Artificial intelligence and English language teaching: A systematic literature review

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Contents

2 Research purpose

English is the most widely spoken language in the world. As the global language of communication, English is one of the most used languages for jobs, markets, tourism, discourse, and international connectivity (Lan et al., 2020). It is also the language that is most widely studied. By some estimates, there are approximately 2 billion English language learners worldwide (Rich, 2021).

While English is a highly desirable language to attain, there are a number of obstacles for learners to overcome such as insufficient input/exposure to the target language, limited opportunities for using English inside and outside the classroom, the need to communicate across language and cultural boundaries in English, a lack of skills to control their own learning (Renandya and Widodo, 2016), lack of access to quality teaching, and the fear of making mistakes and being misunderstood. Educators need to seek ways to help learners be successful. Artificial intelligence (AI) is being heralded as a tool to support English language teaching and learning (ELT/L) that can provide new strategies and opportunities to overcome challenges and extend and enhance learning (Baranwal, 2022).

A scan of the existing literature indicated that an up-to-date, comprehensive study was needed on the use of AI for ELT/L across learners of all ages, examining the literature from 'the ground up' to reveal what the data shows. To address this gap, the British Council conducted a first-of-its-kind systematic review. This involved gathering research on AI in ELT/L which fulfilled specific criteria and carefully analysing it for trends and patterns. This section provides a summary of our systematic review, answering the research questions posed below.

The overarching question for this study was **'How is artificial intelligence being used for English language teaching and learning?' Four research questions guided the systematic review:**

1. **Where are the AI studies taking place geographically and has there been a change in the trend in the number of studies across the years?**

2. **What educational levels are the students in the studies?**

3. **How is AI being used for educational benefits in ELT/L?**

4. **What are the challenges of using AI in ELT/L?**

3 Methods

A systematic review methodology was used, following PRISMA[1] principles, to gather research on how AI is used in ELT/L. This systematic review process involved two main parts: 1) the search for, identification and selection of the studies to be included in the research; and 2) the analysis of those studies. The researchers used a mixed-method approach to answer the research questions. They employed quantitative methods to collect data, followed by qualitative approaches to provide a summary of how AI is being used in ELT/L. A coding methodology was used to identify trends and patterns from across those studies.

To maintain a degree of assurance in the research quality, this study was confined to only research that has been published in peer-reviewed journals. Only primary research – studies in which the researcher gathered data directly from participants, not systematic reviews or theoretical papers – was considered. The search parameters were set to include articles from 2014 to 2023 to keep them relatively current and include the latest additions to AI technologies (see Appendix A for full inclusion and exclusion criteria).

The search for research articles yielded 369 articles for potential analysis in the systematic review. After removing

duplicates, the remaining 366 articles were then assessed against the inclusion/exclusion criteria. Upon the completion of the search selection procedure, 43 articles fulfilled the inclusion criteria for this study. (See Appendix B, which presents the number of articles removed corresponding to the inclusion/exclusion criteria and the final number of studies for this systematic review).

This study was also limited by the absence of research specifically referencing ChatGPT or similar Large Language Models. However, it is expected that a trend towards research on these specific forms of AI could be seen from 2023 onwards. As there are likely to be many more studies emerging involving Generative AI (GenAI) tools, the British Council research team plan to revisit the research six months on from the original study to compare findings.

It is also pertinent to note this study used a grounded approach for coding, meaning the researchers did not define the areas for investigation in advance. Instead, they looked at the literature first to see what trends emerged. Secondary codes were created to further delineate each of the main areas. Although there was overlap in some areas, the title of each code indicated the main use of AI in that study.

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[1] 1 Preferred Reporting Items for Systematic Reviews and Meta-Analysis for Protocols (PRISMA-P; Moher et al., 2015).

4 Findings

4.1 Where are the AI studies taking place geographically?

Asia appears to be at the forefront of AI in ELT research. Before 2021, reviews on AI in education (e.g., Crompton & Burke, 2023) showed at least 50 per cent of the studies taking place in the United States with Asia following second. Since 2021, Asia has been leading in the number of publications with China producing the most (Li et al., 2021).

Our research shows this trend to also be true for studies focused on AI in ELT/L specifically, with well over two-thirds (72 per cent) of the articles coming from Asia, 19 per cent from China.

The three locations with the largest number of publications are also in Asia: China (8), Taiwan (7), and Japan (4). However, it is noteworthy that these studies take place in a wide range of countries and territories (see Fig 1), many of which do not use English as their main language. This shows the far-reaching interest in, and importance of, English language teaching and learning. Future research could explore whether AI in education studies in Asia and elsewhere are increasing across a range of different disciplines or focusing more on ELT/L.
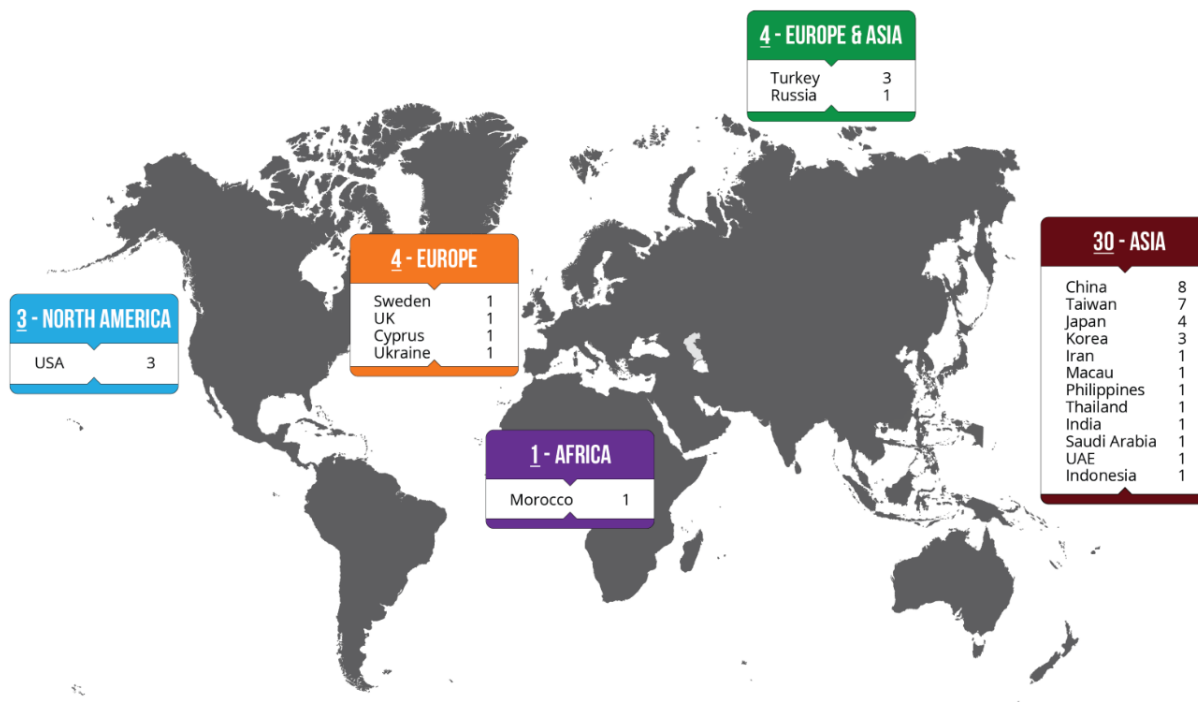

4 - EUROPE & ASIA

Turkey	3
Russia	1

30 - ASIA

China	8
Taiwan	7
Japan	4
Korea	3
Iran	1
Macau	1
Philippines	1
Thailand	1
India	1
Saudi Arabia	1
UAE	1
Indonesia	1

4 - EUROPE

Sweden	1
UK	1
Cyprus	1
Ukraine	1

3 - NORTH AMERICA

USA	3

1 - AFRICA

Morocco	1

Figure 1: Geographical spread of AI in ELT/L studies

4.2 Has there been a change in the trend in the number of studies across the years?

More studies are being conducted on AI in ELT/L than there were five or ten years ago, as anticipated. Figure 2 shows the increase across the last decade. There has been a dramatic escalation in the number of studies published since 2017 and this is projected to continue, with nine already published in the first half of 2023. This increase matches a rise in societal interest in AI, and the number of AI tools available. The steeper climb in the chart from 2022 may also relate to the increase in Large Language Models (LLMs) such as ChatGPT, Google's Bard and Microsoft's Bing Chat. This increase in the number of studies demonstrates a clear upward trend, and it is expected to continue for the foreseeable future.
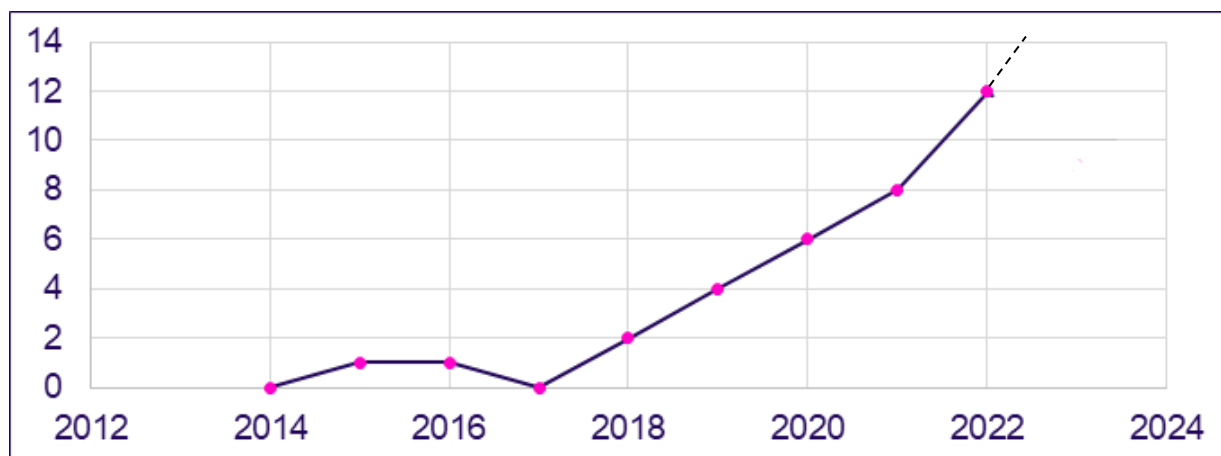

Figure 2: Publications by year (Note: 2023 figures collected for only half of the year, dotted line represents expected upward trend)

4.3 What educational levels are the students in the studies?

This systematic review is one of the first studies to examine AI and ELT/L across all three learner levels: K-12, higher education, and adults. Interestingly, this review found that while studies have been conducted with students of all ages, there is a large difference in the spread of the studies.

The findings show a significant gap in peer-reviewed research on AI in adult ELT/L. The majority of studies take place with students in higher education (see Fig 3). Yang and Kyun (2022), and Sharadghah and Sa'id (2022) examined AI in K-12 and higher education and had similar findings that of the two, higher education had more

publications. This may be due to the fact researchers often themselves work in higher education institutions and so have easier access to students there.

Another possible explanation for the comparatively fewer studies with K-12 students is that, at least initially, there were age restrictions in place for popular AI tools. For instance, OpenAI initially restricted use of its tools to those over 18 years only, although this was revised to children over 13 with parental consent when ChatGPT was released in late 2022. However, these age restrictions wouldn't account for the lack of studies in adult ELT/L.
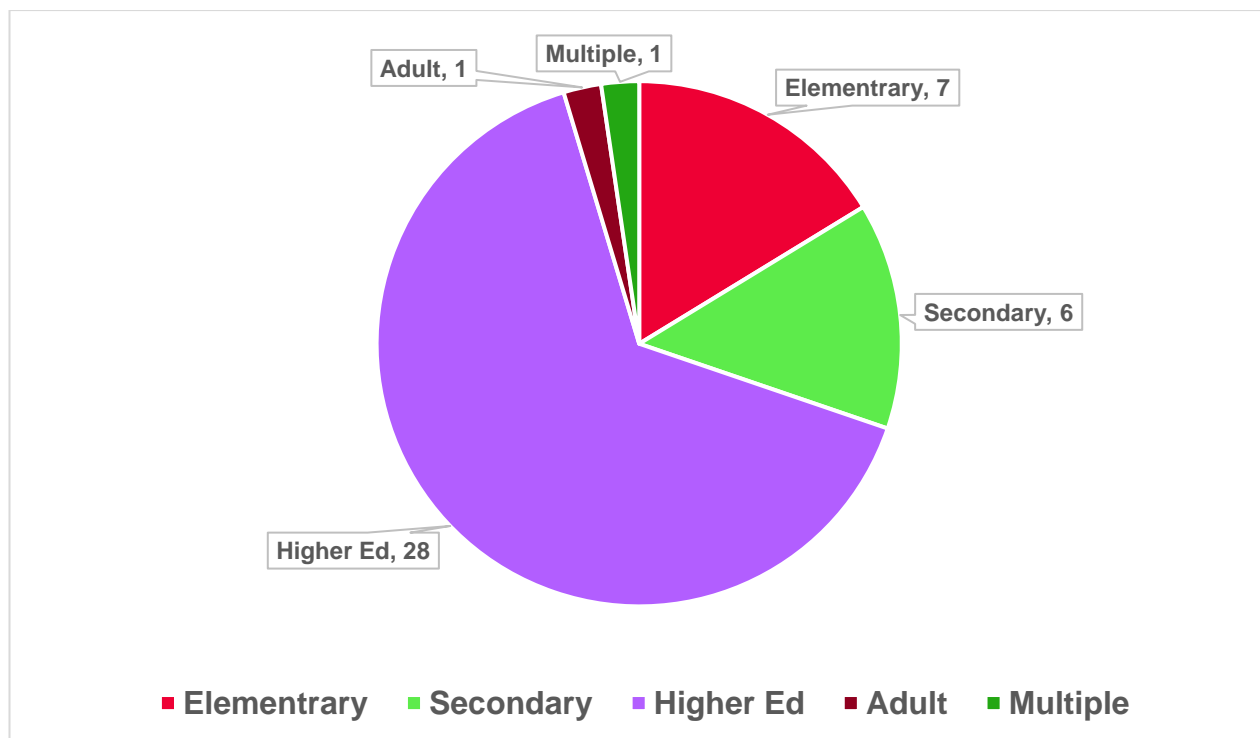

Figure 3: Studies by learner age

4.4 Where is AI being used in ELT/L and what are the benefits of its use?

The review identified five key areas in which AI is being used in ELT/L: for the development of speaking, writing and reading skills, to support pedagogy, and for self-regulation (see Fig 4). Interestingly, among the language skills, listening did not emerge from the data as one where AI is being used. These five uses of AI in ELT/L are described in more detail below.
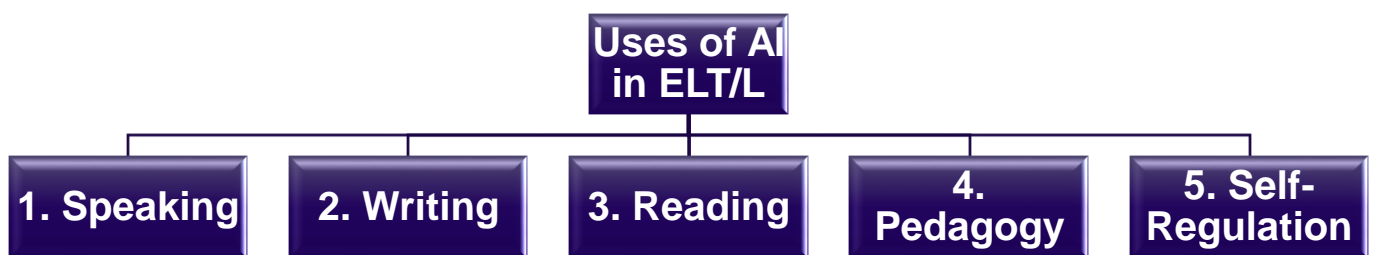
Figure 4: Five key areas where AI is being used in ELT/L

4.4.1   Speaking

The development of speaking skills was one of the five main uses for AI in ELT/L that emerged from this research. Further investigation of studies in which speaking was the main use of AI revealed three secondary codes: skills, pedagogy, and technology. It should be pointed out that while there was overlap in the secondary code areas, the title of each area is determined by the main use of AI in that study (see Fig. 5).

Pronunciation was the only skill revealed in the studies related to the use of AI in speaking. There were a variety of AI systems and programs that helped students in this area. For instance, a study with Taiwanese students by Liu and Hung in 2016 found that the use of AI significantly improved students' pronunciation by reducing the flatness of pitch and intonation patterns. They found that the visual representation of the pitch as a spectrogram provided by the AI was helpful in supporting pronunciation.

Another area that emerged relating to teaching speaking was in relation to pedagogy or teaching methods. AI was used as a conversational partner, a language coach, and in a multimodal capacity. Dizon and Tang (2020) had students converse with Alexa, a personal voice assistant.

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They found that it promoted meaningful interactions, supported vocabulary acquisition, improved language skills, and provided interesting, enjoyable learning.

Related to pedagogy, some studies also highlighted the use of coaching and multimodal systems, that employ multiple ways to present information, such as text, images, audio, and video. For instance, Shivakumar et al. (2019) focused on both language coaching and a multimodal approach in a higher education setting. Students were provided with an AI coach that tailored instruction to each student's learning patterns and needs resulting in the ability to speak more fluently using consistently accurate language structures.

Our review of the research also showed four further areas regarding the use of AI technologies when learning to speak English. These included using AI technology for speech recognition, adaptive learning, automatic speech analysis, and voice assistance. One example is where Kazu and Kuvvetli (2023) developed an AI-supported pronunciation model for Turkish students. This system helped students practise, record, and react to students pronouncing words resulting in longer retention of words and significant benefits in learning consonant and vowel sounds.
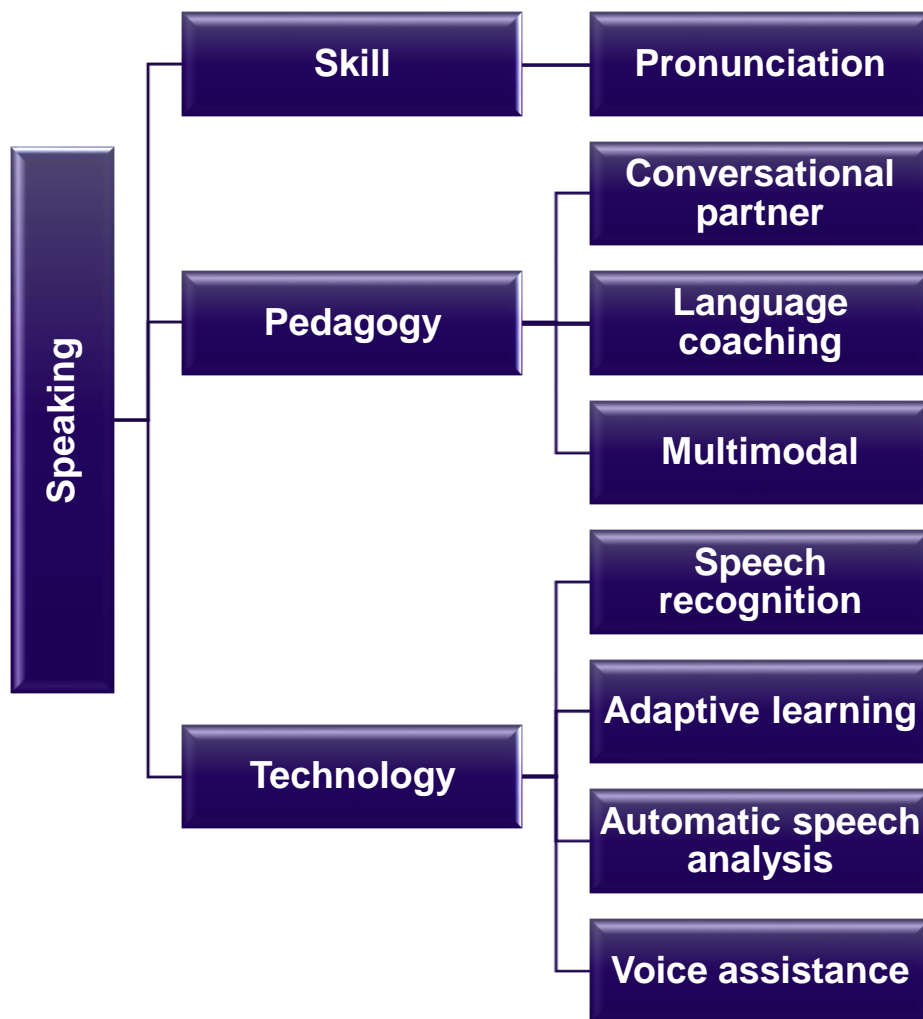
Figure 5: Secondary codes for speaking

4.4.2   Writing

The use of AI in teaching or learning writing skills was another key area that emerged from our research. The studies in the writing category also revealed the use of AI around skills, pedagogies, and technologies.

Two areas that emerged for AI use in writing were related to vocabulary learning and grammar. For example, a study by Lo (2023) found that access to neural machine translation programmes resulted in students' vocabulary improvement, especially when specialised or unambiguous expressions were involved. Another common use of AI in writing is the use of AI grammar checkers. For instance, a study by Dizon and Gayed (2021) specifically examined the impact of Grammarly when used in ELT/L in higher education, finding that students made fewer grammatical errors and wrote with more lexical variation than students without this AI-powered tool.

Notably, only one pedagogical focus, to support giving feedback, emerged in the secondary codes for writing. Studies looking at pedagogy in writing were often connected to AI tools providing feedback via spelling and grammar checkers, along the lines of Dizon and Gayed's (2021) study with Grammarly. Nazari et al. (2021) also examined the use of Grammarly as a feedback tool for English language learners. They reported positive outcomes with an improvement in behavioural, emotional and cognitive engagement, as well as self-efficacy in writing.

There is a lot of potential for further investigation in this area. Given that AI systems are increasingly good at handling procedural knowledge and systems within written text and languages, future research could more closely examine the pedagogical affordances of using AI in teaching writing in English.

A variety of AI technology tools and supports were used in the writing category including, grammar checkers, writing assistants, translation tools, and pattern checkers. The use of translation tools is particularly interesting. A study by Chon et al. (2021) with South Korean college students explored the use of machine translation as a reference tool for L2 writing. Although one argument against using AI translation tools is that students could just use them to bypass language learning, this study found that using Google Translate may have helped less skilled learners to display a level of writing proficiency that was not significantly different from that of skilled learners. The study also found that using machine translation enabled leaners to produce essays with a greater number of lower frequency, more complex words and higher quality syntax.
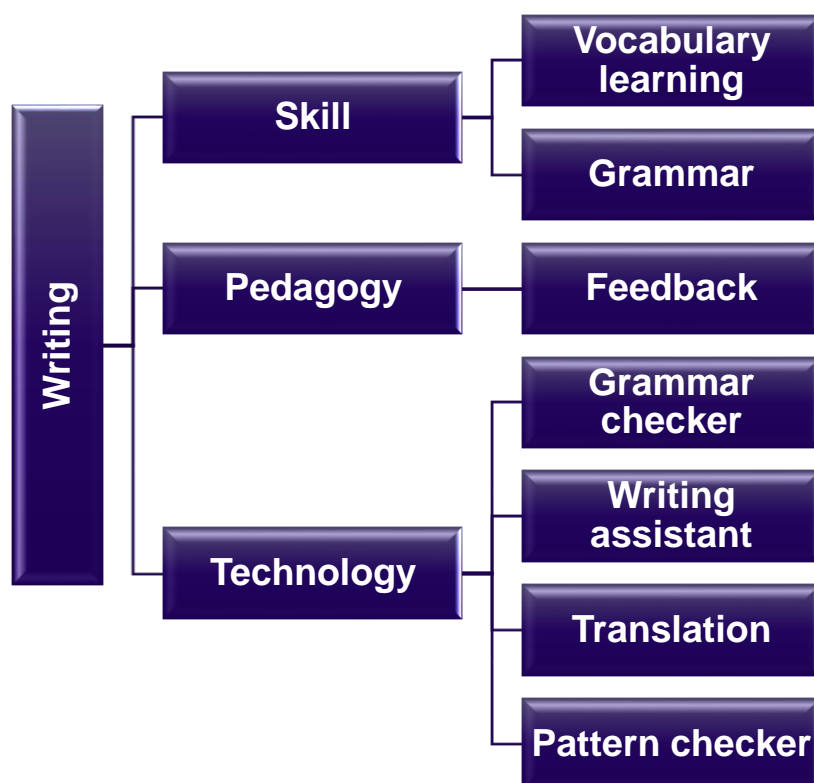
Figure 6: Secondary codes for writing

4.4.3   Reading

The skill of reading did emerge as an area where AI is being used in ELT/L. However, it was not as common as the productive skills of speaking and writing. Nonetheless, there were some AI ELT/L studies focused on reading skills, pedagogies, and technology.

Vocabulary was the only skill focus of studies in reading, while only gaming emerged as a key use to support pedagogy. Zheng et al. (2015) explored how vocabulary learning in reading occurs during gaming quest-play, mediated in English, that had a Japanese student play with an English-speaking player. The students, embodied as avatars, used semiotic resources imbued in the game World of Warcraft (WoW). From the findings, Zheng and colleagues posit that students have opportunities to learn vocabulary and understand meaning via games beyond what a textbook or classroom can provide, by contextualising often decontextualised vocabulary. WoW uses AI to provide that context through the inclusion of AI characters (i.e., those not operated by a human) and pathfinding navigation algorithms that make the environment dynamic and engaging.
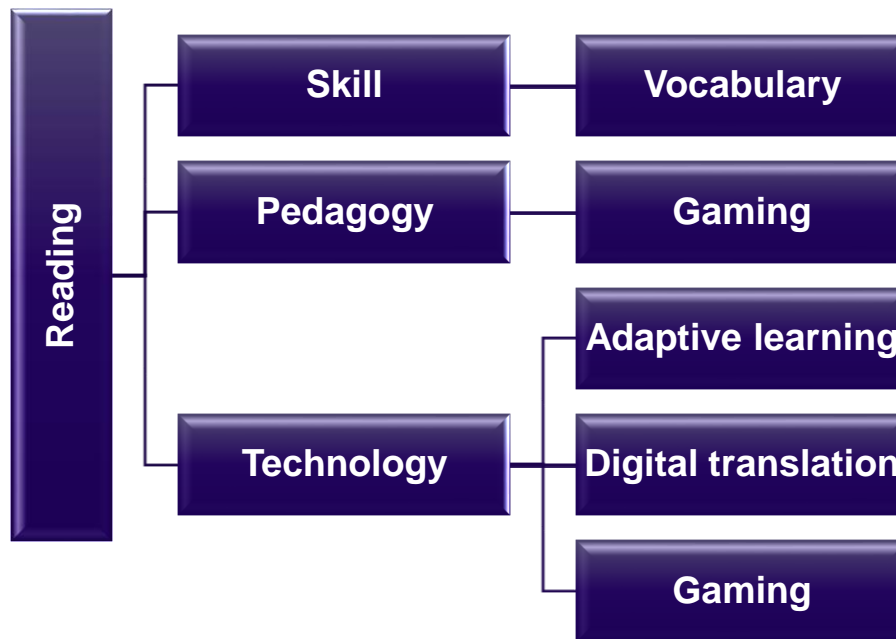
Figure 7: Secondary codes for reading (Note: 'Gaming' appears twice in Fig 7, once under 'pedagogy' and again under 'technology'. This is because some gaming studies concentrated on the method of learning and others on developing the AI gaming systems.)

4.4.4   Pedagogy

Pedagogy looks at the methods, strategies, and techniques used to facilitate ELT. Readers will note that in the preceding sections, pedagogy featured as a sub-code connected to the language skills discussed. However, this section includes studies where pedagogy was a main area of focus, denoting that the researchers focused primarily on the pedagogical methods, strategies, and techniques of AI in ELT/L. Analysis in the pedagogy category revealed six secondary related areas.

Some studies examined multiple approaches which appear to provide a more personalised learning approach. For example, Kim (2022) explored the effects of the pedagogical approaches of score predictions, lectures, explanations, and practice tests on Korean students studying for their Test of English for International Communication (TOEIC). Students began

with a diagnostic assessment in which the AI then used the data to provide lectures, explanations, and practice tests at the level required by the student.

Lee et al. (2023) took a different look into pedagogy by exploring a context-based approach; specifically, learner-generated-context-based (LGC). They defined LGC as the creation and use of digital technology that enables learners to build a 'learner-generated context' and learn within it. This context is derived from data that is collected as the learners perform actions and make choices.

The system then adapts to the learners and provides them with more content that suits heir preferences. The researchers discovered that the LGC AI pedagogical approach fostered learners' self-autonomous learning experiences.
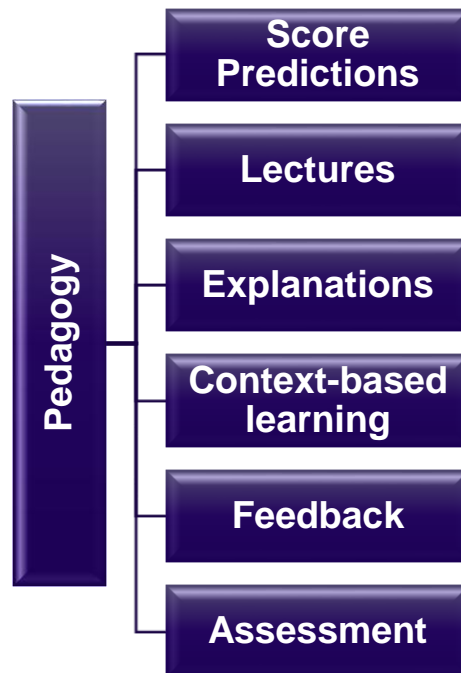

Figure 8: Secondary codes for pedagogy

4.4.5   Self-regulation

The final area that emerged around affordances of AI in ELT/L was self-regulation. This refers to the ability to manage and control one's thoughts, emotions, behaviours, and physiological responses to achieve personal goals and maintain well-being. Students' emotions, or 'affect', can influence the choices and actions they take. Several studies in this systematic review showed a tendency toward promoting tools that could enable self-regulation by engaging students in active thinking, especially regarding their goals and learning autonomy. Six related areas emerged for the category of self-regulation.

It is interesting that self-regulation has appeared in this study as some scholars (viz., He, 2021) warn of the dangers of students becoming over-reliant on AI.

However, what has emerged here is the trend for AI to allow students to actively participate in goal setting and become independent learners. One example of this is Hew et al., (2023), who used chatbots in ELT/L to support student goal-setting and social presence in fully online activities. This helped students to clarify their learning goals, create techniques for setting goals, and raise awareness of learning strategies in goal setting.

In another study, Chen, Hsu et al. (2022) examined robot-assisted language learning where AI and virtual reality were combined to create a system to use robots as a tool for training English language tour guides to

develop a sense of autonomy. The findings of the study identified benefits including increased autonomy, motivation and engagement.

Anxiety was the final key finding in relation to self-regulation. This term was used with regard to students feeling anxious about learning English, for example, around speaking in public, making mistakes with vocabulary, and interacting with others. Chen, Koong et al. (2022) reported that anxiety was reduced when an AI automatic speech recognition tool was used with 5th-grade Taiwanese students. In addition, both Çakmak (2022) and Chen, Koong et al. found that AI raised the students' skills and lowered anxiety. This was a key finding of affordances of the AI.
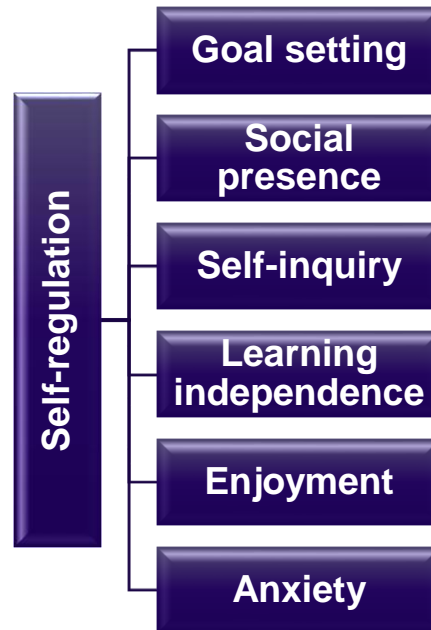

Figure 9: Secondary codes for self-regulation

4.5 What are the challenges of using AI in ELT/L?

Remarkably, the challenges and risks of AI systems in ELT/L did not appear to be as well reported as its benefits, with 67 per cent of the studies not reporting any challenges at all. This may be due to positive publication bias (Mlinarić et al., 2017), a phenomenon where researchers tend to focus on benefits or positive aspects as opposed to the negatives. Nonetheless, of the challenges reported, four key areas emerged from our research: technology breakdowns, limited capabilities, fear, and standardising language.

- **Technology breakdowns** included technical malfunctions and poor connectivity. One specific technology breakdown was incorrect answers given by the AI.

- **Limited capabilities** referred to users requiring more advanced functionality. For instance, some students wanted better chatbot capacity (Thompson et al., 2018) and others wanted more natural interactions. These limited capabilities led to students becoming uninterested in using the chatbot.

- **Fear** took several forms including a lack of clarity on how personal information would be stored and shared. The second fear was of the unknown i.e. uncertainty about how the AI was operating. Lastly there was the fear of losing a natural learning environment and, along with it, real emotions connected to learning (e.g., Viktorivna et al., 2022).

- **Standardising languages and ideologies** emerged as one of the most compelling challenges to which AI might be contributing. In a study by Rowe (2022), involving students in a second-grade American classroom, Google Translate's programming appeared to carry messages about what is considered appropriate and standard language use, disregarding nuances in language groups. One student using the tool found that "Tagalog" was not listed as a language by Google Translate, and the only available option for the Tagalog-speaking pupil when translating her own language to English was Filipino (which has been the official language of the Philippines since 1987). Rowe (2022, p.884) reports that this left the student 'grappling with differences between the named language choices available in Google, and how those matched to her language experiences with her family. She was, in essence, engaged in a negotiation of what counts as a language, who decides what it is called, and which language was "correct."' This suggests that by recognising some historical and political language boundaries over others, Google might re-enforce standardised language use.

5 Implications for practice

The systematic review reveals several key findings that have implications for practitioners. Firstly, it is important to note that prior systematic reviews into AI across disciplines (Crompton et al., 2022) have found a clear trend towards English language learning being the most common discipline for AI use, as opposed to other disciplines in education. This finding underscores the need for English language teachers particularly to be equipped to make ethical and effective use of AI in their teaching practices and raises the question of how pre-service teacher training provision and continuing professional development programmes can equip teachers for this evolving landscape.

Notably, the findings highlight that artificial intelligence can contain messages about 'acceptable' and standardised language use. This brings to light important issues regarding the inclusion or exclusion of languages, or language varieties, which might endorse specific ideologies or groups while overlooking or marginalising others. For example, to mitigate the type of implicit bias that favours certain varieties of English over others, it is important to analyse the criteria and rationale behind why particular pronunciation models are selected over others, and who determines which models are deemed suitable.

The results support the idea that AI can provide a conversational partner, offering opportunities for language practice outside class and helping alleviate students' anxiety about speaking and making mistakes in English. The question remains whether AI effectively prepares students for real-life conversations, or whether their anxiety would persist when faced with human interlocutors.

Another important practical implication is the continuing need for improving teachers' and students' digital literacy. There's an urgent need to broaden the understanding of AI literacy, including issues of transparency, trust, surveillance and privacy. AI literacy involves becoming aware of the limitations and risks of AI and discussing the various aspects of AI ethics (Ziesche & Kumar Bhagat, 2022). A related issue is that as with most emerging educational technology, there is a gap between the expectations around AI and its current capabilities. Practitioners should be cautious of the current hype around AI and should be realistic about its limited capabilities.

This study has raised important questions about students' fear when using AI. Opaqueness in how data is being processed by AI systems could lead to a lack of trust in the system. The implication is that a lack of clear data privacy statements and lack of clarity around the ethical deployment of AI in ELT/L could have adverse effects on learning and teaching. A key priority for policy makers should therefore be to develop and commit to an accessible and unambiguous ethics statement for AI in ELT/L, which could promote user confidence in the adoption of AI systems. When doing so, there is also the issue of digital divides to be considered i.e., the implications if developed nations introduce regulation and ethical alignment, whereas others are not able to do so and are therefore left more at risk.

6 Areas for future research

This research has raised many questions in need of further investigation. Firstly, it has identified a trend where the majority of studies published on AI in ELT/L now come from Asia, with 31 of the 43 reviewed studies conducted on this continent. The findings will be of interest to researchers in other geographies, particularly in the US and UK, which are prominent players in the global ELT industry. Another trend identified is most studies taking place in higher education contexts, even though ELT/L occurs in a range of different contexts. Taken together, these results suggest a need for future studies conducted in a wider range of geographies and contexts, making the results more widely generalisable, and particularly the need to rectify the lack of studies in adult learning and K-12.

One noteworthy finding is that the key area of assessment, which was identified in the coding, was not discussed in depth in the existing research literature. A more detailed analysis of AI assessment in ELT/L would be useful for the wider academic community as well as teachers and practitioners.

The investigation of language skills has shown that speaking and writing emerged as the main focus of existing research. The question raised by this study is whether AI will be better at developing certain skills in ELT/L, namely productive skills, or if it will be useful across all language skills.

Moreover, there is a noticeable lack of focus in the available body of research on the sub-skills typically required to develop these language skills. Therefore, future studies could explore the use of AI in the sub-skills involved in each language skill. Another interesting finding is that in writing, 'feedback' was the only pedagogical focus that emerged. What remains to be explored is the whole area of procedural knowledge in writing (implicitly being able to put the language learned into use in written production) that AI could potentially assist with. This would be a fruitful area for further research work.

As AI capabilities are rapidly advancing, it is encouraging that researchers are concerned with the pedagogical aspects of how AI can enhance effective practices. However, it is noteworthy that even with the rapid changes in available technology, many conventional forms of pedagogy, such as lectures and explanations, are still in use. It would be beneficial for researchers to investigate and expand on how AI can create new opportunities for learning.

Research is also needed to determine the place for AI powered gaming in educational settings for ELT/L. More research could explore explicit design features of multi-player online games for language learning.

Yet another interesting finding for practitioners is how translation tools could help students by giving them access to a larger range of lexical items. While such tools clearly aid output, it remains to be seen what happens when the tool is taken away. The question raised is whether this also results in an improvement in students' skills independent of these tools. If the debate is to be moved forward, a better understanding of the role of such machine translation tools in ELT/L needs to be developed.

7 Conclusion

This systematic review provides a much-needed overview of the field of AI and ELT/L. From gathering the published research of the past decade, the findings reveal the benefits of using AI as well as some of the challenges and issues that need to be addressed. This study also helps improve our understanding of what is being studied around the world in terms of AI in ELT/L, and in which geographical and educational contexts.

This is one of the first formal studies that examines AI and ELT/L across all learner levels from young children to adult learners. It highlights a need to prepare English language teachers to use these new tools, to gain an understanding of what AI is, how they can exploit its benefits, and avoid or overcome its pitfalls. Policy makers, funders, and educational leaders can use the information provided in this study to gain a holistic understanding of the use of AI in ELT/L and guide future AI endeavours.

8 Highlights

- This is one of the first formal studies to examine how AI has been used across all ages of learners.

- Trends show that AI is being used and provides benefits to ELT/L specifically in speaking, writing, and reading skills as well as providing new ways of teaching and also supporting students with self-regulation.

- The majority of studies in AI and ELT/L have taken place in Asia. Future studies conducted in a wider range of geographies would make results more widely generalisable.

- There has been a steep rise in AI ELT/L studies from 2017 onwards.

- AI ELT/L studies are taking place at all learner levels. However, there is a noticeable lack of studies in adult ELT, the majority are conducted in higher education settings. More studies are needed in K12 and adult learning.

- There is a lack of information on challenges of AI use in ELT/L. Further efforts needed to make explicit the challenges of AI in ELT/L.

- Of the challenges reported, there are four main concerns 1) technologies not working as they should, 2) AI is still showing limits to its capabilities, 3) learner fears in using AI, and 4) the way AI is created may lead to a standardisation in languages, and may reflect implicit biases about 'appropriate' and 'standard' language use.

- AI can provide a conversational partner, provide language practice outside class and alleviate learner anxiety about speaking. However, more evidence is needed on whether the gains persist independent of such AI tools.

- Future research could focus on receptive skills and sub skills.

- There is a lack of research on specific tools and longer-term impact on learning e.g., grammar, translation, AI-powered gaming.

- English language teacher education and training must include a focus on AI literacy. Teachers and learners need to develop AI literacy so that they can understand the limitations and risks of AI, and discuss the ethical issues around its use.

- Practitioners should carefully consider how models are chosen, as AI may carry messages about language use and exclude certain groups/varieties of English.

- Practitioners should be realistic about the current limited capabilities of AI and cautious about the hype.

- Accessible and unambiguous ethics statements for AI in ELT/L should be developed and committed to, along with clear systems to ensure data privacy.

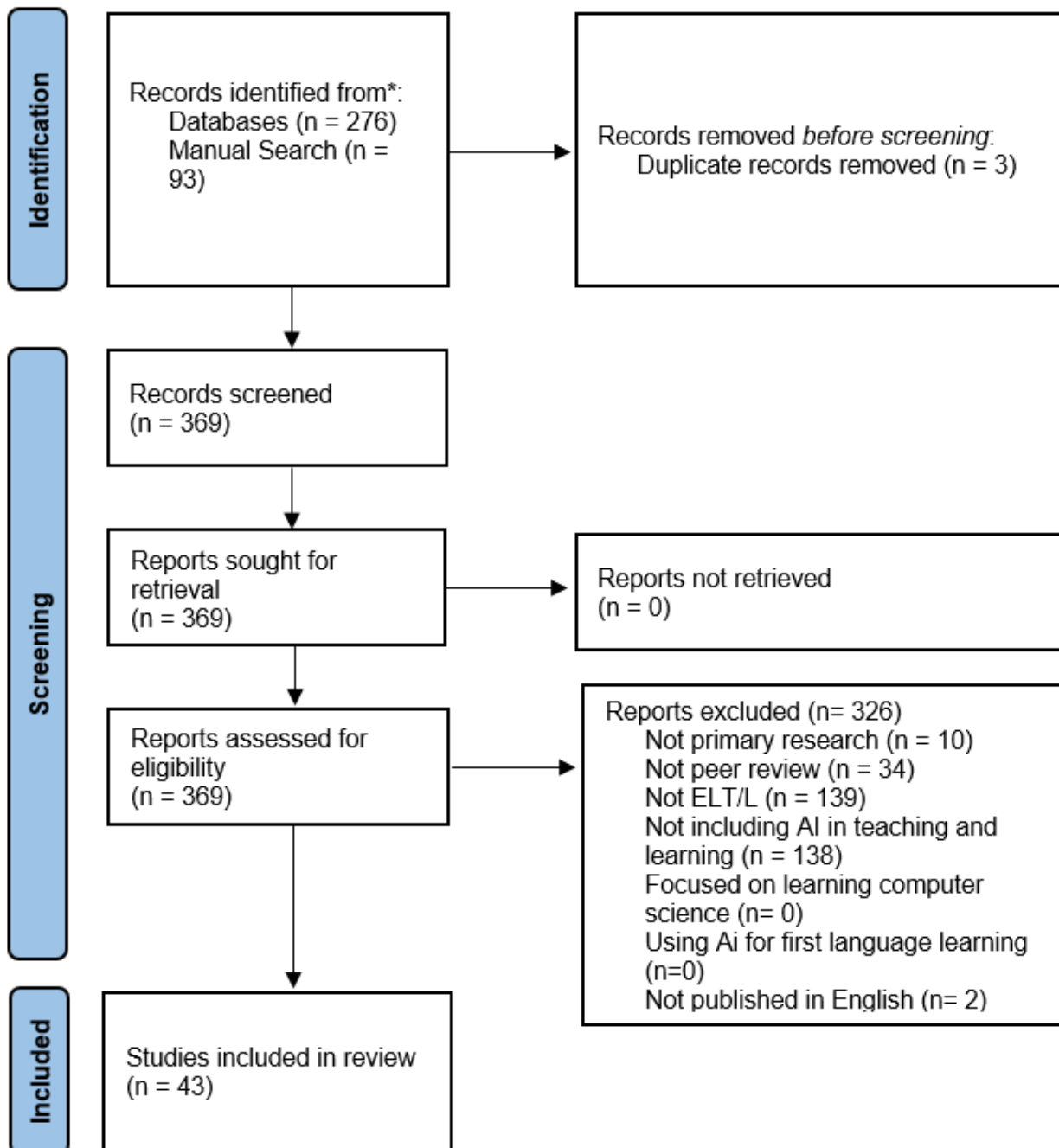- AI and assessment could be a key area of focus for future researchers.

9 Appendices

9.1 Appendix A: Complete Inclusion and Exclusion Criteria

Table: Inclusion and Exclusion Criteria

Inclusion	Exclusion
• Journal articles published between 2014 and 2023 • Peer-reviewed journal articles • Primary research • Involves teaching and learning English as another language • Uses artificial intelligence in ELT/L • Journal articles written in English	• Conference proceedings • Editorials • Research that includes pupils learning about AI, such as a computer science class and not using AI for learning. • Teaching and learning English to those who have English as their first language

9.2 Appendix B: Systematic review process

Identification

Records identified from*:
Databases (n = 276)
Manual Search (n = 93)

→ Records removed *before screening*:
Duplicate records removed (n = 3)

Screening

Records screened
(n = 369)

↓

Reports sought for retrieval
(n = 369)

→ Reports not retrieved
(n = 0)

↓

Reports assessed for eligibility
(n = 369)

→ Reports excluded (n= 326)
Not primary research (n = 10)
Not peer review (n = 34)
Not ELT/L (n = 139)
Not including AI in teaching and learning (n = 138)
Focused on learning computer science (n= 0)
Using Ai for first language learning (n=0)
Not published in English (n= 2)

Included

↓

Studies included in review
(n = 43)

10 References

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Artificial intelligence and English language teaching: A systematic literature review