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Social Justice in Technology-Mediated Second Language Education: A Systematic Review

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ABSTRACT

Technology is here to stay and transfer our entire lives, including modes of communication and education. Its deep impact on our educational lives during the COVID-19 pandemic which forced education everywhere to go online cannot be denied. Technology-Mediated Language Learning (TMLL) otherwise known as Computer-Assisted Language Learning (CALL) in its various realizations (online and offline) has been a common, but limited, practice in many educational encounters for a few decades. Its recent, more widespread use on a global scale has brought to the fore less-attended but thornier issues such as social justice. This paper takes social justice in TMLL as the starting point and attempts to outline social (in)justice issues addressed in published papers on this topic from 2015 to 2023 (4 years before the pandemic up to now). To this end, relevant articles (following the inclusion/exclusion criteria) were identified (N = 16) and examined meticulously in terms of utilized data collection tools, social justice issues addressed, as well as theoretical and pedagogical implications. The review uncovers that more attention has been drawn to social justice issues in online classes after the pandemic compared to the pre-pandemic period. The studies further signify the prominent role of language teachers in promoting social justice, highlight the widening digital gap between learners, and bring to spotlight hegemonies and governing power influencing social media content.

Keywords: Computer/Technology Assisted/Mediated Language Learning/Teaching; Equity/Equality; Inclusion; Diversity; Social (in)justice/fairness

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Introduction

The current eagerness for technology's incorporation in all spheres of life, particularly in education, is an outcome of its acknowledgment as an unavoidable phenomenon. The ease of use and practical applications of computers have led to a shift in emphasis away from computer technology itself to its use for language education, leading to the introduction of Computer-Assisted Language Learning (CALL) (Sadeghi & Dousti, 2012). CALL with its various technological realizations is by no means a new concept; the need to adopt and utilize computer-mediated instruction in language classes permeated our lives for decades, but its role gained more prominence during the COVID-19 pandemic. CALL has offered an opportunity to use networked media to build inclusive learning communities and social relationships in addition to being a method for achieving effective language results (Smith, 2021).

The use of computer technology for language learning has instituted terms such as technology-mediated (Sadeghi & Douglas, 2023), technology-enhanced (Alavi et al., 2022), technology-assisted (Cohen et al., 2023), mobile-assisted instruction and the like; CALL is used as an umbrella term in this study to encompass all such relevant terms including Mobile Assisted Language Learning (MALL), Technology Assisted Language Learning (TALL), Technology-Mediated Language Learning (TMILL), online language education, and other forms of technology-driven language education.

The prevalence of available infrastructures and various online platforms to teach and assess in the last decades led to a bunch of research studies in the field of language education. Although 70 years of CALL presence in the field does not seem to be a short time, widespread unpreparedness for incorporating CALL into language classrooms at the beginning of the pandemic was of great concern (Smith, 2021). Despite various affordances CALL has brought to language learning, there is another side to the story that does not seem to have been properly tackled (such as issues related to CALL's fairness to all learners/teachers as well as the larger social justice considerations). Although studies have reported a number of advantages associated with technology-based language education, specific problems have also been identified with this modern medium, especially in developing countries as far as online education is concerned. As the success of such instruction depends on tackling the shortcomings, taking preventive measures is essential. One such drawback is digital inequity. While studies (e.g., The International Baccalaureate Organization, as cited in Song et al., 2021) suggest that learners can learn equally in online classes, there are reports from developing countries highlighting certain underlying issues for students in underprivileged areas that lack access to proper Internet connection (Song et al., 2021). Lack of remote learning resources, weak Internet connection, poorly dispersed and disorganized information through cell phones, and a lack of TV channels broadcasting educational programs are just a few of the problems that underprivileged students must deal with. To make this unfavorable situation more promising, a strategy/solution must be developed (Song et al., 2021). Moreover, Hawati and Romadan Khalidi (2020) describe how a country's degree of development affects the adoption of online education in that nation. As such, online education is more practical in countries with better incomes than in nations with lesser incomes, where learners unavoidably choose to learn through radio and television.

On the other hand, the technology-as-neutral fallacy has been employed in digital language education to present CALL as an instrument that is prepared to 'dispense' knowledge without respect to a wider social context (Chapelle, 2003). However, it should be noted that "digital spaces [are] social places that do not evade the inequalities of the 'physical' world" (Helm, 2017, p. 226); therefore, attending to such social injustice in computer-assisted instruction should not be ignored. Wang and Stockwell (2023), in this Special Issue, offer a framework for how social justice can be insured in the digital space by catering to its components of "inclusion, diversity, equity, respectful relationships, community building, and actions against bias" (p. 2).

Scattered and scarce literature exists on how issues related to social (in)justice and equity have been addressed in computer/technology-mediated/-assisted language instruction. By trying to highlight the limited literature on the neglected but important topic of social justice in technology-mediated and in particular online L2 education, this paper is one of the first attempts to direct L2 researchers' attention to examining this concept as well as raising awareness among educators and policymakers on how to promote social justice, fairness, equity, and inclusivity in online language education, catering for all or most learners.

Purpose of the study

CALL has been researched from a variety of vantage points to find out elements contributing to or detracting from its success. Social justice is a seminal concept that needs to be integrated into all forms of education, including CALL and online language education; however, due to the highly sensitive nature of the concept, issues related to social justice have not been adequately addressed. Considering that during the COVID-19 pandemic, CALL was used as a crisis-response strategy, and we will most possibly resort to CALL in future world chaoses, this review plays a vital role in enhancing CALL equality and equity in the world. The main goal of this study, therefore, is to reveal how social justice issues have been addressed in the last decade or so, and by so doing, to make recommendations about how elements of social justice can be espoused in online L2 classes to make them more effective and socially inclusive.

Accordingly, to shed light on different aspects of social justice in technology-mediated, online language education (language teaching, learning, and testing), published articles were analyzed in response to the following research questions:

1. What is the publication trend for social justice in the context of technology-mediated language teaching, learning, and testing from 2015 to 2023?
2. What research tools/methods have been utilized while researching social justice in technology-mediated L2 education?
3. What are the social-justice related theoretical and pedagogical issues/themes addressed?

Method

To answer the above-mentioned research questions, different studies relevant to CALL, including technology-mediated and online language instruction that included a theoretical or empirical account of social justice, were identified and coded in terms of employed research questions/themes, research methods/tools, findings, and implications.

Data Collection

In order to facilitate the replication of the study in the future, a standard systematic review procedure was used for data collection. Two main databases: Scopus and WoS (Web of Science) as well as Google Scholar were used to find relevant published papers. Different keywords including "social (in)justice in technology/computer-mediated language learning", "social (in)justice in computer/technology-assisted language teaching", "fairness in technology/computer-assisted language instruction", "equity in technology/computer assisted assessment", were used to identify relevant papers. Moreover, hand-searching specific journals including *CALL*, *ReCALL*, *Language Learning & Technology*, *System*, *Sustainability*, and *Computers & Education* as well as cross-referencing

provided us with a few more relevant papers. Our initial plan was to review empirical studies; however, given the scarcity of empirical research on this topic, we also included non-empirical works (including theoretical and conceptual papers) in this realm as well. Initially, a good number of papers were collected ($N = 56$); however, after meticulous examinations, a number of them were found irrelevant (not specifically focusing on social justice in online second language education) and excluded from the rest of the process. Finally, 16 papers (empirical = 8; non-empirical = 8) were chosen based on inclusion/exclusion criteria, summarized in Table 1, and analyzed for the purpose of the study.

Table 1
Inclusion and Exclusion Criteria

Type of criterion	Review scope
Exposure of interest	Any studies considering social justice in CALL, MALL, TALL, Online/distance L2 education, computer/technology-mediated L2 instruction
Type of publication	Peer-reviewed journal articles
Language	English only
Dates of publications	Between January 2015 and December 2023.
Access	Online
Geographic location	No limitation
Research methods	All methods: Qualitative, Quantitative, Mixed methods
Type of study	Empirical, and non-empirical

Results

RQ1: Social Justice Publication Trend from 2015 to 2023

To answer research question 1, the collected data were examined in terms of publication trend. The number of collected articles ($No = 16$) signified the novelty of the topic and how it has attracted researchers' attention more after the pandemic. That is, 13 out of 16 papers belonged to the period 2021- 2023, and the rest of the papers ($N = 3$) to years 2017 and 2019, with no studies reported before 2017. Figure 1 portrays the growing trends of publications after 2020.

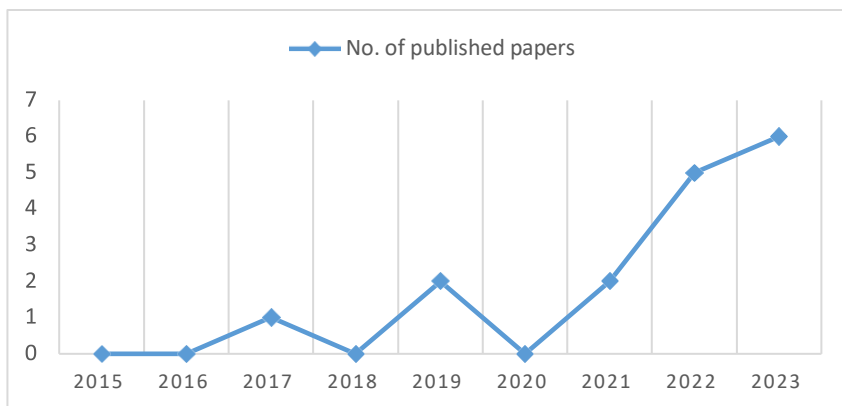


Figure 1. Publication Trend From 2015 to 2023

RQ2: Utilized Research Methods/Data Collection Tools

Six papers (i.e., Cao et al., 2023; Chory et al., 2022; Estaji & Zhaleh, 2022; Moser et al., 2021; Oh, 2019; Yılmaz & Söğüt, 2022) from eight empirical ones used an online open-ended survey as the main data collection instrument. Open-ended questions are increasingly used in survey research as they can provide vital information that cannot be accessed through close-ended questions, specifically in web probing. Recent technological advancements have made the application of open-ended questions easier (in collecting, or coding data); therefore, open-ended online surveys have turned into a common way of gathering data (Neuert et al., 2021).

Among the eight empirical papers, the interview was the main tool for gathering information for two articles (i.e., Azizi, 2022; Marandi, 2023). Indeed, interviews are one of the main data collection tools in qualitative research, where researchers wish to probe into opinions and attitudes as well as motivations behind certain activities and thoughts that are not easy to understand through observation or multiple-choice survey items (Doody & Noonan, 2013).

Concerning the eight non-empirical papers, four papers were conceptual (i.e., Dwivedi et al., 2023; Ortega, 2017; Smith, 2021; Wang & Stockwell, 2023), two were theoretical (i.e., Anwaruddin, 2019; Smith, 2022), and two were considered both conceptual and theoretical (i.e., Alm & Watanabe, 2023; Warschauer et al., 2023). A theoretical framework is the use of a theory, or a collection of concepts drawn from a single theory, to provide an explanation for an occurrence, shed some light on a specific phenomenon, or address a specific research challenge (Imenda, 2014). However, when one theory does not have the ability to provide an answer to the research problem, the researcher synthesizes the existing literature to form a conceptual framework. In other words, a conceptual framework is an outcome of combining several relevant concepts in order to explain or anticipate a certain event, provide a deeper understanding of the topic of interest, or simply address a research problem (Imenda, 2014). Table 2. below summarizes the relevant information.

Table 2
Social Justice Articles, Research Methods/Data Collection Tools, and Addressed Issues

Author	Type of Study	Research tools/methods	Addressed issues
Chory, Zhaleh, & Estaji (2022).	Empirical	Online open-ended questionnaire	Promoting fairness and equity in the online learning environment
Azizi (2022).	Empirical	Semi-structured interview method	Significance of teachers' use of power in their perceptions of fairness
Marandi (2023).	Empirical	Semi-structured interview	Impact of hegemonies on technology-enhanced language learning, particularly in countries that are subject to sanctions and restrictions.
Moser, Wei, & Brenner (2021).	Empirical	A national survey (consisting of open-ended questions)	Inequities and access to technological tools
Oh (2019)	Empirical	A mixed-methods approach (two writing tasks + an online survey)	Impact of writing resources on writing assessment and to develop assessment tasks that reflect the use of writing resources in real-life writing situations.
Yılmaz & Söğüt (2022).	Empirical	Online survey with open-ended questions	Importance of teachers' role (in knowing the risks, and adopting a critical stance)
Estaji & Zhaleh (2022)	Empirical	Open-ended questionnaire	Teachers' lack of technological knowledge and social justice awareness
Cao, Zhou, Lee, Cabello, Chen, & Hershovich (2023)	Empirical	Questionnaire and Hofstede Cultural Survey	Incorporating cultural sensitivity and awareness in developing chatbots

Smith (2022)	Non-empirical	A theoretical exploration	A more contextualized approach of CALL to address social and cultural dimensions
Anwaruddin (2019).	Non-empirical	Theoretical and pedagogical aspects	Re-conceptualizing the possibilities and limits of social media use in language education
Smith (2021).	Non-empirical	A conceptual paper	Considering the sociocultural dynamics of online language education
Dwivedi, Kshetri, Hughes, Slade, Jeyaraj, Kar, ... & Davison (2023).	Non-empirical	A conceptual paper multidisciplinary perspective	New approaches to teaching and learning, development of a new curriculum
Warschauer, Tseng, Yim, Webster, Jacob, Du, & Tate (2023).	Non-empirical	Both conceptual and theoretical research.	Use of new approaches in the integration of AI tools in teaching and emphasizing AI literacy
Alm & Watanabe (2023)	Non-empirical	A theoretical and conceptual paper	Critical pedagogical examination of the integration of ChatGPT into education
Ortega (2017)	Non-empirical	Conceptual paper	Addressing the digital divide and ensuring that all learners have equitable opportunities to learn a second language
Wang & Stockwell (2023)	Non-empirical	Conceptual paper	Addressing different elements of social justice in technology-enhanced classrooms

RQ3: Theoretical/Pedagogical Issues/Themes

The published papers have not all considered social justice from one dimension. More specific Issues raised more specifically in each study appear in Table 2. However, the papers can be categorized into three major groups in terms of main themes addressed as well as theoretical/pedagogical issues: 1. hidden hegemony in the produced material (No = 5); 2. teachers' role (No = 4); and 3. access to resources (No = 7). The distribution of major themes/issues in published research on social justice in CALL-related L2 education is depicted in Figure 2. below.

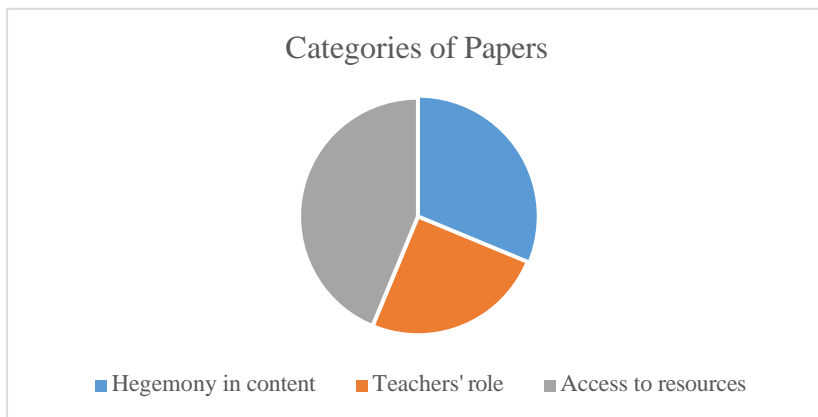


Figure 2. Themes/Issues Addressed in Social Justice-Related CALL Research

The first group of studies considered the hidden hegemony of produced e-content and tools (Anwaruddin, 2019; Cao et al., 2023; Dwivedi et al., 2023; Marandi, 2023; Smith, 2022). Drawing on Feenberg's critical theory of technology, Smith (2022) engaged in discussions around the social and cultural dimensions of CALL, including the dominance of English in online and CALL activities, and the need for a more nuanced understanding of the cultural and social contexts of language learning. The article argued for a more critical and contextualized approach to CALL that takes into account the socio-cultural contexts and power dynamics at play. In a similar vein, Cao et al. (2023) discussed the need for more culturally sensitive dialogue agents (such as ChatGPT) that can better adapt to diverse cultural backgrounds. The paper drew attention to the importance of incorporating cultural sensitivity and awareness in the development of dialogue agents. The study's methodology could also be used to evaluate the effectiveness of other dialogue agents in adapting to diverse cultural backgrounds. As far as the promotion of social justice in CALL is concerned, dialogue agents such as ChatGPT were suggested to be used as a tool for promoting cross-cultural understanding and communication.

Likewise, Marandi (2023) also accentuated the need for a more nuanced understanding of the influence of technology on language learning, particularly in countries that are subject to sanctions and restrictions like Iran. The article underlined the importance of considering linguistic hegemonies in the design and implementation of technology-enhanced language learning programs. Additionally, the article stressed the need for more culturally sensitive approaches to technology-enhanced language learning, as well as the importance of considering the various types of knowledge required for educators in the digital age, as outlined in the Technological Pedagogical Content Knowledge (TPACK) model. Marandi (2023) also acknowledged the potential for technology to perpetuate existing power structures and inequalities, and the need for a more equitable distribution of online power to ensure that technology-enhanced language learning is accessible to all learners, regardless of their linguistic or sociopolitical background. Overall, the article called for a more critical and reflective approach to the use of technology in language learning, and for educators to be aware of the potential hegemonies that may arise in the use of technology for educational purposes. While what Marandi cautioned about is the common practice leading to social inequalities in many parts of the world, interestingly technology can work as a double-edged sword potentially contributing to fairer, more inclusive societies by making quality education and resources available to a majority of the population who could be deprived from such a service without access to technological affordances. It is this aspect of technology that requires highlighting if educators and policymakers wish to promote equity and justice among the members of their society.

To be viewed from a similar perspective, Anwaruddin (2019) also referred to the hidden power of social media and how they can be used for language teaching and promoting social justice, but it requires a dialogic approach to pedagogy that is based on serendipity and contingent scaffolding. The author argued that language teachers and teacher educators need to re-conceptualize the possibilities and limits of social media use for teaching and learning languages. The author also emphasized the importance of promoting social justice and equity in language education and suggested that social media can be used to facilitate dialogues with a wider community with diverse and conflicting viewpoints. This way technology can be used to its best potential at large, fostering collaboration, dialogue, awareness, mutual understanding, and respect, all pillars of a just society. A similar approach can be followed in educational settings where social media and other forms of technology can raise awareness among students, promote constructive collaboration, and enhance respect, leading to fairer educational systems.

Dwivedi et al. (2023) not only underlined the limitations of Artificial Intelligence (AI), but also discussed the potential for Generative Artificial Intelligence (GenAI) to be implemented in various business and societal contexts, and the need to identify the optimal combinations of human and GenAI for various tasks. The paper also emphasized the prominence of examining biases of GenAI that are attributed to training datasets and identifying ways to assess the accuracy of

text produced by GenAI. The article proposed research questions related to various perspectives of GenAI tools, their impacts on social, political, organizational, and economic issues, and the challenges and opportunities provided by this tool. It was suggested that GenAI may require new approaches to teaching and learning, and the development of new curricula and training programs to prepare students for the use of these technologies in their future careers. What was missing from the article is, apart from a consideration of AI's affordances and challenges in language education, an account of how AI can be employed to promote fairness and equality both in educational contexts and the society at large. Generally, papers in this category called attention to the concept of diversity as one of the main ingredients of social justice. The produced educational material and online content need to cater to the cultural and social backgrounds of various learners across the world. However, research shows that current e-content favors a group of learners over others by being inundated with the specific culture of authority that is in control of content production and does not care for the diversity of cultures and contexts in the globalized world, resulting in the prevalence of native speakerism.

In the second category of studies, the focusing lens turns to be on language teachers (i.e., Azizi, 2022; Chory et al., 2022; Estaji & Zhaleh, 2022; Yılmaz & Söğüt, 2022). For instance, Chory et al. (2022) drew on previous research to argue that perceptions of (teacher) injustice can have a negative impact on students' motivation, engagement, and learning outcomes. The majority of the participants in their study believed that technological problems and breakdowns impeded proper communication between teachers and learners. Insufficient student technological knowledge besides the anxiety of using new tools/mediums led to further issues augmenting the violation of equity by teachers in grading students. Moreover, teachers violated equality regularly in relational communication with students. Such unfair chances to contribute to the class and perceived excessive attention to certain pupils exacerbated teacher unfairness as teachers did not have the opportunity to know students well in online classes. Similarly, Estaji and Zhaleh (2022) noted teachers' unfairness in online EFL classes which was mainly due to a lack of face-to-face interactions, improper student-teacher relationships, and teachers' unavailability outside the classroom. Moreover, the lack of teachers' digital literacy augmented teacher injustice in online classes. In addition, the technological issues that students encountered, influenced teachers' incorrect evaluation and led to their unfair scoring. The participants also suffered from teachers' excessive attention to certain learners and its discouraging impact on other students. Inclusion which refers to involving all the learners in the learning process and motivating them to take part in the educational activities regardless of any background differences as a major element in social justice is also under question in this group of studies. Moreover, the issues raised in online classes also underscored the concept of diversity in language classes, in which all the students with their unique identities should be valued and activities should be designed in a way to accommodate all individual preferences (Wang & Stockwell, 2023). Teachers' lack of technological knowledge as well as unawareness of justice issues in online classes were the significant reasons leading to injustice.

Moreover, Yılmaz and Söğüt (2022) highlighted the importance of teachers' beliefs, attitudes, and practices in shaping the use of technology for social justice in language education. The study signified a need for clear policies and guidelines on the use of technology in language education for social justice, and for adequate training and support for teachers to use technology effectively and responsibly, as well as the chance to collaborate with other stakeholders, to promote social justice. Teachers were also found to be aware of fairness issues in online education in a study by Azizi (2022). The participants (teachers) identified several factors that contribute to fair assessment practices, including transparency, validity, reliability, and feedback. The study reported that teachers faced several challenges in administering fair assessments in online education, including technical issues, cheating, and plagiarism. The study is based on the Social Psychological Theory (SPT) of fairness, which approaches fairness from three different perspectives: distributive justice,

procedural justice, and interactional justice. The findings suggest that the teachers' ideas of fairness are greatly influenced by how they exercise their power. The study also makes the case that evaluation procedures are unfair if equitable access to resources, time, space, and materials is not guaranteed. Such unfair evaluations seem to be prevalent even in high-stakes exams (i.e., university entrance exams) where not all students have access to equal resources and opportunities but are assessed without catering to unequal conditions (Pourbahram et al., 2023).

Finally, in the last category of studies (i.e., Alm & Watanabe, 2023; Moser et al., 2021; Oh, 2019; Ortega, 2017; Smith, 2021; Wang & Stockwell 2023; Warschauer et al., 2023) where the focus is on equality and equity, Moser et al. (2021) noted that teachers at all levels reported concerns about inequities in access to technology and the Internet, which disproportionately affected some students compared to others. Instructors in grades K–12 described providing technology and hotspots as "not easy" or "impossible". According to the article, pre K–12 instructors were more concerned about these discrepancies than postsecondary academics. Ortega (2017) argued that CALL-SLA research should focus on addressing the digital divide and ensuring that all learners have equitable opportunities to learn a second language. Indeed, she proposed a number of ways to do this, such as developing CALL materials that are accessible to learners with limited technology resources and conducting research on how to use technology to support language learning in underserved communities. Such concerns and recommendations sound ideal on a theoretical ground but what is also required is to offer practical suggestions for bridging the digital divide. Such an endeavor requires, first of all, local governments to allocate funds for making technology accessible to all learners, and secondly at the international level, richer countries and those with access to technology to offer every support, financially and technologically, to make resources available to those who cannot afford. Given the current political and military priorities and tensions among world leaders, it is very unfortunate that the earth's resources are being used in matters which lead to further deprivation of learners in less developed regions of the world, depriving them of not only the right to receive education but more importantly the right to live.

In the context of fairness in language assessment, Oh (2019) considered learners' use of online writing resources and how they can broaden the construct of writing ability and provide a more accurate representation of test-takers' writing skills. The study highlighted the need to consider the impact of writing resources on writing assessment and to develop assessment tasks that reflect the use of writing resources in real-life writing situations. The article concluded that writing resources can be beneficial for L2 learners in various writing tasks and assessments. Teachers can incorporate the use of writing resources into their writing instruction to help students develop their writing skills and become more independent writers. The study found that the interpretation of test-takers' writing skills in terms of content, organization, and language control was the same whether they had access to writing resources or not, despite the fact that students did higher on the task that allowed access to writing resources. In general, test takers were happy about their experience using writing resources, while completing a writing exam, especially in terms of the confidence and utility of the tools, according to their individual comments and replies. Although linguistic tools were well received, there were differing opinions on whether using them in assessments was a fair procedure. The use of writing resources and linguistic tools may be seen as unfair as several test-takers commented on the fairness issue and one test-taker mentioned how they were advised by the teacher that utilizing external tools in exams is cheating and hence is unfair. Thus, the question that arises here is, 'Which one is fairer: having access to online tools (used for improving writing ability) or not having access to such facilities (as is the case in many underdeveloped countries)?' Indeed, a growing number of reports are appearing on academic misconduct and plagiarism due to access to GenAI. Misuse of AI-powered tools provides some students with unfair advantages by saving them time and energy in completing their assignments, exacerbating inequity from a different dimension (Bannister et al., 2023; Morreel et al., 2023).

Considering justice from a similar perspective, Warschauer et al. (2023) proposed a pedagogical framework and argued that this framework can help address the "imitation," "rich get richer," and "with or without" contradictions that arise when using AI-generated writing tools. The phrase "rich get richer" refers to the idea that new technologies, such as AI-generated writing, often have the opposite effect of leveling the playing field and reducing inequality. Instead, those who already have the skills, knowledge, and resources to access and exploit these technologies are the first to benefit, while those who lack these advantages are left behind. This can lead to a widening gap between the advantaged and the disadvantaged, as the former group continues to accumulate more resources and opportunities while the latter group falls further behind. The authors argue that AI-generated writing has the potential to address linguistic inequality, but it also runs the risk of becoming yet another contributor to the same inequality it seeks to address.

Concerned about such injustice, Alm and Watanabe (2023) emphasized the need for continuous innovation in strategic prompt engineering and activity design, focusing on realizing liberatory ideals, rather than solely for efficient information transfer. Their paper concluded that the ethical integration of ChatGPT in language education can contribute to personalized and situated learning, expand access to language learning opportunities, and promote equitable outcomes for learners. The paper discussed access to technology in relation to ChatGPT. Specifically, the paper noted that while ChatGPT provides technical access to multiple languages, its benefits may disproportionately accrue to the already privileged. It argued that efforts are needed to democratize access for disadvantaged groups and ensure that users have the necessary socio-economic resources, technological literacy, and prompt writing skills to use ChatGPT effectively. The study also proposed strategies for the equitable use of ChatGPT's affordances and emphasized the importance of responsible integration to avoid inequalities and protect core educational values.

Similarly, Smith (2021) discussed the design of online language courses, the role of teachers in facilitating online language learning, and the importance of accommodating the cultural and social backgrounds of learners in online language education. The study also underlined the importance of community-based CALL, which seeks to highlight different epistemologies, unequal social processes, and subjugated knowledge. The paper argued that digital language education must be designed to promote social justice and equity and that practitioners of CALL must recognize and take into account the sociocultural frameworks that different groups use to navigate online language acquisition. Although the importance of fair access to technology in online language education was recognized by the author, there was no practical advice as to how this can be promoted and achieved in real life.

One last paper in this category is a comprehensive account of the status quo of EFL education in the technology era by Wang and Stockwell (2023). After segregating the concept of social justice into its components (i.e., inclusion, diversity, equity, and relationships), the authors raised concern over the digital divide. Moreover, they mentioned gender and racial divides as other instances of injustice. By referring to the unfair conditions of immigrants and people with disabilities, the authors painted a grim picture of teachers' conditions in regard to their technological knowledge and social justice awareness. To sum up, all the papers in this category drew special attention to equity as a concept of paramount importance in social justice. In fact, equity is meant to ensure that everyone has the essential resources (based on their specific needs) and support to reach their language learning goals (Wang & Stockwell, 2023), whereas equality is providing similar resources to everyone which could maintain the already existing gaps between learners.

Discussion

Research trend

The present review was an endeavor to identify studies focusing on issues pertinent to social justice in computer-assisted language teaching, learning, and testing within the last 9 years and to analyze the same in terms of methodological orientations as well as the theoretical and pedagogical issues tackled. The collected data demonstrated a rising trend in publications after 2020, which is most possibly due to the prevalence of technology-based education and the severe need to resort to technology during and after the COVID-19 pandemic. Moreover, the limited number of published works about this topic attests to a lack of due attention to this concept (given the culturally and politically sensitive nature of the term) and calls for the conduction of more future research projects in this area, especially in developing and less developed countries where there are more serious social (in)justice concerns.

Research methods/data collection tools

The study found open-ended surveys and interviews as the most popular data collection tools in empirical studies used for researching social justice in CALL. This can be due to the strength of these tools in eliciting information from participants that cannot be provided by other instruments. Future research into the link between CALL and social justice may involve these and other qualitative tools like journals obtained not only from the learners but from other stakeholders including parents, teachers, educational authorities, and policy-makers. Besides empirical studies, there were quite a number of non-empirical studies that need to be expanded to better introduce the relevant theories and concepts, and to examine the relevant beliefs and opinions, in an attempt to help understand the phenomenon better.

Pedagogical/theoretical issues/themes

The reviewed empirical and non-empirical studies in this project were divided into three main categories with regard to their examined content. A number of studies (N = 5) considered the inequity of CALL with respect to hidden power within the available online content worldwide (Anwaruddin, 2019; Cao et al., 2023; Dwivedi et al., 2023; Marandi, 2023; Smith, 2022). While Smith (2022) drew on Feenberg's critical theory of technology to argue that CALL is not neutral but rather reflects and reinforces existing power structures, Marandi (2023) pinpointed the importance of considering linguistic hegemonies in the design and implementation of technology-enhanced language learning programs. Moreover, the hidden power of social media and how they could be used for language teaching and promoting social justice was also noted by Anwaruddin (2019). Along a similar line, Cao et al. (2023) discussed the need for more culturally sensitive dialogue agents (such as ChatGPT) that could better adapt to diverse cultural backgrounds. Likewise, Dwivedi et al. (2023) emphasized assessing biases of GenAI attributable to training datasets and processes and identifying ways to evaluate the accuracy of text produced by GenAI. All in all, papers in this category attempted to warn individuals of the unequal distribution of culturally sensitive educational content and materials as well as the bias in the production of technologically based educational tools. Such issues could favor a group of learners over the rest and indirectly influence educational outcomes worldwide. Indeed, attention should be drawn to valuing the diversity of language learners and respecting their background political, social, and cultural orientations. With the globalization of the world, language education needs to encompass a variety of cultures and beliefs and advance toward global diversity. Wang and Stockwell (2023) put forth ideas of virtual language exchange programs, Augmented Reality (AR), and Multi-user Virtual Environments (MUVes) as possible solutions that can help circumvent such discrimination. In other words, incorporating

cultural awareness and sensitivity in producing online content, Chatbots, and applications seems urgent, as currently “westernization” of online material is invading social media.

The second group of papers considered social justice in computer-mediated language learning from the perspective of language teachers (i.e., Azizi, 2022; Chory et al., 2022; Estaji & Zhaleh, 2022; Yılmaz & Söğüt, 2022). For instance, Chory et al. (2022) reminded teachers of their injustice (which they may not be aware of) and how its perception influenced learning outcomes. Possible reasons for teacher injustice and potential solutions were put forward by Estaji and Zhaleh (2022) who also highlighted the gap between well-off and poor language learners. On the other hand, Yılmaz and Söğüt (2022) gave prominence to teachers' beliefs, attitudes, and practices in shaping the use of technology for social justice in language education. Based on the Social Psychological Theory (SPT) of fairness, Azizi (2022) also stressed the need for teachers' awareness of justice issues in computer-assisted language teaching. Although injustice is prevalent on a universally broad scale, individual language teachers can play a role in controlling the influence of such inequalities by being aware of such issues and raising the awareness of learners as well as policymakers and material developers. Teachers need to understand that students from underserved families may not have access to suitable e-devices, and critical issues may arise if teachers assume that they do. Such technological problems should not invade the concept of inclusion which entails all individuals have the right to be included in the educational process. Even for learners with disabilities, features such as speech-to-text or text-to-speech, or various eye-tracking technologies can be adopted (ADCET, 2023). Indeed, technology is here to enhance personalized learning approaches rather than ruling out the deprived. The papers in this group bring to light the important role of language teachers in promoting social justice in computer-mediated language teaching, learning, and testing. Teachers need to be supported and educated in this process. New approaches to teaching and learning, as well as designing new curricula and adapting them to the growing need for computer-assisted instruction, besides boosting teachers' TPACK and social justice awareness, are highly needed.

The third and the largest group of studies, focusing on (in)justice in computer-mediated language learning, teaching, and testing attend to learners' (lack of) access to technological tools, applications, and facilities (Alm & Watanabe, 2023; Moser et al., 2021; Oh, 2019; Ortega, 2017; Smith, 2021; Wang & Stockwell, 2023; Warschauer et al., 2023). For instance, Moser et al. (2021) noted that teachers at all levels reported concerns about inequities in access to technology and the Internet, which disproportionately affected some students compared to others. Equity to Smith (2021) also meant the fair and just distribution of resources, opportunities, and outcomes in digital language education. The author argued that digital language education must be designed to promote social justice and equity. Similarly, Ortega (2017) identified the digital divide as one of the key social justice implications of language learning in the digital age. Language acquisition may suffer as a result of this gap, as those without access to technology may find it more difficult to acquire a second language. Such digital, racial, and gender divide elaborated by Wang and Stockwell (2023) seems to be exacerbating educational disparities worldwide and needs to be solved through creative ideas and tools. Oh (2019) considered social justice in the assessment process, and how (lack of) access to online resources can lead to unfair judgment in learners' test performances. Likewise, focusing on assessment in language education, Shohamy (2022) advised that language testers should consider the impact of tests on marginalized populations, domestic language minority learners, and new immigrants and work towards promoting social justice and equity in language testing. Her paper rightly proposed that critical language testing can help promote social justice and equity by identifying and addressing the negative consequences of language tests on individuals and society.

The remaining non-empirical studies of this category considered CALL, AI, and ChatGPT in the social and cultural contexts. Warschauer et al. (2023) highlighted the widening digital gap by emphasizing “rich get richer” and how technological resources can augment inequality. Similarly, Alm and Watanabe (2023) concluded that the integration of ChatGPT into language education

demands critical pedagogical examination and foregrounds the salient implications for socially empowering language education. Indeed, the authors proposed that the integration of ChatGPT should be guided by humanistic educational values and principles, such as those of Paulo Freire's critical pedagogy. Such problems are being augmented in the chaotic world of today as the gap between developing and developed countries is widening due to increasing complications such as pandemics and wars. The digital divide is becoming a serious concern. That is, the unequal distribution of digital facilities is a worldwide problem. Such gaps are even noticed inside one community where only the elite can have access to digital equipment, whereas the deprived population in the same community may even lack a stable Internet connection. Moreover, the use of AI-powered tools such as ChatGPT is growingly leading to academic dishonesty and cheating (Chan, 2023) and assisting privileged students to artificially improve their academic performance (Dai, et al. 2023), an observation that threatens justice from a new dimension.

Equality and equity as major components of social justice are questioned in this category of studies. Unfortunately, it is not only immigrants or people with disabilities that suffer from such unfair conditions. A large number of people in socio-economically disadvantaged locales do not even have the privilege of access to a stable Internet connection. Some countries (e.g., Iran) suffer from serious sanction pressure due to socio-political orders, and access to websites with free content is restricted for them. Similarly, due to economic sanctions, online transactions of the fee to have access to subscriptions or premium features are impossible. This not only influences language learners and teachers, but also puts L2 researchers in an unfair condition who have to compete with researchers from other countries that have extensive access to various editing, paraphrasing, and writing tools and applications. In addition, people whose mother tongue is not English, may not be able to use online content/apps because of a lack of linguistic knowledge, widening the gap between "information haves and have-nots" (Warschauer, 2003, p. 6). In fact, in this world of differences and varieties, we need to move away from a one-size-fits-all approach and take steps toward the personalization of education, and one potential option can be designing new applications in various languages. The use of AI-powered interactions and AI one-to-one tutoring can alleviate some of the problems (Wang & Stockwell, 2023). Moreover, projects such as MASELTOV (Kukulaska-Hulme et al., 2015) can promote the social inclusion of immigrants. By including immigrants and minorities in education as well as by allowing them fair assessment chances, we can make them part of society, rather than keeping them in the peripherals (Shohamy, 2022).

Moreover, there are various platforms such as Google Classroom, and Moodle that include flexible forums for language learners (Fageeh, 2015) and Open Educational Resources (OER) make resources available for free in places where there is access to an Internet connection. Such ubiquitous learning at anytime and anywhere should be accessible to all language learners, and political conflicts between governments should not act as an obstacle to fair access to such facilities.

Overall, the reviewed papers imply that the current level of fairness in technology-based education is not at an acceptable level. While the number of conducted studies suggest that the concept has not been the locus of attention of scholars, their findings also indicate the need for more attention to this ignored issue.

Pedagogically, the reviewed studies offer implications for practitioners who need to understand the status of social justice in computer-based language instruction. Teacher trainers need to raise teachers' awareness of the issue and highlight their role in understanding and promoting equity through technology-mediated instruction. Moreover, policymakers and those responsible for the content of social media need to be aware of the hidden hegemonies in the produced content and strive to design more culturally and socially sensitive digital material. Theoretically, the findings display the categories under which social justice has been researched, with the outcome being that we still do not know enough about the extent to which (and how) technology either promotes or demotes social justice. The implication of such an observation is the need to assess social justice in

multiple contexts, conduct comparative studies, and offer solutions to promote social equity in the digital world.

From a methodological perspective, the reviewed empirical studies mostly used interviews and open-ended surveys to examine social justice. Future studies can implement other methods such as journals, story completion tasks, case studies, longitudinal studies, and correlational studies and can also consider student and teacher perceptions of the topic. Meanwhile, non-empirical studies are growing alongside empirical ones and suggest the need for researchers to explain and predict how far humans can promote equity in the digital era. We still need to see whether the most recent technological advances (such as ChatGPT) will mean the end of social (in)justice in L2 education.

Conclusion

The study was an attempt to illuminate the social equity path in digital language teaching, learning, and testing by amalgamating the findings of studies published from 2015 to 2023. Based on the findings, the following conclusions can be made: First, there is a very limited number of papers in the realm, indicating the novelty of the topic and the need for more research in different contexts. Second, interviews and open-ended surveys were the most used data collection tools in empirical studies, with an equal number of non-empirical studies existing on the topic. Third, studies focused on three concepts of unfair hidden power in online content, the digital gap in developing and developed communities, and the role of teachers in promoting equity. Fourth, the papers implied the vitality of promoting social equity in digital-based language instruction in the new era. Such social equity needs to be studied in the population of refugees and people who are suffering in secluded areas. Likewise, people with disabilities (i.e., blinds) need to be examined in their access to and use of technology in the language learning process. Furthermore, such digital inequities ring bells for researchers, especially in developing/deprived countries as they can influence many different aspects of people's lives such as wellbeing (Moser et al., 2021; Pourbahram & Sadeghi, 2022). This review was only a departure point to put the link between digital technology and social justice in the spotlight and it is hoped to serve as an impetus for future researchers to delve deeper into the concept of equity in language learning to make the world a fairer and more peaceful place for humanity, life, and language education.

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AI-empowered tools have been used to enhance the clarity and fluency of the manuscript.

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