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# Online informal language learning (OILL): a systematic review of studies (2014–2023)

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## ABSTRACT

The rise of informal language learning, especially learning conducted online outside the classroom context, has received considerable scholarly attention in recent years. To date, however, there has been limited evidence-based systematic analysis of the prevalence of online informal language learning (OILL). Accordingly, we conducted a systematic review of empirical studies on OILL published over the past decade (2014–2023) to identify gaps in the current research and suggest potential directions for future research on this topic. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach was followed, and 123 studies met the selection criteria. The studies included in this review highlight the following three themes: (1) focusing on ICT affordances and constraints to identify the potential of online technologies for OILL; (2) focusing on learners in OILL to explore the nature and learners' cognition of learning; and (3) the roles of various stakeholders in OILL. Building upon this review, a conceptual framework for understanding and supporting learners' OILL is proposed, followed by detailed recommendations for future research and practice.

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## KEYWORDS

Online informal language learning; systematic review; affordance; constraint; language learners; language teachers

## Background

The concept of online informal language learning, especially learning conducted outside the classroom context, has attracted considerable interest among language researchers and educators over the past two decades (Benson and Reinders 2011; Chong and Reinders 2022; Dizon 2023; Dressman and Sadler 2020; Zhang, Liu, Gao and Lee 2024). The high penetration of the internet and ICT, and particularly of portable devices, allows learners of diverse social, cultural, and economic backgrounds to support their language learning with a rich variety of online content (e.g., Godwin-jones 2018; Tao and Gao 2022; Tao, Xu and Gao 2024). In turn, the multilingual and multimodal nature of the digital world affords what we refer to as online informal language learning (OILL). Despite the availability of numerous studies on OILL, there has so far been a lack of reviews mapping out the current state of the literature on this topic and identifying knowledge gaps to guide future research in the area. This paper therefore aims to systematically analyse and synthesize

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empirical studies on OILL reported in the current literature in order to inform language teaching, learning practice and research.

OILL is considered to be an emerging field of study (Lyriqkou 2019; Pooley, Midgley, and Farley 2019). Stemming from research on how adults learn naturally in workplace settings, informal learning began to reach the realm of second language learning through the works of scholars such as Sundqvist (2009), Toffoli and Sockett (2010), and Sockett and Toffoli (2012). Defined as intentional or unintentional activities performed outside formal instruction by language learners to increase their communication skills (Dressman 2020b), various closely related terms have been used to discuss OILL. In addition to informal language learning, other terminology used to refer to the trend in the literature include out-of-classroom language learning (Lai 2015b; Lai, Zhu, and Gong 2015), self-regulated language learning (Mahayanti, Kusuma, and Wibawa 2020; W. Wang and Zhan 2020), extramural language learning (Hannibal Jensen and Lauridsen 2023; Sundqvist 2009), self-directed language learning (Lai and Zheng 2018; Zhang and Pérez-Paredes 2021), language learning in the wild (Hannibal Jensen 2019; Sauro and Zourou 2019; Sockett 2023) and learning beyond the classroom (Benson and Reinders 2011; Chong and Reinders 2022; Nunan and Richard 2015). It should be noted, however, that not all studies using the aforementioned terms are within the area of informal language learning, as the learner's initiation of learning is considered a defining characteristic of informal language learning (Sockett 2014).

In this way, online informal learning can also include situations of unintentional, incidental, or natural language exposure, in which learners perform activities in the target language for purposes other than learning, such as entertainment or information-seeking (Sockett 2014, 2022). In other words, following Dressman's (2020b) and Sockett's (2014) definitions, this study acknowledges that informal language learning includes all activities that learners engage in beyond their formally-organized language instruction programs.

While early studies on informal language learning did not typically distinguish between online and offline activities, recent studies indicate a growing influence of online technologies. In the first decade after the turn of the millennium, Hyland (2004) and Lamb (2004) found that students used their target language (English) in a range of offline out-of-class activities such as reading books, novels and articles, watching TV programs, listening to the radio, corresponding via email, and speaking on the phone. Although it was noted that most of these activities were receptive in nature, Hyland also found that her Hong Kong-based university student respondents spent a considerable amount of time on them (e.g. up to 49 hours per week). Further, Sundqvist's (2009) work on extramural English has been influential in understanding and mapping the types of informal out-of-class activities that students engage in both offline and online. In addition, more recent studies on OILL indicate increasing use of online-based resources and activities (Arvanitis 2020; Dizon 2023; Inayati and Karifianto 2022; Lamb and Arisandy 2019; Sockett 2014; Sundqvist 2020). These studies suggest that globally, learners complement their classroom-based language learning with various activities outside the classroom, most of which are online; this has been found in locations such as Hong Kong (Lai and Gu 2011; Lai and Zheng 2018), France (Kusyk 2020; Sockett 2014), Korea (Lee 2019a, 2020), Morocco (Dressman 2020a), Denmark (Hannibal Jensen and Lauridsen 2023), and Sweden (Sundqvist 2020). Indeed, advances in ICT have allowed for increased flexibility in the way learners access various digital-based materials and activities in other languages, including for foreign language learning purposes.

In terms of fully online modes, one of the earliest and most significant studies on informal language learning has been Sockett's (2014) work entitled 'Online Informal Learning of English (OILE).' Based in France, Sockett's (2014) study remains one of the most comprehensive in its focus on the informal learning of English primarily through online activities. First, he focuses on the various activities that learners undertake to support their informal learning of English, eventually narrowing the study down to two sample activities that reflected what was most popular at the time; namely, music on demand (known as MOD) and online drama serials. He reached the following four conclusions: (1) the informal learning that students participate in is very diverse and personalized; (2) it is mostly undertaken for communicative purposes; (3) these informal learning activities heighten

learners' awareness of register as one of the key elements of language; and (4) informal learners use a range of online resources to participate in these activities. Further, Sockett (2014) also measured the learners' language acquisition from this informal learning of English using corpus analysis and vocabulary scale tests. Having identified a few popular drama series watched by the learners, he then developed a vocabulary scale and a corpus based on the series' scripts, to be later compared with the learners' writing. His results suggest that the learners were more likely to acquire – and be able to correctly understand and produce – language chunks in the form of registers, either complete or incomplete, that were frequently used by the characters in the series.

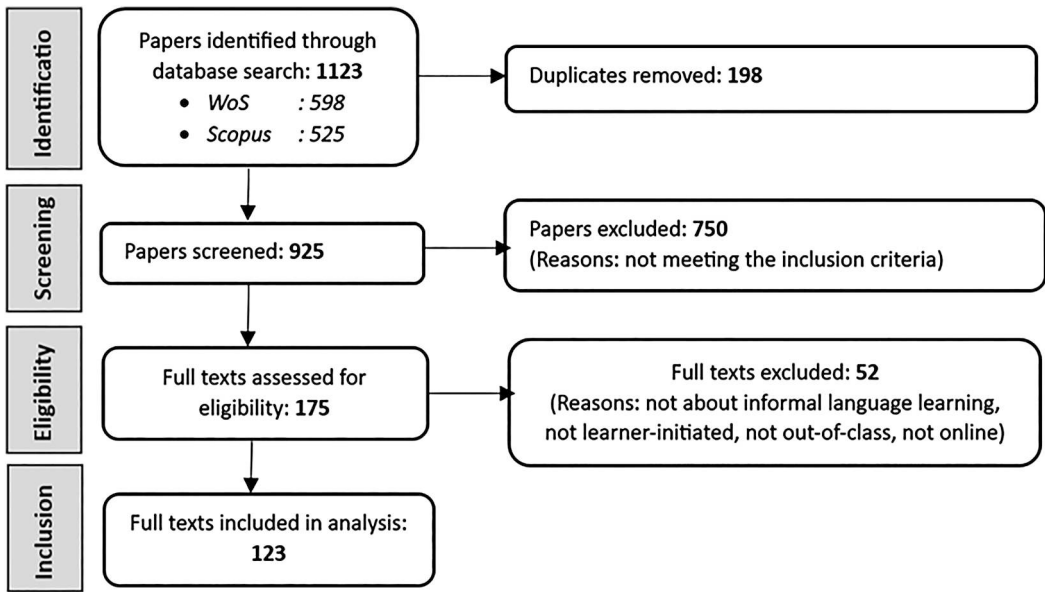
We believe that a comprehensive review of research on the topic of informal language learning is needed. A number of major works have been published in this area, including edited volumes by Ahmed, Al-Kadi, and Hagar (2020), Dressman and Sadler (2020), and Reinders, Lai, and Sundqvist (2022), respectively comprising 8, 31, and 30 chapters on language learning and teaching beyond the classroom. Existing reviews of work on this topic include Zainuddin and Yunus's (2022) examination of 30 studies focusing on informal language learning in the context of social networking sites, and Zhang et al.'s (2021) analysis of 33 studies on extramural language learning, which was not specific to online contexts. Most recently, Dizon (2023) reviewed 13 qualitative studies on foreign learning in the 'digital wilds,' and Soyoof et al. (2023) reviewed 30 studies on the informal digital learning of English (IDLE), all sourced via the Web of Science database. Nevertheless, to the best of our knowledge, there has been no effort to review studies on OILL more broadly, i.e. regardless of the online modes of learning studied, the target language, or the methodological approach taken to the research. With more studies being conducted on informal language learning online, there is a pressing need to systematically analyse previous studies to consolidate our knowledge, and to identify areas that require further investigation to guide future research in this field. Thus, the current study aims to fill the gap by reviewing a decade of studies on OILL.

## Methods

To answer the research questions, we conducted a systematic literature review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach as proposed by Moher et al. (2009). Systematic review is a type of a secondary research aimed to consolidate and advance understanding of a specific topic within a discipline of study, characterized by its systematic, rigorous, and transparent methods used (Chong and Plonsky 2023). Such design, coupled with the use of PRISMA, is considered appropriate for the present study as it allows greater trustworthiness to emerge from the research process and lends support to the credibility of the findings. The procedure was performed in four stages: identification, screening, eligibility and inclusion. Further details are provided in Figure 1.

## Literature search

This review covers studies published between 2014 and 2023, representing a decade of research on informal learning following Sockett's (2014) publication of his seminal work on OILE, which has greatly influenced research on online informal language learning. We limited our search to two major research databases, Web of Science (WoS) and Scopus, due to their longstanding reputations as comprehensive and trusted libraries indexing thousands of quality education research articles (Oo, Alonzo, and Asih 2022; Zainuddin and Yunus 2022). Although manual handpicking and snowballing techniques have also been suggested as approaches to identifying relevant texts in systematic literature reviews (Alexander 2020), we chose to focus on peer-reviewed empirical research published identified via these databases as they yielded considerable results, more than any other relevant prior systematic reviews on OILL ( $n = 123$ ). We understand that quality work has been published in this area in formats that are excluded by this search approach, such as books and edited volumes, and we suggest that these be the subject of future systematic reviews.



**Figure 1.** PRISMA flow diagram of the present review.

When searching the relevant papers, we first broke down the three main concepts – *online*, *informal*, and *language learning* – to determine other closely-related terms that researchers may have used in their papers. For example, the literature suggests that informal language learning is closely related to autonomy and self-regulation in learning (Arvanitis 2020; Odo 2020). Therefore, we randomly checked five studies under the topic of ‘self-regulated learning’ to confirm its suitability for inclusion as one of the keywords. If we found that one or more of the papers were aligned with our definition of informal learning, we would include it as one of the keywords. Similarly, if none of the papers were aligned with our definition, then the term was excluded. Finally, we compiled the selected keywords into Boolean search syntax as shown in Table 1.

The initial literature search yielded a total of 1,123 papers. These were then checked for duplicates ( $n = 198$ ), which were removed. This resulted in a total of 925 papers being selected for title and abstract screening to see if they met the inclusion criteria. The following inclusion criteria were used to ensure the quality and scope of the review: (1) peer-reviewed journal articles, (2) empirical research, (3) published between 2014–2023, (4) articles related to online informal language learning,

**Table 1.** Boolean search syntax used.

Database	Syntax	Results
Web of Science	(online OR technology OR ICT OR digital OR computer OR CALL OR mobile OR MALL) AND (Informal OR autonom* OR ‘out of class’ OR extramural OR ‘self regulated’ OR ‘self directed’ OR independent) AND (‘language learning’) (All Fields) and 6.69 Language & Linguistics or 6.11 Education & Educational Research (Citation Topics Meso) and Article (Document Types) and Education Educational Research or Linguistics or Language Linguistics (Web of Science Categories) and English (Languages) and Associated Data and Early Access (Exclude – Document Types)	598
Scopus	TITLE-ABS-KEY ((online OR technology OR ict OR digital OR computer OR call OR mobile OR mall) AND (informal OR autonom* OR ‘out of class’ OR extramural OR ‘self-regulated’ OR ‘self-directed’ OR independent) AND (‘language learning’)) AND PUBYEAR > 2013 AND (LIMIT-TO (PUBSTAGE, ‘final’)) AND (LIMIT-TO (DOCTYPE, ‘ar’)) AND (LIMIT-TO (SUBJAREA, ‘SOC’)) OR LIMIT-TO (SUBJAREA, ‘ARTS’)) AND (LIMIT-TO (LANGUAGE, ‘English’))	525
Total papers:		1123

Note: The search covers papers published up to 8 November 2023.

(5) full texts accessible in English. The first, second, and third authors conducted the screening. To ensure agreement, ten papers were randomly selected and individually screened by all three authors. The screening results were compared and discussed, and any differing perceptions were clarified and agreed upon before the authors proceeded to divide the remaining papers for screening. Further, a regular biweekly meeting was set up to further address any doubts, issues, or differing perceptions during the analysis process as they arose. This procedure yielded 175 papers that were deemed eligible for further analysis.

Next, we assessed the quality of each paper using the 10-criteria framework for appraising articles for systematic literature reviews proposed by Nguyen et al. (2024). Developed based on Cohen, Manion, and Morrison's (2018) key elements of an academic article, this framework (see Appendix 1) focuses on research conceptualization, methods, and interpretation of findings, and can be topically modified to suit the specific purpose of the present literature review. The appraisal results revealed that most ( $n = 147$ ) papers identified in the database search are of high quality, and a few papers ( $n = 28$ ) are of medium quality. No paper was found to be of low quality, which further confirmed the appropriateness of the choice of databases as discussed above. Then, to ensure alignment with the definition of OILL, studies which did not focus on informal learning or which dealt with autonomous language learning that was not learner-initiated, not out-of-class, or not online were also excluded at this stage ( $n = 52$ ), resulting in a total of 123 papers being included in the review after full-text analysis.

### **Data analysis**

Analysis of the 123 included papers was conducted by following the three stages of thematic synthesis as proposed by Thomas and Harden (2008). These three stages were: (1) text coding performed using NVivo 14 software and Microsoft Excel; (2) developing descriptive themes based on the two research questions; and (3) generating analytical themes to guide the writing of this report. The first author developed the initial themes based on the research questions, and these initial themes were then reviewed by and discussed among the other authors.

Data analysis of all included papers was conducted by the first, second, and third authors. In order to ensure the reliability and consistency of the analysis, the initial codes were reviewed by all three authors together, followed by coding training in which all three authors coded a similar paper. The coding results were then compared, with a similarity rate of 87% recorded. The remaining 13% differing perceptions about the codes were then addressed and discussed to reach a consensus. Once all ambiguities were clarified, each author proceeded to perform a deep analysis of each paper assigned to them, and the regular biweekly meeting set up during the initial screening was resumed to further address any issue and differing perception as they arose during the analysis process. The results of the analysis were then reviewed and discussed again by all authors during a series of meetings to resolve any differences and reach a final consensus.

We found several notable research profiles in the reviewed papers. First, the research designs were seemingly equally distributed, with 38% of the reviewed studies using mixed-method designs ( $n = 47$ ), followed by quantitative designs 33% ( $n = 40$ ), and qualitative designs 29% ( $n = 36$ ). Second, the target languages that the participants learned were dominated by English (69%), followed by general L2 (24%), and the remaining 9% of included studies involved the learning of Chinese, Korean, German, and Spanish. Next, we found that research on OILL is dominated by an excessive focus on learners (96%), especially adult learners (79%), with a lack of focus on other stakeholders (4%). The majority (62%) of the reviewed OILL studies were conducted in Asian countries, with European contexts representing the next largest geographic group (19%). A further 11% studies were set in American and Australian contexts. The remaining 8% of studies used global data and were not specific to any geographic area; no study in the sample was conducted in African language learning settings. As for the results of the thematic analysis of the findings, the synthesis results are



summarized in the following section. A complete list of the papers and a detailed summary of their findings can be accessed in the supplementary materials.

## Findings

This section discusses the analysis results for the reviewed papers, which cover three general areas: (1) ICT in OILL; (2) learners and OILL; and (3) the roles of various stakeholders in OILL.

### 1. ICT in OILL

Our analysis found that many studies on OILL examine how online technology has afforded various aspects of language learning, complemented with notes of caution about its constraints. We also observed a tendency to focus more on the technological aspects of the affordances and constraints, with a lack of clear direction about the promotion of ICT in language education. Below is a synthesis of what the literature has found regarding technological affordances and constraints.

#### Affordances

Discussion about ICT affordances in the literature on OILL published in the past decade can be classified into three main themes: instrumental, social, and affective.

First, instrumental affordances cover the ownership of digital devices and access to an internet connection, which have recently penetrated learners' daily lives in profound ways and open countless possibilities for OILL activities (Godwin-jones 2018). Such devices are also shown to have the capacity to cater to learners of different ages, from young learners (Hannibal Jensen 2019; Koivistoinen 2015; Terantino 2016), to teenagers (Lyrikgou 2019; Mulyono and Saskia 2021; Qasim 2021), and especially adults (Arung, Rafli, and Dewanti 2020; Bin-Hady and Al-Tamimi 2021; Dincer 2020; Lyu and Lai 2020). Nevertheless, learners are found to selectively use these devices based on the positioning of these tools in their lives (Lai and Zheng 2018); mobile devices are used more for personalization purposes, and less for authentic language learning and social connection purposes. Therefore, future studies must be directed towards helping learners reap the benefits of language learning from this profile of language use.

Second, affordances often mentioned in the reviewed OILL studies are related to the social aspects of the digital world. For example, the instrumental roles of online interactions in informal language learning were highlighted in the studies; these instrumental roles included allowing authentic communication and feedback, which in turn allows for progress checks and motivates learners to continue (Chik and Ho 2017; Dettori and Torsani 2014; Turula 2017). Along the same lines, other studies mentioned the value of extensive exposure to English online, and its affordance of productive language use and practices by learners (Benson 2015; Haidari, Yelken, and Akay 2019; Jones et al. 2017; Koivistoinen 2015; Wrigglesworth and Harvor 2018). However, some studies also found that L1 still dominates learners' use of their devices on a daily basis (Fathali and Okada 2018; Huzairin, Putrawan, and Riadi 2020). In addition, Lyrikgou (2019) also found that the literature may have uncovered rich varieties of potential contacts with English online, but very limited actual use of these resources by learners. This calls for urgent attention by language-learning professionals to help learners effectively take advantage of their gadgets for seamless language-learning purposes.

Next, affective affordances were also found to be among the main strengths of OILL mentioned in the reviewed studies. Mulyono and Saskia (2021) pinpoint the comforts for communication that the digital sphere offers learners, which helps to reduce their anxiety and enhances their willingness to communicate. In addition, Bytheway (2014) and Chik and Ho (2017) also highlighted the popularity of many online platforms among learners, such as social networking sites, video sharing platforms, and massive multiplayer online role-playing games (MMORPGs). These platforms were found to be

learners' go-to activities for most of their free time. However, few studies have explored how various language-learning stakeholders could provide support for learners with regard to these affective affordances, and this area of research could serve as a potential direction for future studies.

### **Constraints**

As for the constraints, the analysis of the reviewed studies resulted in three main themes relating to concerns about digital content, technical issues, and learner-related issues, all of which provide sound bases for future research on OILL.

The difficulty of assessing high-quality free digital content was mentioned in at least five studies (Alhadhrami 2016; Dettori and Torsani 2014; Gonulal 2019; Rosell-Aguilar 2018; Turula 2017). These studies discussed the challenge of critically evaluating the reliability of online content for language learning (Dettori and Torsani 2014), the variety of mobile applications causing confusion and/or misunderstanding (Alhadhrami 2016), poor content quality such as ineffective teaching and a lack of clear indication of difficulty levels (Rosell-Aguilar 2018), and the under-representation of certain genres, especially formal and academic genres (Gonulal 2019; Turula 2017). These limitations should motivate future studies to explore solutions for the facilitation of learners' OILL.

Technical constraints may also hinder learners' OILL progress. Common technical issues discussed in the reviewed studies included software bugs and the poor interfaces of certain language learning apps (Rosell-Aguilar 2018), as well as the technological and psychological limitations of devices such as smart phones (Sierocka, Jurković, and Varga 2019). In addition, a lack of practical knowledge among learners and teachers about how to use specific types of technology to support OILL was also noted in studies by Fathali and Okada (2018) and Yunus et al. (2016). Studies by Dizon (2021), Chik and Ho (2017), and Rosell-Aguilar (2018) noted concerns related to the paywall system and financial burdens. These limitations could be addressed by gadget or application developers by designing technological features that better facilitate OILL activities by various stakeholders.

Finally, learner-related issues were another focus of the reviewed studies on OILL. These included affective issues and a lack of autonomy and motivation. Lai, Hu, and Lyu (2018), Lee (2019a) and Sierocka, Jurković, and Varga (2019), for instance, found that the social affordances of OILL can also serve as double-edged swords which can present challenges for language learning. These studies agree that psychological factors such as anxiety (Lai, Hu, and Lyu 2018; Lee 2019b), a fear of losing face (Sierocka, Jurković, and Varga 2019) and a lack of native-speaking friends (Lai, Hu, and Lyu 2018) are significant issues that hinder the active engagement of learners with social OILL-related activities. In addition, a lack of autonomy among learners was found to be a significant challenge in OILL, as noted in studies by Liu (2014) and Turula (2017), as was learners' lack of motivation as observed in Lamb and Arisandy's (2020) study. These issues highlight areas where learners require more support to maximize the positive contributions of OILL to their language learning, calling for teachers to help them address those issues, and for policy makers to systematically support both teachers and learners in this regard.

## **2. Learners and OILL**

Another salient theme we found in our analysis of the reviewed studies was the strong focus of OILL literature on learners. 96% of the reviewed studies were directed toward understanding learners' OILL practices and their cognition about the learning process, but with a notable lack of focus on the documentation of their progress. Albeit insightful, this approach offers only a partial account of learner's informal language learning, leaving a notable gap which future studies could address.

### **Learning in OILL**

Most of the reviewed studies investigated learners' engagement with online language learning resources. This included examining the types of activities learners engage in, how learning happens in various OILL contexts, and language development in OILL settings.



First, the types of activity performed by learners in various OILL settings can be viewed from the perspective of a continuum of language skills ranging from receptive to productive. Analysis of the reviewed papers found that receptive skills and vocabulary-building activities dominate learners' choices of activities when it comes to informal language learning (Honarзад and Rassaei 2019; Liu 2014; Muharom, Nugroho, and Putra 2021; Sierocka, Jurković, and Varga 2019; Şad et al. 2022; Turula 2016). However, studies also show that, while still limited, learners conduct some forms of productive language skill learning through OILL (Almekhlafy and Alzubi 2016; Peng, Jager, and Lowie 2022). Further, a large number of communicative activities are performed by learners for the purposes of OILL, most of which are entertainment – and information-oriented (Haidari, Yelken, and Akay 2019; Lai, Hu, and Lyu 2018) or social and communicative (Kızıl and Savran 2018). Examples of learners' OILL activities include engagement with pop-culture artifacts such as music and movies (Chik and Ho 2017), videos (H. Wang and Chen 2020), fan translations (Vazquez-Calvo 2021; Vazquez-Calvo et al. 2017), online games (Bytheway 2014; Chik 2014; Dizon 2021; Hamat and Amran 2021; Sundqvist 2019), social media (Hamat and Hassan 2019; Turula 2016), and online communities (Gomes Junior 2020; Lyu and Lai 2020; Malik and Haidar 2021). In this regard, studies showed that learners are engaged in a rich variety of OILL activities on a daily basis (Grosu-Rădulescu and Stan 2018; Kızıl and Savran 2018; Muharom, Nugroho, and Putra 2021; Şad et al. 2022), and especially during weekends and holidays (Botero, Questier, and Zhu 2019).

Other studies also focused on how learning happens within OILL contexts (Arung, Rafli, and Dewanti 2019; Bin-Hady and Al-Tamimi 2021; Lyu and Lai 2020; Malik and Haidar 2021; Vazquez-Calvo 2021). For example, Kızıl and Savran (2018) found that in OILL learners create immersive language learning environments using three broad approaches: passive-unaware, passive-aware, and active-aware. Similarly, Malik and Haidar (2021) also found that incidental language learning among fan translation communities occurs in three ways: (1) while translating as they ensure linguistic transfer quality; (2) through sharing language doubts with other members; and (3) through meta-linguistic discussions on new members' translation test results. Other studies pinpointed that learners' active engagement in OILL using higher cognitive motives increases their chances of successful learning (Chik and Ho 2017; Hannibal Jensen 2019; Rosell-Aguilar 2018). Such motives allow learners to more substantially engage with the linguistic resources available at their disposal, such as by choosing to set their devices to use English rather than their L1. Considering the diverse range of OILL activities, future studies could be directed to creating OILL categories to better understand how language learning happens in a specific OILL context. This would offer practical as well theoretical benefits for learners, teachers, researchers, parents, and other relevant stakeholders with regard to conducting and supporting OILL.

Despite the many studies on OILL activities, our analysis shows that research documenting the language development that learners acquire from such learning is scarce. Of all 123 studies reviewed in this paper, only seven investigated OILL outcomes quantitatively, with mixed results. For example, comparing Swedish teenage gamers and non-gamers, Sundqvist (2019) found significantly higher scores in vocabulary tests among the group of gamers. Similarly, Terantino (2016) also found that US pre-school children's vocabulary significantly increased after a six-month intervention of iPad-based OILL activities. Although small-scale ( $n = 6$ ), and thus limited in terms of the generalizability of the findings, this study offers meaningful insights about OILL among young learners.

In addition, investigating Korean university learners, Lee (2019b) found a significant correlation between the quality (i.e. diversity) of OILL activities and vocabulary test scores, but not between the quantity (i.e. frequency) of OILL activities and vocabulary test scores. The scarcity of studies measuring OILL acquisition reflects Benson's (2011) and Sockett's (2014, 2023) arguments about the challenging nature of measuring the learning outcomes of autonomous learning. As a result, there is still work to be done toward assessing the linguistic gains that result from OILL activities, as well as how to rigorously measure them and, as Sockett (2023) suggested, how to pave the way for OILL certification. Future studies could be directed toward analysing the impacts of OILL

on the development of specific language skills (e.g. speaking, writing) or how OILL has impacted learners' language learning trajectories over time (i.e. longitudinal research).

### ***Cognition of OILL***

Learners' cognition has also been the focus of studies on OILL. Following Borg (2003) and Borg and Sanchez (2020) definition of cognition, this section covers studies about the knowledge, thoughts, attitudes, emotions, and beliefs that underlie learners' OILL behaviours. Analysis of learner's cognition of OILL can be classified into positive and negative themes, as follows.

Studies found that learners largely perceive OILL activities positively (e.g. Gonulal 2019; Lai and Zheng 2018; Lai, Yeung, and Hu 2016; Sydorenko et al. 2017; Terantino 2016). Support for the positive perception varies; for example, OILL helps to enhance learners' exposure to L2 (Lai, Yeung, and Hu 2016; Liu 2014), facilitates general L2 learning (Hamat and Hassan 2019), increases learning enjoyment (Terantino 2016) and affords flexible 'anytime-anywhere' learning (Haidari, Yelken, and Akay 2019; Lai and Zheng 2018). Furthermore, Hamat and Hassan (2019) attribute positive perceptions about OILL to the facilitative roles it plays in supporting language learning. Studying Malaysian learners of English, they found that the use of social networking sites mostly benefits learners' L2 writing, communication, vocabulary development, and reading, while fewer benefits were found in the areas of grammar, listening, and speaking. Studying mobile-assisted language learning outside the classroom among Hong Kong university students, Lai and Zheng (2018) found that most of them expressed positive perceptions about the use of such devices for the personalization of learning, but fewer were positive about aspects relating to the authenticity of language learning experience and socialization. These positive perceptions of OILL could practically inform various stakeholders such as teachers, parents, and language institutions, and be used as a basis for the design of positive language-learning experiences for learners.

Nevertheless, negative perceptions were also noted in our analysis. For instance, at least four studies reported mixed feelings about the use of particular digital applications such as video streaming services (Dizon 2021), YouTube (H. Wang and Chen 2020), Duolingo (Botero, Questier, and Zhu 2019), and chatbots (Alm and Nkomo 2020). Studying the use of video streaming services among Japanese foreign language learners, Dizon (2021) found that his respondents were constrained by the cost of subscriptions to these services and had difficulties understanding and remembering aural inputs. Learners in Mullen's (2022) study even problematized the nature of learning in these contexts, stating that casual exposure to online content does not equal 'actual, proper study' (86). These perceptions should be used as a practical guide for learners during their OILL practices, as well as for teachers and language-learning institutions when designing effective supports for their learners.

### ***3. The roles of various stakeholders in OILL***

Another key finding of our analysis is the lack of consideration given in OILL studies to stakeholders other than learners. Contextual supports such as those provided by teachers, language institutions' leadership and management structures, and parents are essential for allowing and nurturing autonomous learning. However, there is a notable lack of OILL-related studies involving stakeholders other than learners. Only 4% ( $n: 5$ ) of the reviewed studies focused on other stakeholders, all of which were directed toward teachers.

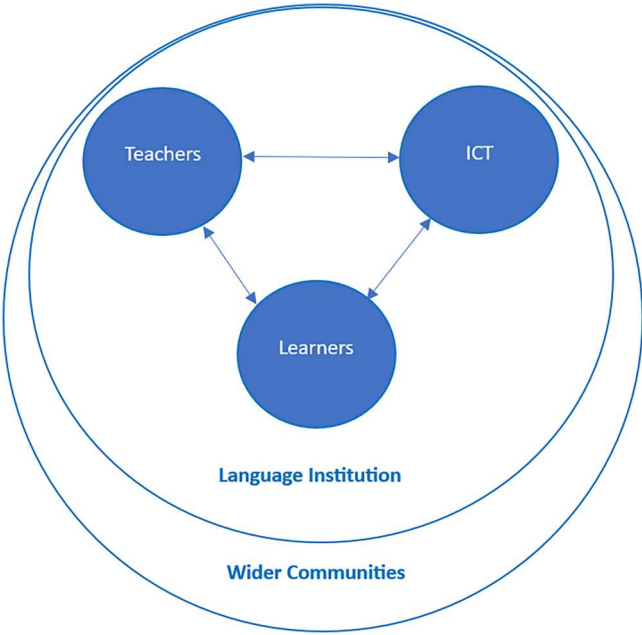
Among the five OILL studies related to teachers found in the literature, four were conducted in university settings (i.e. Lai 2015a; Lai, Yeung, and Hu 2016; Toffoli and Sockett 2015), and one involved primary school settings (Hannibal Jensen and Lauridsen 2023). First, Hannibal Jensen and Lauridsen (2023) examined Swedish primary school teachers' perceptions of the affordances, constraints, and benefits of OILL. They found that the perceived benefits related to vocabulary learning and motivation, while the main constraint noted was demotivation as a result of boredom during

classroom instruction. Next, two studies involving university teachers by Toffoli and Sockett (2015) and Lai, Zhu, and Gong (2015) revealed a mismatch between students and teachers' expectations about support for learners' OILL. On one hand, students expected teachers to play stronger roles by offering practical recommendations and teaching informal language-learning strategies, while on the other hand teachers expected to play minimal roles due to an overestimation of learners' capacities and concerns about learners' limited abilities. In addition, Lai (2015a) conducted a study in which she found that learners expected three types of support for their OILL: affective, capacity, and behaviour support. Affective support influences learners' OILL through the strengthening of perceived usefulness, while capacity and behaviour support their OILL through self-efficacy in ICT and enhanced facilitating conditions.

Another study conducted by Bin-Hady et al. (2023) conducted a focused group discussion with 20 teacher-researchers from 16 different countries about the potential of ChatGPT, an emerging and highly popular artificial intelligence (AI) tool. They agreed that ChatGPT, along with other similar AI tools, has the potential to be used to support language learning both inside and outside the classroom, but these tools are still in their early stages and studies about them are therefore still limited. Though few in number, these studies offer much-needed insight into the roles that teachers are expected to fill to better facilitate learners' OILL. Nevertheless, work remains to be done toward better understanding the ways in which different contexts, as represented by various stakeholders such as parents, institutional leadership and management, and communities, can support learners' OILL.

**Discussion and recommendations**

This systematic review critically examines the last decade of research on online informal language learning (OILL). It highlights investigations of the potential and limitations of online contexts for language learning. The review emphasizes learners' experiences, the variety of learning activities present in OILL, and language development within OILL contexts. Importantly, it also identifies some gaps in OILL research which point to possible directions for future studies in this area. Informed by the results of this review, we propose a simple framework for the conceptualization of OILL



**Figure 2.** The proposed OILL framework.

(Figure 2). This framework is intended for all relevant stakeholders who wish to support learners' OILL, including teachers, language institutions, application developers, and researchers. This framework covers five key components that shape and support learners' OILL.

At the core of our framework are the three key components of OILL: learners, ICT, and teachers. The findings of this review suggest that learners undertake various activities involving the use of online technologies for informal language learning. In addition, ICT development provides language learners with access to various L2 resources beyond the formal classroom setting. Although only a small number of reviewed articles discussed teachers, this review also suggests that teachers attempt to form better connections between formal and informal language learning by using online technologies. In fact, most research dealing with learners or ICT in OILL also has practical pedagogical implications which teachers can consider when designing their instructions, thus confirming the critical role played by teachers in facilitating language learners' OILL. As can be seen in Figure 2, both teachers and learners are actively connected, in that they influence and are influenced by one another through OILL.

Furthermore, the three components of OILL – learner, teacher, and ICT – commonly operate under the supervision, direction, and influence of language institutions and/or the wider community to which they belong. Institutional policy regulates and facilitates the technological resources and language teaching approaches used by the teachers, which in turn influences informal language learning beyond the classroom. Language institutions also play an essential role in connecting the three core elements of OILL and the wider community, which consists of stakeholders who directly and indirectly influence learners in their language learning journey, such as family, friends, and other communities to which the learners belong. This framework acknowledges the importance of the wider contextual settings in which OILL is situated as factors that shape the trajectories of learners' language learning outside the classroom. We acknowledge the simplified nature of this framework and understand that there are many other factors at play in shaping learners' OILL, such as motivation, age, and home environment. However, we believe that this framework offers a workable structure to guide future researchers and educators, while providing a useful foundation for future studies.

Taking the results of this review into account, the proposed framework could be used as a guide for future research and practice as summarized below.

- Future OILL research and practice should be directed toward better harnessing ICT to support language learning. There needs to be a shift from the limited view that language learning happens only within the context of formal learning, to include the wider context of holistic language learning which happens both within and beyond the classroom walls – whether physical or virtual. This shift in perspective would allow for the acknowledgement of informal out-of-class language learning within formal educational contexts, which would eventually enable us to address current challenges in foreign language education such as inequality of access to technology and teaching and learning resources.
- Future studies could also be directed at profiling the effective OILL activities in which learners are engaged. A framework aimed at identifying and profiling such activities would allow various stakeholders, such as language institutions, teachers, parents and app developers, to offer better support for OILL. Such profiling also should focus on the variety of technical constraints experienced by language learners when engaging in these activities so that possible solutions can be explored.
- Future OILL studies should also involve different stakeholders in order to promote the process to the wider learning community. It is essential that the leadership and management of language institutions acknowledge the importance of informal out-of-class learning and take action to promote and support it. Understanding that language learning happens in settings beyond the formal classroom requires a good understanding of how the micro-, meso- and macro-levels of contexts play a part in the success of learners' language learning endeavours.

- Future OILL studies could also be directed toward assessing the effect of informal language learning on learning progress. There is a lack of studies on this aspect of OILL, and rigorous assessment of OILL would allow effective integration of informal and formal language learning in language education programs.

## Conclusion

This systematic review has offered a critical account of OILL studies published in the past decade and identified directions for future research and practice in this area. The limitations of this work include its sole focus on empirical studies published in English and the exclusion of publications other than journal articles, such as books (e.g. Sockett 2014) and edited volumes (e.g. Dressman and Sadler 2020; Reinders, Lai, and Sundqvist 2022). Despite these limitations, this review offers important insights into the development of OILL research over the past decade and has the potential to meaningfully guide future studies in this area. The analysis indicates that the past decade has seen a spike in research interest in informal language learning as an emerging field of study. A significant amount of research has been conducted exploring the potential of OILL and the affordances and constraints of various relevant technologies. Further, OILL studies have also investigated learners' experiences and learning in OILL settings, with particular focus on the variety of informal language learning activities taking place in online contexts, the mechanisms by which language learning happens in these contexts, and learners' language development in OILL contexts. Finally, the reviewed studies indicate that there is presently a lack of research exploring the perspectives of stakeholders other than learners in the context of OILL. There is still work to be done to better understand this phenomenon in order to help learners benefit from OILL in their daily language-learning activities. As a result, we have proposed an OILL framework to aid future researchers and educators to better understand this phenomenon through innovative research and practice in language learning and pedagogy.

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