

A systematic review on technology-based instructions to develop English pragmatic competence for non-native speakers

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ABSTRACT

With the rapid development of world Englishes (WEs) and multilingualism, pragmatic failure is still an unsolved matter for non-native speakers (NNSs). Although many studies have paid attention to technology application in second language acquisition (SLA), there are limited systematic reviews concerning technology-based instructions to develop English pragmatic competence for NNSs. This study gains a comprehensive overview to identify the situation and trend of technology-based instructions to develop English pragmatic competence for NNSs based on 20 articles from 2015 to 2023. Various findings indicate that based on technology instructions and technology resources, English pragmatic awareness and multidimensional development should be emphasized to foster English pragmatic competence among NNSs. Implications and suggestions are also provided for further research from this review.

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1. INTRODUCTION

With the accelerating process of globalization in this internet era, English is more and more widely used in all spheres of global activities [1]. According to Al-Mutairi [2], to improve the English of non-native speakers (NNSs) in the global world, there is a great need to better understand the relationship between the language and the culture of its speakers. It is challenging for English learners to achieve effective and accurate communication due to the rapid development of world Englishes (WEs), which, alongside linguistic diversity, has garnered equal attention in educational materials [3]. As English gains dominance and becomes a widely used language worldwide [4], regional variations and new forms of English eventually emerge, which are distinct from the traditional, native, and standard forms. What's more, it brings high requirements in integrating skills of language use in the context of multilingualism, which results in a transnational society where people are exposed to a variety of dialects and languages that have different functions [5]. Therefore, it is essential to use English appropriately in a pragmatic sense in today's multicultural and multilingual environment for NNSs.

However, NNSs still face various challenges in terms of English pragmatic competence. There is never-ending attention to pragmatic failure from linguists and scholars [6]–[8]. Initially proposed by British linguist Thomas [9], pragmatic failure is defined as “the inability to understand what is meant by what is said.” A communication breakdown caused by a lack of pragmatic competence will negatively impact the learning process [10]. This is further explained by García-Gómez [11] who claimed that students struggle to

communicate effectively due to pragmatic failure, although they seemingly have mastered enough linguistic competence. What is worse, a more serious dilemma is faced by NNSs because there are highly limited chances in the authentic foreign language context for input and interaction outside the classroom. Given this, according to Bouzekria *et al.* [12], English as a foreign language (EFL) teachers and curriculum designers are encouraged to support the implementation of explicit instruction in teaching pragmatic features. Certain elements, such as pragmatic competence, language proficiency, and awareness of the norms and customs of the target language, have acquired significant traction to counteract pragmatic failure and communication breakdowns [13]. Meanwhile, Ajabshir [14] noted that formal instruction remains the main source of acquiring knowledge of form-function-context mapping for L2 learners due to their restricted chances for naturalistic pragmatic development. Hence, there is an urgent need to involve instructions in English pragmatic competence development for NNSs [15].

Instruction is one of the most well-liked applications of pragmatic research [16]. Numerous studies on interlanguage pragmatics (ILP) have confirmed that it is possible to teach pragmatic competence, especially through explicit instruction on different pragmatic targets [17], [18]. ILP is defined as “the study of the development and use of strategies for linguistic action by NNSs” [19]. Meanwhile, pragmatic instructions have been considered an important method for increasing NNSs’ attention to target community norms and patterns of behavior [20], thereby emerging as a standalone field aimed at improving pragmatic competence [21]. What is more, in the case of foreign languages, practical instructions could make up for the limited chances for competence development in a classroom environment [22]. Therefore, influenced by the development of applied linguistics, pragmatic instructions have been an increasingly significant research area [23].

Many empirical and practical studies concerning technology to foster second language acquisition (SLA) have been paid attention to, especially computer-aided studies on EFL learners’ pragmatic competence. Students are allowed to participate in genuine communication outside of the classroom with many technology-based features, including synchronous and asynchronous computer-mediated communication (CMC), mobile place-based games, and synthetic immersive environments [24]. In the field of language learning, the term “technology” is used broadly, particularly in numerous computer-aided studies. In this study, it refers to a broad meaning such as technologies employed in computer-aided learning, or specifically concentrating on particular technology types such as multimedia and mobile devices, communication facilitated by computers [25], and technology-based learning materials. Due to the importance of computer-aided studies, it is essential to probe further into its historical development. Computer-assisted language learning (CALL), “coined in the 1970s to describe computer software that was specifically designed for, or adapted to, language learning” [26], is widely applied to digital L2 pragmatic learning. Computer-mediated communication for language learning (CMCL), as an extension of CALL, refers to the use of computers and the internet as learning environments [27]. Along with the digital technology era, language pedagogy is gradually evolving to mobile-assisted language learning (MALL) which breaks down the limitation of time and space of language learning [28]. According to Benson [26], the “future of CALL” is strongly interlinked with “intelligent applications”.

Although several studies have adopted various CALL-based devices to foster SLA, the vital component of instructions based on technology has received limited attention [29]. A review of earlier pragmatic research revealed slow pragmatic growth in a practical context [30]. Meanwhile, technology has opened exciting doors for the collection of data and the analysis of ILP [31], but few studies have delved into this issue in parallel comparison and vertical analysis. In the realm of studies exploring pragmatic instructions, there has not been a comprehensive effort to synthesize the empirical research on pragmatics and identify the gaps in terms of the teachability of pragmatics [32]. As Bardovi-Harlig [33] illustrated, “knowledge of teaching of pragmatics entails knowledge of pragmatics, but knowledge of pragmatics does not guarantee knowledge of how to teach it, as demonstrated by the fact that pragmatics pedagogy is still developing.” There is still a central concern to determine the more appropriate and effective approaches to promote the growth of pragmatic skills for NNSs [34]. Based on the aforementioned limitation of previous studies, opportunities for further review of technology-based instructions to develop pragmatic competence are provided. This paper is intended to summarize related articles about technology-based instructions in pragmatic competence development for NNSs in the recent 9 years (2015-2023) from five aspects including pragmatic competence, technology-based instructions, technology-based resources, research methods, research participants to analyze the research situation and clarify the future development direction of technology-based instructions to develop English pragmatic competence for NNSs. Above all, the answers to the research questions will be aimed to find out: i) What aspects of pragmatic competence have been examined? (Q1); ii) What technology-based instructions have been applied to develop English pragmatic competence for NNSs? (Q2); iii) What kinds of technology-based resources have been used in these studies? (Q3); iv) What types of research methods have been applied to these studies? (Q4); and v) Who are the participants in these studies? (Q5).

2. METHOD

The method to screen out these articles is elaborated in this section. Specifically speaking, this review is informed by the systematic review guide in social science published by Petticrew and Robert [35], which concerns several steps, such as research questions development, searching strategy, literature search, inclusion criterion, evaluation of the quality of included studies, and data extraction. It is divided into four parts, including search strategy, quality appraisal and screening, inclusion/exclusion criteria, and data extraction.

2.1. Search strategy

To ensure a holistic literature search and to reach a wider range of studies, the researchers of this study consulted professional librarians to check on the search strategies, which were ensured to be feasible and effective. Keywords (“EFL learners” OR “EFL learning” OR “ESL” OR “L2” AND “pragmatic*” AND “technology*”; “EFL learners” OR “EFL learning” OR “ESL” OR “L2” AND “pragmatic*” AND “computer*”; “EFL learners’ pragmatic*” AND “technology*” OR “computer*”) were searched in several online databases, for instance, Scopus, Web of Science (WoS), ERIC, ScienceDirect, and ProQuest. The included studies were filtered whenever the built-in filter searching was available, in which only the peer-reviewed articles written in the English language were incorporated for further analysis. The researchers of this study also conducted a backward and forward literature search to seek relevant articles, which was done by referring to the reference lists in the included studies. After searching by the keywords, a total of 793 articles were retrieved as shown in Figure 1.

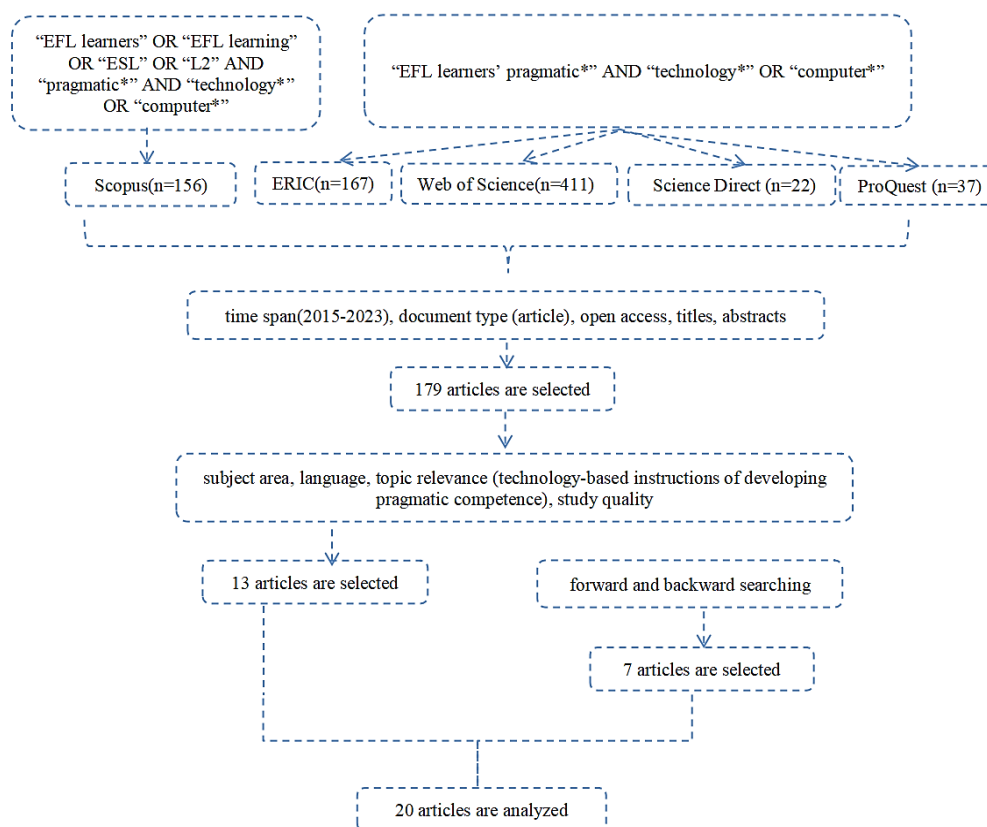


Figure 1. The process of article selection

2.2. Quality appraisal and screening

A triple screening was conducted by the researchers in this study. The first screening involved the check on the titles and abstracts of the obtained articles from the strategic search to ensure their relevance to the overall review topic and questions. Repeated articles were omitted. The second screening was completed by inspecting the quality of the included studies. Initially, the researchers in this study individually inspected the quality of the included articles based on the adapted guidance proposed by Hong *et al.* [36]. This process involved assessing the quality of the included studies by referring to three criteria: i) are the articles' main

aims relevant to English pragmatic competence? ii) do the articles contain a complete methodology? and iii) do the articles clearly describe the methodology? Each study was graded based on these three criteria. The agreement between the researchers was 90% for the second individual screening. The last screening resolved the differences regarding the quality of several articles jointly done by the collaboration of the researchers of this study.

2.3. Inclusion/exclusion criteria

Inclusion and exclusion criteria are elaborated according to the purpose of the review. After serious consideration, there are four inclusion criteria and five exclusion criteria presented below in Table 1. This means that only studies that satisfied the following inclusion criteria were included during the screening process. Eventually, 20 full-text articles were chosen to analyze in light of the inclusion and exclusion criteria.

Table 1. The inclusion and exclusion criteria

SN	Inclusion criteria
1	The articles published since 2015
2	Peer-reviewed journal articles written in English
3	NNSs
4	Technology-based instructions to develop English pragmatic competence
SN	Exclusion criteria
1	Languages other than English
2	Native speakers
3	Review studies, conference papers, and book chapters
4	Not focus on technology-based instructional strategies for developing English pragmatic competence
5	Not open access to full-text articles

2.4. Data extraction

The data extraction was performed by the researchers of this study independently at first, which aims to minimize errors [37]. As shown in Figure 1, the initial search led to 793 publications. Through applying the search criteria such as time span, document type, open access, titles, and abstracts, there remained 179 articles. According to the criteria of the subject area, language, topic relevance, and study quality, as well as forward and backward searching, the most suitable 20 articles were included for further analysis. The detailed article selection and screening processing are presented in Figure 1.

3. RESULTS

In this section, the focus is on analyzing and synthesizing the data collected to unveil the findings pertaining to the five research questions previously posed. The examination encompasses aspects such as pragmatic competence, technology-based instructions, technology-based resources, research methods, and participants. By delving into these key components, a comprehensive illustration of the study's outcomes is provided, offering insights into the nuanced interplay between pragmatic competence and technology-based language instructions.

3.1. What aspects of pragmatic competence have been examined?

To discuss what aspects of pragmatic competence were identified, the specific research purposes related to pragmatics were analyzed. Although some studies have more than one research purpose, only purposes connected to pragmatics are listed. As seen in Figure 2, they are categorized into five overarching parts. First of all, the speech act, dedicated to developing learners' pragmatic competence by helping them use language accurately and appropriately, is paid maximum attention ($n=11$), making up the largest proportion 55% of all the aspects. The speech act of request is the biggest contributor to the speech act research ($n=6$). Besides, the other speech acts are illustrated in these articles including refusal, thanking, compliment, suggestion, and complaint. In addition, other aspects related to pragmatic competence are also illustrated in some articles. Specifically, in two studies [38], [39], English pragmatic competence developing for specific purposes such as information technology and law is concerned. Then pragmatic competence-related language skills including speaking and writing are illustrated ($n=3$). For instance, L2 writing practice was examined in EFL courses assisted with social media [40]. Next, pragmatic awareness is considered ($n=6$) in terms of words at work as a self-access digital pragmatics learning tool [41], film and TV shows as authentic video materials [30], and consciousness-raising activities such as cross-linguistic comparisons and form-comparison tasks [11]. Finally, pragmatic routines are also mentioned in one article [28].

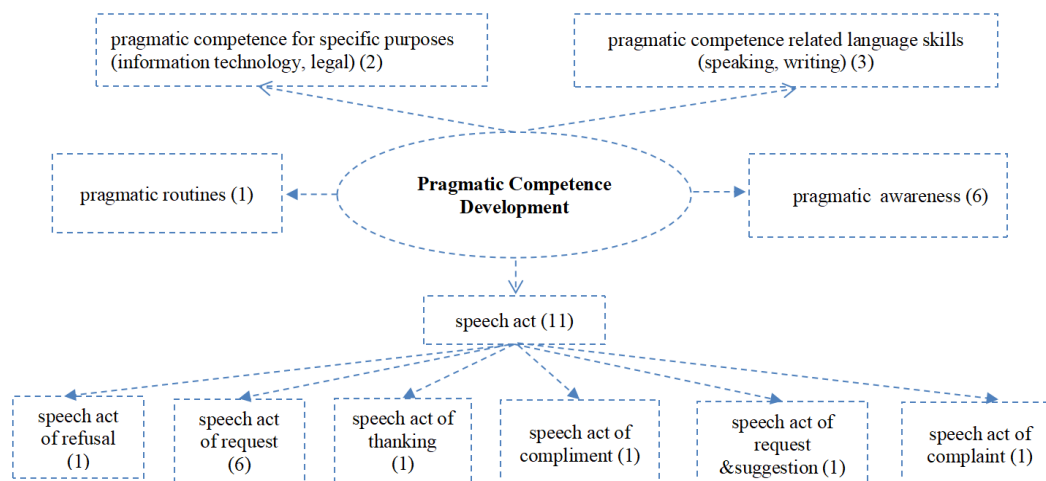


Figure 2. The aspects of pragmatic competence development

3.2. What technology-based instructions have been applied to develop English pragmatic competence for NNSs?

By summarizing the major technology-based instructions in these 20 articles, these articles address four aspects of different types, including teaching objects, teaching designs, teaching materials, and teaching tools. Figure 3 shows instructions based on teaching tools ($n=10$) and teaching designs ($n=6$) are two more popular types. Teaching materials ($n=3$) are illustrated including corpus-based instruction and video-based instruction. Then it is followed by teaching objects ($n=1$) concerning on learner-centered approach. Specifically speaking, concerning teaching tools, CMCL instructions are favored by 6 out of 10 articles. The reason can be found in one study that reported both synchronous CMCL and asynchronous CMCL can offer an authentic learning environment where learners can practice L2 pragmatics by interacting with expert users of language [42]. Another significant research by Zhang [29] also emphasized the positive effectiveness of CMCL integrated into data-driven instruction in accelerating the pragmatic development of compliment responses. Besides, it is interesting to note that a study focusing on the effects of a Facebook project on developing rural EFL learners' email literacy in English was conducted with the guidance of MALL, rather than CMCL [17]. Furthermore, robot-assisted language learning (RALL) focuses on a humanoid robot as an assistant to the teacher to interact with the students [20]. Meanwhile, when it refers to teaching designs, flipped learning instruction ($n=3$) could not be ignored. Flipping learning focuses basically on technology to shift content presentations outside the classroom, then allowing for more class time to be allocated to meaningful exchanges in L2 [43]. For example, a study was conducted to examine the significant impact of flipped learning by application of the Google Classroom platform before the class [44]. What is more, some other favorable instructions are also illustrated in this angle, such as distance learning ($n=1$), text-based instruction ($n=1$), and language play-based instruction ($n=1$). In addition, it is found that explicit instruction is the most commonly used approach in pragmatic competence. This is in line with the previous study which indicated explicit and systematic instructions as the most effective pedagogical practice in enhancing students' pragmatic competence [45].

3.3. What kinds of technology-based resources have been used in these studies?

After synthesizing all the articles, there are many technological resources applied to pragmatic competence development. As shown in Figure 4, they are categorized into six parts depending on different features and functions. They are receptively digital materials ($n=5$), mobile-based tools ($n=9$), open-source learning management system ($n=1$), self-access digital pragmatics learning tool ($n=1$), test-based tool ($n=1$), and AI-based tool ($n=1$). Mobile-based tools, applied in nine studies, occupy the largest proportion. For instance, Haghighi *et al.* [46] examined the effectiveness of the Telegram app on the requirements of a technology acceptance model for flipped classrooms. As an online platform, Telegram instant messaging was used in a relaxed and genuine environment making learning more enjoyable and interesting. Furthermore, digital materials are also well-received in five studies. In the research of Omar and Razi [44], an attempt was made to investigate whether EFL learners' pragmatic competence could be improved by integrating with movie and TV series with an experimental design. Beyond those, some other promising technological tools are also discussed in these studies. For example, words at work, as a self-access digital pragmatics learning tool, was designed as "a prototype for a self-access, computer-based, interactive learning platform that was

intended to help adult EFL learners to increase their awareness of pragmatics in the U.S. workplace domain” [41]. What’s more, when it comes to the most frequently studied aspect of pragmatic competence which is the speech act of request, many technological resources have been applied, such as Moodle, WhatsApp, Robot, movie and TV series clips, computerized video clips, and email. For the most popular instruction method which is CMCL, mobile-based tools such as Skype and email are favored. An interesting discovery is that email, as a primary manifestation of asynchronous CMCL [47], plays a very important role in pragmatic competence development, especially for speech act development.

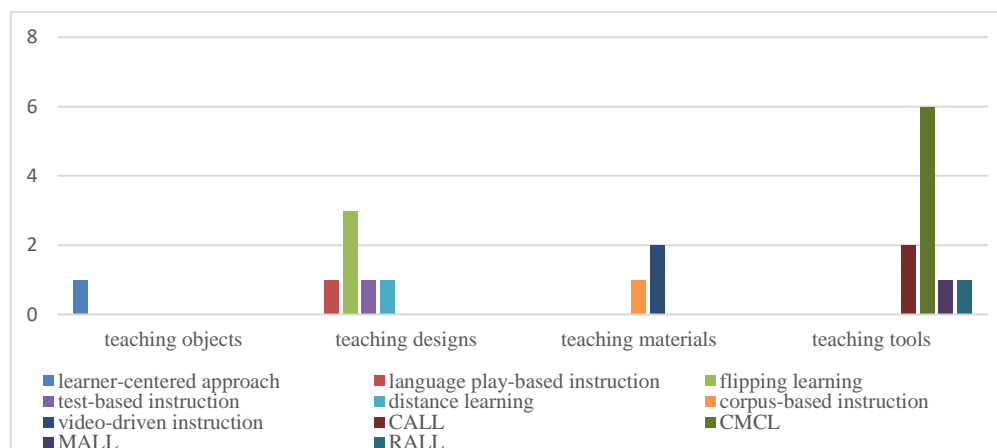


Figure 3. Technology-based instructions applied in the pragmatic competence development for NNSs

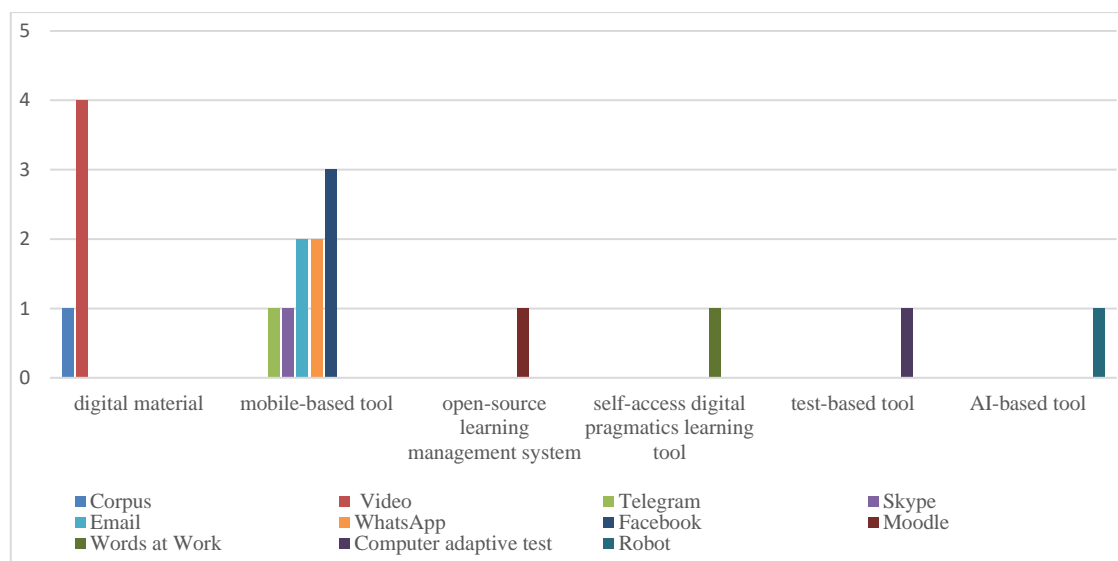


Figure 4. Technology-based resources applied in the pragmatic competence development for NNSs

3.4. What types of research methods have been applied to these studies?

To continue discussing how to conduct data analysis in these studies, research methods were illustrated. As can be seen from Figure 5, quantitative research ($n=11$) accounts for 55%, including t-test, ANOVA analysis, multiple regression analysis, and so on. Mixed methods ($n=7$) are followed, taking for 35%. Only 10% of studies ($n=2$) specifically adopt purely qualitative research. One example is a qualitative approach that involved focus groups applied to understand students’ views on how WhatsApp contributes to their learning experience [11]. Besides, discourse completion tasks (DCT), as a data collection instrument to evaluate learners’ speech act performance, is popularly utilized in 11 studies. For instance, in the research of Alsmari [34], a written DCT, made up of six scenarios, each involving a situation that simulates a complaint to someone in students’ family, social, or academic lives to ensure the naturalness of data, was adapted in line with the research purpose.

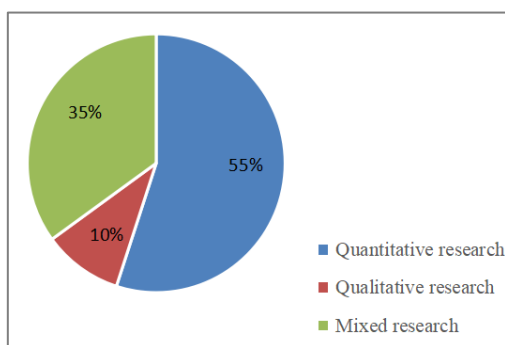


Figure 5. Percentage of research methods in these studies

3.5. Who are the participants in these studies?

After a deep-going analysis, samples, numbers, country/province, and educational background were analyzed in this part to answer this question according to Table 2. It is shown that nearly all the participants in these 20 articles are NNSs and only two articles proceeded with interaction and comparison between L2 learners and L1 learners. For example, Winans [47] conducted research with participants from diverse language backgrounds with Asia students ($n=25$) and L1 students ($n=32$) who were compared in the speech acts data analysis. Furthermore, a worth-ruminating finding is discovered in the participants' locations. It is found that the research on technology-based instructions for developing pragmatic competence is mainly in some countries of the expanding circle such as China, Iran, and South Korea according to the three concentric circles model put forward by Kachru [48]. Besides, when it refers to participants' educational background, it is shown that university students including students gaining entrance to university are widely chosen as the samples with a proportion of 85% ($n=17$). Then it comes to the studies done with kindergarten children [20] and secondary school students [49]. What's more, it is worth mentioning that there is a unique perspective to improve rural EFL learners' email literacy with instructions from English major students in the University [17]. Last but not least, it also deserves attention to the pragmatic competence of English for working professionals [41].

Table 2. Information of participants

SN	Participants	N	Country/province	Educational background
1	ESL learners (IT students)	34	Czech Republic	University students
2	EFL learners (Legal students)	120	Russia	University students
3	EFL learners	60	Iran	University students
4	EFL learners	30	UAE	University students
5	EFL learners	40	Indonesia	University students
6	EFL learners	74	Iran	University students
7	EFL learners	106	Iran	University students
8	EFL learners	38	Iran	Kindergarten children
9	EFL learners	59	China	University students
10	EFL learners	34	Spain	University students
11	ELL learners and L1 learners	57	Asia (25) the majority coming from English-speaking homes (32)	Students gaining entrance to university
12	EFL learners	40	South Korea	University students
13	EFL learners	18	Taiwan	University students (6); rural junior high school students
14	L2 learners	60	Colombia (14); Finland (21); Sweden (17); Taiwan (8)	Secondary school students
15	L1 and L2 learners	78	Britain (19); Spain (59)	University students
16	EFL learners	40	Saudi	University students
17	EFL learners	42	Iraq	University students
18	EFL learners	62	Saudi Arab	University students
19	ESL learners	54	US	University students
20	ESL learners	19	Spain ($n=6$), Arab ($n=4$), Korea ($n=3$), China ($n=3$), Italy ($n=1$), France ($n=1$), and Pashto ($n=1$)	Adult professionals

Notes: ELL=English-language learning; ESL=English as a second language; Language 2=L2; Language 1=L1

4. DISCUSSION

4.1. The essential raising of English pragmatic awareness for NNSs

When discussing the contribution of technology-based instructions to pragmatic competence, most of these articles are concerned with learners' pragmatic awareness as well [11], [29], [30], [34], [41]. Depending on Schmidt [50] groundbreaking research on awareness within SLA, pragmatic competence development is

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regarded as a process where NNSs are firstly aware of the co-occurrence of linguistic structures, and functions with contextual features, and then turn to comprehend the combination of fundamental principles. Hence, it is essential to focus more on how to increase learners' pragmatic awareness [22], [51], [52]. As in the research of pedagogic principles in digital pragmatics learning [41], it is beneficial to enhance pragmatic awareness when completing oral response tasks with the guidance of pedagogic principles in an immersive environment based on a self-access digital pragmatics learning tool words at work.

This is echoed by another research that L2 learners' pragmatic awareness has been significantly improved based on an intervention of a computer-based learning tool words at work [53]. At the same time, the longitudinal effects are far from enough and should continue to be examined by using Words at Work and other self-access digital pragmatics learning tools on the development of learners' pragmatic awareness. Besides, although it is helpful to improve NNSs' awareness of paralinguistic and sociopragmatic aspects with the implementation of excerpts from film and TV shows [34], more pragmatically centered materials such as authentic audio-visual materials should be taken into consideration by teachers to offer various chances for EFL learners to raise their awareness of the communication norms of the native culture. Meanwhile, these findings echo Zhang [29], who claimed that it is the first step to developing pragmatic competence by raising EFL learners' awareness of target pragmatic features including more appropriate usage of compliment responses through consciousness-raising activities. In future research, EFL teachers must raise learners' pragmatic awareness by equipping them with explicit pragmatic information through authentic audio-visual materials and participating in consciousness-raising activities with response tasks to familiarize them with the targeted pragmatic feature in a technology-based immersive environment.

4.2. The multidimensional development of English pragmatic competence for NNSs

The result of this review shows that speech acts, especially speech acts of request, account for a huge percentage of technology-based instructions for pragmatic competence development. The speech act is far more than this. According to speech acts taxonomy [54], it includes assertions, directives, commissions, expressions, and declarations five types. For NNSs, it is challenging to use apt verbal utterances to proceed with different speech acts based on different cultural norms due to cultural diversity [55], [56]. This is further supported by Ed-deraouy and Sana [57] who noted that the complex interplay of language and society implies that each utterance, word, and pause mirrors the broader sociocultural environment we inhabit. Hence, further research should expand the range of exploration to other pragmatic features of speech acts such as asserting, claiming, advice, promise, blaming, congratulating, and so on. Besides, speech functions and sociolinguistic competence are also essential to promote the comprehensive development of pragmatic competence [58].

Meanwhile, pragmatic competence in the English for specific purposes (ESP) context should not be overlooked [59] where the global prevalence of English as a lingua franca is on the rise [60]–[62]. Specifically speaking, concerning legal pragmatic competence in the research of Almazova and Sheredekina [39], future studies should focus more on real-life legal practice with the instructions of distance learning to develop a comprehensive legal pragmatic competence with other legal tactics such as mediation. What's more, pragmatic competence should also be emphasized in other diverse professional communicative contexts, including medical, management, and academic fields.

4.3. The trends of technology-based instructions to develop English pragmatic competence for NNSs

Findings from this study indicate that technology-based instructions develop unevenly in different dimensions, ranging from teaching objects, teaching designs, teaching materials, and teaching tools, with a notable emphasis on the widespread application of teaching tool-based instructions for English pragmatic competence development of NNSs. It developed from CALL, CMCL to MALL due to the rapid changes in science and technology from 2015 to 2022 along with the arising of RALL in 2020. As to CALL, it has shown a downward trend from focusing on how to develop pragmatic competence in immersive learning environments based on pragmatic learning materials [41] to pragmatic failures lying on cross-cultural analysis [11]. CMCL, as the extension of CALL, is supposed to be a positive growth from 2020 to 2022.

However, due to the failure of open access to full-text articles, some latest articles in 2022 are excluded from the analysis. For example, one excluded article was conducted to justify whether technology-mediated tasks are an excellent and effective pedagogic tool to promote L2 pragmatic development [23]. What's more, it develops from synchronous and asynchronous CMCL to a combination with other strategies such as language play [40], [49]. With the booming internet, it begins combining with social networking tools such as WhatsApp and Facebook [11], [17], [40], [49], [63], indicating the transition from CMCL to MALL. Therefore, the MALL should be taken into more consideration, since it makes language learning more personalized. It is also worth mentioning that RALL, a promoting attempt based on artificial intelligence, has attracted the attention of teachers and researchers in the field of pragmatics [20]. Besides, the implication of the current studies shows that more technology-based opportunities should be given to creating real-life

teaching instructional conditions for researchers and instructors. Another thing worth mentioning is that technology-based pragmatic instructions should be an essential part of English learning, calling for more specific guidelines to avoid anger and hostile interactions among students due to misunderstanding [11].

4.4. The trends of technology-based resources to develop English pragmatic competence for NNSs

From the findings, it can be seen that mobile-based tools are frequently used resources related to technology, such as Facebook [17], [40], [49], WhatsApp [11], [63], and Telegram [46]. It is thought-provoking why these tools not specifically designed for language learning are so welcome to develop English pragmatic competence for NNSs. Through comparison, it is worth noting that such tools as social communication platforms have certain similar features including instant messaging, multimedia sharing, group chatting, voice and video calling, status updates, and privacy settings which are beneficial to English pragmatic competence development for NNSs. Digital tools provide essential means for delivering L2 pragmatic content and enabling learners to engage with the materials [64]. This includes features such as multimedia capabilities, immersive game environments, and virtual reality. Therefore, it is necessary to develop teachers' digital literacy [65] for exploring more similar engagement strategies on platforms like Twitter, Kakao, WeChat, and Weibo to create a more interactive environment for learners.

In addition, open-source learning management systems such as Canvas and Sakai are worth in-depth study in pragmatic competence development of NNSs for their adaptive, comprehensive, interactive, versatile, and user-friendly features, not merely Moodle. Moreover, self-access digital pragmatics learning tools like words at work are not widely available for the development of pragmatic competence for NNSs and it's better to deeply examine the effect on the development of productive pragmatic competence in both instructions and assessment by automated speech recognition [41]. As to the AI-based tool, although robots are effective for language learning, it is essential to consider the obvious disadvantages such as high cost and lack of innovative thoughts [66]. It is also challenging for teachers when there are some technical problems in the period of use.

4.5. The concerns on research methods and participants of English pragmatic competence for NNSs

When it refers to research methods, it is discovered that there is an imbalance. More attention is paid to quantitative research in terms of examining the effect of technology-based instructions on English pragmatic competence development for NNSs. While qualitative research is limited to only two studies [11], [41]. Therefore, several qualitative methods should be used to improve the validity of future studies by exploring students' views and teachers' attitudes towards technology-based instructions to develop English pragmatic competence for NNSs.

Concerns regarding the research participants in these studies arise from the predominant scope of research conducted in certain countries within the expanding circle. With the spread of WEs, the countries of outer and expanding circle countries decreasingly depend on native speakers of English as norm providers. English varieties found across the globe, regardless of whether we consider them as legitimate or illegitimate offspring of their parent languages, exist independently and will develop their paths, serving unique roles in sociolinguistics, culture, nationality, politics, and psycholinguistics [67]. These countries on their own, become norm-provider for their varieties of English. In multilingual and multicultural environments, English speakers must navigate communication with individuals from diverse linguistic and cultural backgrounds, as well as owing different language proficiency. This raises the question of whether native or non-native English should prevail in such contexts [68]. Intelligibility refers to how much utterances are understood [69], [70] while comprehensibility, about pragmatic factors [71], pertains to how easily L2 speech is understood [72]. Even though we understand vocabulary, accent, and literal meaning, failure to grasp culture-bound, culturally determined, and contextual meanings represents a pragmatic failure [71]. So, comprehensibility will probably become an obstacle to effective communication, necessary to be further investigated in the future [73].

5. CONCLUSION

This study performed a systematic literature review of technology-based instructions on English pragmatic development for NNSs based on 20 articles published from 2015 to 2023. In general, these studies all affirm the advantages of technology-based instructions in improving NNSs' English pragmatic competence, and learners also give very positive evaluations and high satisfaction with technology-based instructions. The results reveal that English pragmatic awareness should be raised by explicit pragmatic information with targeted pragmatic features in a technology-based immersive environment. And English pragmatic competence is suggested to develop in multidimensions. Meanwhile, technology-based pragmatic instructions including CMCL and MALL are two main promising instructions in English pragmatic competence development. Moreover, the technology-based resources able to provide adequate interaction in an authentic interacting environment should be considerably applied in English pragmatic competence development, especially mobile-based tools. However, instructions must be emphasized on avoiding anger

and hostile interactions among students due to misunderstanding. Last but not least, the qualitative method and bigger sample size should be emphasized to ensure the validity and reliability of the research.

This systematic literature review provides rigorous insights into effective technology-based instructions and technology-based resources for pragmatic competence development in terms of pragmatic aspects, offering practical guidance for educators and instructional designers. This research contributes to further investigation in the field of technology-based instructions for English pragmatic competence by systematically synthesizing existing literature and identifying trends, gaps, areas, methods, and participants. However, it is not without acknowledged limitations which hopefully could be addressed in further research. Firstly, only 20 articles from the past 9 years were reviewed in this study. Secondly, articles were only retrieved from Scopus, WoS, ERIC, ScienceDirect, and ProQuest databases, while other databases such as Google Scholar and CNKI were ignored. Thirdly, some latest articles failed to be included due to unavailable open access to full-text articles. Further research with more latest articles from more databases will be more convincing. Nevertheless, the findings and implications have pointed out the direction to develop English pragmatic competence based on technology instructions for NNSs.

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