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(IJEPC)**[www.ijepr.com](http://www.ijepr.com)**INFORMAL DIGITAL LEARNING OF ENGLISH AMONG EFL  
UNDERGRADUATES: A SYSTEMATIC LITERATURE REVIEW  
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**DOI:** 10.35631/IJEPC.955003This work is licensed under [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/)**Abstract:**

The prevalence of digital technologies greatly facilitates informal digital learning of English (IDLE) among undergraduate students who are raised in a digital environment. While there has been a rising studies on IDLE, there is limited information for undergraduate students learning English as a foreign language (EFL). Therefore, this study seeks to address this gap by examining the status and trends of informal digital English learning in the EFL setting. The research questions in this study are: (1) What has been the interest of IDLE-related research from 2019 to 2023? (2) What trends were reported in the existing literature? (3) What are the recommendations for the future research on IDLE? To address the questions, the study conducted a systematic literature review of 31 relevant articles between 2019 to Nov. 2023 focusing on EFL undergraduate students. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines are utilized for the selection, screening, and reporting processes. The study yields 10 themes on IDLE and offers valuable insights for researchers in EFL teaching and learning. This review aims to contribute to a deeper understanding of the current interests, trends, and existing gaps in IDLE research within the EFL domain.

**Keywords:**

Digital Technologies, IDLE, EFL, PRISMA, Systematic Literature Review

## Introduction

The accessibility of digital technologies has brought significant potential for EFL learning beyond the traditional classroom. With the emergence of 5G in 2019, EFL learning underwent a profound revolution worldwide, with informal digital learning garnering significant attention in the realm of language acquisition (Wang, 2023). A noteworthy phenomenon is the rising popularity of Informal Digital Learning of English (IDLE) among EFL learners, as documented by numerous studies (Lee, 2019, 2020; Lee & Drajati, 2019; Lai, 2018; Sundqvist & Sylvén, 2016; Soyoof, 2023; Liu & Abdullah, 2024). IDLE is described as autonomously utilizing various digital devices (e.g. smartphones and desktop computers) and resources (e.g. web apps and social media) beyond the classroom (Lee, 2019b, p. 2). In this review, the conceptualization of IDLE is based on Benson's (2011) four-dimensional framework, namely, *formality* (herein refers to informal), *location* (herein refers to extramural), *pedagogy* (herein refers to self-instructed or naturalistic) and *locus of control* (herein refers to self-directed). Recent years, most researchers expanded their research on IDLE-related topics, primarily by building upon his framework (Zhang & Liu, 2022).

As the body of knowledge on IDLE has expanded rapidly, there has been a corresponding increase in the number of review papers published on IDLE-related topics in recent years. For example, in a scoping review conducted by Soyoof et al. (2023), 30 papers published between 1980 and 2019 were examined to explore various dimensions of Computer-Assisted Language Learning (CALL), including linguistic, affective and cultural, and digital literacies related to IDLE. However, the review did not differentiate between English as a Foreign Language (EFL) and English as a Second Language (ESL), nor did it distinguish between students at different proficiency levels. In another systematic literature review, Guo and Lee (2023) approached IDLE from an ecological system perspective. Their findings indicated that personal interest and motivation were the most frequently mentioned factors. Similar to the previous review conducted by Soyoof et al. (2023), Guo and Lee (2023) did not make distinctions among learners at different proficiency levels. For this reason, this present study differs from previous research by specifically examining EFL undergraduate students, considering the latest digital learning tools, and distinguishing between EFL and ESL contexts.

First, prior studies did not distinguish between learners of different levels, leading to a lack of understanding of IDLE specifically among undergraduate students (Wang & Liang, 2021). Contemporary undergraduate students, primarily belonging to the 2000s generation are recognized as digital natives. They are aware of the importance of English for their academic and vocational advancement, and thereby exhibit a keen enthusiasm for English learning beyond the classroom (Wang et al., 2022). Despite the crucial importance of EFL learning to undergraduate students, there is a notable scarcity of research examining the comprehensive landscape of IDLE within this specific target population.

Second, previous literature reviews on IDLE have either primarily focused on technologies-mediated learning methods such as CALL or MALL (Papadakis, & Kalogiannakis, 2020), ignoring the latest digital devices for digital learning such as digital apps, social media, artificial intelligence, etc. Recently, there has been a growing interest in advanced digital technologies like ChatGPT, as highlighted in studies by Ipek et al. (2023), Karakose et al. (2023), and Athanassopoulos et al. (2023).

Lastly, many existing review articles did not make a clear distinction between EFL and ESL contexts, or between countries where English is a native language. Given the distinct differences between ESL and EFL, a comprehensive literature review on IDLE in the EFL context is crucial, and it is of necessity to address the gap by focusing on IDLE in EFL context.

Thus, the present review offered a thorough and systematic examination of 31 articles that focused on EFL undergraduate students and the current state of IDLE within the EFL context. It aims to address existing gaps in the literature and presents an updated and comprehensive overview of the latest advancements in IDLE. The significance lies in its rigorous review of prior research and its potential to serve as a guiding reference for researchers. By addressing specific research questions, the paper aims to provide valuable insights into the ongoing discussion on EFL learning in the digital age. The paper also aims to answer and provide insights into the following research questions:

RQ 1: What has been the interest of IDLE-related research from 2019 to 2023?

RQ 2: What trends were reported in the existing literature?

RQ 3: What are the recommendations for the future research on IDLE?

## Methodology

To answer the above questions, a systematic literature review was conducted following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021; Rethlefsen et al., 2021). Specifically, PRISMA methodology was employed, utilizing a 27-item checklist. This research method emphasizes transparency, standardized inclusion, and exclusion criteria, and is structured into four distinct stages: identification, screening, eligibility, and inclusion. The application of PRISMA ensures a methodical and transparent approach, aligning with established criteria to systematically gather and evaluate relevant literature for the comprehensive exploration of Informal Digital Learning of English in the EFL context from 2019 to 2023.

## Identification

Documents selected from different databases should strictly meet five eligibility criteria: i) EFL, ii) peer-reviewed articles, iii) EFL undergraduates, iv) full-length and published, and v) year of publication (Sharif, 2019). Reports from sources other than English language were excluded from this research. In this systematic research, databases were chosen based on their authority and quality namely SCOPUS and Web of Science (WOS). They are considered central databases in social sciences being queried with 'peer reviewed' checked. To be specific, WOS can be used to search all SSCI-indexed journals, and SCOPUS is considered to have the largest abstract and citation database worldwide (Zhong & Abdullah, 2023; Taylor, 2003). Despite Google Scholar is the largest database, it was excluded due to the lack of quality control prevents (Shaffril et al., 2020). The screening of articles was performed by two independent reviews, the findings of which were consistent.

**Table 1. Inclusion and Exclusion Criteria**

Criteria	Inclusion	Exclusion
Language	English	articles other than English
Time frame	2019-Nov. 2023	Publications before 2019
Publication	Academic peer-reviewed journal article	Books, book chapters, editorials, review papers, conference papers, dissertation thesis, retracted publications

Database	Web of Science, SCOPUS	Other databases
Discipline	EFL	Articles other than EFL
Participants	Undergraduates	Students other than undergraduates

### Search String

Accurate keywords together with their synonyms and variations were identified based on research questions and further categorized into specific domains for the purpose of retrieving more potential articles in the researching process. For example, informal learning was expanded to learning beyond the classroom, learning outside the classroom, learning in the digital wild, extramural learning, etc. This study employed the Boolean operator AND and OR to include these keywords into a search strings. In short, the search string in the study is concluded as (digital-enhanced OR digital OR digital-assisted OR digital-mediated OR digital-aided OR technology OR technology-assisted OR technology-mediated OR technology-aided OR computer-assisted OR computer-mediated OR “computer aided” OR mobile OR online OR internet OR virtual) AND (informal OR self-direct\* OR “beyond the classroom” OR extramural OR extracurricular OR wild OR “outside the classroom” OR “out of classroom” OR out-of-classroom OR autonomous) AND (EFL OR English OR L2). The Boolean expression was searched by title for the purpose of precisely retrieving the most relevant papers (Soyoof et al., 2023). As a result, 296 were retrieved in this stage.

### Screening

All studies conducted between 2019 and Nov. 2023 were meticulously selected, and English language are used as the primary language in their articles. Since EFL learning qualitatively differs ESL, and thereby this paper intentionally excludes studies conducted in ESL context. Initially, 51 ineligible publications such as books, book chapters, editorials, review papers, non-English publication, dissertations, and retracted publications were excluded. Subsequently, 63 duplicated papers across the two databases were removed in the detection phrase. Finally, 26 articles involved participants other than undergraduates were excluded. As a result, 60 articles were included during the screening stage. The inclusion and exclusion requirements in table 1 showed the details.

### Eligibility

The identification and screening process excluded papers by automation tools (i.e. computer), and these two processes might lead to errors (Shaffril et al., 2020). To minimize such deficiency, eligibility was considered as essential manual screening process. Publications included by automation tools might not conform the inclusion criteria. The eligibility process allows the author to manually select or exclude literature items based on specific criteria in line with the research question and study objectives. During manual screening, 15 irrelevant articles were excluded. Except for 14 articles cannot access, the process of eligibility results in 31 articles.

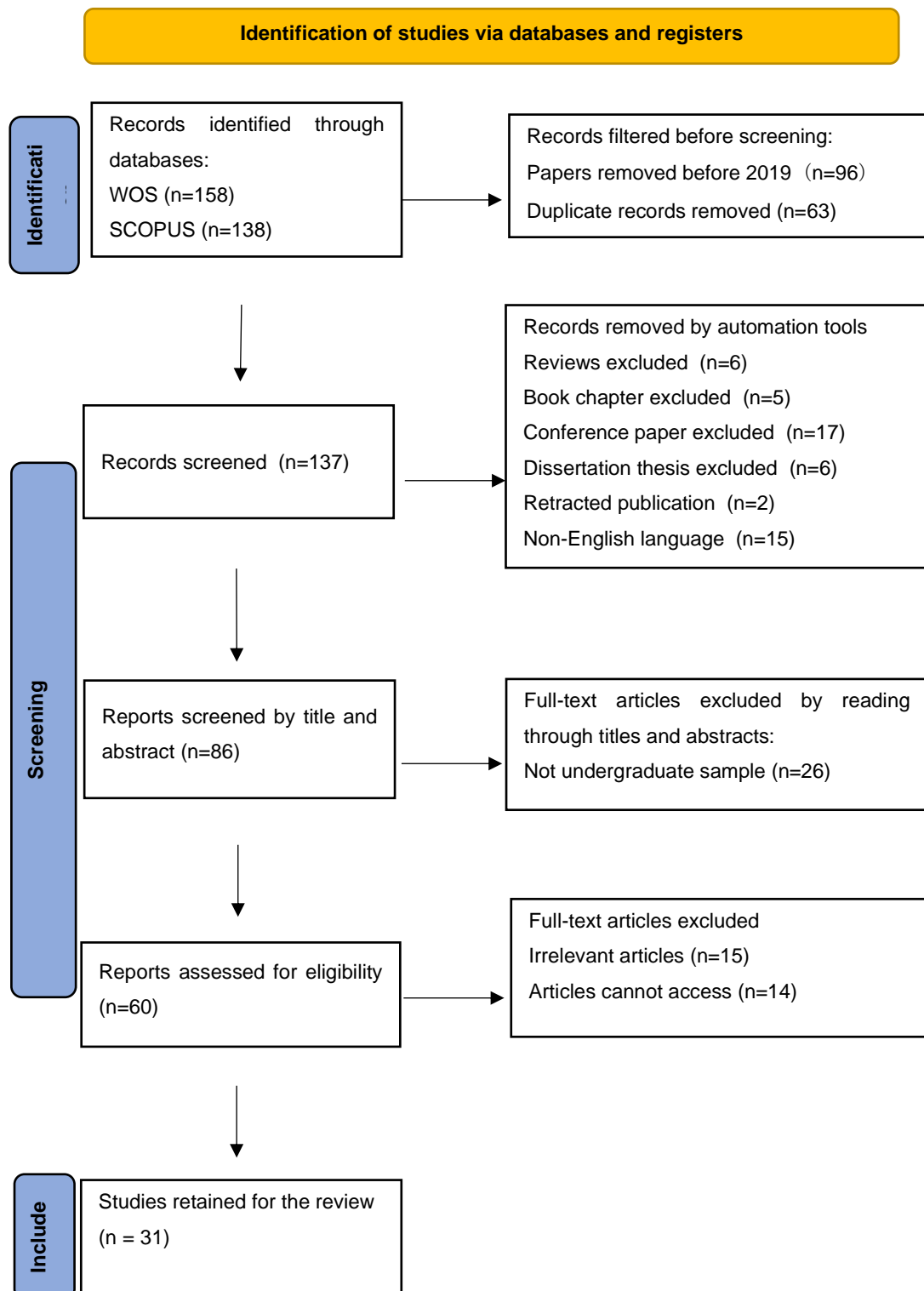
### Data Collection

The researchers conducted a comprehensive search for IDLE-related articles, focusing on EFL contexts by using WOS and SCOPUS, which have the most indexed journals. To find enough research about IDLE in EFL, Boolean operators “AND” and “OR” (Gough et al., 2017) were used between the keywords in each search string. The outcome of this meticulous search revealed 31 studies were found within the databases, as illustrated in Figure 1.

**Data Analysis**

The content analysis method (Wallen & Fraenkel, 2013) was adopted for the analysis section in this study, which has been widely used as a methodology to qualify data in educational research. Steps involved in content analysis include, firstly, researchers used Excel spreadsheet to create a form for the purpose of data management of the extracted data. All data items of the extracted variables were listed and described in the table 2 (Sharif et al., 2019). The structure consists of categories linked to research questions. For example, the year the study was conducted, the distribution of the participant, the research methodology, and the research themes. Each article was carefully read, the information on the research theme was coded, and the related analysis was collected to fill the form. Data collection was finished by the researcher.

**Figure 1. Flow Diagram for Systematic Reviews (adapted from Page et al., 2021)**





### Validity and Inter-rater Reliability

To ensure the coding's validity concerning both the appropriateness of the coding scheme and the accuracy of the coding outcomes, the two proficient experts in EFL teaching coded according to (1) the location of the articles conducted; (2) methodology; and (3) IDLE-related themes. The two sets of codes were calculated to get the Cohen's Kappa coefficient value. The result was 0.61, which falls within the range of 0.61 to 0.80, indicating an optimal consensus between the researchers, according to McHugh (2012).

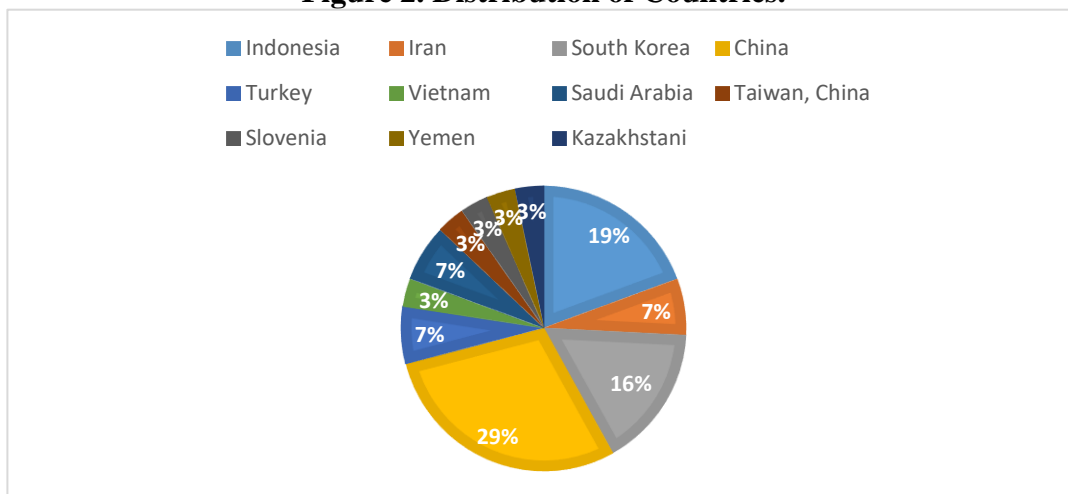
### Results

The researchers examined the distribution of nations where the studies were conducted, the research methodologies employed, and the themes explored in the selected articles. Each category is meticulously elaborated upon in the subsequent section.

#### *Distribution Of Countries*

The IDLE-oriented studies were predominantly conducted in China (n=9), Indonesia (n=6), and South Korea (n=5). Other countries represented include Iran (n=2), Turkey (n=2), Saudi Arabia (n=2), Taiwan (n=1), Slovenia (n=1), Yemen (n=1), and Kazakhstan (n=1). Notably, most of these countries, except South Korea, are developing countries. This geographical distribution suggests a growing interest in IDLE in developing regions, highlighting the need for more research in diverse contexts to enhance generalizability.

**Figure 2. Distribution of Countries.**



#### *Research Methods*

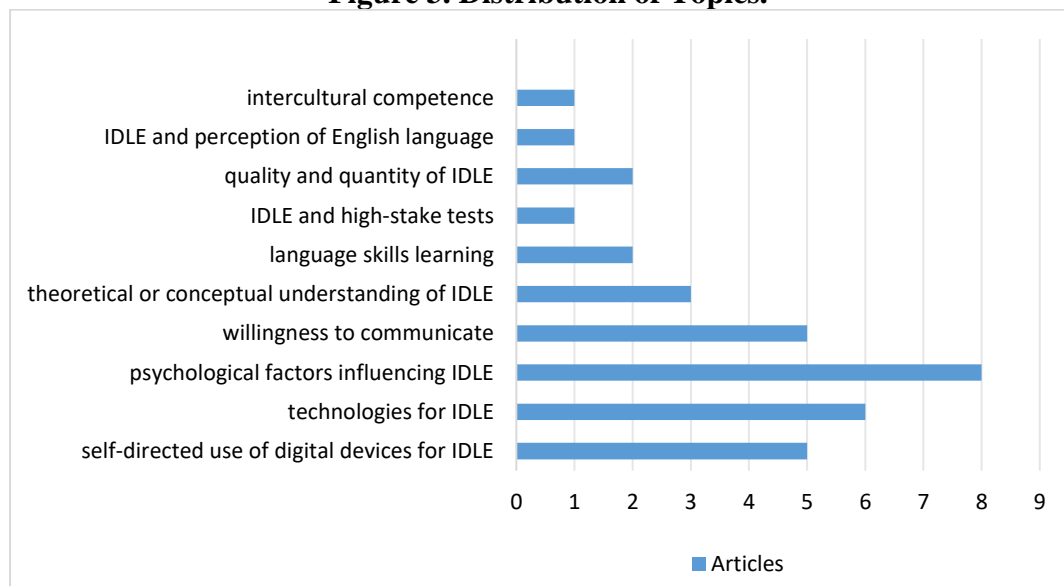
Quantitative methods were the most frequently used (n=16), with surveys being employed in 29 of the 31 articles reviewed. Mixed methods (n=13), typically combining questionnaires and semi-structured interviews, were also common. Qualitative methods (n=2), mainly involving semi-structured interviews, were the least used. This methodological preference indicates a reliance on quantifiable data to study IDLE, which could benefit from more qualitative insights to capture nuanced learner experiences.

#### *Interests Of Topics*

The review identified 10 main topics of the 31 articles reviewed, with 8 articles exploring psychological factors influencing IDLE (Bhatti & Aldubaikhi, 2023; Mohammed & Ali, 2021;

Lee et al., 2021; Gonen & Kizilay, 2023; Bhatti & Aldubaikhi, 2023; Peng et al., 2022; Liu et al., 2023; Fan & Wang, 2023), 6 articles focusing on technologies for IDLE (Bin-Hady & Al-Tamimi, 2021; Haidari et al., 2019; Jurkovic, 2019; Huzairin et al., 2020; Zhang & Liu, 2023; Putrawan and Riadi, 2020), 5 articles focusing on self-directed use of digital devices for IDLE (Muharom et al., 2022; An et al., 2023; Shen et al., 2023; Yu, 2023; Pham et al., 2023), 5 articles focusing on willingness to communicate (Alimorad & Akbarzadeh, 2022; Lee, 2019; Lee & Drajiati, 2019; Zadorozhnyy & Lee, 2023; Taherian et al., 2023), 3 articles on theoretical or conceptual understanding of IDLE (Zhang & Liu, 2022; Gonen & Kizilay, 2023; Inayati and Karifianto, 2022), 2 articles on language skills learning (Mohammed & Ali, 2021; Lee, 2019), 2 articles on quality and quantity of IDLE (Lee, 2019; 2019), 1 article on IDLE and perception of English language (Lee & Lee, 2019), 1 articles addressing the intersection of IDLE and high-stake tests (Lee, 2020), and 1 articles delving into intercultural competence (Liu et al., 2023) (see Figure 3).

**Figure 3. Distribution of Topics.**



**Table 2 Characteristics of Investigated Studies Selected for Analysis.**

Reference	Title	Topic	Methodology
Muharom et al. (2022)	Self-directed Use of Digital Devices for Out-of-class English Learning	Self-directed use for digital devices for IDLE	questionnaire semi-structured interview
Z. An et al. (2023)	Motivation in self-directed use of technology for English learning among high, average, and low achievers	Motivation in self-directed use of technology	quantitative questionnaire
F. Shen et al. (2023)	A study on factors influencing Chinese undergraduate EFL learners' self-directed use of mobile English learning resources	Factors influencing self-directed use of technology	quantitative questionnaire



Z. Alimorad and S. Akbarzadeh (2022)	Unraveling Advanced EFL Learners' L2 Willingness to Communicate in Extramural Digital Settings	Affective, contextual, and language proficiency impact willingness to communicate	semi-structured interview
Mohammed & Ali (2021)	Informal Digital Learning of English Vocabulary: Saudi EFL Learners' Attitudes and Practices	Correlation between attitudes, practice and vocabulary via IDLE	questionnaire
Y. Zhang and G. Liu (2022)	Revisiting informal digital learning of English (IDLE): a structural equation modeling approach in a university EFL context	An expanded IDLE model: learners' IDLE-enhanced benefits, other and support, resources and cognition, learners' authentic L2 experience, IDLE frequency, devices	questionnaire;
I. K. Gonen & Y. Kizilay (2023)	Taking the Picture of Informal Digital Learning of English (IDLE) in a Higher Education Turkish EFL context	Motivating factors and deterring factors, teacher's guidance frequency and digital devices	questionnaire; quantitative research
H. Peng et al. (2022)	A person-centered approach to L2 learners' informal mobile language learning	Psychological factors of person-centered approach to IDLE	questionnaire; semi-structured interviews
Jurkovic (2019)	Online informal learning of English through smartphones in Slovenia	Smartphone activities and IDLE	questionnaire semi-structured interviews
Ju Seong Lee (2019)	Quantity and diversity of informal digital learning of English	Quantity and diversity of IDLE	questionnaires , outcomes, semi-structured interview
J. S. Lee (2019)	EFL students' views of willingness to communicate in the extramural digital context	Willingness to communicate	semi-structured interview
Huzairin et al. (2020)	Technology and Language Learning: English as a foreign language Learner's use of smartphones for online informal learning in Indonesia	Smartphone activities and IDLE	quantitative questionnaire
J. S. Lee, and K. Lee (2019)	Informal digital learning of English and English as an international language: The path less traveled	IDLE and perception of English as international language	questionnaire

G. Liu, et al. (2023)	Bridging imagination and informal digital learning of English: a mixed-method investigation	psychological factor (i.e. imagination) and IDLE	Mixed method; questionnaire interview
J. S. Lee (2019)	Informal digital learning of English and second language vocabulary outcomes: Can quantity conquer quality?	Quality and quantity affect vocabulary learning in IDLE	questionnaire; vocabulary measures; semi-structured interviews
J. S. Lee (2020)	The role of informal digital learning of English and a high- stakes English test on perceptions of English as an international language	IDLE and high-stake tests	questionnaire; English proficiency tests
J. S. Lee et al., (2021)	Informal digital learning of English and perceptions of using EIL materials: attitude toward varieties of English as a mediator	Psychological factor (attitude) towards varieties of English	questionnaire, semi-structured interviews, and stimulated recalls
Bin-Hady & Al-Tamimi (2021)	The use of technology in informal English language learning: evidence from Yemeni undergraduate students	Technology and IDLE	mixed methods, questionnaire, interview
Bhatti & Aldubaikhi (2023)	Investigating the Influence of Informal Digital Learning of English on Attitude towards and Motivation to Learn English as a Second Language	Psychological factors (attitude, motivation) and IDLE	questionnaire
Li-Tang Yu (2023)	A Comparison of the Autonomous Use of Technology for Language Learning for EFL University Students of Different Proficiency Levels	Self-directed use for digital devices for informal learning	mixed research questionnaire items & open questions
J. S. Lee & N. A. Drajati (2019)	Affective variables and informal digital learning of English: Keys to willingness to communicate in a second language	psychological factors (grit, motivation, self-confidence and L2 speaking anxiety) and WTC	questionnaire
A.Zadorozhnyy & J. S. Lee (2023)	Informal Digital Learning of English and willingness to communicate in a second language: self-efficacy beliefs as a mediator	psychological factors (enjoyment and anxiety) and WTC	questionnaire
G. L. Liu et al. (2023)	Examining the relationships among motivation, informal digital learning of English, and foreign language enjoyment: An explanatory mixed-method study	Psychological factor motivation (the ideal L2 self and the ought-to L2 self,	mixed methods: questionnaire, semi-

language enjoyment) structured  
and IDLE interview

G. Liu et al.,(2023)	Toward a model of informal digital learning of English and intercultural competence: a large-scale structural equation modeling approach	IDLE and intercultural competence	questionnaire
Y. Zhang & G. L. Liu (2023)	Examining the impacts of learner backgrounds, proficiency level, and the use of digital devices on informal digital learning of English: an explanatory mixed-method study	Factors predicting IDLE activities	questionnaire; post-survey interview
Taherian et al. (2023)	A Longitudinal Analysis of Informal Digital Learning of English, Willingness to Communicate and Foreign Language Boredom: A Latent Change Score Mediation Model	Psychological factor (language boredom) and WTC	questionnaire
C. Fan & J. Wang (2023)	Undergraduates' behavioral intention to use indigenous Chinese Web 2.0 tools in informal English learning: Combining language learning motivation with technology acceptance model	Psychological factor (perceived usefulness, perceived enjoyment, intrinsic motivation) and IDLE	questionnaire
Pham et al (2023)	Exploring English Major Students' Self-Directed Technology Use for Language Learning	Self-directed use for digital devices for informal learning and psychological factors	questionnaire
Haidari et al (2019)	Technology-enhanced Self-directed Language Learning Behaviors of EFL Student Teachers	Technology and IDLE	mixed methods, questionnaire, interview
Inayati and Karifianto (2022)	Autonomous Online English Language Learning in Indonesian Higher Education Contexts	IDLE	mixed methods questionnaire & interview
Putrawan and Riadi (2020)	English as a Foreign Language (EFL) Learners' Predominant Language Use for Online Informal Learning Activities through Smartphones in Indonesian Context	Smartphone activities and IDLE	questionnaire

## Discussion

### ***RQ 1: What Has Been The Interest Of IDLE-Related Research From 2019 To Nov. 2023?***

Our review indicates that 31 articles evaluated cover a spectrum of themes, illustrating the intricate nature of IDLE. Among the articles, the predominant focus revolves around psychological factors (n=13), with digital technologies (n=6) and self-directed use of digital technologies (n=5) following closely. These major themes broadly fall into two categories: external and internal factors. External factors, primarily digital technologies especially smartphones dominate discussions (Jurkovic, 2019; Huzairin et al., 2020; Putrawan and Riadi, 2020). Nevertheless, latest digital technologies extend beyond smartphones, iPods, digital apps, social media, digital platforms, and artificial intelligence also hold the potential to facilitate informal learning (Tejasvee et al., 2021).

A noticeable shift toward internal factors is evident among EFL researchers. In contrast to a scoping literature review by Soyoo et al. (2021), the psychological factor, which was typically overlooked in prior discussions, emerges as the most frequently explored theme in the present findings. This departure from past studies underscores the evolving landscape of EFL research, emphasizing the need for a nuanced understanding of the intricate interplay between external and internal elements in shaping language learning outcomes. Specifically, psychological elements are addressed in 13 articles, tackling motivation and self-directed technology use (An et al., 2023; Gonen & Kizilay, 2023), motivation and IDLE (Bhatti & Aldubaikhi, 2023), attitudes and IDLE (Mohammed & Ali, 2021; Lee et al., 2021; Bhatti & Aldubaikhi, 2023), and imagination and IDLE (Liu et al., 2023). Notably, even articles exploring willingness to communicate constitute a significant portion (Alimorad and Akbarzadeh, 2022; Lee, 2019; Lee & Drajadi, 2019; Zadorozhnyy & Lee, 2023; Taherian et al., 2023).

Among the psychological aspects influencing IDLE, motivation (n=6) is mostly frequently discussed. The reason for this is because motivation plays a crucial role in determining an individual's willingness to engage in learning activities either formally or informally. In the context of informal digital learning, this means that individuals who are highly motivated are more likely to engage with digital learning resources, which can lead to success in learning English.

As Table 2 demonstrates, a majority of the 31 studies underscored external or internal factors of IDLE, while English language skills are surprisingly explored to a lesser extent. Beside two articles on vocabulary, crucial language skills such as listening, speaking, reading, and writing remain unexplored in these articles. This is worthy attention, particularly given the poor performance of most undergraduates in writing and speaking skills (Altınmakas & Bayyurt, 2019; Phoeun & Sengsri, 2021).

Among the remaining articles that need discussion, the concept or in-depth understanding of IDLE was addressed. It has been widely accepted that IDLE serves as an effective method for learning EFL, aiming to furnish learners with enhanced opportunities for authentic language practice and skill development. However, this systematic literature review highlights that technological tools alone are insufficient for ensuring effective IDLE. To achieve satisfactory EFL learning outcomes, it is necessary to integrate external factors, internal factors, and language skills during informal digital learning of English.

To some extent, the study's insights into psychological factors, technologies, and the self-directed use of digital devices in IDLE can guide the creation of more effective language learning strategies and tools. By understanding what influences learners' willingness to communicate and the technologies that support IDLE, educators and language program developers can design more engaging and supportive learning environments specifically tailored to the needs of EFL learners.

### ***RQ 2: What Trends Were Reported In The Existing Literature?***

The geographical distribution of countries of the studies identified accentuates the global impact of this burgeoning research field. The prominence of IDLE in China, Indonesia, and South Korea is intricately linked to the escalating demand for English-speaking proficiency and the pervasive integration of digital technology in the educational landscape (Zhang & Liu, 2022; Shen et al., 2023). Beyond these nations, the heightened global significance of English is fostering a parallel surge in attention to IDLE among undergraduates in Iran, Saudi Arabia, and Turkey. This shift underscores a trend wherein researchers worldwide are prompting a focus on leveraging digital tools for language acquisition among students (Lai, 2018; Lee, 2019).

Despite technology-related themes, self-directed technology use and psychological factors account for a majority in the studies reviewed, in the future, research on IDLE will delve deeper into diverse topics, highlighting the multidimensional nature of this field (Guo & Lee, 2023; Lee & Lee, 2019). Besides, although language skills within the IDLE context have yet to be fully explored, their significance will increasingly draw the attention of researchers in the areas of speaking, reading, writing, and listening. As the importance of language skills in IDLE contexts will become more recognized, further research will focus on examining their role in IDLE.

As digital technologies evolve beyond smartphones, their increasing popularity promises more diverse learning experiences. This evolution will incite researchers to probe how various digital technologies can be harnessed to foster IDLE. With the accessibility of digitalization and 5G, digital resources in various digital platforms (Mahfoodh & Hashim, 2021), and emerging AI devices (Jiang, 2022) increasingly play a role in EFL learning in the digital wild.

### ***RQ 3: What Are The Recommendations For The Future Research For IDLE?***

The synthesis of reviewed articles suggests a strategic redirection for future research on IDLE. A primary recommendation is to intensify the focus on language skills—specifically, listening, speaking, reading, and writing. This emphasis is crucial, given the prevalent challenges faced by most undergraduates in mastering these foundational skills, which are quintessential for effective communication. Simultaneously, a call to broaden the scope beyond smartphones and delve into emerging digital technologies is made, acknowledging their anticipated ascendance in popularity. This expansion ensures that research remains aligned with the trajectory of technological advancements.

Moreover, there is a compelling suggestion to delve more deeply into internal factors like motivation, attitudes, and imagination, as they intricately influence the efficacy of IDLE. A nuanced exploration of these psychological aspects is deemed vital for a comprehensive understanding of their roles in shaping learning experiences of language skills. Therefore, researchers are urged to integrate these internal factors into the IDLE research, ensuring a more



holistic comprehension and enhancing the applicability and impact of IDLE across diverse educational contexts.

In addition, the choice of research methodology is important in elucidating the validity of findings. According to the finding, questionnaires (n=29) have predominantly served as the primary research tool in the 31 examined articles. While 13 articles used a mixed method of questionnaires and interviews, and 2 articles employed qualitative methods such as interviews, there is a need to explore other qualitative methods such as case study, reflective journals and phenomenological analysis that can provide a deeper understanding of participants' experiences and perspectives. By using a variety of qualitative methods, researchers can gain a more comprehensive understanding of the complexities and nuances of participants' thoughts and feelings, which questionnaires alone may not capture fully.

### Conclusion

In this research, a crucial discovery has been made regarding the oversight in existing literature on IDLE. While many articles highlight the increasing use of digital devices in EFL learning, there is a noticeable gap in understanding language learning outcomes. This study delves into key trends and topics in IDLE, providing a thorough overview that will shape future research endeavors. By offering a roadmap for conducting impactful IDLE-focused studies and highlighting current research themes, this research equips researchers, educators, and language program developers with valuable insights. It sheds light on psychological factors, technologies, and self-directed digital device usage, paving the way for the development of more effective language learning strategies and tools. Moreover, it stresses the importance of a holistic approach that combines technological tools and psychological elements in IDLE, offering a nuanced perspective for EFL researchers to enhance language learning methodologies.

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