Literacy and language education in the digital age: Emerging trends and pedagogical ideologies

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Abstract

This article offers an exploration of the evolving landscape of language education, with a particular focus on the influence of the digital age and emerging pedagogical ideologies. The article begins by examining the profound impact of the digital age on language learning. It explores concepts such as so-called digital natives and the transformation and emergence of new literacies. It examines the complexities of language acquisition in a world characterized by multiliteracies and discusses the tension between monoglossic language ideologies and heteroglossia. It finalizes by addressing the global spread of languages and the pedagogical approach of translanguaging, concluding with insights drawn from Complexity Theory as emerging ideologies. This comprehensive examination of language learning provides valuable insights for educators, researchers, and policymakers navigating the complexities of language education in the digital era.

Keywords: second language acquisition, digital age, emerging pedagogies, literacies

Introduction

The digital age fundamentally redefines our conceptualization of literacy and second language education. Whereas literacy was once primarily associated with reading and writing competence only, contemporary discourse encompasses a broader spectrum of competencies, including media literacy, critical literacy, financial literacy, multiliteracies, and new literacies. Concurrently, second language education is undergoing a transformation driven by emerging technologies in the digital age. Artificial intelligence, advanced translation software, and accessible tools for creating infographics, 360-degree multimedia content, and website design are reshaping the landscape of second language education. Given these developments, it is necessary to examine the evolving and dynamic nature of literacy and second language acquisition within the context of the digital age. With this understanding, this paper begins with an exploration of the key concepts such as the digital age, digital natives, and digital immigrants. It critically examines the notion of digital natives and digital immigrants in light of the complex realities of technology adoption across different demographics. It discusses how such clear-cut definitions might cause misunderstandings.

The paper then examines the transformation of literacies in the digital age, exploring how contemporary definitions of literacy embed a broader range of skills and knowledge (multiliteracies, new literacies, etc.) that extend beyond the conventional boundaries, i.e., reading and writing. Through the lens of various scholars and educational theorists, the section examines the dynamic and ever-changing (deictic) landscape of literacies in the context of new information and communication technologies, societal shifts. This exploration emphasizes the necessity for educators to raise awareness among students for the imperative of lifelong learning and a future

where adaptability and diverse literacies are paramount.

By analyzing these developments in the digital age, the paper concludes with emerging pedagogical ideologies in the field of second language education. These approaches represent a shift away from monoglossic, prescriptive models of language education towards more fluid, inclusive, and dynamic pedagogies. These emerging ideologies can better equip educators for the linguistic needs and demands of their learners in the digital age.

Basically, this article aims to answer two research questions:

1. How does the digital age redefine literacy and second language education?
2. What are some emerging pedagogical ideologies for second language education in the digital age?

2a. How are the digital age and emerging pedagogical ideologies related to second language acquisition and teaching?

Digital Age

What is Digital Age?

Even though the term Digital Age is often heard in both day-to-day and academic conversations, defining it and operationalizing it is a pressing issue that needs to be addressed (Rosenfeld, 2018). As the literature suggests, with the advent of personal computers and the World Wide Web (Beck & Hughes, 2013; Lata & Owan, 2022), the Digital Age (Chiparausha & Chigwada, 2019; Iuga, 2021) started in 1980s (Joe, 2021) as a result of a transformation from an industry-based economy into an information-based economy (Owolabi & Nurudeen, 2020). However, given the existing digital divide within countries and across the globe, as highlighted by Çilan et al. (2009), can we confidently assert that all language learners, regardless of their socioeconomic background, truly inhabit the Digital Age? By taking this question into consideration, an exploration of the literature to understand what language learning in the digital age entails is necessary.

The historical account of the Digital Age defined in the literature relies on computerized devices and internet connections accessible to individuals in an information-based economy. This perspective on the Digital Age aligns with its emergence in the 1980s, despite variations in progress observed within countries and across different regions of the world. Despite the digital divide within and between societies, the global trend is undeniably toward the Digital Age, even as some societies may face limitations in accessing emerging technologies like artificial intelligence and augmented reality.

The So-Called Digital Natives

Another term that entered the literature is digital natives, a term coined by Prensky (2001) as “native speakers of the digital language of computers, video games and the Internet” (p. 1), who were “born into digital world” (Nichols, 2023, p. 109). Interestingly, people who were born before the advent of information technology became “digital immigrants” (Prensky, 2001). This distinction was found to be obscure since “young people’s relationships with technology is much more complex than the digital native characterisation suggests” (Bennett et al., 2008, p. 783). It oversimplifies the diverse and nuanced ways young people interact with technology, which vary based on factors like access, education, and individual preferences. This binary classification poses the risk of misinterpreting the learners' capabilities. One may overestimate individuals born after

a certain point in time as possessing inherent digital competence, therefore, in no need of assistance or guidance. On the other hand, one may underestimate the digital skills of non-traditional language learners born before a certain point in time, therefore, in need of special instructions. As Hobbs (2017) says "most students have not yet acquired the full range of knowledge and skills they need to be effective multimedia communicators" (p. 11). Furthermore, the point at which one becomes a "digital native" (or a "digital immigrant") is unclear. A common tendency among individuals is to label members of generations younger than theirs as "digital natives". Experienced teachers often refer to novice teachers as digital natives, while novice teachers typically reserve the term not for themselves but for their students.

Digital Transformation

Digital transformation is not limited to diachronic changes in technologies. It is also the driving force of societal changes which, in turn, lead to new digital capabilities. Rapid online communication tools and networks are transforming how people connect and communicate. However, due to its reciprocal nature, it is not the needs of the society only that transform technological tools for communication; rapid communication also transforms societies. In simpler terms, the demand for rapid communication has reshaped societies through the rise of social networking and ubiquitous translation tools, leaving a distinct mark on how we interact. This dynamic causes a reciprocal transformation. Leu et al. (2013) point out instances where employees increase work efficiency by utilizing the internet to address workplace challenges, and citizens use communication tools to dismantle undemocratic political systems. It also dismantles democratic political systems. Hence, it is seen that transformation does not only happen in terms of time and technological gadgets, it also happens in societal levels.

Digitally Transforming World: Long Term Impacts of Education

As the landscape of language learning evolves in a digitally transforming world, it is crucial to explore the long-term impacts on education, especially given that sustained language proficiency is a key objective of language education (McCoy et al., 2017). This means that the steps taken today in language education will likely resonate in the world for up to 70 years and beyond, considering an average life expectancy of 73.4 years as reported by the World Health Organization (2019) in 2019.

As mentioned by Chun et al. (2016), technology is "so interwoven with human activity that to teach language without some form of technology would create a very limited and artificial learning environment" (p. 65) since technology is integrated in the learners' everyday lives so immensely. Therefore, regarding language learning in the digital age, specific attention must be paid to the ever-changing, occupational, academic, and day-to-day lives of individuals. Students of today will have work titles that do not exist today (Weise, 2021). Whether in their professional or personal lives, they will work on projects to find solutions to problems that we cannot currently foresee. Moreover, 'work' encompasses more than just income-generating professional activities; it should be understood to include the daily tasks and efforts that comprise human life. To this end, what the education system of today needs is to cultivate adaptability in students so that they can overcome problems that are unprecedented today.

Transformation in Literacies

The Digital Age's transformations extend beyond technological changes, reshaping how we define literacies. Leu et al. (2013) used the linguistic term deixis in their interpretation of literacies. Deixis refers to "person, place, and time… whose interpretation is relative to the occasion of utterance, and to the identity of a speaker and the intended audience" (Fillmore, 1966, p. 220). For instance, the term *here* varies in meaning based on the speaker's location while speaking and its significance shifts accordingly as the speaker changes position. According to Leu et al. (2013), "in an age of rapidly changing information and communication technologies" (p. 1150), possessing skills and knowledge, i.e., being literate, is also deictic.

While in the past, literacy was thought to equate being able to read and write (The New London Group, 1996), being literate today is more than simply knowing how to decode letters and characters on a piece of paper or a screen. To be literate in the future will necessitate different and possibly unprecedented skill sets (Hackett, 2022) due to ever-changing societal needs and information and communication technologies that are in a reciprocal relation.

Because of the deictic nature of literacies, the new literacies of today may not necessarily be the new literacies in the future (Hackett, 2022). This issue brings forward challenges and opportunities. Educating students solely for the present world is insufficient (O'Brien & Scharber, 2008). The duty of educators is to help students be open to embracing the new literacies of tomorrow. Educators can discuss this point with their students to raise awareness. In their talk, they focus on the importance of adaptability, encourage creativity and innovation, and promote lifelong learning.

As discussed above, new literacies are not limited to technology-induced transformations. Society itself is shifting, which in turn creates new opportunities for new(er) literacies and with new(er) technologies. To this end, learners should be explicitly informed about the evolving nature of the world and encouraged to embrace change (Warner & Dupuy, 2018).

Multiliteracies

The New London Group (1996) claims literacy is not a single notion that only embeds strongly formalized, monolingual, and prescriptive written forms of communication. This new understanding leads to the notion of multiple literacies. It is revolutionary because literacy was previously thought to be equated to reading and writing of print-based texts (Thibaut & Curwood, 2018), an understanding that still has deep influences in elementary, secondary and tertiary school systems, in work settings, and everyday life. We need a broader and more diverse understanding of literacy that recognizes various text formats and the multiple ways people create meaning within them. This approach is supported by Knaus (2022), who argues for a broader concept of literacy, and Jones (2022), who emphasizes the importance of literacies in a plural form.

In this broader and plural understanding of literacies, a person's knowledge and skills in multiple areas (cooking, gardening, using tools, communicating, speaking languages, coding) are acknowledged as literacies (Vidergor, 2023). Cooking literacies are acknowledged as they involve cooking vocabulary and terminology, styles, knowledge in various cuisines, ingredients and their effects on body and health. Hence, within the multiliteracies framework, we obtain cooking literacies. Beside cooking literacies, "writing an academic essay, participating in a discussion on

a social network, creating online fan fiction, playing video games, or programming with Scratch" (Thibaut & Curwood, 2018, p. 49) are all practices of literacies.

The emergence of internet technologies has led to a proliferation of literacies. As individuals engage in dialogues on pertinent subjects and collaborate, they develop new literacies. These literacies are not hierarchical; rather, people learn from one another. Each individual functions as both a learner and the creator and producer of unique forms of literacies.

One should remember that literacies are in an ever-changing continuum. They adapt in reaction to the myriad possibilities offered by new technologies and online environments, facilitating personal, networked, and global connections. Hence, literacies are dynamic and multifaceted, as noted by Cope and Kalantzis (2009). They "regularly change as their defining technologies change" (Coiro et al., 2017, p. 121). This notion challenges traditional understandings of education, in which knowledge is treated as static and students are first provided with and then tested on the knowledge of the day only; they are not prepared for the acquisition of new literacies that they will be introduced to in the future (Vidergor, 2023).

The concepts of multiliteracies and lifelong learning should be introduced during language teacher professional development (Kalantzis & Cope, 2000) to increase teachers' awareness of the concepts. Hence, the concept of "multiliteracies will prepare teachers to use diversity as a resource for teaching and learning in their classrooms" (Ajayi, 2010, p. 11). Earlier definitions of literacy are deep into teachers' minds and many teachers value highly formulaic and prescriptive written forms of the language only, in which having knowledge of classics is equated to literacy. This is an awareness issue (Warner & Dupuy, 2018). There is a need for raising awareness in the concept of multiliteracies in pre- and in-service language teacher professional development (Ural, 2025; Ural & Dikilitas, 2025).

"[T]he concept of multiliteracies describes two essential arguments. The first is that schooling needs to take account of the multiple channels of communication and media now in popular use. The second is the need to acknowledge the increasing salience of multiple cultures and linguistic diversity" (Thorne & Reinhardt, 2008, p. 562). At this stage, one might ask the question of how we can help students before the high school level. Some educators implemented methods to bring multiliteracies to their classroom settings. One of these methods is called Personal Digital Inquiry (PDI), a system of inquiry, as the name suggests, that guides students to develop creative solutions to real-life problems and learn from each other through "online research and comprehension practices across disciplines as part of full and equitable participation" (Coiro et al., 2017, p. 121). In this method, learners come up with a self-inquiry and search for solutions. They assert their individual autonomy in the course of inquiry and communicate ideas. One main advantage of this method is that the inquiry itself comes from students themselves instead of teachers providing it. In language learning settings, such an activity can be completed in the target language. At lower levels, the inquiry can be leveled with students with possible guidelines such as the comparison of the weather/population/size of their hometown and another city that they wish to visit when teaching comparatives. Similarly, when teaching adults numbers and household vocabulary, incorporating discussions about the housing market in different cities can be helpful. Then, students can describe their answers and compare findings.

At a university level, Michelson and Dupuy (2014) created a "culturally grounded, fictitious scenario, wherein students adopt specific character roles through which they enact discourse styles associated with their characters' identities and the simulation's attendant social

demands" (p. 21). Students were lower-level French learners at a university setting in the US. They practiced the target language through a variety of modes such as visual, auditory, and gestural as well as genres like newspaper articles, interviews, personal diaries, and so on. The study fits the multiliteracies framework in language education because target language forms are not prescriptive in nature, multiple discourses and registers in communication are recognized (neighbor meet-ups, describing oneself, film reviews, political speeches), and diverse genre types are involved (personal narratives, autobiographical accounts).

New Literacies

Castek et al. (2007) say "[l]iteracy has always been shaped by the dominant technologies of every historical period. Cuneiform tablets, papyrus scrolls, velum transcriptions, and printed paper have each demanded their own reading and writing skills to fully exploit the information potential of each technology" (p. 121). While in medieval times being literate was equated with being able to read and write religious texts, during the 20th century, the concept expanded to involve photography and sound, which led to the rise of visual literacy, information literacy, and media literacy (Hobbs, 2017). Today, new technologies demand new sets of skills (Kellner, 2000). For example, the Internet requires new reading, writing, and communication skills because "reading comprehension in online environments is more complex and requires new skills and strategies. Locating information with a search engine, evaluating the accuracy of information located, synthesizing key ideas from disparate information sources, participating in online discussions, and communicating with email are important new literacies to be acquired" (Castek et al., 2007, p. 122). "Many of these new literacy practices—such as multimodal compositions, combined uses of voice and text, both localized and globally distributed conventions for text messaging, email, synchronous chat, and instant messaging, and communication via avatar in online gaming environments—extend beyond traditional print-based text" (Thorne & Reinhardt, 2008, p. 561).

At times, technologies arise in response to demands, yet they also give rise to new needs (Sundar & Limperos, 2003). Consequently, there exists a symbiotic relationship between societal needs and the innovations introduced by new technologies (Wajcman, 2002). New literacies encompass more than just the utilization of new technologies. In today's interconnected world, there are abundant opportunities for sharing, revising, and revisiting information. Digital learning now emphasizes teamwork and collaboration (Palloff & Pratt, 2005). This concept raises the question of what it truly means to be literate, as the outcome of a collaborative process reflects the contributions of multiple individuals and requires the collective knowledge, or literacies, of many people.

Manderino and Castek (2020) highlight various examples of new literacies, such as media literacies, critical media literacies, digital literacies, twenty-first century literacies, and web literacies. These new literacies often intersect with each other (Elola & Oskoz, 2017). However, the pending question is how new literacies are related to second language acquisition and teaching. While learners acquire digital literacies and web literacies in their everyday lives, "schools [are] one of the least likely places one might find new literacies" (O'Brien & Bauer, 2005, p. 121). In many school settings, one form of literacy is highly regarded, that is, the formulaic and prescriptive forms of languages (Larsen-Freeman & DeCarrico, 2010). Students are asked to let go of what they actually do in their social and private lives and embrace a world at school that does not represent them.

Emerging Pedagogical Ideologies in Second Language Education in the Digital Age

As literacies multiply and they are no longer limited to prescriptive and text-based forms of the languages, language teaching should follow suit and answer the needs of learners in the 2020s and beyond (Aşık, 2023). As The Douglas Fir Group (2016) said "SLA must now be particularly responsive to the pressing needs of people with regard to their education, their multilingual and multiliterate development, social integration, and performance across diverse contexts" (p. 20). In terms of theoretical framing, teaching and learning principles, and instructional approaches, four prominent directions emerge in language teaching in the digital age: (1) heteroglossic ideologies in language teaching, (2) world languages (Englishes, Spanishes, Turkishes, etc.) perspectives, (3) translanguaging, and (4) the Complexity Theory.

Monoglossic Language Ideologies vs. Heteroglossia

While in many parts of the world, students learning languages are praised for their dedication, time, and effort, their second language is often viewed as an additive to their first language (Flores & Beardsmore, 2015). In the Americas and Western Europe, the acquisition of a second language is often associated with the learning of one of the official languages of a neighboring country (Heller, 2010). These languages are viewed as "prestigious language[s]" (García & Wei, 2015, p. 48). Learning a second language outside these regions may be "looked down upon and … students who studied their indigenous [languages are tagged] as academically weak" (Akuamah et al., 2022). Education in another language (i.e., bilingual education) is limited until immigrants let go of their first language(s) spoken in the developing world. García (2020) refers to these practices as monoglassia, a language ideology in which second language learning is viewed either as additive to one's first language or is seen as temporary until the person learns the dominant language of the society one has immigrated to.

Monoglossic language ideologies can be found in many course books that are in use today. Such ideologies "that are found quite frequently in coursebooks might make it all the way to the cutting-edge technological course materials" in the digital age (Ural, 2022, p. 195). This is a challenge since old ideologies might be in a magnetic repulsion with progressive ideas. As Manderino and Castek (2020) exemplify, critical literacies come into play in language education. Imbalanced power relation examples in course books such as misrepresentation of a community or reducing language acquisition to prestigious languages (García & Wei, 2015) bring forward the "value of social reflection practices for exploring propaganda in the context of formal and informal learning" (Hobbs & McGee, 2014, p. 56). When witnessing these ideologies in course materials, teachers and students can question purposes through a critical inquiry stance (Boyd, 2022).

In response to monoglossic language ideologies that tout a single and prescriptive form of language and literacy, heteroglossic language ideologies best match with the notions of multiliteracies and new literacies (Leppänen et al., 2017). Literacies are not a single entity, nor are the languages one can speak. Heteroglossia asserts fluid language practices (Flores & Beardsmore, 2015); one can start a sentence in a language, then switch codes, and complete the sentence in another language. Multiliteracies recognize dynamic knowledge of a person in multiple fields (Taylor et al., 2008). One can advance in a domain of knowledge, embark on a new one and transfer previously acquired literacies to new fields.

In heteroglossia, there is no hierarchy or decision makers that act upon language practices. In multiliteracies, people learn from people and equality is ensured. Heteroglossia follows real life

incidents of language use. In their everyday lives, speakers themselves decide on the selection of languages, formality, and registers of words depending on circumstances. Rules are dynamic, and it is impossible to predict precisely when or at what point in their relationship two people may transition from more formal registers to more informal ones during their conversation.

World Englishes and World Languages

While the concept of power dynamics between native and non-native speakers of languages originally revolves around English as the most common second language across the globe, the issue does not concern English only. There are world Spanishes (Demuro & Gurney, 2018), world Chineses (Lin et al., 2019), World Turkishes, and so on. However, the common ideology in many language settings is that there is a single form of a language, that is, "competence of an 'ideal speaker-listener' of each given language, and that the intuitions of the (educated) native speaker provide access to this" (Mitchell et al., 2019, p. 10, emphasis original). This definition resonates powerfully with the definition of literacies in a traditional sense, an accumulation of knowledge of an educated person "mediated by written text" (Barton & Hamilton, 2000, p. 8). The traditional approach to language and literacy education typically focuses on providing access to only one form of language and one form of literacy. However, just as there are multiple forms of literacies, languages also exist in plural forms in the digital age. Therefore, our understanding of languages, such as Englishes, Spanishes, Arabics, and so on, is similarly diverse and multifaceted.

Graddol (2006) manifests that in second language acquisition settings "the target language is always someone else's mother tongue; the learner is constructed as a linguistic tourist – allowed to visit, but without rights of residence and required always to respect the superior authority of native speakers" (p. 83). Learners in language classes as well as non-native language teachers feel the pressure (Seidlhofer, 1999) as their competence is often compared with native speakers in terms of prescriptive linguistic codes (Jenkins, 2005). These codes are not limited to pronunciation and grammar only. Five-paragraph essays, "a building block of Anglophone" literacy, are reinforced in standardized writing tests (Belcher, 2017, p. 80). Assessment "serves as a particularly strong mechanism to set, maintain, and reinforce the linguistic norms" (Aoyama et al., 2023, p. 828).

In the digital age, on the other hand, the sole aim of language learners is not to mimic native speakers of the target language. As Seidlhofer (2009) notes, "a closer look at professional and private interactions reveals … how non-native speakers assert and communicate their own identities, how they use the language creatively rather than mimicking native speakers of English" (p. 239). All in all, language extends beyond the confines of paper and pen; it is a multimodal activity enriched by technological tools. It is co-constructed by multiple users and transcends the traditional constraints of formats like the five-paragraph essay.

Translanguaging

Each multilingual student brings to the class linguistic, cultural, and sociohistorical riches to achieve the benefits that diversity provides (Castek et al., 2007). In language teaching, these riches have the potential to be a springboard to be utilized. However, competence in a second language, especially if this language is the native language of an immigrant, is viewed as a problem (Agirdag, 2014) since some heritage languages are not viewed as one of the "prestigious language[s]" (García & Wei, 2014, p. 48). This causes a potential loss. Brecht and Ingold (1998)

indicate heritage language speakers are "an important, but largely untapped, reservoir of linguistic competence" (p. 2).

There are fears for the use of a second/heritage language in education. As Block (2007) posits, "there are often comments to the effect that the children of immigrants end up fully proficient in neither the host community language nor their heritage language" (p. 67). It is believed that "[t]he native language and the target language have separate linguistic systems. They should be kept apart so that the students' native language interferes as little as possible with the students' attempts to acquire the target language" (Larsen-Freeman & Anderson, 2011, p. 47). However, recent studies indicate that bilingual speakers develop both distinct and overlapping linguistic capabilities across various domains. Hence, raising bilingual students is not detrimental to their school learnings and language acquisition.

Another problem related to issues faced during second language acquisition and bilingual education is practices related to subtractive bilingualism (Flores & Beardsmore, 2015), which aims at raising monolingual children who speak the dominant language of the society one has immigrated to. This causes the problem of children losing their primary languages as they learn their second language (Wong-Fillmore, 1991). To this end, there is a need for a shift from monolingual language learning and teaching practices to heteroglossic practices.

Translanguaging is a heteroglossic perspective to language teaching and learning practices, in which all languages in a person's repertoire are appreciated. This repertoire carries the potential to be utilized for the learning of other languages, during communication, identity construction, linguistic expertise, language affiliation, and semiotic means of meaning making such as a person's look, style, gait, and clothes. Hence, it goes beyond formal language instruction in school settings.

According to Linguistic Interdependence Hypothesis of Cummins (1979), competence in a second language can be attained only on the basis of a well-developed first language. This indicates that first and second languages complement each other, instead of being viewed as interfering entities. There are implications to this hypothesis in education systems. The better immigrant children learn their first language, the better they acquire a second language.

Translanguaging recognizes the dynamic use of languages in a person's repertoire. Languages at a person's disposal can intersect each other from heteroglossic perspectives (Bakhtin, 1934). Hence, language practices can be dynamic and fluid (García, 2020). It means having the ability to speak multiple languages in one context. For meaning-making purposes, a person can start a language in their first language, switch codes, and complete the sentence in the second language. If we observe real life practices of bilingual people, this dynamic is quite common, so why wouldn't language education follow real life applications (Turnbull, 2016)?

Complexity Theory

Dewaele (2009) indicates, "nobody has yet come up with the Grand Unified Theory" (p. 625) in second language acquisition and teaching to anticipate what variables (cognition, sociolinguistic background, linguistic awareness, instruction…) play a predetermined role and a strictly measurable effect to gauge one's second language acquisition process, rate, and speed. "Nobody knows whether this is possible [either], but it seems unlikely for SLA since the whole is essentially a theory of everything to do with human life" (Bird, 2008, pp. 354-355). What does that mean? As second language acquisition is fundamentally rooted in human life science,

asserting that there are definitive and precise influences—such as motivation, affect, working memory capacity, and so forth—on an individual's SLA is not feasible. We know that these factors have effects, but the extent of each influence varies drastically among individuals. That is why, there is no Grand Unified Theory of Individual Differences. All influences on second language acquisition are inherently complex. Taking this issue at hand, Larsen-Freeman (2007) "offered Chaos/Complexity Theory (C/CT), not as a new, grand unified theory, but rather as a more encompassing, balanced, yet detail-oriented, perspective" (p. 35). This theory helps us understand the dynamic and nonlinear complexity of human nature and processes for second language acquisition. Every human is like a seed; with sunshine, water, and nutrients from the soil, the person grows; however, the growth, shape, and size are determined by the individual seed and its context (Roberts, 2016).

The Intersection

The intersection between the digital age, emerging pedagogies, and second language acquisition and teaching is an important issue that needs to be addressed. The digital age and emerging pedagogical ideologies are strongly related to second language acquisition and teaching since the field of second language acquisition and teaching directly reflects in social life. Digital technologies expose learners to a vast array of linguistic inputs (different varieties, styles, and registers), mirroring the heteroglossic nature of the language. In digital spaces, learners encounter authentic interactions from podcasts, videos, social media, and forums, where formal and informal language varieties intermingle. A teaching method includes a multimodal discourse analysis project, in which students collect samples of language use from different media and analyze how different voices (e.g., slang, academic English, professional jargon) coexist and interact with each other.

In a digital world, English is no longer the property of a few inner circle countries but a lingua franca with diverse localized forms. A similar issue persists in other languages, which also manifest regional varieties. Digital communication platforms amplify these realities and connect speakers across regions and different backgrounds. SLA pedagogies increasingly prepare learners to navigate pluricentric languages, valuing intelligibility and adaptability. Teaching methods can include exposure to global Englishes and varieties of world languages through authentic videos and interviews that focus on understanding rather than correcting non-standard forms.

In digital environments, learners naturally translanguage, switch between languages, use emojis, and mix registers. Recognizing this, progressive SLA pedagogies encourage translanguaging practices in classrooms, through which they legitimize students' multilingual identities. Teaching methods inspired by this ideology include collaborative and multimodal storytelling projects where students can mix languages (such as writing a comic in two languages).

Finally, Complexity Theory offers a broad, holistic framework for understanding SLA in the digital age. Languages, learners, and environments are seen as constantly evolving through interaction. Emerging digital tools like artificial intelligence create emerging learning pathways. SLA pedagogies are increasingly embracing these dynamic approaches. Teaching methods here include adaptive topics, where students use digital resources to answer big questions collaboratively as they translanguage. These teaching methods acknowledge the unpredictable and adaptive nature of learning to prepare students to be adaptive themselves to emerging situations in the digital age.

Conclusion

The convergence of the digital age, emerging pedagogical ideologies, and second language acquisition and teaching calls for a reimagining of traditional SLA frameworks. As learners increasingly engage with language in dynamic, fluid, and technology-mediated environments in the digital age, language teaching must evolve to reflect these realities in social life. Theories such as heteroglossia, World Englishes and world languages, translanguaging, and Complexity Theory offer valuable perspectives for understanding this shift. By embracing multimodal analyses, exposure to diverse language varieties, legitimization of multilingual identities and practices, and flexible, adaptive learning methods, second language educators can better prepare language learners for the demands of a rapidly changing world in the digital age.

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