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Article abstract

With massive migratory flows observed around the world, schools are experiencing an unprecedented increase in the enrolment of children who speak multiple languages. Educators are called upon to facilitate immigrant plurilingual students' inclusion and development of functional competencies in the target language(s), often using digital technologies (DTs) to promote language learning and plurilingual teaching practices. This research synthesis explores the research trends, methods, and findings from studies focused on the use of DTs with immigrant plurilingual language learners. The results highlight that DTs are used in heterogeneous contexts to support the development of immigrant plurilingual students' overall language proficiency, (multi)literacies, engagement, as well as identity development. However, teachers and learners may require additional support to use DTs and plurilingual practices to their full potential. These concerns point to the need for ongoing professional learning and contextualised supports for educators at the intersection of these areas.

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Abstract

With massive migratory flows observed around the world, schools are experiencing an unprecedented increase in the enrolment of children who speak multiple languages. Educators are called upon to facilitate immigrant plurilingual students' inclusion and development of functional competencies in the target language(s), often using digital technologies (DTs) to promote language learning and plurilingual teaching practices. This research synthesis explores the research trends, methods, and findings from studies focused on the use of DTs with immigrant plurilingual language learners. The results highlight that DTs are used in heterogeneous contexts to support the development of immigrant plurilingual students' overall language proficiency, (multi)literacies, engagement, as well as identity development. However, teachers and learners may require additional support to use DTs and plurilingual practices to their full potential. These concerns point to the need for ongoing professional learning and contextualised supports for educators at the intersection of these areas.

Keywords: digital technologies, immigrants, teachers, language learners, plurilingualism, bilingualism

Résumé

Les flux migratoires massifs observés dans le monde poussent les éducatrices et éducateurs à faciliter l'intégration des élèves immigrants

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plurilingues par le développement de compétences fonctionnelles dans la ou les langue(s) cible(s). Il a également été démontré que les technologies numériques (TN) présentent un grand potentiel pour promouvoir l'apprentissage des langues et les pratiques d'enseignement plurilingues. Cette revue systématique de la littérature se consacre aux études empiriques centrées sur l'usage des TN auprès des élèves nouveaux arrivants depuis 2000. Les résultats soulignent que les TN sont utilisés dans des contextes hétérogènes pour soutenir le développement des compétences linguistiques globales, la (multi)littératie et l'identité. Cependant, le personnel enseignant et les apprenants peuvent avoir besoin d'un soutien supplémentaire pour utiliser pleinement les TN et les pratiques plurilingues. Un apprentissage professionnel continu et contextualisé s'avère donc nécessaire pour les éducatrices et éducateurs à la croisée de ces domaines.

Mots-clés : technologies numériques, personne immigrante, personnel enseignant, apprenants de langues, plurilinguisme, bilinguisme

Introduction

With the massive migratory flows that we now observe around the world, schools are experiencing an unprecedented increase in the enrolment of children who speak a variety of languages (Suàrez-Oroszco, 2019). This diversity includes populations who are now longstanding and potentially multi-generational residents (e.g., heritage language speakers), as well as those who have recently arrived (e.g., refugees and temporary migrants). As a result, schools and educators are increasingly called upon to assist with immigrant plurilingual students' inclusion through the development of functional competencies in the target language(s). In this article, plurilingual speakers are conceived as social actors who can use an interdependent, uneven, multilingual repertoire with some flexibility to communicate and interact in diverse linguistic and cultural contexts (Council of Europe, 2020).

Undoubtedly, within this context, considering students' competencies in both taught languages and other languages within the learners' linguistic repertoire is crucial (Cummins, 2019). Indeed, legitimising learners' linguistic repertoire supports one's cognitive, intellectual, and academic skills across a wide range of environments and has positive affective implications in terms of one's individual identity and social integration (Armand et al., 2008; Cummins, 2019). However, some schools have been reluctant to adopt plurilingual approaches that legitimise the linguistic repertoire of plurilingual immigrant students because of a range of social and political factors, even up to the present day (e.g., Fleuret & Auger, 2019).

Despite this slow progress, research shows that digital technologies (DTs)

offer great potential to promote language learning (Healey, 2016; Murphy, 2010) and plurilingual approaches for plurilingual learners (Thibeault et al., 2022; Van Laere et al., 2017). DTs may refer to electronic tools, systems, devices, and resources that generate, store or process data, such as personal computers, tablets, software and apps, Internet, social media, multimedia, and mobile phones. However, language teachers may feel unprepared to integrate DTs into their practice (Son & Windeatt, 2017), compounding hesitancy related to plurilingual approaches (Bangou, 2020; Bangou et al., 2021). In light of these observations, the purpose of this article is to systematically synthesise the research trends, methods, and findings addressed by journal articles that focused on the use of DTs with immigrant plurilingual language learners.

Conceptual framework

Digital technologies and L+ education

Without a doubt, DTs have transformed how we learn and teach, and how teacher candidates are trained (Hui-Wen Huang et al., 2013; Kessler, 2016). DTs have been proven to contribute to improving L+ learners' overall skills, literacy, competencies, and motivation, and to help educators design meaningful, and empowering learning activities (Son & Windeatt, 2017). Research also shows that DTs have the potential to support plurilingual learners in using their heritage languages as a resource for learning the target language (Ntelioglou et al., 2014; Van Laere et al., 2017).

However, many educational institutions often fail to effectively integrate DTs into existing educational contexts as curricular goals, pedagogical considerations, technological concerns, and the linguistic and cultural diversity of classrooms are just some of the many factors that an educator must take into consideration to fully enhance L+ learning through DTs (Sun & Zou, 2022). Moreover, Son and Windeatt (2017) argued that L+ teachers commonly feel ill-prepared to address the challenges generated by the integration of DTs into their teaching practices. So, one of the major factors in achieving immigrant plurilingual student success with DTs is the preparedness of our L+ teachers. Another major factor is the role played by what immigrant plurilingual students bring with them to classrooms in terms of language, educational, and technological backgrounds. These students may not be as technologically savvy as we think, given the fact that access to and usage of DTs is extremely unequal around the world, including in Canada (Williams et al., 2014).

Immigrant plurilingual language learners

With current transnational mobility, teaching practices are urged to transform to support immigrant plurilingual learners in their adaptation to a new learning

environment and the development of their technological competencies (Chen et al., 2017; Crosby, 2018; D'Agostino & Mocciaro, 2021). In this article, the term "immigrant" is be used to cover newcomers, migrants, refugees, and other expatriates — recognizing that definitions are fluid and that no exact term will reflect the complexity and fluidity of acculturation and resettlement of diversity of people in their host country.[1] Plurilingual students with immigrant backgrounds will most likely face multiple challenges and barriers to adapt to a new educational environment, depending on — amongst other factors — their knowledge of the language and culture of schooling, the ways they use DTs, and whether they are first- or second-generation immigrants (Hansen-Thomas et al., 2021; Kendrick et al., 2022). Indeed, learning a language and adapting to a new educational culture are complex processes that can vary greatly depending on an individual's specific circumstances such as education, socio-economic status, access to DTs, and personal background (Cummins, 2016; Cummins et al., 2006). For instance, power relationships between languages of schooling and home languages may create linguistic anxiety and feelings of inadequacy in immigrant plurilingual learners (Magnan et al., 2022). In addition, lack of access to DTs can affect plurilingual immigrant learners' capacity to complete the procedures required for their inclusion in host communities (Nteliou et al., 2021). Unfortunately, educators do not always feel well equipped to address such complexities and support immigrant plurilingual learners (Kanouté et al., 2016). In this regard, plurilingual approaches and DTs may provide helpful conceptual, methodological, and material resources.

Plurilingual approaches

The current plurilingual conceptual reorientation of language and language use has contributed to the emergence of plurilingual approaches that support the use of multiple languages and semiotic systems in the language classroom. By recognizing the complex linguistic and cultural practices in which plurilingual learners engage, researchers are problematizing previously compartmentalised conceptions of language learning and use; they now consider these concepts within the framework of a plural and integrated repertoire to language teaching and learning (Vallejo & Dooly, 2020). Examples include pluralistic approaches to language education (e.g., language awareness, integrated didactic approaches, intercomprehension between related languages, intercultural approaches) which promote educational activities that involve multiple languages and cultures (CoE, 2020; Moore &

[1] While we recognize that refugees present a unique case in contrast with immigrants who have chosen to expatriate, their language learning needs may share similarities with those of other immigrants.

Sabatier, 2014) as well as teaching and learning practices based on the concept of translanguaging (García & Li, 2014).

Plurilingual approaches have been shown to promote students' overall language and literacy development, their plurilingual and pluri/intercultural competences; their agency and identity; as well as a positive orientation towards plurality and hybridity (Chen et al., 2017). When there is flexibility in institutional policy, a commitment to material support and a respect for the experiences of classroom teachers, these approaches can contribute to the reconfiguration of power relations (García & Kleyn, 2016; Moore & Sabatier, 2014). As such, plurilingual approaches can also have positive cognitive and affective effects on immigrant plurilingual language learners' overall experience in language classrooms (Fleuret et al., 2018). Allowing these students to use their heritage languages may ameliorate dominant-dominated relationships with the host culture, and therefore contribute positively to their learning of a target language (Fleuret, 2020). In addition, the combination of digital skills and plurilingual proficiency can serve as a powerful means to foster language acquisition, students' understanding of diverse linguistic landscapes, and promote cross-cultural awareness (Boggio-López & Ruiz-Madrid, 2024). Indeed, the successful adoption of plurilingual methods with DTs can result in significant linguistic gains for newcomers (Konerding et al., 2020), address issues related to social justice (Crosby, 2018), and help strengthen student self-confidence and motivation (Chen et al., 2017). When immigrant plurilingual students' heritage languages are seen as assets, they do not feel threatened by learning a language, and they, as well as their parents, have a more positive view of the school (Bangou et al., 2021).

Yet, despite the great potential for plurilingual approaches and DTs to support immigrant plurilingual students in learning a language, research shows that educators do not always feel comfortable implementing such practices. Their concerns largely stem from a lack of familiarity with technology-integrated plurilingual language teaching practices as well as lack of support in implementing plurilingual approaches within institutions where monolingual ideologies and discourses are still strong (e.g., Chen et al., 2017; Tour et al., 2021). Moreover, the successful adoption of DTs and plurilingual pedagogy often involved specific practices aimed at countering initial teacher and student reluctance through explicit explanations of the pedagogical and learning goals as well as a focus on metalinguistic awareness of everyday language use (e.g., Kirsh & Bes Izuel, 2019; Song & Cho, 2021).

In sum, it appears using DTs with (im)migrant plurilingual language learners is a multifaceted process that is affected by many human, social, cultural, linguistic, educational, political, and material elements. As such the effective use of DTs within the language classroom should be as diverse as the

needs of immigrant plurilingual learners, the teaching practices of educators, and the technological resources available (Bangou, 2020). Therefore, the research questions that guided this research synthesis are:

1. Within the research, in what contexts and in what ways are DTs used with immigrant plurilingual language learners? What are the outcomes associated with technology-integrated practices?
2. To what extent is this research informed by plurilingual approaches?

Methodology

In order to explore the intersection of these concepts across the extant literature, we used a qualitative meta-synthesis approach. With the support of a research librarian, we drew on the techniques for conducting scoping reviews, while remaining flexible in our approach, to accommodate for the diversity of terms and methodological approaches within the studies.

We generated initial search terms for each of the central themes (i.e., L+ education, digital technology, newcomers/immigrants, bi-/multi-/plurilingualism) using recent articles and research database subject terms. Search strings were then developed, combined, and run in each of the respective databases. Searches were conducted in two EBSCO databases (Education Resource Information Centre [ERIC]; Education Source), two OVID databases (APA PsycInfo; Linguistics and Language Behavior Abstracts [LLBA]), and LearnTechLib. Additional searches were conducted in the Web of Science Core Collection, SCOPUS, as well as Google Scholar. These terms and searches were refined and re-run as we noticed potentially relevant synonyms or related keywords during the initial review process as well as the absence of pertinent articles. Drawing on the linguistic strengths of our bilingual team, equivalent but not necessarily identical searches were also conducted in French in the Erudit and Cairn databases. As much as possible, these searches reflected the terminology prevalent in French research literature — e.g., *allophone*, *plurilingue*, *didactique* — rather than being a direct translation of the English terms.

The search results were imported into Covidence.org, an online tool for conducting systematic reviews, and screened by the authors for relevance. Our inclusion criteria specified that the studies needed to be empirical journal articles, published after the year 2000 with a focus on:

- digital technologies;
- educational institutions — rather than participants' homes and communities;

- K–12 school-aged L+ immigrant/ newcomer youth — i.e., normally $\leq$ 18 years old, and/or educators specifically identified as working with such students; and
- language education — i.e., language learning processes and experiences.

With the inclusion criteria in mind, the team read the abstracts of 1,172 articles for eligibility and determined an initial corpus of 135 articles that were then read in full to determine the final corpus of 22 articles that deeply engaged the nexus of the themes (see Figure 1 and the Appendix). It is important to note that many of the articles which were examined may have mentioned all the inclusion criteria, yet one or more of these categories may only have been superficially engaged. We therefore did not retain them at this phase of our analysis. Throughout this process, conflicting decisions to include or exclude were resolved by reviewing the article collectively in light of the inclusion criteria. Then, a standard template was developed in Covidence to assist with providing consistent analysis across the articles. This template included contextual (i.e., participant demographics), methodological (i.e., data collection and analysis), and conceptual details (i.e., frameworks and research traditions), as well as the findings and implications put forward by the authors. The results of these analyses are explored below.

Findings

To address this first part of research question one — within the research, in what contexts and in what ways are DTs used with immigrant plurilingual language learners — the following sections focus on findings associated with the spaces where the research took place, the participants of the studies, the types of technologies used, as well as the activities conducted with DTs.

Spaces, participants, types of technology, and activities

Looking across the spaces in which these studies were conducted, we noted a relatively even distribution across different pedagogical contexts. Most common were primary/elementary[2] classrooms (n = 6). This count was followed by computer labs or similar rooms (n = 5), then secondary/high school classrooms (n = 4). Alternative pedagogical spaces included separate ELL/ESL classrooms (in countries where English was a majority language; n = 2), community centres with youth programming (n = 2), an English as Foreign Language classroom (n = 1), initiatives run through a masters TESOL program (n = 1), and a summer L2 literacy program run in a school (n = 1).

[2]Although these educational systems are not synonymous and can vary both within and across countries, we have chosen to group them to facilitate this analysis.

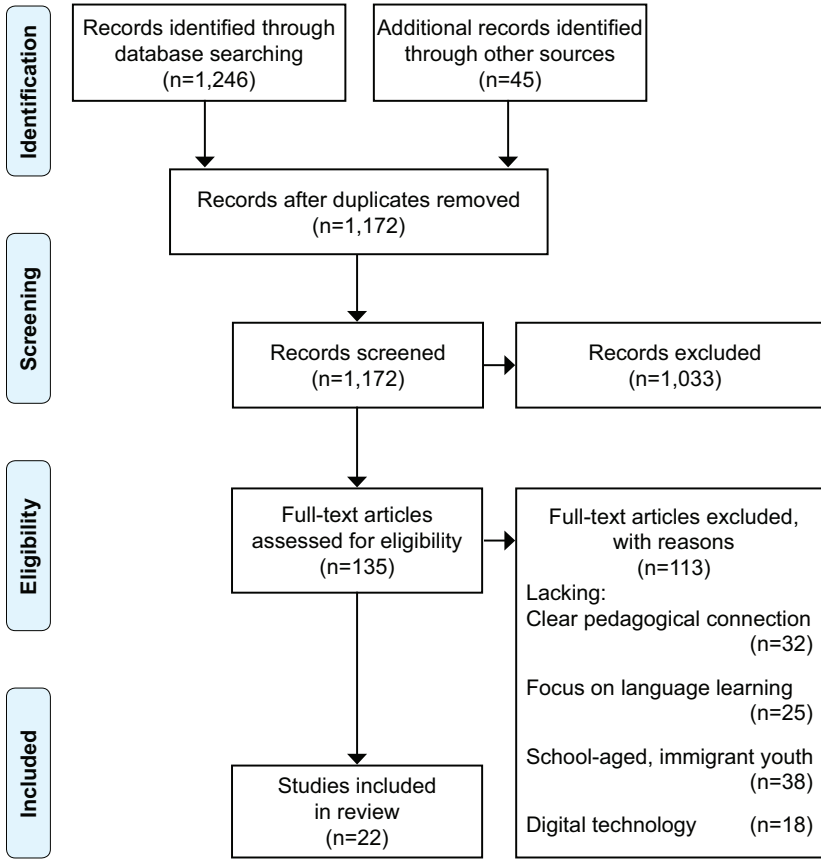

Figure 1
PRISMA-P flowchart
(adapted from Shamseer et al., 2015)

The studies focused on students at the elementary (n = 7), secondary (n = 6), both elementary and secondary (n = 2), or kindergarten (n = 2) level. As for teachers, they were the focal participants in four articles, and were usually identified as white females with experience working with immigrant, plurilingual students. However, teachers of various racial and linguistic backgrounds were also noted (Crosby, 2018).

In terms of the technologies used in the research, studies most commonly involved a variety of digital devices, software, and Internet-based resources for various pedagogical purposes (n = 8). This mix could include combinations of social media, videos, translation tools, websites, interactive whiteboards, cell

phones, apps, cameras, and so on. Using a variety of tools was particularly prevalent in longitudinal studies, compared to inquiries that only focused on one specific digital app, lesson, or unit. Computers and computer programs (n = 7) were the next most frequent category. In several studies (e.g., Konerding et al., 2020; Segers & Verhoeven, 2005), the tool included a specially designed program used to facilitate language testing and/or training. Studies focusing on select tools included tablets and apps (n = 4), or programs that facilitated digital storytelling (n = 2). One study referred to information technology but did not provide additional information on what tools or practices this term included.

Unsurprisingly, this diversity of technological tools was used to improve immigrant plurilingual students' learning of the majority language(s) of the host region or country. English (n = 12) was the most common L+ studied. In two studies, English learning was noted alongside another language — Norwegian (Krulatz & Iverson, 2020) and Spanish (Martínez-Álvarez, 2017). Other languages of study included Dutch (n = 2), French (n = 2), French and German (n = 1), German (n = 1), Russian (n = 1), and Swedish (n = 1).

In the research that focused on learners (n = 18), most (n = 16) of the activities were designed as part of an experiment to gain insights into the ways the technological resources or activities affected students' learning. For instance, Konerding and colleagues (2020) conducted pre-and post-tests to measure the effects of a computerised grapho-phonological training program on literacy acquisition and vocabulary knowledge in immigrant children learning German. Another example is the study conducted by Dunn et al. (2012) that aimed at getting new insights on the possibilities offered by technology-integrated drama pedagogy on the resilience of young refugee language learners. The majority of these activities (n = 11) were associated with the composition of texts/stories, whether they be written or multimodal. Other activities focused on phonological awareness (n = 2); reading (n = 2), and oral language (n = 1). It is worth noting that some of these activities went beyond learning the language and also aimed at contributing to learners' well-being and adaptation. For instance, Emert (2013) illustrated how a multimodal *transpoemation* activity enhanced the academic confidence of a group of plurilingual refugee boys. One study stood out (Collin et al., 2015) as it provided an overview of the educational uses of DTs in relation to their non-educational digital uses and their digital competence. Their data revealed a discrepancy between both educational and non-educational uses which aligns with results associated with non-immigrant students. The next section of findings addresses the latter part of question one — what were the outcomes associated with technology-integrated practices — and focuses on the aims and results of the studies.

Aims and results of articles

We compared the aims and results of the studies, with a specific focus on how technology was implicated in the objectives and outcomes. As this category contained numerous themes, we coded the "aims and results" into a further four subcategories based on the extent to which the article explored: general technology-integrated teaching and learning practices (n = 5); the effects of technology on specific language competencies (n = 9); additional language and digital (multi)literacies (n = 8), and inclusion and identity development (n = 5).[3]

General technology-integrated practices

The first category relates to articles which focused on technology-integrated practices and the ways in which these tools (do not) support language learning in the classroom. This topic includes comparing students' educational and non-educational uses of technology (Collin et al., 2015), teachers' experiences and perceptions of technology with newcomers (Hell & Sauro, 2021), digital resources (Song & Cho, 2021; Gromova et al., 2019), and examining the effects of technology on instructional support (Carhill-Poza & Chen, 2020). These studies highlighted that technology was commonly used to facilitate immigrant students' interaction and engagement in the classroom. Teachers could provide multimodal explanations of new concepts, employ tools to assist language learning, and provide feedback during discussions (Carhill-Poza & Chen, 2020). Students with developing language proficiency could in—teract with their teachers, peers, and engage in the daily life of the classroom using translators or tools which support communication beyond written texts; digital tools provided entry points for morphology exercises (i.e., letter recognition), oral language practice through videos, as well as collaborative story construction using the Google Classroom suite (Hell & Sauro, 2021). Song and Cho's (2021) study highlighted the importance of translanguaging strategies that can facilitate students' use of technology: to access resources, expand their topic knowledge, plan responses, and monitor their learning.

However, Collin et al. (2015) and Gromova et al. (2019) noted that the use of technology with immigrant students is not a given: students may lack the digital skills to use technology for educational purposes; teachers may also not feel confident using technology with immigrant language learners, citing a lack of training in using technology for L+ pedagogy (Hell & Sauro, 2021). Carhill-Poza and Chen (2020) provided two important caveats for technology-integrated practices with language learners. First, digital practices may be

[3] As studies related to multiple categories, the count here exceeds 22 articles.

less effective if they are frequently centred around completing worksheets or passively reading texts; rich, communicative, and active tasks were found to be more influential on student learning. Further, the use of DTs alone does not ensure high quality teaching — pedagogical factors (e.g., feedback, scaffolding) and individual factors (e.g., age, language use outside of the classroom, academic engagement) also influence the effectiveness of these practices. Therefore, technology-integrated tasks cannot be viewed as a simple solution to L+ learning for plurilingual immigrant students.

Effects on specific language competencies

Another group of studies focused on the learning gains that resulted from technology practices on distinct language competencies. Overall, technology had a positive effect on skills and knowledge development across language domains, including: vocabulary acquisition (e.g., Li, 2009), writing composition (e.g., Brown & Allmond, 2021), grapho-phonological awareness (e.g., Konerding et al., 2020), reading ability (e.g., Song & Cho, 2021), and oral language fluency (e.g., Kirsch & Bes Izuel, 2019). For example, in their experimental study on vocabulary and reading, Lavoie's (2020) participants used screen capture tools to more effectively categorise semantic relationships between words, while Verhallen and Bus's (2010) video books were found to better develop students' expressive vocabulary when compared to their paper-based control groups. Similarly, Li's (2009) reading app supported students in effective reading practices, suggesting that being able to work faster through the app may have helped participants to spend more time dealing with higher order questions and procedures than their peers who did not use the digital tool.

When using specially designed training software, Konerding et al. (2020) found that the program improved phonological awareness, spelling, and vocabulary. Likewise, Segers and Verhoeven's (2005) CD-based program had a significant positive effect on grapheme knowledge, as students benefitted from the presence of computer games involving letters. The training was found to have lasting positive effects on students' early literacy into the first grade, supporting learning to read. When looking at composing oral and written texts, Brown and Allmond's (2021) use of word prediction software resulted in students demonstrating greater control, choice, and variety of vocabulary in their texts. Chen et al. (2017) reported that the technology engaged students in the different stages of the writing process, while Kirsch and Bes Izuel (2019) found that the ability to replay oral text during production allowed students to develop their listening competencies. Together, the studies in this category emphasised using topics of personal interest and relevance to these students (Chen et al., 2017; Krulatz & Iversen, 2020), as well as providing explicit, guided pedagogical instruction and peer support (Brown & Allmond,

2021). While the use of digital technology did not always result in significantly greater growth than their peers using analogue formats, the technology-based experimental groups did not perform worse than the control groups (e.g., Lavoie, 2020; Verhallen et al., 2010).

Additional language and digital (multi)literacies

Other studies took a more holistic look at the ways technology supported additional (L+) language literacy (e.g., Hell & Sauro, 2021), digital literacy (e.g., Tour et al., 2021), multimodal, and multiliteracies (e.g., O'Mara & Harris, 2016). These studies focused on the ways in which students, and their teachers, engage with technology and language(s) in complex, dynamic ways to communicate their meaning. A central theme in this area pertained to students' ability to work with technology as a physical object, and also as a tool which mediates engagement and learning in digital and material worlds (Dunn et al., 2012). The interactivity and creative affordances of the tools allowed students to grapple with technical skills, texts, symbols, language, and culture in the pursuit of meaning-making — prompting them to think about the purpose and design of media, modifying language practices for different audiences, and connecting language conventions with literacy products (Emert, 2013; Tour et al., 2021). Here, digital storytelling was frequently praised for engaging language learners in a low-risk, but "contextual and socially situated use of language in digital spaces" (Tour et al., 2021, p. 37). Discussions of translanguaging could also be intentionally incorporated in these hybrid spaces, in which students made purposeful and agential use of their language resources in varying modalities, and through different media, to demonstrate their literacy practices. By creating hybrid language practices in the "flexible" digital world, such as through mixed media comics, "children can both resist defending their translanguaging … and do exactly the opposite, with the goal of standing up to teachers' (i.e., societal) expectations" (Martínez-Álvarez, 2017, p. 265).

Inclusion and identity development

Technology use may also be tied to identity development — supporting these students in understanding themselves (e.g., Angay-Crowder et al., 2013) and their experiences as newcomers (e.g., Dunn et al., 2012). These studies aimed to promote students' positive self-image through reflection and playful creation with digital media, with the hopes that these skills and attitudes can support them through turbulent times. In terms of outcomes, these studies highlighted that technology facilitated the use and mixing of multiple languages and media throughout the learning process (e.g., O'Mara & Harris, 2016).

DTs encouraged students to code-switch, translanguage, and engage their multilingual peers in discussion as they planned, wrote narratives, and shared digital stories (Angay-Crowder et al., 2013). These affordances could help students express themselves as their language proficiency developed, provide them a means to take ownership of the creation of their work, and build on their existing skills (Dunn et al., 2012; Krulatz & Iversen, 2020). Sharing stories locally and globally was central to promoting inclusive classroom cultures, as well as providing authentic ways for students to interact in supportive ways with others online (Crosby, 2018). However, O'Mara and Harris (2016) offered the caveat that a critical stance can help educators understand the ways that these digital media creations might not always transcend stereotypes and reductionist understandings these students hold of themselves and others. The studies concluded that these approaches help students invest in and affirm multilingual, multicultural, and transnational identities (Angay-Crowder et al., 2013), helping them see "that they are capable of becoming multilingual and multiliterate" individuals (Krulatz & Iversen, 2020, p. 385). Helping students to reflect on, share, and celebrate their work were key to fostering this sense of belonging and positive sense of self.

The next section addresses the findings associated with the second research question — to what extent is this research informed by plurilingual approaches? The focus is on the theoretical frameworks as well as manuscripts that explicitly included terms associated with plurilingualism in the aims and outcomes of the studies.

Theoretical frameworks

Broadly, we found that the articles were mostly situated epistemologically within sociocultural frameworks (n = 18), and others within critical approaches to education (n = 4). Turning first to language learning, the most common framing of immigrant students was through the lens of their status as L+ language learners (n = 11). These studies might discuss the processes of general meaning making, decoding language, understanding text and media in various modalities, learning strategies, as well as the sociocultural considerations affecting these students. Several studies identified multilingualism as part of their stance (n = 4; e.g., Kirsch & Bes Izuel, 2019; Krulatz & Iversen, 2020). These authors might take up the work of Cook (1995) or Cummins (2017, 2019) to note how this framing pushes back on monoglossic conceptualizations of language, recognizing that students have multiple language systems which can be effectively used to benefit language learning (Krulatz & Iversen, 2020). In French-language studies, this concept is also referred to as *plurilingualism*, though in Canadian bilingual journals the term is often still translated to *multilingualism* (e.g., Lavoie, 2020). In addition,

Kirsch and Bes Izuel (2019) noted the way in which context might still limit uses of multilingual policies and practicewhere languages are seen to require distinct and separate development, which can inhibit multilingual practices in the classroom.

Translanguaging was another common concept used to provide theoretical grounding to language practices (n = 5; e.g., Hansen-Thomas et al., 2021; Martínez-Álvarez, 2017; Song & Cho, 2021). Drawing on scholars such as García and Li, translanguaging provided these articles both a philosophical and pedagogical orientation. Authors drawing on translanguaging emphasised the democratising and equitable approach to incorporating students' languages and cultures, challenging language hegemony, boundaries, and hierarchies in schools (Martínez-Álvarez, 2017; Song & Cho, 2021). Pedagogically, the concept also emphasised the ways that teachers drew upon students' linguistic and other funds of knowledge, to communicate expansively and across imagined siloes of language (Brown & Allmond, 2021; Hansen-Thomas et al., 2021).

When considering the other concepts and terms used among the corpus, we noted several shared ideas. Studies such as those by Angay-Crowder et al. (2013) and Emert (2013) framed their work primarily from a (multi)literacies perspective, noting that a plurality of communication modes, media, languages, and resources contribute to meaning-making practices. We explore the results of literacy-focused studies in a later section. Other studies adopted critical or social justice concepts in their frameworks (Collin et al., 2015; Crosby, 2018). In light of the socio-emotional impacts of immigration, as well as the potentially precarious and marginalised experience of newcomers (Tour et al., 2021), these concepts emphasised the importance of looking to the personal and contextual factors impacting learning. The potential of arts-based pedagogy and research interventions with this population was also emphasised for this reason (Dunn et al., 2012; Emert, 2013; O'Mara & Harris, 2016). These approaches provide opportunities for communication beyond written and verbal modes of communication.

Three articles explicitly used computer-assisted language learning (CALL) as part of their framing (Carhill-Poza & Chen, 2020; Hell & Sauro, 2021; Li, 2009). Scholarship cited in these articles pointed to the numerous considerations and factors related to the potential success of using technology with language learners (see Ortega, 2017). Yet, while almost all studies in this corpus might broadly fall under the category of CALL, we wondered why work in this area was not more intentionally engaged.

Plurilingual terms

Finally, we looked at manuscripts that explicitly included terms associated with plurilingualism in the aims and outcomes of the studies. Some studies (n = 3) explicitly took into consideration the participants' plurilingualism. For instance, Angay-Crowder et al. (2013) explored "how digital storytelling can be a practice for many multilingual adolescent students to negotiate their multiple literacies and positive cultural identity" (p. 39). The study revealed that such practice can have powerful effects on the learning process of multilingual adolescents as it "permits them to reflect on and recreate their multilingual and multicultural lives and identities" (p. 44), facilitates code-switching, and promotes peer support.

Other studies (n = 2) focused on experimentations of plurilingual pedagogical practices. For instance, Hansen-Thomas et al. (2021) explored what it might look like for monolingual teachers and emergent bilingual learners when translanguaging practices are included in a high school English medium classroom. It appeared that technology and multilingual texts contributed to creating a translanguaging space. However, students relied more on each other for support. The teachers, for the most part, felt uneasy with implementing translanguaging and needed professional development on the subject. Krulatz and Iversen (2020) aimed to "assess the effectiveness of the multilingual pedagogical practices" (p. 372) of identity texts written in three languages. Such practices enabled students to use their home languages and languages in diverse situations. However, participants still considered Norwegian and English more important than their home languages.

In short, the data revealed that a majority of studies were situated within a sociocultural paradigm. Some studies explicitly drew on concepts that could be associated with plurilingual approaches to language education, such as multilingualism and translanguaging. However, the use of the term plurilingualism was marginal within anglophone research literature.

Discussion

The goal of this article was to conduct a systematic review of the research that focused on the use of DTs with immigrant plurilingual language learners by highlighting:

1. the contexts and ways in which DTs are used with these learners;
2. the outcomes of technology-integrated practices; and
3. the extent in which such research was informed by plurilingual approaches.

If the "goal of a plurilingual approach is to implement teaching and learning practices that are conducive to the use of knowledge, skills, and mindsets within the entirety of learners' linguistic repertoires" (Bangou et al., 2021, p. 18), then the findings, for the most part, confirm that using DTs with immigrant plurilingual language learners is an intricate process that is influenced by many heterogeneous elements. Indeed, within the research, different activities were conducted in heterogeneous contexts to get more insights on the ways diverse digital resources could, on one hand, enhance various elements associated with language learning (e.g., phonological awareness, reading ability, etc.), and on the other hand, support immigrant plurilingual learners' overall learning experience (e.g., their engagement, confidence, and positive self-image, etc.). As such, DTs showed potential to enhance varied aspects of immigrant plurilingual students' learning experiences in the language classroom. In the same vein, technology-integrated plurilingual approaches also appeared to positively affect immigrant learners' plurilingual identity and competence, which is something that Chen et al. (2017) highlighted in their recent article.

However, the results largely reflect studies undertaken in prescribed, (quasi-) experimental situations where the activities, tools, and processes were driven by the research agenda. Indeed, the cultures-of-use (Thorne, 2016) surrounding these tools with this target population remains largely unexplored. The prevailing uses of DTs were either for specific interventions, which do not reflect regular classroom environments, pedagogical activities with very general overviews of DT use (e.g., Gromova et al., 2019), or very specific use cases (Lavoie, 2020). Only a few studies (e.g., Hansen-Thomas et al., 2021) seemed to follow what teachers were doing in their normal routines with immigrant plurilingual learners, considered the effects of these practices, and suggested possible paths forward for supporting the growth of their professional practice. DTs presented opportunities to engage these students in plurilingual, functional communication, help them modify their practices for social conventions, and interrogate the purpose of text (Tour et al., 2021). Krulatz and Iversen (2020) and Hansen-Thomas et al. (2021) contend that all teachers of multilingual students — regardless of their own multilingual competence — are able to support them through tasks such as creating and editing multilingual media, identity texts, linguistically inclusive materials, translanguaging lesson templates (García et al., 2017), translators, and dictionaries.

Moreover, only a minority of studies appeared to be informed by plurilingual approaches. Within anglophone literature, the prefix 'pluri-' was minimal, and only five studies explicitly drew from the concept of translanguaging. This is a concern, considering that teachers in some studies

did not feel comfortable implementing plurilingual teaching practices because of their lack of familiarity with such approaches (Hansen-Thomas et al., 2021). Technology-integrated plurilingual practices' potential is only as strong as the immigrant learners' capacity to use DTs in educational settings, as well as teachers' familiarity with such practices (e.g., Carhill-Poza & Chen, 2020; Collin et al., 2015; Chen et al., 2017). This is why we need more anglophone studies that are explicitly grounded within a plurilingual frame to help anglophone teachers get a better understanding of what technology-integrated plurilingual approaches are capable of doing in the language classroom. It may also be worthwhile to conduct more reviews of studies on teachers' professional development associated with technology-integrated plurilingual approaches.

A limitation of this review was that it was inherently bounded by the choice of search terms and inclusion criteria. Despite our efforts to refine the search terms, and appraisal from team members required at each phase, potentially relevant articles may not have been captured. It may be why most technology usages within the manuscripts we analysed were associated with the design of an experiment to provide more insights on the effects of a digital tool or activity on students' learning. More reviews of studies that explore the ways that language teachers use DTs in their day-to-day work with immigrant plurilingual learners are therefore necessary.

Overall, this systematic review of literature demonstrates that DTs can be used as resources to enhance immigrant plurilingual language learners' experiences. However, it also shows that DTs' potential is affected by many circumstantial elements. As such, it is as important for stakeholders to expand their conceptual, methodological, and pedagogical resources to be able to use DTs to their full potential, specifically with plurilingual approaches to language teaching and learning. However, neither teachers nor learners can do it alone; further research-informed guidance and professional development are necessary in this domain.

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