input-rich but also including interaction and opportunities for learners to use the second language for production (Inayati et al., 2025). The largest gains in the studies reviewed in this paper were reported for environments in which the primary type of exposure that learners received was receptive exposure to language. Thus, passive EE is useful, but the several active measures of engagement included in this study are likely to be more powerful.

Frequency of engagement (EE frequency) is the fourth aspect of learners' extramural English engagement revealed in our data. Learners engage with English regularly, add to their existing vocabulary, and use in real situations the new vocabulary that they have found in any number of sources of English language data. Indeed, as increasing evidence and methodologies are being developed to support a usage-based perspective on language acquisition, situations in which English language forms and functions are used by native speakers of other languages will continue to be highly important for encounters with the target language to be stored in long-term memory and retrieved as needed (Fujisawa & Shintani, 2025; Zhao et al., 2025)**.** It is quality EE, as opposed to frequent EE, which is less important; thus, it is a core component of Effective Extramural English. The ANOVA results provide further insight into the above findings. The results indicate significant differences between the three groups of participants. In particular, communication-intensive environments were found to be more conducive to EE engagement and language proficiency than less communication-intensive environments. Participants from these environments reported that English was relevant for future careers, academic purposes, and future professional identities. Research into language motivation in recent years in vocational and professional environments has found that learners' motivation to learn English is instrumental. This has led learners to engage in English language learning autonomously and adopt effective self-regulated learning practices (Kim & Su, 2024; Pyo & Lee, 2025).

This study is relevant to vocational education and training, particularly for professionally oriented programs that view English as a practical skill for students' employability rather than an academic subject. In this context, the study found that aviation-related learners were more engaged and more proficient in English than their counterparts from other professions. Previous studies conducted by (Muliati et al., 2023; Raharjo et al., 2025; Rossydi et al., 2026) found that by applying digitally supported learning and profession-oriented learning that is contextualized, learners' motivation and engagement were heightened. The language learning activities that were related to learners' real-life occupational needs and could be applied outside the classroom for productive purposes led to more sustainable, meaningful, and effective English learning.

The present findings also align with broader trends in informal second language learning research, which indicate that learner engagement, motivation, and contextual factors interact in complex ways to influence language development (Kusyk et al., 2025; J. Wang et al., 2025). Including participant workbook data is an important methodological strength of this study. Much of the previous EE literature relies heavily on self-reported surveys, which may be affected by memory bias or overestimation. By integrating process-based behavioral records, the present study provides stronger evidence regarding actual engagement patterns. Recent methodological scholarship recommends combining questionnaires with diaries, analytics, and behavioral traces to more accurately capture language learning engagement (Huang, 2026; Smith & González-Lloret, 2021). The findings of the current study indicate that, while higher-proficiency learners reported being more motivated to learn English than their lower-proficiency counterparts, they were also more behaviorally engaged in the learning process over time.

Taken together, the findings support reconceptualizing Extramural English as a multidimensional construct consisting of frequency, passive exposure, interaction, and production. This is theoretically important

because many earlier studies treated EE as a broad category of out-of-class exposure. The present results demonstrate that such a generalized approach may obscure critical differences among activity types. Recent scholarship increasingly advocates for more fine-grained models of learner engagement that distinguish among the behavioral, cognitive, and social dimensions of participation (Mercer & Dörnyei, 2020). The current study contributes to that movement by proposing an activity-based interpretation of EE. The stronger predictive effects of interactive and productive EE activities may also reflect differences in learner agency, as successful engagement in digital environments often depends on learners' ability to recognize opportunities, navigate constraints, and regulate participation (Dong, 2025; Lin & Huang, 2025).

The present findings further demonstrate that not all forms of Extramural English engagement contribute equally to language development. Productive and interactive activities emerged as stronger predictors than passive exposure, indicating that language outcomes depend on the nature of engagement rather than exposure alone. This aligns with Kaatari et al. (2023), who found that different target-language extramural activities contributed differently to students' written production: reading was associated with greater adjectival modification, while conversing in English and watching television programs positively influenced lexical diversity. Together, these findings reinforce the view that specific forms of EE engagement foster distinct dimensions of language proficiency.

The findings of this study also reveal potential intersections between formal and informal learning in the post-digital English language teaching classroom. Rather than viewing classroom learning and Extramural English as two adversarial sites of investment, this study demonstrates their potential to function as complementary systems, each powerful in its own way. Formal instruction can offer learners structured input, explicit explanations, and targeted feedback, while EE can offer them repetition, authenticity, personalization, and emotional relevance to the content and processes of learning that formal instruction cannot. Research into blended learning and the synergies between institutional learning and independent digital out-of-class learning (Guan et al., 2024; Lai et al., 2026) also holds significant potential for curriculum design in the post-digital era.

This study has several implications for language teaching and learning. Teachers and curriculum and materials writers can move beyond simply distributing learners' stock of Extramural English and help them use English more interactively and productively. The language-learning classroom in the digital age can capitalize on technology to focus on communication and content production. This can include, for example, using chatbots for conversational practice with AI. A growing body of meta-analytic research is beginning to document the positive effects of chatbot-based interventions in a variety of educational settings (Du & Reynolds, 2025; Laun & Wolff, 2025; Y. Yang et al., 2025).

Regarding the design of English media programs, in the end, it was the teachers who triggered the shift from students consuming English media to actually using English to communicate with each other. Step by step, students moved from watching and listening to English media to reading it and joining English online discussion forums, where they created and interacted with English online content such as student blogs, class podcasts, and their own social media updates in the L2. Together, teachers and students designed online activities to foster English interaction. Students also produced written work and consumed English media in the target language to share with fellow students in other classes and programs around the world. Program administrators and teachers of English media programs, in particular, set up these digital learning spaces to connect students' classroom experiences with their real-life use of English outside the program walls. As learners use English, form an English identity, and negotiate their learning in CALL, this is particularly relevant (Y.-J. Lee, 2025; Lin & Huang, 2025). There are many avenues for further investigation. For example, one could track the levels of EE that students take over time and gain insight into whether EE is used more by the most proficient students in a program to sharpen their skills. The impact of emerging technologies, for example, the use of AI, adaptive learning, and/or learning environments that are personalized for individual learners, on how learners currently utilize informal English exposure to inform their L2 development, and how that may or may not change in the future from a perspective of SLA.

This study addresses four major questions of second language acquisition (SLA). The first question is a complete description of the EE activity studied in this report. EE was previously studied as a single dimension of informal exposure to English outside students' formal classrooms. However, EE has four dimensions. The four dimensions of EE studied here, as reflected in the four questions of the present report, are frequency, passive, interactive, and productive. The study has developed a set of instruments designed to measure each of the four dimensions of EE studied here as four separate questions of this report. These four dimensions of EE are found to be different from one another, and each of the four studied here is found to be a powerful predictor of English proficiency among the four dimensions of EE studied here. A second question of SLA studied here is the EE of students in post-secondary vocational education and training outside of school. The present report is the first to study EE of learners in three very different types of post-secondary vocational education and training programs. The study's major finding is that the four dimensions of EE are found in very different amounts across the three programs studied here. The major implication of these findings for SLA is that studying the EE of students in any program of vocational education and training outside of school must take into account the institutional setting in which the learner is studying. This report develops a new contextual dimension of EE, the

institutional dimension, studied here for the first time as a major question of SLA. A third question of SLA addressed in this report is how the EE of any learner outside of school may be studied as a major aspect of that learner's overall learning. The major findings of this report as they relate to this question of SLA are that the study of EE of any learner outside of school studied here as a major aspect of the overall learning of that learner is found to be a window into that learner's L2 development outside of school. A fourth question of SLA studied in this report concerns the methodological issues involved in studying the informal acquisition of a second language. This report studies EE as a major aspect of informal L2 acquisition outside of formal classrooms. The major findings of this report, as they relate to this question of SLA, are that the methodology developed for studying informal L2 acquisition outside formal classrooms is highly effective. The study of informal L2 acquisition outside formal classrooms, as a major question of SLA, will be supported by the methodology developed in this report for studying learner engagement in SLA across a wide array of formal and informal educational settings.

CONCLUSION

Engagement with Extramural English (EE) is a reliable predictor of English language proficiency for language learners. This study explores the relationship between engagement with EE and English language proficiency. By addressing research questions, this study found that overall engagement with EE predicted language proficiency; however, different types of EE activities contributed differently to language proficiency. Specifically, productive and interactive engagement predicted language proficiency the most. This study found that the effectiveness of informal language learning from digital sources goes beyond simple exposure frequency; engagement with the source also plays a crucial role. Addressing a long-standing research problem in informal English language learning with digital technologies, this study provides a multidimensional, activity-based conceptualization of learners' engagement with EE. The findings contribute to second language acquisition theories and research by integrating perspectives on language input, output, and interaction with research on learners' engagement with EE and English language learning from digital sources. The findings offer a thorough investigation into why and how young English language learners cognitively and motivationally use Extramural English, and provide pedagogical ideas for how English learners can actively and meaningfully engage with the language to aid their acquisition.

DECLARATION OF GENERATIVE AI

The authors declare that no generative AI or AI-assisted technologies were used in the writing process of this manuscript.

CONFLICTS OF INTEREST

The authors declare no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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