From fragmentation to framework: the need for theoretical integration

Europe's linguistic heritage and potential

Europe's rich linguistic tapestry represents not only cultural heritage but also a vital resource for social inclusion and democratic participation. Preserving this diversity and creating legitimate spaces for multilingualism to thrive is essential for fostering cohesive, multilingual societies. When individuals are encouraged to maintain and develop their linguistic repertoires, it reinforces identity, supports educational equity, and enhances intercultural dialogue (Cummins, 2000). As the European Commission (Council Resolution of 21 November 2008 on a European Strategy for Multilingualism, 2008) asserts, promoting multilingualism is key to both individual empowerment and societal integration in an increasingly interconnected Europe. This is not surprising, as plurilingualism[1] offers a plethora of advantages across multiple domains.

From a *cognitive* perspective, early research (Bialystok, 1988) found that bilingual children surpassed their monolingual peers in metalinguistic tasks involving attentional control and inhibition (Bialystok, 2009). Bilingual children have also been shown to resolve problems involving conflicting or misleading cues at an earlier age and display greater flexibility in shifting task criteria (Bialystok, 2009; Quinteros Baumgart & Billick, 2018). On the whole, balancing attention between multiple languages reshapes specific brain networks, which enhances executive control and supports cognitive performance across the lifespan (Bialystok et al., 2012). From a *health* perspective, lifelong multilingualism has been found to delay the onset of dementia (Alladi et al., 2013) and Alzheimer disease, suggesting potential neuroprotective benefits stemming from regular engagement with multiple languages (Bialystok, 2011; Craik et al., 2010). These personal health benefits also have *societal* impacts, as a major challenge confronting contemporary healthcare systems is the substantial economic and clinical strain associated with supporting elderly individuals who are limited by physical or cognitive impairments. Hence, reducing the global burden of dementia has the potential to significantly alleviate healthcare expenditures across the globe (Gallo et al., 2025; Robertson et al., 2013). From a *cultural* viewpoint, multilingualism fosters appreciation and awareness of cultural values embedded within languages, enriching multilingual individuals' attitudes, skills, and broadening their worldview (Okal, 2014). Finally, from an *economic* vantage point, multilingualism offers a competitive advantage in today's job market (Okal, 2014; Porras et al., 2014) as proficiency in multiple languages broadens career prospects by allowing people to thrive in globalized environments and culturally diverse workplaces (Gómez Parra et al., 2021; Grin et al., 2011). Cumulatively, multilingualism enriches individual development and contributes positively to society at large.

The cost of multilingualism

Despite all these benefits, research also highlights potential disadvantages for plurilingual individuals (Quinteros Baumgart & Billick, 2018). At the *linguistic* level, multilinguals may exhibit smaller vocabularies in each language compared to monolinguals (Portocarrero et al., 2007), leading to slower lexical retrieval and increased word-finding difficulties (Bialystok, 2009). Why bilinguals experience lexical access disadvantages is not fully understood. One explanation posits that limited usage of each language weakens the connections necessary for efficient speech production (Bialystok, 2009). Additionally, plurilinguals tend to exhibit modest disadvantages in verbal recall tasks, yet no differences are observed in non-verbal short-term memory task (Portocarrero et al., 2007). This is also called the "weaker links" hypothesis, which suggests that plurilinguals may perform less well than monolinguals on speaking tasks because their language use is split between two languages, reducing how often each one is used (Gollan et al., 2008). Multilingual language development is shaped by the *quantity* and *quality* of exposure to each language. Children exposed to multiple languages do not automatically become equally proficient in all of them, which is also why plurilingual children exhibit lower proficiency compared to monolingual peers when their abilities are evaluated in only one of their two languages (Hoff et al., 2012). As plurilinguals need to divide the same amount of time over multiple languages, it is logical to assume that their respective vocabularies in each language are smaller than in monolingual controls, while their total vocabulary might be the same or even larger. In educational contexts, multilingual students may face difficulties when their home

[1] Although theoretical distinctions exist between *plurilingualism* and *multilingualism* – particularly in European language policy frameworks – for the purposes of this paper, the terms will be used interchangeably.

languages are undervalued, impacting academic performance, well-being and participation in monolingually structured classrooms (Agirdag, 2009, 2010; Soto et al., 1999). Such systemic challenges may reinforce deficit perspectives, further disadvantaging multilingual learners in school settings. Although such costs cannot be dismissed, they are heavily outweighed by the documented benefits of multilingualism. Moreover, because linguistic diversity is an irreversible social reality, efforts to suppress it are neither feasible nor desirable. The more pragmatic course is to design language policies and pedagogical practices that address these challenges while harnessing multilingualism's advantages (Cummins, 2005).

The European identity

Within the Universal declaration on Cultural Diversity Rights, several articles explicitly link multilingualism and the right to express oneself in the language of choice to cultural identity (Universal Declaration on Cultural Diversity, General Conference 2nd November 2001, 2001). Language diversity is a crucial element in safeguarding cultural identity and by extension, the broader *European* identity. The Council of Europe's "White Paper on Intercultural Dialogue" (Council of Europe, 2008, p. 4) states that "if there is a European identity to be realised, it will be based on shared fundamental values, respect for common heritage and cultural diversity as well as respect for the equal dignity of every individual". Europe advocates for the recognition of home languages as integral to both community cohesion and individual identity. At the same time, it aims to situate dominant lingua francas – such as English and Spanish – in a symbiotic relationship with home languages. Today, the predominance of English as a global lingua franca threatens to overshadow other languages. One might wonder why English continues to expand in a way that displaces other languages, rather than simply *coexisting* with them (Skutnabb-Kangas, 2013). Non-European – migrant or heritage – languages remain marginalized within current European policies, even though these languages are also part of Europe's broader linguistic repertoire. At first glance, the European Commission exhibits a desire to foster plurilingualism, allowing young people to develop and embrace their multilingual identities (Council Recommendation of 22 May 2018 on Key Competences for Lifelong Learning, 2018); however, in practice, little is done to capitalize on the existing linguistic diversity (Duarte & van der Meij, 2018). In addition, and more recently, the widespread adoption of technologies like ChatGPT and machine translation may hinder language acquisition as students may no longer perceive learning languages as necessary. Despite this, technology is often regarded as inherently motivating and supportive of learner autonomy (Van de Guchte et al., in preparation). However, without pedagogical approaches that leverage its potential and provide adequate training for language learning, technology alone is unlikely to foster motivation or autonomous behaviour in most learners (Stockwell & Reinders, 2019).

Pluridentities: a conceptual intersection

The concept of 'Pluridentities' is derived from the intersection of *plurilingualism* and *identities*, two intricately interconnected constructs. The relationship between language and identity is *dynamic* – rather than static – as identities evolve over time and across contexts, and are continually shaped through social interactions (Cummins, 2015). In fact, a person navigates a range of identities that are fluid, adapting and being re-negotiated according to specific situations. In this light, language plays a significant role as both a symbol and a marker of boundaries and identities, reflecting an individual's identification with a particular group, region, or nation (J. Li et al., 2022). While "identity" often appears as a broad, sometimes nebulous concept, "identification" can offer a more refined lens. It captures the interplay between an individual and a particular concept (i.e., geographic entity) that they either see themselves reflected in or aspire to embrace. This does not imply that the concept defines them definitively or remains static. Instead, the key to understanding identification is not in how it classifies groups but in the extent to which it informs and shapes linguistic choices and attitudes (Janssens, 2019). In order to grasp the concept of plurilingualism and identity, usage of identification will therefore give a much clearer view on this highly complex, multilayered and fluid relationship.

Plurilingualism, as defined by the Council of Europe (Common European Framework of Reference for Languages: Learning, Teaching, and Assessment, 2001), refers to one's capacity to acquire, learn and use multiple languages, distinguishing it from multilingualism, which is taken here to describe the coexistence of multiple languages at the *societal* level (García & Otheguy, 2020). Although theoretical distinctions exist between *plurilingualism* and *multilingualism* – particularly in European language policy frameworks – for the purposes of this framework, the terms will be used interchangeably. A plurilingual and intercultural education must safeguard not only the right to learn additional languages but also the right to maintain one's home language(s) (Hélot & Cavalli, 2017). According to the Council of Europe (Common European Framework of Reference for Languages: Learning, Teaching, and Assessment, 2001), plurilingual competence should be positioned at the *core* of language education and regarded

as an essential competence for European citizens. In Europe, Content and Language Integrated Learning (CLIL) approaches have been developed, promoting early language learning through *subject* content rather than focusing solely on language as the main subject (García & Otheguy, 2020). Although the target language choice in CLIL is not determined within EU guidelines and the idea behind it is to stimulate the acquisition of different languages, reality shows that the large majority of CLIL programs use English as a target language (European Commission & Eurydice, 2006). Albeit that CLIL outcomes seem to indicate that proficiency in the target language indeed is higher than in regular educational programs (Graham et al., 2018; San Isidro Agrelo, 2019), the aim to reach proficiency in various (European) language is not met. Equally important is creating a classroom environment that affirms students' identities and provides them with the linguistic and intellectual tools to engage in wider social contexts. Affirming students' identities fosters academic engagement, while neglecting their languages, cultures, and experiences hinders their participation and learning (Cummins, 2000). In reality, however, many teachers continue to view students' linguistic backgrounds as *problems* rather than resources, reflecting deficit discourses and a monolingual emphasis on acquiring the dominant language of instruction. This tendency underscores the persistent language-as-problem orientation (Ruiz, 1984) in language use decisions (Groff et al., 2023). To mitigate the potential consequences of this perspective, it is essential to consider approaches that recognize and value students' linguistic and cultural backgrounds. This requires implementing language policies that define how such affirmation can be embedded in both classroom practices and the broader school environment (Cummins, 2000).

The Pluridentities framework

The Pluridentities framework aims to support all kinds of educational stakeholders in their attempts to stimulate two key priorities within European policy: plurilingualism and identity (Council Recommendation of 22 May 2018 on Key Competences for Lifelong Learning, 2018). Within this context, European identity is increasingly conceptualized as multilayered and dynamic, shaped by individuals' evolving linguistic and cultural repertoires. The development of plurilingual identities – referred to as *pluridentities* – is influenced by multiple intersecting domains, including the family nexus, peer groups, and leisure spaces (such as music academies, sports facilities, and youth organizations). Among these influential spheres, formal education stands out as a particularly critical site for shaping and affirming learners' plurilingual identities (Cummins, 2000). Given that (most) children spend the majority of their first eighteen years in school, its impact is potentially enormous for the (language) development of young learners. Moreover, education potentially functions as a catalyst for safeguarding pupils' linguistic capital, fostering identity development, and promoting social inclusion (Cummins, 2000). Hence, the Pluridentities framework (see Figure 1) focuses specifically and exclusively on the school context as a central site of intervention. The extant literature puts four crucial components in developing, maintaining and/or stimulating multilingualism and identity forward, which jointly shape how education can foster linguistic diversity as well as students' identification with European values: linguistic capital, the learning environment, the role of language policy and technology.

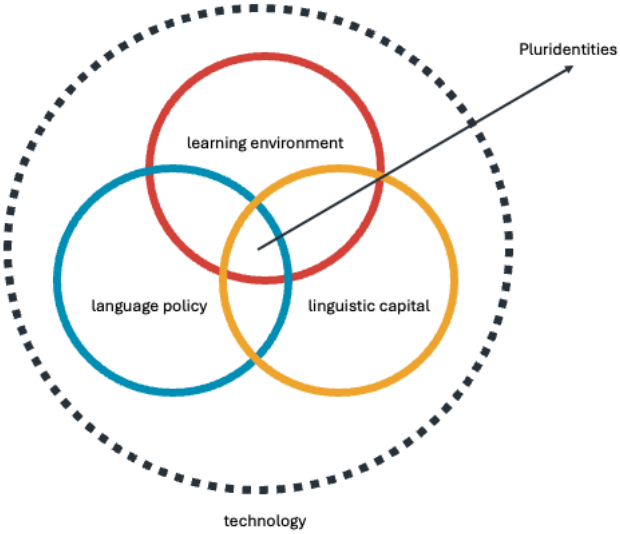

Figure 1. Pluridentities' conceptual model

The strength of this framework resides in the exploration of the *coherence* among its four components, a relationship that has thus far remained underexplored in scholarly literature.

- *The learning environment:* a linguistically inclusive learning environment embraces pupils' home languages and multilingual identities. Classroom strategies that integrate translanguaging, linguistic plurality, and intercultural dialogue emphasize students' linguistic repertoires as valuable assets and encourage teachers to recognize and incorporate these resources into their pedagogy (Veerman et al., 2025).
- *Linguistic capital:* students' linguistic repertoires represent valuable capital that education systems can either enhance or erode. Recognizing and integrating these existing linguistic resources into the curriculum not only enhances pupils' academic engagement and a sense of belonging, but also aligns with broader European values of linguistic diversity and inclusion (Council Recommendation of 22 May 2018 on Key Competences for Lifelong Learning, 2018) contributing to the construction of a multilayered European identity.
- *Language policy:* classroom language practices are shaped by a chain of policies that reaches far beyond a school's own language policy. National and regional laws, school-board directives, teacher-education standards and assessment rules all feed into how teachers approach their pupils' linguistic diversity. If these layers are not aligned, meaningful change at the chalkface is unlikely. Coherent action is therefore needed on every level: governments must anchor multilingualism in language-in-education legislation; training providers must prepare teachers for linguistically diverse classrooms; and schools must adopt procedures that protect pupils' right to use, maintain and develop all their languages. When this vertical alignment is achieved, teachers can tap into learners' full linguistic capital and affirm their multilayered identities.
- *The role of technology:* digital tools and online platforms increasingly mediate language use and learning. Technology can either reinforce dominant linguistic norms or serve as a powerful tool for maintaining heritage languages and accessing diverse linguistic content.

In the following sections, we shed more light on each of the four components. We will first discuss each component separately and then focus on the interplay between the different components. Although we begin with a discussion of 'linguistic capital', this sequencing reflects exposition rather than hierarchy. In other words, the framework is non-hierarchical: it affords no prescribed starting point or rank order among its four components, and one is free to engage with them in any order and move fluidly among them.

1. Linguistic capital

The first component of the Pluridentities model is 'linguistic capital' (see Figure 2), which is the value of linguistic *repertoire*. The latter refers to the complete set of languages, language varieties, registers, and communicative resources that an individual can draw upon, and can use in different contexts. It not only includes one's home language(s), but also learned additional languages, sociolects, registers, and styles (Finegan, 2012). Linguistic *capital* refers to the (perceived) value of this repertoire (Bourdieu, 1986). Linguistic capital provides people access to social and cultural exchanges and experiences, the labour market, education, knowledge and skills. While Bourdieu focuses on how linguistic capital and the use of a specific language can reinforce social power structures and social inequality, in research on multilingualism, "linguistic capital" often holds a different meaning. It is used to refer to the (actual or perceived) economic and social value of a broad linguistic repertoire and emphasises how language proficiency and communicative strategies can be a resource instead of a means to social exclusion (J. Li et al., 2022; López Blanco, 2025; Zschomler, 2019). Protecting the existing repertoires, stimulating the expansion of repertoires will not only sustain the EU-linguistic capital, but will also create more opportunities to increase pupils' sense of belonging and potential EU-identity.

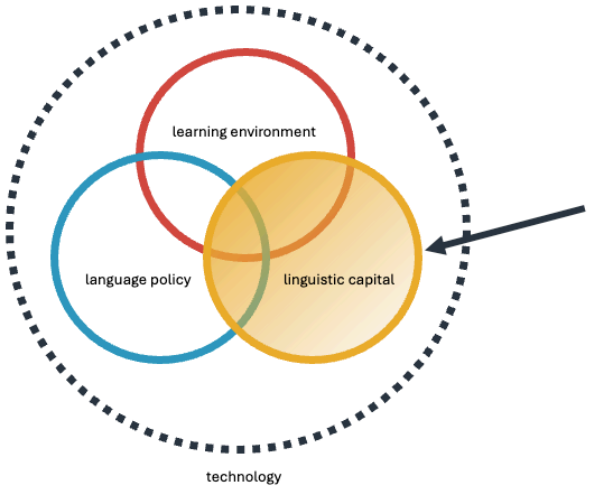

Figure 2. Zooming in on the 'linguistic capital' component

Inequalities in status

Even though promoting multilingualism is embedded in the European ideal, not *all* languages are perceived as equally legitimate or valuable. Standard language ideology promotes the idea that certain language varieties are inherently superior to regional or minority languages (Lippi-Green, 2006). For example, Western languages like English are often considered of higher status than non-Western languages or migrant languages. In many European nation-states, migrant languages are not part of the majority linguistic landscape but are rather restricted to use by migrant communities in a country, who may experience pressure to adopt the dominant language (Blommaert, 2010). Gogolin (2013, p.41) defines this "monolingual habitus" as "the deep-seated habit of assuming monolingualism as the norm in a nation", even though it is not an accurate reflection of the increasingly diverse societal reality. These perceived values of a language reflect a position of (symbolical) power in society (Blommaert, 1999). Heller (2003, p. 474) conceptualized this as the "commodification of language", meaning that knowledge of the languages used by economically strong majorities results in more monetary profit, hence language becomes a marketable commodity.

The status of standardized national languages is reinforced through language policies, institutionalization, legal frameworks, or the education system. Favouring dominant languages might result in linguistic discrimination (Skutnabb-Kangas & Phillipson, 1994): speakers of a minority language that is not valued as highly as the national language, or speakers with limited proficiency in the dominant language may experience prejudice, limited opportunities, social barriers, exclusion or discrimination (Piller, 2016). That may even lead to a "language shift", meaning that speakers "cease to use their ancestral language in favour of some

other language, often the language of a larger majority community", which can occur both on a community and on an individual level (known as "attrition") (Grenoble, 2021).

Linguistic repertoire and identity are deeply intertwined. Language is an important marker of not only group belonging, but also personal identity. Knowing that linguistic practices are not neutral, individuals whose linguistic repertoire aligns with dominant norms, may possess a higher status than those who speak dialects or minority languages (Lippi-Green, 2006). Thus, linguistic repertoire also plays a crucial role in shaping how individuals perceive themselves and are perceived by society. In multilingual contexts, speakers may engage in strategies such as code-switching or translanguaging to negotiate their identities (García & Wei, 2014).

Threats to linguistic diversity

Determining the exact number of endangered languages within the European Union (EU) is complex, due to varying definitions of "endangered", "minoritized" or "vulnerable", and due to difficulties in counting not only speakers, but also what constitutes as "a language" (Austin & Sallabank, 2011). Data shows that language distribution across the world is skewed: 50 percent of the world's population speak the twenty largest languages, and speakers of minority languages are often under pressure to make the shift (Austin & Sallabank, 2011). Economic incentives may come into play, with an advantaged position for global languages and a labour market that prioritizes proficiency in dominant languages (Schroedler, 2018). New technologies, such as Artificial Intelligence (AI), often mostly cater to majority languages; minority languages lack these resources and remain underrepresented (Mattioda, 2024). We further elaborate on this in the 'technology' section below.

Multilingualism in the learning environment

Multilingualism in the learning environment is often interpreted in two ways: on the one hand there is the focus on pupils who speak several languages outside the school (which are seldom the school's instruction language) and on the other hand there are the attempts to stimulate the multilingualism of the pupils via multilingual teaching approaches such as CLIL. For the former, the question whether multilingual pedagogies can support plurilingual students has been subject to many studies in educational research (Cenoz & Gorter, 2015; Cummins & Swain, 1986; Duarte & van der Meij, 2018). A notable example is the work of Thomas and Collier (2017; 2002), whose longitudinal research in the U.S. has shown that high-quality and long-term bilingual programs support multilingual students in their academic achievement. However, other studies that reported effects of multilingual pedagogies, often include small sample sizes in specific regions, or only discuss specific forms of multilingual education such as Teaching Through English (TTE) (Ljosland, 2017).

Still, some effects of multilingual pedagogies on learners have been found and they can be divided into cognitive and affective effects. Cognitively, exposure to multiple languages enhances executive functions, such as working memory, cognitive flexibility and metalinguistic awareness (Lorenzo et al., 2019). This can facilitate the cross-linguistic transfer of skills and support vocabulary acquisition (Carbonara et al., 2024). On an affective level, multilingual pedagogies can promote a positive sense of self, enhancing motivation, engagement, well-being and confidence (Van Raemdonck, 2024). They can also promote inter-ethnic friendships and a sense of belonging (Van Der Wildt et al., 2015).

When it comes to the implementation of multilingual programmes such as CLIL, results indicate not only that pupils have a higher proficiency in the target language, but also that their proficiency in the "regular" instruction language is not negatively affected (San Isidro Agrelo, 2019). On content level, mixed results are found, as some studies indicate that pupils enrolled in CLIL trajectories achieve higher content score (Graham et al., 2018), other studies show no effect (Wode, 1999; Jäppinen, 2005; Stohler, 2006) and other studies show a lower score for CLIL pupils (Fernández-Sanjurjo et al., 2019). On a cognitive level, certain studies show that CLIL can have a positive effect (Woumans et al., 2016). Interestingly, there also seems to be a positive effect of CLIL on motivation of pupils (Bulté et al., 2022). Interestingly, multilingualism can also play a significant role in shaping people's motivations for foreign language learning, as learners' existing linguistic repertoires influence their attitudes, goals, and self-perceptions. Dörnyei & Ushioda's (2010) L2 Motivational Self System highlights that motivation in language learning is driven by three key factors: the ideal L2 self (i.e., a learner's aspirations to become proficient in the target language), the ought-to L2 self (external pressures to learn the language), and L2 learning experience (a learner's attitudes toward the learning process). Multilingual learners, who

already have experience navigating multiple linguistic and cultural systems, often show higher motivation and confidence in learning additional languages (Cenoz & Gorter, 2015). However, motivation can be affected by the aforementioned language hierarchies.

Language policy in schools and classrooms plays a crucial role in shaping students' linguistic development. The choices that are made on policy level(s) affect which classroom practices are used towards the present and emergent multilingualism of the pupils. Many education systems prioritize dominant languages, which can marginalize minority language speakers and limit their academic potential (Skutnabb-Kangas, 2013) . The interaction between language policy and learning environment therefore clearly affects pupils' linguistic capital.

Protecting all linguistic capital in and through multilingual pedagogies

A more inclusive approach to the use of languages other than the main language of instruction in the classroom is often referred to as the "multilingual turn" in educational research (Meier, 2017). Even so, schools and teachers often adhere to monolingual policies and operate under the belief that pupils' academic success depends primarily on their proficiency in the dominant language of instruction, often overlooking the broader cognitive and cultural resources embedded in students' full linguistic repertoires (Bosch et al., 2024; Dooly, 2005).

Sierens & Avermaet (2014) point to the fact that the positive effects of multilingual pedagogies were often determined in high-status pupil groups learning high-prestige languages. For example, Caira et al. (2024) found that pupils with a lower SES and/or a multilingual background have lower access to CLIL in English. For pupils with a minority home language, multilingual pedagogies have not yet had a chance to prove themselves, even though students may more easily acquire new school skills when they are supported by a high level of proficiency in their home language. In her overview of studies examining language minority student data on academic achievement, Collier (1992) found that "the greater the amount of L1 instructional support for language-minority students, combined with balanced L2 support, the higher they are able to achieve academically in L2". Moreover, the classroom can be an important place where learners construct their linguistic and multilingual identities. An intervention study focusing on multilingual identity in languages pedagogy by (Forbes et al. (2021, p. 443) suggests that "being provided with information about the benefits of language learning may increase the extent to which students value languages as well as their own ability to do well in languages".

2. Learning environment

The second component, the 'learning environment' (see Figure 3), includes all the physical, social, and digital spaces in which language acquisition takes place, both inside and outside the formal classroom context. This includes both formal classrooms, semi-formal school environments (such as hallways and play areas), and informal contexts outside school (such as home, social interactions during leisure-time activities, and social media) (Benson, 2013; Richards, 2001). Within these environments, language acquisition occurs through meaningful activities and social interactions, where learners are actively involved and make use of the linguistic opportunities provided by their environment (Van Lier, 2004). However, alongside these meaningful activities, explicit instruction and systematic input also play a crucial role in language acquisition (Lightbown & Spada, 2013). Explicit instruction in vocabulary, grammar, and learning strategies helps learners develop a deeper understanding of the language's structure, supporting both retention and the accurate application of language (Ellis, 2016).

As outlined in the introduction, the Pluridentities framework centres on the school environment. Nonetheless, learners engage in a broader range of contexts beyond school. Extramural activities shape how learners perceive and experience school activities. Therefore, while they are not the primary focus of this framework, they must be taken into account. The choice of focusing on the school context in this framework is based on several factors. First, the school is the central learning environment in which systematic language input, opportunities for language output through meaningful interaction and feedback, and explicit instruction contributes to language development (Cummins, 2000; Lightbown & Spada, 2013). In addition, the school provides a social space where interaction with peers plays an important role in language acquisition (Ellis, 2015). Furthermore, regular exposure to diverse language practices fosters language development. Finally, the school provides a bridge between home language and social language requirements, which is crucial for academic language proficiency and social integration (Ortega, 2014; Spolsky, 2003).

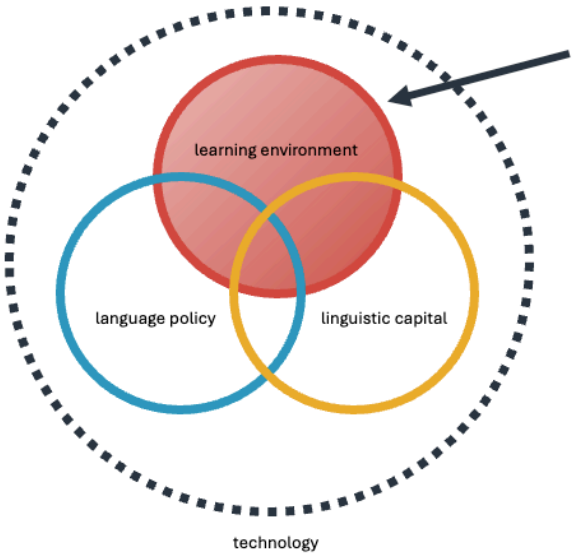

Figure 3. Zooming in on the 'learning environment' component

Within the school context, several actors influence the learning environment. Firstly, teachers play a crucial role in language acquisition, both through their didactic approach and their attitude towards multilingualism. Their professional development is essential, as teachers often unconsciously adopt the same methods they experienced as pupils (Medgyes & Malderez, 1996). Targeted professional development can help teachers develop a broader pedagogical vision and apply innovative strategies in the classroom. The choice of teaching materials plays a key role here; accessible and authentic materials that connect to pupils' lifeworld contribute to motivation and effectiveness (Little & Kirwan, 2018). Van Avermaet & Sierens (2010) emphasise the need for functional multilingualism, in which language is not only addressed within language lessons but also integrated into non-language subjects. For teachers, this might mean using learners' multilingual resources functionally in practical ways in the classroom as an aid to further understanding and application of content and skills, through practices which encourage students to make meaningful connections between subject content knowledge and with the various languages in their repertoire.

Secondly, classroom peers play an important role in students' linguistic learning environment within the school context by providing both informal and formal language input and output opportunities through interaction. Peer interaction creates a space in which pupils can use language in practical, authentic situations. This process allows them to practise their language skills without the pressure of formal assessment. Peer interaction occurs in formal learning contexts when pupils are asked to give each other feedback on exercises, or in learning practices in pair or group work scenarios. Following Long's (1996) interaction hypothesis, such interaction facilitates language development through negotiation of meaning and opportunities for feedback. Swain (1995) argues that peer interaction enables learners to produce and apply language in a context in which they are actively involved, which deepens their understanding of language. Moreover, the presence of more language-savvy pupils as role models can be motivating by serving as role models for less experienced pupils (Lam, 2000).

Another important factor in the language learning environment is language policy (LP), as described by Spolsky (2003). Language policies consist of three components: language management, language practice and underlying beliefs. These policies have a significant impact on how multilingualism is integrated into education. Above the importance of teacher professionalisation was mentioned: to ensure that this professionalisation affects the classroom practices, an effective language policy is needed at both school level and also higher levels (see below). To embed multilingualism as a practical reality in classrooms, the European Commission (Promoting Language Learning and Linguistic Diversity: An Action Plan 2004–2006, 2003) recommended the implementation of Content and Language Integrated Learning (CLIL). CLIL is a teaching method in which an additional language is used as a medium for teaching and learning non-linguistic content. In CLIL, both content and language are taught simultaneously, distinguishing it from approaches that focus exclusively on language teaching or subject content. CLIL may not

only promote language development but also pupils' cognitive skills and cultural awareness (Coyle, 2008). More information on LP (or language educational policies) can be found in the section on language policy.

In other words, a powerful learning environment contains many elements that support pupils' language development. Teacher-student interaction is an important factor, but also peer learning provides opportunities for sharing knowledge and improving language skills in an informal setting, for example on the playground (Swain, 1995). Van den Branden (2022) emphasizes that language acquisition thrives when learners are exposed to rich, elaborate, and meaningful input, elaborate opportunities to produce target language output for meaningful purposes and receive feedback on their output. Pupils should have the opportunity to experiment with language and make mistakes, which helps them develop their language skills in a safe and supportive environment (Hattie & Timperley, 2007). All pupils progress at their own pace and therefore differentiation plays a role in adapting the learning environment to the different levels and needs of pupils (Hattie, 2009). Students are also engaged daily in recreational, incidental language learning outside of school by watching streaming services, using social media, or playing online games (Thorne et al., 2009). This type of engagement is referred to as technology-mediated informal language learning (TMILL). While research has shown that TMILL can enhance language motivation, proficiency, and intercultural awareness (Dizon, 2018; Smeins et al., 2022), , it remains largely disconnected from formal instruction. Since many students actively participate in such activities in their leisure time, it is essential for schools to recognise and incorporate extramural learning into language instruction (Sundqvist & Sylvén, 2016), thereby enriching the learning environment with additional input and interaction opportunities that reflect real-world language use.

While much research has focused on extramural English, the broader phenomenon of extramural language learning with additional languages has not yet been sufficiently explored. Investigating this gap can offer valuable insights into how language acquisition takes place outside formal educational institutions. This is especially important given that learning only English as a lingua franca is considered insufficient by the European Commission (2003). Following the White Paper in 2003, the European Commission presented an action plan for language teaching and the promotion of linguistic diversity for the period 2004 to 2006. The importance of language learning by European citizens was raised as a necessity for communicating with neighbours with different ethnic, cultural and linguistic backgrounds. Other positive aspects were also discussed: language learning contributes to more openness towards others as well as different cultures and points of view. In addition, it is considered an added value within the free movement of citizens, capital and services. The report concludes, 'in short, understanding and speaking other languages should be part of the basic knowledge of all European citizens' (Promoting language learning and linguistic diversity: An action plan 2004–2006, 2003, p.3). If this importance of language learning is also perceived by teachers and students, motivation increases and is often followed by higher levels of effort. Pupils' belief in the value of multilingualism directly influences their commitment (Dörnyei, 2005).

But when teachers and pupils do not believe in the positive impact of multilingualism, there can be negative implications. In some contexts, multilingualism in a minority language is often perceived as something negative that can lead to a learning deficit or underachievement, which may lower the students' expectations in advance (Slembrouck et al., 2018). In addition, multilingual students face certain challenges in the school context, where they may feel isolated and have a sense of not belonging to the class. They may also encounter language barriers with their classmates and teachers, which can make communication more difficult. These barriers can harm their self-esteem and their level of confidence in their educational competencies and the way they look towards other languages (Rubio-Alcalá, 2017).

Situated at the intersection of the framework's components – linguistic capital and the learning environment – an inclusive classroom begins with recognising and valuing the linguistic diversity that students bring. As the Organisation for Economic Co-operation and Development (OECD, 2010) emphasizes: valuing students' native language is regarded as "an essential component of intercultural education, ensuring that migrant children feel that their cultural and language background is appreciated as much as that of the majority" (Brind et al., 2007, as quoted in Nusche, 2009). To fully understand the complexities of language learning and teaching, it's crucial to consider the multifaceted nature of identity. As Norton (2013) states, "It is only by acknowledging the complexity of identity that we can gain greater insight into the myriads of challenges and possibilities of language learning and

language teaching in the new millennium" (p. 191). Multilingual learners bring valuable linguistic resources to their learning environment, which shapes not only their own identity but also that of their teachers. When valued, learners' motivation increases and these resources support both L1 and L2 development (Little & Kirwan, 2018). Language acquisition is not only about skills but also about navigating linguistic hierarchies and social connectedness. Teachers, like students, are affected by the multilingual realities in the classroom. Their professional identity is shaped by the languages they teach, use and encounter.

In summary, there are several factors and actors within a language learning environment that influence both learners and teachers. These elements influence not only language development, but also pupils' sense of belonging and identification processes. Cummins (2013)emphasises that multilingualism and the appreciation of different languages contribute to positive identity and motivation. Language attitudes of both learners and teachers influence the learning climate and success in language acquisition processes (Norton, 2013). In the following section, we explore the various ways in which technology – the model's third component – can promote linguistic diversity in education (see Figure 4).

3. Technology

In the contemporary globalized landscape, technology emerges as a pivotal force reshaping human interaction and communication, as well as education. The proliferation of digital tools and platforms does not only facilitate synchronous and asynchronous communication across geographical boundaries but also transforms the way knowledge is disseminated. This has led to the emergence of new paradigms in (language) education, where traditional methods are increasingly supplemented or replaced by innovative, technology-driven approaches. The integration of technology into educational frameworks has made learning more accessible and personalized, allowing for diverse learning styles and needs to be addressed effectively. Crucially, these technologies also create new opportunities for the use, visibility, and transmission of multiple languages, thereby supporting and expanding Europe's linguistic capital. Moreover, the global interconnectedness fostered by technology has enabled the sharing of resources, ideas, and cultural exchanges, enriching the educational experience. This rapid advancement, however, also brings challenges, including digital divides and the need for educators to adapt to evolving technologies.

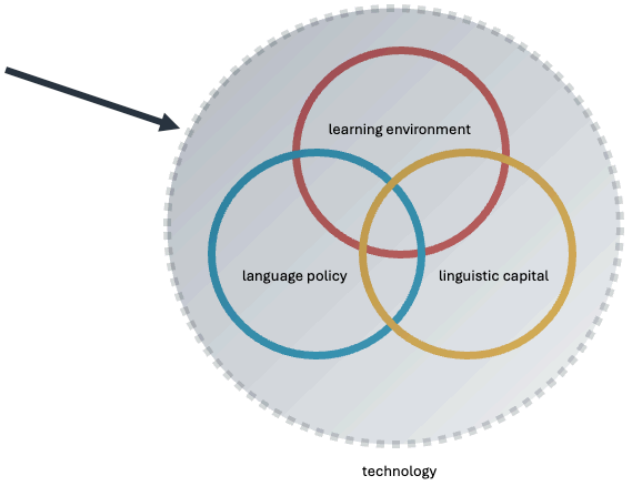

Figure 4. Zooming on the 'technology' component

Technology and language learning

The integration of technology into language education has revolutionized traditional pedagogical approaches, offering innovative tools that enhance language acquisition and learning. Digital platforms and tools provide learners with unprecedented access to resources and opportunities for practice, fostering users' engagement and promoting consistent practice through interactive

exercises and immediate feedback (Yang & Baldwin, 2020). Moreover, current tools utilize algorithms to personalize learning paths, adapting to individual progress and preferences, thereby facilitating a more tailored educational experience (Casanova et al., 2020).

Furthermore, the rise of social media has offered new opportunities for language learners to engage with other speakers of the target language, facilitating authentic communication and cultural exchange (Van den Branden, 2022). This real-world interaction is essential for developing linguistic competence and intercultural awareness (Ogunseiju et al., 2021). Additionally, the incorporation of AI in language learning tools has further advanced personalized learning. AI-driven chatbots can simulate conversations, providing learners with opportunities to practise speaking and listening skills in a low-pressure environment (Huertas-Abril & Palacios-Hidalgo, 2023). The reliance on technology in language learning also raises concerns regarding accessibility and equity: not all learners have equal access to digital devices and high-speed internet, which can exacerbate existing inequalities in (language) education (Huertas-Abril & Palacios-Hidalgo, 2025), especially among students from low SES and marginalized backgrounds, who may experience burdens in their ability to develop their linguistic capital (Brigitta Kaiser & Ivancheva, 2022).

Technology and multilingualism

The advent of technology has profound implications for multilingualism, as it facilitates access to diverse linguistic resources and promotes the use of multiple languages in multiple contexts. This accessibility to diverse linguistic materials is particularly beneficial in a world where multilingualism is increasingly valued in professional and social contexts (Barkhuus & Lecusay, 2011). Furthermore, technology can play a crucial role in preserving and promoting endangered and minority (minoritized) languages.

Digital tools enable linguistic communities to document and share their languages online, ensuring that linguistic diversity can be maintained in the face of globalization (Hutson et al., 2024). For example, initiatives that utilize mobile applications for language learning can help revive interest in lesser-known languages by making them more accessible (Hemphill & Hemphill, 2021). Additionally, social media platforms provide spaces for speakers of minority languages to connect, share resources, and promote their languages within broader communities (Cunliffe, 2019). This digital engagement not only supports language maintenance but also fosters a sense of identity and belonging among speakers of minority languages (Assis, 2011).

The role of technology in multilingual education is increasingly recognized as vital for fostering linguistic diversity in educational settings. Educational institutions are beginning to integrate technology into their language curricula, promoting multilingualism through blended learning approaches that combine traditional instruction with digital resources (Mohd Tahir et al., 2018). This integration allows learners to engage with multiple languages in a cohesive manner, enhancing their overall linguistic competence (Q. Li, 2022). In this context, it is necessary to gain deeper understanding on how plurilingual learners use technology in and out of lessons, not only to improve their linguistics skills but also to reinforce their identities.

Technology, languages, and identity

The interplay between technology, language learning/multilingualism, and identity is a complex and multifaceted phenomenon. Language is intrinsically linked to personal and cultural identity, and the ways in which individuals engage with technology can significantly influence their linguistic identities. For many (language) learners, technology provides a platform for self-expression and exploration of their linguistic identities, allowing them to navigate multiple languages and cultures in a digital landscape (Kamalova et al., 2020). In this context, social media platforms afford individuals the opportunity to develop and shape their online personas through linguistic choices, thereby reflecting their diverse identities (M. Minei et al., 2021), which can empower learners to embrace their plurilingualism and foster a sense of belonging within various linguistic communities. Furthermore, technology can facilitate the negotiation of identity in language learning contexts. Online interaction with people from different backgrounds can challenge stereotypes and promote understanding among speakers of different languages, ultimately enriching the language learning experience (De Los Ríos, 2022).

Opportunities and challenges in education

Digital technologies and AI, for example tools like ChatGPT and DeepSeek, are rapidly transforming language learning by reshaping how language identities and competences develop in the classroom. Recent studies highlight the promise of the use of technology in education. For instance, Li (2024) found that integrating ChatGPT into language tasks increased student engagement and reduced communication anxiety through instant, context-sensitive feedback. Complementing this, preliminary findings by Van de

Guchte et al. (in preparation) reveal that learners are more motivated to acquire languages via ChatGPT and feel more confident about communicating in the target language. Moreover, a study by Van de Guchte et al. (2022) demonstrated that incorporating online communication in the classroom yielded positive effects, and not only increased the quantity of target language output but also enhanced learners' enjoyment, willingness to communicate, and confidence in engaging in language interactions. Their findings also revealed that different modes of online interaction (such as text-, audio-, and video-chat) offered distinct advantages and limitations in terms of negotiation of meaning, strategic behaviour, and anxiety reduction. Although extensive research exists on multilingual teaching practices, a knowledge gap remains regarding how technology can be used to effectively stimulate multilingualism and leverage the full linguistic capital of all students. Not only that, while AI-based translation and learning tools offer valuable support for linguistic development, their uncritical use may compromise the cultivation of higher-order cognitive and interpersonal skills essential to authentic language competence. Alvarez & Lane (2023) argue that exclusive dependence on AI can reduce learners' opportunities to develop critical thinking, creativity, problem-solving abilities, and culturally responsive communication. Consequently, integrating human interaction and traditional pedagogical practices remains indispensable for fostering comprehensive multilingual proficiency. Educators still face challenges in integrating translanguaging practices, often because they do not speak all of their students' home languages and fear losing control when multiple languages are used (Cunliffe, 2019; Kamalova et al., 2020; Sierens & Avermaet, 2014). Persistent misconceptions about multilingualism continue to shape teacher beliefs and practices (Cummins, 2000; García & Wei, 2014), and the rise of AI tools also raises ethical and environmental concerns regarding data privacy, algorithmic bias, and energy consumption. In addition, the use of technology and AI raises broader questions of inclusivity, such as whether students have adequate access to the necessary technology at home and whether schools are equipped with the right tools, and concerns about the variability in effectiveness of AI-powered translation and adaptive language support systems across different languages. This should be considered when developing technology-enhanced interventions.

Overall, while these challenges must be addressed, the technological shift holds significant promise: it validates diverse language practices and identities, enriches students' language skills, and boosts their motivation to engage with languages (González-Lloret & Ortega, 2014; Huertas-Abril & Palacios-Hidalgo, 2023; Van den Branden, 2022; Zhao et al., 2021). Moreover, technology opens up numerous possibilities for students to explore languages in varied ways, deepening their understanding of different cultural norms, values, and world views (Zhang & Zhou, 2023).

Teacher professional development and teacher training

In response to rapid technological changes, it is essential for educators to receive targeted training to integrate digital tools effectively in classrooms with students from multilingual backgrounds. Training programmes that combine digital literacy with culturally responsive teaching practices help teachers overcome language barriers, even when they do not speak every language represented in their classrooms and make effective use of translation tools and other technologies and digital resources (Mohd Tahir et al., 2018; OECD, 2023).

A significant challenge in this context is the lack of teacher knowledge regarding suitable digital tools for fostering multilingualism, aligning these tools with curriculum objectives, and designing technology-mediated tasks that promote multilingual practices. The recently published *UNESCO AI Competency Framework for Teachers* offers practical guidance on integrating AI tools into classroom practice while addressing both ethical and pedagogical challenges (*AI Competency Framework for Teachers*, 2024). Furthermore, this integration of technology calls for a new didactic approach that ensures the cognitive load of language learning is not entirely offloaded onto digital tools. Learners must also have opportunities to demonstrate and apply their skills in face-to-face settings. Ongoing professional development helps teachers keep up with emerging technologies and new teaching strategies, turning challenges into opportunities for creating more inclusive, engaging, and linguistically rich learning environments (Daugherty et al., 2022). There remains a knowledge gap in offering actionable strategies within teacher professional development and training that empower both pre-service and in-service educators to effectively and critically utilize digital tools for multilingual practices. In the following section, we discuss the fourth and final component of the Pluridentities model: 'language policy' (see Figure 5).

4. Language policy

Effective and inclusive language policy (LP) is an essential ingredient to embedding multilingual practices in education. In this way, LP plays a key role in protecting multilingual and minority language capital in pupils. In a time where there is increasing pressure

on these types of capital due to technological innovations and the hegemony of national languages and the English language on communication and culture, it becomes an important challenge for LP to formulate educational responses. Specific language in education policies (LEP) therefore must be created. The Council of Europe (CoE) (From linguistic diversity to plurilingual education: Guide for the development of language education policies in Europe., 2007, p. 117) defines these as a "set of actions related to the role of languages in national and/or private teaching." To ensure that these LEP's are effective, it is important that they consider the multilayeredness that is inherent to education with all its different stakeholders. Language in education policy does not only comprise of the curricula of pupils/students in pre-school, primary, secondary and higher education, but also the curricula of teacher education programs. Therefore, within this framework, multiple socio-linguistic, sociological and policy-analytical frameworks are combined to capture this complex reality.

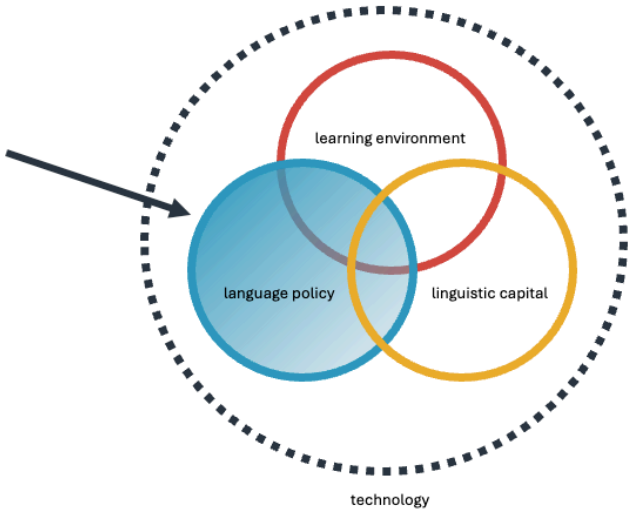

Figure 5. Zooming in on the 'language policy' component

With regard to language policy, perspectives on language in education, ranging from more monoglossic approaches to more heteroglossic approaches. There is tension between the two approaches regarding their effects on the curriculum. Garcia and Flores' taxonomy (Flores & Beardsmore, 2015) makes a distinction between four types of multilingual approaches which shows the continuum between monoglossic approaches and more heteroglossic approaches: the foreign language instruction model, the second language instruction model, the bilingual instruction and the plurilingual instruction. A heteroglossic approach offers diversity and flexibility in the way languages are addressed but also requires flexibility in the core curriculum, in order to accommodate home languages, minoritized languages and national languages. A monoglossic approach lends itself well to a structured core curriculum, with a focus on the national language and a selection of (a limited set of foreign) languages but does not support a truly plurilingual approach to education. Thus, the challenge lies in striking the right balance between a structured core curriculum and diversity in the way languages are addressed (van den Akker et al., 2010). The first step towards finding this balance is capturing the multilayeredness and the interaction between these layers that is inherent to educational policy. The heuristic framework based on a 'multilevel governance' framework to analyse public policies (Marks, 1993; Tamtik & Colorado, 2022) allows us to identify key interdependencies, inputs, processes and outcomes at the levels of policy development (Kirss et al., 2020) (see Figure 6).

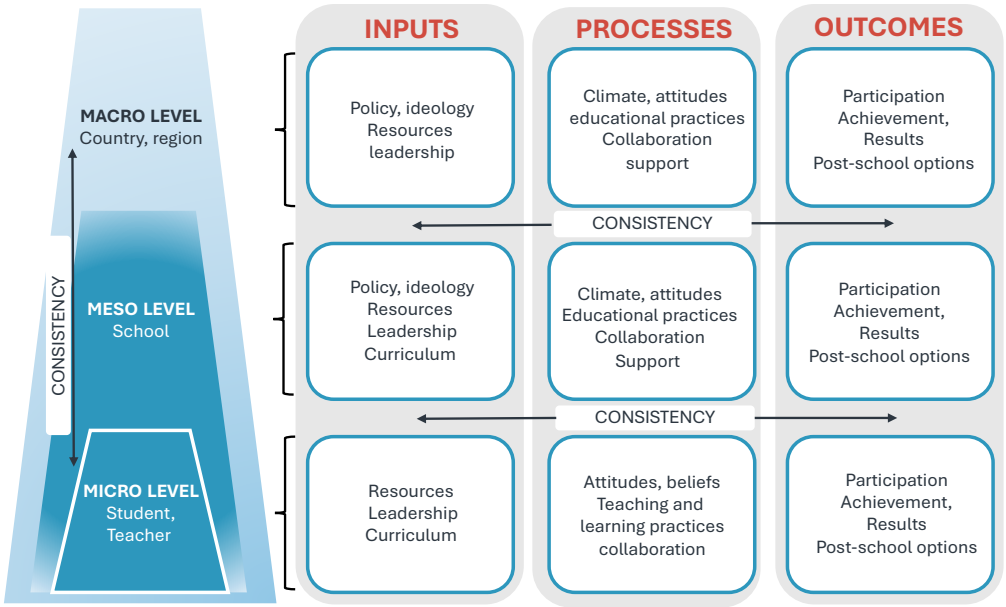

Figure 6. The conceptual framework of factors shaping multilingual education (Kirss et al., 2020)

Such a frame of reference starting from the multilevel governance perspective will need to consider the different levels present in educational contexts: pupils in classrooms; taught by teachers; whose goals and scope for action are co-determined by the principal or management team, as well as by school boards; which in turn fall under a regional/national ministry of education. These actors partly determine the institutional framework but are also co-conditioned by national legislation and find themselves within a European institutional context. The representation of levels of governance in the left-hand column of the model developed by Kirss et al. (2020) is a simplification which can be expanded to grasp the multilevel governance complexity of the language planning and policy (LPP) processes in various settings. Some national contexts might, for example, have their schools organized under school boards, and others have educational policymaking delegated to regional governments. Further, there could be a supra-macro level (for example, an intergovernmental organization) that influences educational policymaking. This would lead to the following adaptation of the left-hand side of the model by Kirss et al. (2020) model (see Figure 6). The addition of more levels also implies an elaboration of the factors shaping multilingual education policy at the supra-macro level. The adapted model also features the pupil at the nano-level. By featuring this level, the model stimulates elaboration on how policymaking and -implementation at the various levels affect the (language) identity of the pupil, and also how pupils' identities can inform the development of multilingual education.

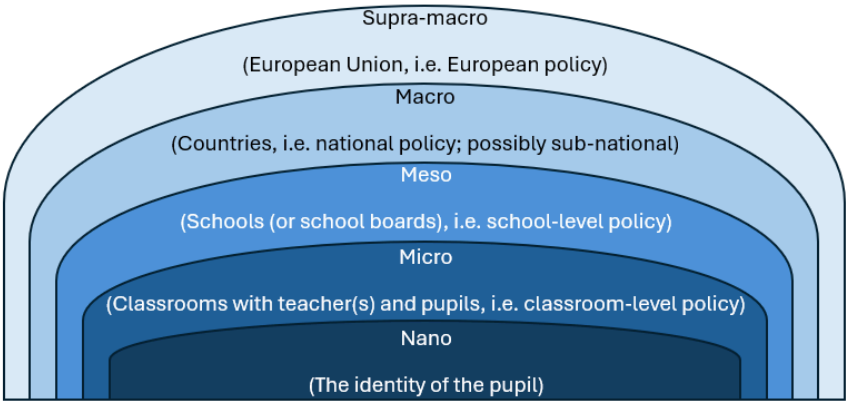

Figure 7. A partial, adapted version of the left-hand column from the model in Kirss et al. (2020)

At supra-macro level overarching policy levels like the European Union are located. European policy seeks to foster multilingualism and a shared European identity primarily through non-binding objectives and supportive measures rather than enforceable regulations. For example, the 2015 United Nations Sustainable Development Goal 4.7 calls on education systems to promote linguistic diversity and cultural awareness, while the European Council's "mother tongue plus two" objective has driven the adoption of CLIL as Europe's counterpart to Canadian immersion programmes (Promoting Language Learning and Linguistic Diversity: An Action Plan 2004–2006, 2003). Crucially, however, the EU has no mandate to impose education policy on its member states. Although these frameworks signal a clear commitment to fostering multilingual competence and a shared European identity, they delegate implementation entirely to national authorities, yielding considerable variation in practice across the Union.

At the macro-level, national and regional governments issue official objectives that directly shape curriculum design and underpin high-stakes assessments in many jurisdictions. These objectives – grounded in each locality's cultural norms and policy traditions – can influence the introduction and scope of multilingual programs such as CLIL (Surmont et al., 2015; Van De Craen et al., 2013). Moreover, by funding schools and monitoring educational quality through national inspectorates, authorities exert strong leverage over classroom practice, ensuring alignment with policy goals. Beyond statutory language-education mandates, related policies on teacher training and professional development also bear on multilingualism and student identity. According to the OECD Teaching and Learning International Survey (TALIS) - an international, large-scale survey of teachers, school leaders, and the learning environment in schools – 2018 data reveal that teachers across all participating countries and educational tiers consistently report a need for additional training to effectively serve multicultural and multilingual classrooms (OECD, 2021).

At the meso-level, a diverse array of actors – including educational providers, school boards, individual schools, and other contextual stakeholders – either maintain their own language-education policies or influence the development, implementation, and refinement of institutional school-based LEPs. These policies, in turn, shape both multilingual practices and learners' identity construction within each school community. Van den Branden and Vanbuel's framework builds on a macro-level mandate requiring schools to establish LEPs that actively promote students' language development, but it relocates agency firmly at the meso-level by insisting that policy design and enactment must not be a top-down edict from school boards alone (Van den Branden & Vanbuel, 2018; Vanbuel, 2015). On the contrary, teachers are integral to co-constructing the LEP: they collaborate to foster collective efficacy, engage in joint professional development, and formulate a shared vision for multilingualism and language education. Their model basically puts school teams at the steering wheel of their own local, contextualised, school-based language policy, so to speak.

At the micro-level, the success of a school's LEP ultimately depends on its two principal actors: teachers and pupils; whose daily interactions both realize and reshape institutional policy. Teachers translate broad LEP goals into classroom practices by selecting materials, planning activities, and modelling language strategies. In doing so, they too become policymakers "on the ground," adapting guidelines to learners' needs and co-constructing a plurilingual classroom ethos (Hornberger & Johnson, 2007; Ricento & Hornberger, 1996). According to Kavadias (2004) the micro layer constitutes the interaction between the school environment (i.e., parents, peers, media), the school organisation (i.e., management and regulations), teachers (embedded in the political culture, school culture and school climate) and their influence on the pupil. This leads to the final level: the nano-level, in which the pupil (and its identity) is central. All the above-mentioned layers affect how this identity is formed within a school setting.

A key aspect within LEP research is understanding the complex interaction between its different layers. For example, the significant influence of teaching professionals on policy implementation is well-documented (see, for example, Ricento & Hornberger, 1996; Wessel-Powell et al., 2019), indicating that policy is not always made top down, but can also be created (or influenced) from the bottom up. Various models, like Kavadias (2004), Grin & Gazzola (2010) and Mijts (2021) look into these interactions. Each of these models highlight different aspects of these interactions. The model of Kavadias (2004, see Figure 8) focusses on understanding interactions and actors at the micro-level on the one hand and some main interactions at the various social and political levels. These levels contain different policy levels and policy "co producers", which indicates that these levels differ and overlap in different national contexts.

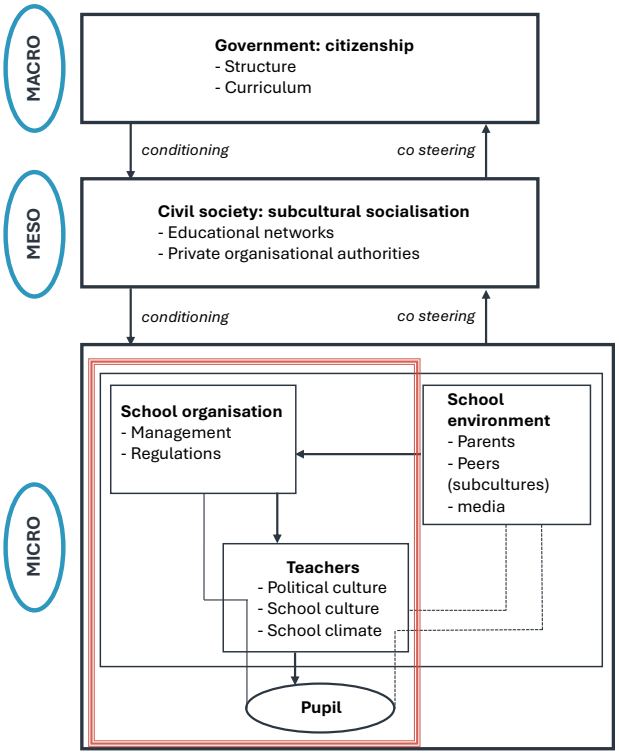

Figure 8. Conceptual model for conditioning and co-directing between different levels of educational policy (Kavadias, 2004)

Within the model of Mijts (2021; see Figure 3) the levels of policymaking, as well as how, through ideology and pragmatics are identified. These relate individual and collective language practices. Further, there is interdependency at all levels of policy, ideology and practice. This relates to the factors (inputs, processes and outcomes) identified in Figure 1, as ideology and pragmatics (and by interdependence, practices) are key inputs in the language policy-making process (Mijts, 2021). This also aligns with Spolsky's amalgam of three components mentioned previously, namely language practices, beliefs and management (Spolsky, 2004, as cited in Van Oss et al., 2022)

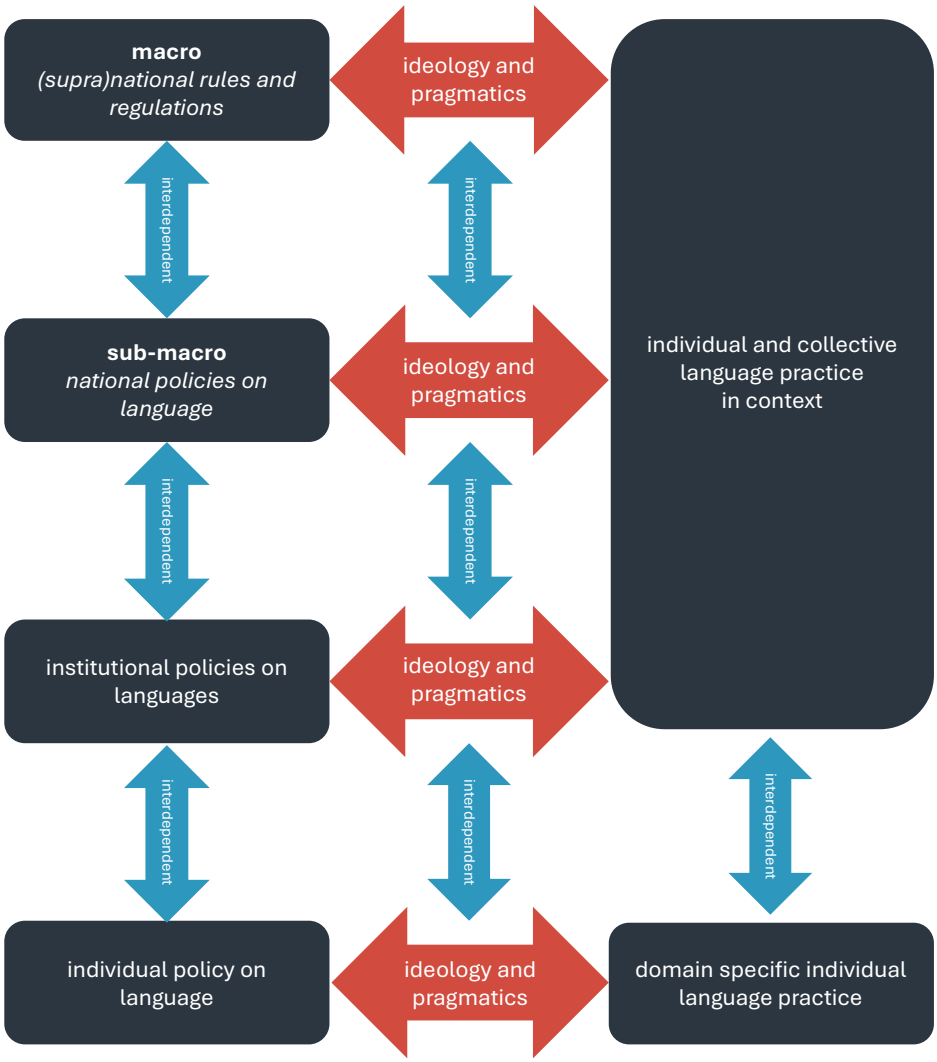

Figure 9. Interdependency of language policy at all levels (Mijts, 2021)

Finally, the model on the interactions between public debate and policymaking as put forth by Grin & Gazzola (2010) cannot be ignored. In relation to the model by Mijts (Figure 9), this model explains how ideological arguments (in the red column on the right, Figure 10) influence the political debate and thus the policy-making process. This process, by means of feedback, influences arguments and the debate once again. Moreover, the public reception of policies also influences the further development of policies. Incorporating these perspectives will allow us to gain understanding of the outputs of the LP processes and instruments that are designed to achieve the goals as defined in the LPs.

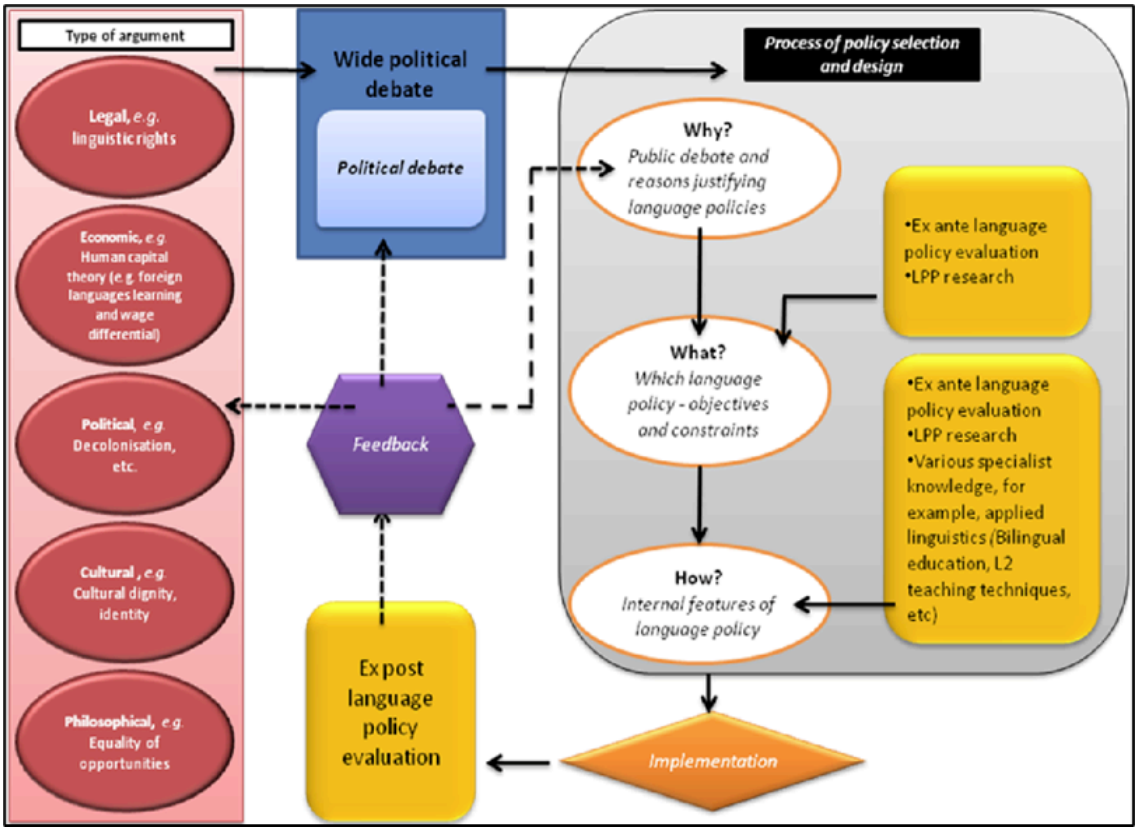

Figure 10. Interactions between arguments, the political debate and the policy-making process (Grin & Gazzola, 2010)

When looking into the impact of language policy on plurilingualism and identity, it is therefore important to take all these layers, actors and interactions processes into account in order to really gain insights in the crucial elements, processes and procedures.

Exploring the connections

In this concluding section, we turn our attention to the interconnections among four distinct yet mutually reinforcing components: linguistic capital, the learning environment, the role of technology, and language policy, which the scientific literature identifies as jointly shaping the capacity of education to nurture pupils' linguistic repertoires and their identification with European values. Until now, these elements have largely been examined in isolation; what remains overlooked is the coherence that binds them together. It is precisely this integrative perspective – the systematic investigation of how these four dimensions interact – that constitutes the principal strength of this overarching framework and addresses a critical gap in current scholarly discourse.

The role of digital technologies in protecting linguistic repertoires

The relationship between technology and linguistic capital is increasingly recognized as a critical area of study in language education. In the digital age, technology has the potential to enhance individuals' linguistic capital by providing access to diverse language resources and learning opportunities. Moreover, technology facilitates the development of digital literacy skills, which are essential for navigating the modern job market (Bejaković & Mrnjavac, 2020). As such, the integration of technology in language education can empower learners to enhance their linguistic capital and improve their career prospects (Zhao et al., 2021). Technology can also support lifelong learning by providing individuals with ongoing access to language resources and learning opportunities, enabling them to continuously develop their linguistic competences (Șișianu & Pușcașu, 2024). However, the relationship between technology and linguistic capital is not without challenges: the digital divide can limit access to technology for certain individuals, particularly those from marginalized backgrounds, thereby hindering their ability to develop linguistic capital (Brigitta Kaiser & Ivancheva, 2022).

New digital technologies, such as AI, can play a crucial role in protecting linguistic repertoires and enhancing linguistic capital, especially in the context of minority and endangered languages (Huertas-Abril & Palacios-Hidalgo, 2025). The advent of digital tools offers new platforms for language preservation and allows speakers to connect and share resources. Speech recognition,

machine translation, and AI-generated content can support multilingual communication and help integrate lesser-used languages into education and public life. Moreover, because AI is trained on dominant language data, it risks reinforcing linguistic hierarchies and marginalising non-standard or heritage varieties (Berber Sardinha, 2024). Hence, to use AI effectively, educators must not only embrace its benefits but also promote digital literacy and critical awareness, ensuring AI supports rather than dilutes Europe's linguistic capital.

Technology and language policy

Language-in-education policies must now reckon with the rapid integration of innovative digital technologies, which offer novel opportunities to foster linguistic diversity, enhance proficiency, and boost learner motivation (Van de Guchte et al., 2022). Policymakers must therefore address inequitable access – particularly in disadvantaged areas – to reduce inter-school digital divides and ensure that all students can benefit from these tools; while leveraging the data they generate on language proficiency and engagement for informed resource allocation (OECD, 2023). Moreover, general education policies play a crucial role in curriculum design, creating space for digital literacy and related competencies alongside language learning (Common European Framework of Reference for Languages: Learning, Teaching, Assessment, 2020). Yet the swift pace of technological change poses a significant challenge: policy frameworks must remain sufficiently flexible to integrate emerging technologies coherently with overarching educational objectives.

The role of technology in language learning environments

Technology has a crucial role in the language learning environment of teachers and students within the school context. The integration of technology into learning environments has transformed traditional educational practices, creating new opportunities for engagement and collaboration among learners. Technology-enhanced learning environments facilitate interactive and immersive experiences that augment student learning, engagement and participation (Oliech Owidi et al., 2024). Adaptive learning technologies can analyse student performance and provide customized feedback, enabling language learners to progress at their own pace, and consequently they are empowered to take ownership of their learning (Daugherty et al., 2022).
However, the successful integration of technology into learning environments requires careful planning and consideration, and professional development opportunities are essential for ensuring that educators can navigate the complexities of technology-enhanced learning and create inclusive environments that support all language learners.
For *students*, educational platforms such as Google Classroom and language acquisition software provide opportunities for interactive practice and feedback, which supports foreign language learning. Technology also makes it possible to use online resources, such as videos in the target language, for authenticity in language teaching (Thorne, 2013). *Teachers* can also benefit from digital tools to improve lesson planning, monitor student progress and apply differentiation. In addition, they can share experiences through online communities, which enhances their professional development (Siemens, 2005). However, there is concern about the use of AI for plagiarism, with students potentially misusing technology, which could threaten the integrity of the learning process (Graham, 2021). Nevertheless, the impact of technology on language acquisition depends on how it is integrated. If technology does not contribute to meaningful tasks, comprehensible input, extensive output opportunities, formative feedback and interactive learning processes, the added value will remain limited (Van den Branden, 2022). Thus, thoughtful deployment according to effective instructional principles is essential for success in language learning.

The role of language policy in language learning environments

In any education system, policy documents are essential because they provide guidance to schools and educators, ensuring consistency and equity. These documents determine how different educational practices, including language instruction take shape. As Alderson (2009) points out, language policies play a significant role in education by outlining how and which languages should be taught, learned, and assessed. However, as Ricento & Hornberger (1996) highlight, teachers play an active role in interpreting and adapting language policies to their specific classroom contexts. The learning environment corresponds to the micro-layer of policy. It is where the teacher implements and adapts policy into teaching practices (Ricento & Hornberger, 1996; Wessel-Powell et al., 2019).

The European Union's goal for its citizens to be proficient in their mother tongue plus two other European languages is outlined in the European Commission's White Paper of 1995. This vision aimed to encourage secondary school students to study certain

subjects in the first foreign language (FL) they learn. However, the mandate to organize and regulate official education lies with the member states' governments, not with the EU. Consequently, individual countries may interpret and implement these objectives in diverse ways. Tender & Vihalemm (2009) conclude that the EU's MT+2 and CLIL policies primarily emphasize the teaching of prestigious majority and official EU languages, with limited attention given to immigrant and regional minority languages.

The role of linguistic capital in language learning environments

Linguistic capital is essential in shaping a pupil's learning experiences both in a classroom context and outside it. Language skills influence access to knowledge, participation in social interaction and self-expression (Vygotsky, 1980). Nonetheless, linguistic diversity in a school context can create barriers such as school segregation, self-fulfilling expectations of teachers or a negative impact on multilingual pupils' sense of belonging (Agirdag et al., 2013). However, Agirdag (2014) proclaims that multilingualism can have long-term positive effects on, for example, future economics outcomes. An inclusive learning environment where diversity is embraced is necessary for multilingualism and a sense of belonging.

References

Agirdag, O. (2009). All Languages Welcomed Here. *Educational Leadership*, *66*(7), Article 7.

Agirdag, O. (2010). Exploring bilingualism in a monolingual school system: Insights from Turkish and native students from Belgian schools. *British Journal of Sociology of Education*, *31*(3), Article 3. https://doi.org/10.1080/01425691003700540

Agirdag, O. (2014). The literal cost of language assimilation for the children of immigration: The effects of bilingualism on labor market outcomes. In *The literal cost of language assimilation for the children of immigration: The effects of bilingualism on labor market outcomes*. Multilingual Matters; Clevedon, Bristol.

Agirdag, O., Van Avermaet, P., & Van Houtte, M. (2013). *School Segregation and Math Achievement: A Mixed-Method Study on the Role of Self-Fulfilling Prophecies*.

AI competency framework for teachers. (2024). UNESCO. https://doi.org/10.54675/ZJTE2084

Alderson, J. C. (Ed.). (2009). *The politics of language education: Individuals and institutions*. Multilingual Matters.

Alladi, S., Bak, T. H., Duggirala, V., Surampudi, B., Shailaja, M., Shukla, A. K., Chaudhuri, J. R., & Kaul, S. (2013). Bilingualism delays age at onset of dementia, independent of education and immigration status. *Neurology*, *81*(22), 1938–1944. https://doi.org/10.1212/01.wnl.0000436620.33155.a4

Alvarez, J., & Lane, S. (2023). Rising against the machine: Appeasing the educators' fears of artificial intelligence taking over foreign language education. *UNC System Learning and Technology Journal*, *1*(1).

Assis, T. (2011). Crioulas Media: Technology, Language and Identity in a Quilombola Community in Brazil. In K. Gallagher (Ed.), *Multiculturalism: Critical and Inter-Disciplinary Perspectives* (pp. 149–155). BRILL. https://doi.org/10.1163/9781848880634_018

Austin, P. K., & Sallabank, J. (Eds.). (2011). *The Cambridge Handbook of Endangered Languages*. Cambridge University Press. https://doi.org/10.1017/CBO9780511975981

Barkhuus, L., & Lecusay, R. (2011). Technologies and social learning in an urban after-school center. *CHI '11 Extended Abstracts on Human Factors in Computing Systems*, 273–282. https://doi.org/10.1145/1979742.1979616

Bejaković, P., & Mrnjavac, Ž. (2020). The importance of digital literacy on the labour market. *Employee Relations: The International Journal*, *42*(4), 921–932. https://doi.org/10.1108/ER-07-2019-0274

Benson, P. (2013). *Teaching and Researching: Autonomy in Language Learning* (0 ed.). Routledge. https://doi.org/10.4324/9781315833767

Berber Sardinha, T. (2024). AI-generated vs human-authored texts: A multidimensional comparison. *Applied Corpus Linguistics*, *4*(1), 100083. https://doi.org/10.1016/j.acorp.2023.100083

Bialystok, E. (1988). Levels of bilingualism and levels of linguistic awareness. *Developmental Psychology*, *24*(4), 560–567. https://doi.org/10.1037/0012-1649.24.4.560

Bialystok, E. (2009). Bilingualism: The good, the bad, and the indifferent. *Bilingualism (Cambridge, England)*, *12*(1), 3–11. https://doi.org/10.1017/S1366728908003477

Bialystok, E. (2011). Reshaping the mind: The benefits of bilingualism. *Canadian Journal of Experimental Psychology / Revue Canadienne de Psychologie Expérimentale*, *65*(4), 229–235. https://doi.org/10.1037/a0025406

Bialystok, E., Craik, F. I. M., & Luk, G. (2012). Bilingualism: Consequences for Mind and Brain. *Trends in Cognitive Sciences*, *16*(4), 240–250. https://doi.org/10.1016/j.tics.2012.03.001

Blommaert, J. (1999). *Language ideological debates*. de Gruyter.

Blommaert, J. (2010). *The sociolinguistics of globalization*. Cambridge University Press.

Bosch, J. E., Olioumtsevits, K., Santarelli, S. A. A., Faloppa, F., Foppolo, F., & Papadopoulou, D. (2024). How do teachers view multilingualism in education? Evidence from Greece, Italy and The Netherlands. *Language and Education*, *39*(2), 337–356. https://doi.org/10.1080/09500782.2024.2380073

Bourdieu, P. (1986). The Forms of Capital. In J. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education* (pp. 241–258). Greenwood.

Brigitta Kaiser, E., & Ivancheva, M. (2022). Transcending Motivation Barriers in Technology Enhanced Language Learning: A Social Inequalities Perspective. *Journal of Biomedical Research & Environmental Sciences*, *3*(3), 227–235. https://doi.org/10.37871/jbres1427

Bulté, B., Surmont, J., & Martens, L. (2022). The impact of CLIL on the L2 French and L1 Dutch proficiency of Flemish secondary school pupils. *International Journal of Bilingual Education and Bilingualism*, *25*(9), 3151–3170. https://doi.org/10.1080/13670050.2021.2018400

Caira, T., Surmont, J., & Struys, E. (2024). Which pupils have access to CLIL? Investigating the schools' choice for English-based CLIL programmes in Belgium. *Language and Education*, *38*(1), 65–79. https://doi.org/10.1080/09500782.2023.2244917

Carbonara, V., Scibetta, A., & Torregrossa, J. (2024). The benefits of multilingual pedagogies for multilingual children's narrative abilities. *International Journal of Multilingualism*, *21*(2), 645–669. https://doi.org/10.1080/14790718.2022.2148675

Casanova, D., Huet, I., Garcia, F., & Pessoa, T. (2020). Role of technology in the design of learning environments. *Learning Environments Research*, *23*(3), 413–427. https://doi.org/10.1007/s10984-020-09314-1

Cenoz, J., & Gorter, D. (2015). *Multilingual education: Between language learning and translanguaging*. University Press.

Collier, V. P. (1992). A Synthesis of Studies Examining Long-Term Language Minority Student Data on Academic Achievement. *Bilingual Research Journal*, *16*(1–2), 187–212. https://doi.org/10.1080/15235882.1992.10162633

Collier, V. P., & Thomas, W. P. (2017). Validating the Power of Bilingual Schooling: Thirty-Two Years of Large-Scale, Longitudinal Research. *Annual Review of Applied Linguistics*, *37*, 203–217. https://doi.org/10.1017/S0267190517000034

Common European Framework of Reference for Languages: Learning, Teaching, and Assessment, Council of Europe (2001). https://rm.coe.int/1680459f97.

Common European Framework of Reference for Languages: Learning, Teaching, Assessment (2020).

Council of Europe. (2008, May 7). *White Paper on Intercultural Dialogue: Living Together As Equals in Dignity*.

Council Recommendation of 22 May 2018 on Key Competences for Lifelong Learning, 2018/C, Council of the European Union, Official Journal of the European Union, 189/01 (2018). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018H0604(01)

Council Resolution of 21 November 2008 on a European Strategy for Multilingualism (2008). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2008_320_R_0001_01

Coyle, D. (2008). CLIL–A Pedagogical Approach from the European Perspective. In N. H. Hornberger (Ed.), *Encyclopedia of Language and Education* (pp. 1200–1214). Springer US. https://doi.org/10.1007/978-0-387-30424-3_92

Craik, F. I. M., Bialystok, E., & Freedman, M. (2010). Delaying the onset of Alzheimer disease: Bilingualism as a form of cognitive reserve. *Neurology*, *75*(19), 1726–1729. https://doi.org/10.1212/WNL.0b013e3181fc2a1c

Cummins, J. (2000). *Language, Power and Pedagogy: Bilingual Children in the Crossfire*. Multilingual Matters. https://doi.org/10.21832/9781853596773

Cummins, J. (2005). A Proposal for Action: Strategies for Recognizing Heritage Language Competence as a Learning Resource within the Mainstream Classroom. *The Modern Language Journal*, *89*(4), 585–592.

Cummins, J. (2013). Language and Identity in Multilingual Schools: Constructing Evidence-based Instructional Policies. In D. Little, C. Leung, & P. Van Avermaet (Eds.), *Managing Diversity in Education* (pp. 3–26). Multilingual Matters. https://doi.org/10.21832/9781783090815-003

Cummins, J. (2015). Intercultural education and academic achievement: A framework for school-based policies in multilingual schools. *Intercultural Education*, *26*(6), 455–468. https://doi.org/10.1080/14675986.2015.1103539

Cummins, J., & Swain, M. (1986). *Bilingualism in education: Aspects of theory, research and practice*. Longman.

Cunliffe, D. (2019). Minority Languages and Social Media. In G. Hogan-Brun & B. O'Rourke (Eds.), *The Palgrave Handbook of Minority Languages and Communities* (pp. 451–480). Palgrave Macmillan UK. https://doi.org/10.1057/978-1-137-54066-9_18

Daugherty, K., Morse, R., Schmauder, A. R., Hoshaw, J., & Taylor, J. (2022). Adjusting the Future of Adaptive Learning Technologies via a SWOT Analysis. *Intersection: A Journal at the Intersection of Assessment and Learning*, *3*(2). https://doi.org/10.61669/001c.36295

De Los Ríos, C. V. (2022). Translingual Youth Podcasts as Acoustic Allies: Writing and Negotiating Identities at the Intersection of Literacies, Language and Racialization. *Journal of Language, Identity & Education*, *21*(6), 378–392. https://doi.org/10.1080/15348458.2020.1795865

Dizon, G. (2018). Netflix and L2 learning: A case study. *The EuroCALL Review*, *26*(2), 30. https://doi.org/10.4995/eurocall.2018.9080

Dooly, M. (2005). How Aware are They? Research into Teachers' Attitudes about Linguistic Diversity. *Language Awareness*, *14*(2–3), 97–111. https://doi.org/10.1080/09658410508668827

Dörnyei, Z. (2005). *The psychology of the language learner: Individual differences in second language acquisition* (digital printing 2010). Routledge.

Dörnyei, Z., & Ushioda, E. (2010). *Motivation, language identity and the L2 self.* (Reprint). Multilingual Matters.

Duarte, J., & van der Meij, M. (2018). A holistic model for multilingualism in education. *EuroAmerican Journal of Applied Linguistics and Languages*, *5*(2), 24–43. https://doi.org/10.21283/2376905X.9.153

Ellis, R. (2015). *Understanding second language acquisition* (2nd edition). Oxford University Press.

Ellis, R. (2016). Focus on form: A critical review. *Language Teaching Research*, *20*(3), 405–428. https://doi.org/10.1177/1362168816628627

European Commission & Eurydice (Eds.). (2006). *Content and Language Integrated Learning (CLIL) at school in Europe*. Publications Office.

Extra, G., & Yagmur, K. (2004). Urban Multilingualism in Europe: Immigrant Minority Languages at Home and School. In *Urban Multilingualism in Europe*. Multilingual Matters. https://www.degruyterbrill.com/document/doi/10.21832/9781853597800/html

Fernández-Sanjurjo, J., Fernández-Costales, A., & Arias Blanco, J. M. (2019). Analysing students' content-learning in science in CLIL vs. non-CLIL programmes: Empirical evidence from Spain. *International Journal of Bilingual Education and Bilingualism*, *22*(6), 661–674. https://doi.org/10.1080/13670050.2017.1294142

Finegan, E. (2012). *Language: Its structure and use.* (6th int. ed.). Wadsworth Cengage learning.

Flores, N., & Beardsmore, H. B. (2015). Programs and Structures in Bilingual and Multilingual Education. In W. E. Wright, S. Boun, & O. García (Eds.), *The Handbook of Bilingual and Multilingual Education* (1st ed., pp. 203–222). Wiley. https://doi.org/10.1002/9781118533406.ch12

Forbes, K., Evans, M., Fisher, L., Gayton, A., Liu, Y., & Rutgers, D. (2021). Developing a multilingual identity in the languages classroom: The influence of an identity-based pedagogical intervention. *The Language Learning Journal*, *49*(4), 433–451. https://doi.org/10.1080/09571736.2021.1906733

From Linguistic Diversity to Plurilingual Education: Guide for the Development of Language Education Policies in Europe., Council of Europe (2007). https://rm.coe.int/09000016802fc1c4

Gallo, F., Myachykov, A., Abutalebi, J., DeLuca, V., Ellis, J., Rothman, J., & Wheeldon, L. R. (2025). Bilingualism, sleep, and cognition: An integrative view and open research questions. *Brain and Language*, *260*, 105507. https://doi.org/10.1016/j.bandl.2024.105507

García, O., & Otheguy, R. (2020). Plurilingualism and translanguaging: Commonalities and divergences. *International Journal of Bilingual Education and Bilingualism*, *23*(1), 17–35. https://doi.org/10.1080/13670050.2019.1598932

García, O., & Wei, L. (2014). *Translanguaging: Language, bilingualism and education*. Palgrave Macmillan.

Gogolin, I. (2013). The 'monolingual habitus' as the common feature in teaching in the language of the majority in different countries. *Per Linguam : A Journal of Language Learning*, *13*(2). https://doi.org/10.5785/13-2-187

Gollan, T. H., Montoya, R. I., Cera, C., & Sandoval, T. C. (2008). More use almost always a means a smaller frequency effect: Aging, bilingualism, and the weaker links hypothesis. *Journal of Memory and Language*, *58*(3), 787–814. https://doi.org/10.1016/j.jml.2007.07.001

Gómez Parra, M. E., Huertas Abril, C. A., & Espejo Mohedano, R. (2021). *Key factors to evaluate the impact of bilingual programs: Employability, mobility and intercultural awareness*. https://doi.org/10.30827/portalin.v0i35.15453

González-Lloret, M., & Ortega, L. (2014). Chapter 1. Towards technology-mediated TBLT: An introduction. In M. González-Lloret & L. Ortega (Eds.), *Task-Based Language Teaching* (Vol. 6, pp. 1–22). John Benjamins Publishing Company. https://doi.org/10.1075/tblt.6.01gon

Graham, K. M., Choi, Y., Davoodi, A., Razmeh, S., & Dixon, L. Q. (2018). Language and Content Outcomes of CLIL and EMI: A Systematic Review. *Latin American Journal of Content & Language Integrated Learning*, *11*(1), 19–38. https://doi.org/10.5294/laclil.2018.11.1.2

Grenoble, L. A. (2021). Language Shift. In *Oxford Research Encyclopedia of Linguistics*. https://doi.org/10.1093/acrefore/9780199384655.013.347

Grin, F., & Gazzola, M. (2010). Criteria-based comparison in language policy: Principles and methodology. *Working Papers of the DYLAN Project*, *5*, 10–45.

Grin, F., Sfreddo, C., & Vaillancourt, F. (2011). *The Economics of the Multilingual Workplace*. Routledge. https://doi.org/10.4324/9780203852675

Groff, C., Zwaanswijk, W., Wilson, A., & Saab, N. (2023). Language diversity as resource or as problem? Educator discourses and language policy at high schools in the Netherlands. *International Multilingual Research Journal*, *17*(2), 157–175. https://doi.org/10.1080/19313152.2022.2162761

Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.

Hattie, J., & Timperley, H. (2007). The Power of Feedback. *Review of Educational Research*, *77*(1), 81–112. https://doi.org/10.3102/003465430298487

Heller, M. (2003). Globalization, the new economy, and the commodification of language and identity. *Journal of Sociolinguistics*, *7*(4), 473–492. https://doi.org/10.1111/j.1467-9841.2003.00238.x

Hélot, C., & Cavalli, M. (2017). Bilingual Education in Europe: Dominant Languages. In O. Garcia, A. Lin, & S. May (Eds.), *Bilingual and Multilingual Education* (pp. 1–18). Springer International Publishing. https://doi.org/10.1007/978-3-319-02324-3_26-3

Hemphill, C., & Hemphill, A. (2021). Maximizing Scalability in Literacy Game App Design for Minority Languages. *International Journal of Technology in Education*, *4*(4), 668–680. https://doi.org/10.46328/ijte.138

Hoff, E., Core, C., Place, S., Rumiche, R., Señor, M., & Parra, M. (2012). Dual language exposure and early bilingual development. *Journal of Child Language*, *39*(1), 1–27. https://doi.org/10.1017/S0305000910000759

Hornberger, N. H., & Johnson, D. C. (2007). Slicing the Onion Ethnographically: Layers and Spaces in Multilingual Language Education Policy and Practice. *TESOL Quarterly*, *41*(3), 509–532. https://doi.org/10.1002/j.1545-7249.2007.tb00083.x

Huertas-Abril, C. A., & Palacios-Hidalgo, F. J. (2023). New Possibilities of Artificial Intelligence-Assisted Language Learning (AIALL): Comparing Visions from the East and the West. *Education Sciences*, *13*(12), 1234. https://doi.org/10.3390/educsci13121234

Huertas-Abril, C. A., & Palacios-Hidalgo, F. J. (2025). Artificial intelligence–assisted language learning for all in the new global context. In W. Wei & J. Schnell, *The Routledge Handbook of Endangered and Minority Languages* (1st ed., pp. 355–376). Routledge. https://doi.org/10.4324/9781003439493-27

Hutson, J., Ellsworth, P., & Ellsworth, M. (2024). Preserving Linguistic Diversity in the Digital Age: A Scalable Model for Cultural Heritage Continuity. *Journal of Contemporary Language Research*, *3*(1), 10–19. https://doi.org/10.58803/jclr.v3i1.96

Janssens, R. (2019). Language policies versus language practices: A new language conflict? In G. Caliendo, R. Janssens, S. Slembrouck, & P. Van Avermaet (Eds.), *Urban Multilingualism in Europe* (pp. 13–36). De Gruyter. https://doi.org/10.1515/9781501503207-002

Jäppinen, A.-K. (2005). Thinking and Content Learning of Mathematics and Science as Cognitional Development in Content and Language Integrated Learning (CLIL): Teaching Through a Foreign Language in Finland. *Language and Education*, *19*(2), 147–168. https://doi.org/10.1080/09500780508668671

Kamalova, L. A., Umbetova, M. Zh., & Putulyan, N. S. (2020). Technologies and Practices of Linguistic and Sociocultural Adaptation of Foreign Students during Their Studies at the University. *Contemporary Educational Technology*, *13*(1), ep288. https://doi.org/10.30935/cedtech/9312

Kavadias, D. (2004). *De school als politieke leeromgeving: De (beperkte) invloed van het secundair onderwijs op politiek relevante houdingen van jongeren in Vlaanderen*. Vrije Universiteit Brussel.

Kirss, L., Säälik, Ü., Pedaste, M., & Leijen, Ä. (2020). A Synthesis of Theoretical Frameworks on Multilingual Education for School Leaders. *Trames (Tallinn)*, *XXIV*(1), 27–51.

Lam, W. S. E. (2000). L2 Literacy and the Design of the Self: A Case Study of a Teenager Writing on the Internet. *TESOL Quarterly*, *34*(3), 457. https://doi.org/10.2307/3587739

Li, J., Xu ,Ming, & and Chen, J. (2022). A Bourdieusian analysis of the multilingualism in a poverty-stricken ethnic minority area: Can linguistic capital be transferred to economic capital? *Journal of Multilingual and Multicultural Development*, *43*(2), 122–139. https://doi.org/10.1080/01434632.2020.1733585

Li, M. (2024). The Impact of ChatGPT on Teaching and Learning in Higher Education: Challenges, Opportunities, and Future Scope. In M. Khosrow-Pour, D.B.A. (Ed.), *Advances in Information Quality and Management* (pp. 1–20). IGI Global. https://doi.org/10.4018/978-1-6684-7366-5.ch079

Li, Q. (2022). A Study on Mobile Resources for Language Education of Preschool Children Based on Wireless Network Technology in Artificial Intelligence Context. *Computational and Mathematical Methods in Medicine*, *2022*, 1–10. https://doi.org/10.1155/2022/6206394

Lightbown, P., & Spada, N. (2013). *How languages are learned* (4. ed). Oxford Univ. Press.

Lippi-Green, R. (2006). *English with an accent: Language, ideology, and discrimination in the United States.* (Reprint). Routledge.

Little, D., & Kirwan, D. (2018). From plurilingual repertoires to language awareness: Developing primary pupils' proficiency in the language of schooling. In C. Hélot, C. Frijns, K. Van Gorp, & S. Sierens (Eds.), *Language Awareness in Multilingual Classrooms in Europe* (pp. 169–206). De Gruyter. https://doi.org/10.1515/9781501501326-006

Ljosland, R. (2017). Teaching through English: Monolingual Policy Meets Multilingual Practice. *HERMES - Journal of Language and Communication in Business*, *45*, 99–113. https://doi.org/10.7146/hjlcb.v23i45.97349

Long, M. H. (1996). The Role of the Linguistic Environment in Second Language Acquisition. In *Handbook of Second Language Acquisition* (pp. 413–468). Elsevier. https://doi.org/10.1016/B978-012589042-7/50015-3

López Blanco, J. D. (2025). Do languages open doors? A theoretical model of linguistic capital and (im)mobility and its application in Spanish youth migration. *Journal of Ethnic and Migration Studies*, *51*(3), 565–582. https://doi.org/10.1080/1369183X.2024.2359676

Lorenzo, F., Granados, A., & Ávila, I. (2019). The development of cognitive academic language proficiency in multilingual education: Evidence of a longitudinal study on the language of history. *Journal of English for Academic Purposes*, *41*, 100767-. https://doi.org/10.1016/j.jeap.2019.06.010

M. Minei, E., Razuvaeva, T., & Dyshko, D. (2021). Modern day digital pen pals: A semester-long Collaborative Online International Learning (COIL) project. *Communication Teacher*, *35*(4), 336–344. https://doi.org/10.1080/17404622.2021.1887906

Marks, G. (1993). 23 Structural Policy and Multilevel Governance in the EC. In A. W. Cafruny & G. G. Rosenthal (Eds.), *The State of the European Community* (pp. 391–410). Lynne Rienner Publishers. https://doi.org/10.1515/9781685856540-024

Mattioda, M. M. (2024). Intelligence artificielle et diversité linguistique: Quelle gestion équitable pour la garantie des droits linguistiques ? *Language Problems and Language Planning*, *48*(2), 146–167. https://doi.org/10.1075/lplp.00118.mat

Medgyes, P., & Malderez, A. (Eds.). (1996). *Changing perspectives in teacher education* (1. publ). Macmillan Heinemann English Language Teaching.

Meier, G. S. (2017). The multilingual turn as a critical movement in education: Assumptions, challenges and a need for reflection. *Applied Linguistics Review*, *8*(1), 131–161. https://doi.org/10.1515/applirev-2016-2010

Mijts, E. (2021). *The situated construction of language ideologies in Aruba: A study among participants in the language planning and policy process*. University of Antwerp, Ghent University.

Mohd Tahir, Z., Haron, H., & Kaur, J. (2018). Ubiquitous Learning Environment and Technologies: A Review. *International Journal of Engineering & Technology*, *7*(3.15), 31. https://doi.org/10.14419/ijet.v7i3.15.17402

Norton, B. (2013). *Identity and Language Learning: Extending the Conversation* (2nd ed). Multilingual Matters.

Nusche, D. (2009). *What Works in Migrant Education?: A Review of Evidence and Policy Options* (OECD Education Working Papers No. 22; OECD Education Working Papers, Vol. 22). https://doi.org/10.1787/227131784531

OECD. (2010). *Educating Teachers for Diversity: Meeting the Challenge*. OECD. https://doi.org/10.1787/9789264079731-en

OECD. (2023). *OECD Digital Education Outlook 2023: Towards an Effective Digital Education Ecosystem*. OECD. https://doi.org/10.1787/c74f03de-en

Ogunseiju, O. O., Akanmu, A. A., & Bairaktarova, D. (2021). Mixed reality based environment for learning sensing technology applications in construction. *Journal of Information Technology in Construction*, *26*, 863–885. https://doi.org/10.36680/j.itcon.2021.046

Okal, B. O. (2014). Benefits of Multilingualism in Education. *Universal Journal of Educational Research*, *2*(3), 223–229. https://doi.org/10.13189/ujer.2014.020304

Oliech Owidi, S., K. Omieno, K., & Nabwire Lyanda, J. (2024). Exploring the Potential of Immersive Technologies to Enhance Online Learning Experiences and Engagement: A Systematic Literature Review. *International Journal of Innovative Science and Research Technology (IJISRT)*, 1862–1871. https://doi.org/10.38124/ijisrt/IJISRT24SEP1144

Ortega, L. (2014). *Understanding Second Language Acquisition*. Taylor and Francis.

Piller, I. (2016). *Linguistic diversity and social justice .: An introduction to applied sociolinguistics*. Oxford University Press.

Porras, D. A., Ee, J., & Gándara, P. (2014). Employer Preferences: Do Bilingual Applicants and Employees Experience an Advantage? In *The Bilingual Advantage* (pp. 234–258). Multilingual Matters. https://www.degruyterbrill.com/document/doi/10.21832/9781783092437-011/html

Portocarrero, J. S., Burright, R. G., & Donovick, P. J. (2007). Vocabulary and verbal fluency of bilingual and monolingual college students. *Archives of Clinical Neuropsychology: The Official Journal of the National Academy of Neuropsychologists*, *22*(3), 415–422. https://doi.org/10.1016/j.acn.2007.01.015

Promoting Language Learning and Linguistic Diversity: An Action Plan 2004–2006, No. COM(2003), European Commission, 449 (2003). https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:52003DC0449

Quinteros Baumgart, C., & Billick, S. B. (2018). Positive Cognitive Effects of Bilingualism and Multilingualism on Cerebral Function: A Review. *The Psychiatric Quarterly*, *89*(2), 273–283. https://doi.org/10.1007/s11126-017-9532-9

Ricento, T. K., & Hornberger, N. H. (1996). Unpeeling the Onion: Language Planning and Policy and the ELT Professional. *TESOL Quarterly*, *30*(3), 401. https://doi.org/10.2307/3587691

Richards, J. C. (2001). *Curriculum Development in Language Teaching* (1st ed.). Cambridge University Press. https://doi.org/10.1017/CBO9780511667220

Robertson, D. A., Savva, G. M., & Kenny, R. A. (2013). Frailty and cognitive impairment–A review of the evidence and causal mechanisms. *Ageing Research Reviews*, *12*(4), 840–851. https://doi.org/10.1016/j.arr.2013.06.004

Rubio-Alcalá, F. D. (2017). 11. The Links Between Self-Esteem and Language Anxiety and Implications for the Classroom. In C. Gkonou, M. Daubney, & J.-M. Dewaele (Eds.), *New Insights into Language Anxiety* (pp. 198–216). Multilingual Matters. https://doi.org/10.21832/9781783097722-012

Ruiz, R. (1984). Orientations in Language Planning. In N. H. Hornberger (Ed.), *Honoring Richard Ruiz and his Work on Language Planning and Bilingual Education* (pp. 13–32). Multilingual Matters. https://doi.org/10.21832/9781783096701-004

San Isidro Agrelo, F. X. (2019). *The multi-faceted effects of CLIL: a literature review*. *4*, 33–49.

Schroedler, T. (2018). *The Value of Foreign Language Learning: A Study on Linguistic Capital and the Economic Value of Language Skills* (1st ed. 2018.). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-19736-0

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, *2*(1), 3–10.

Sierens, S., & Avermaet, P. (2014). Language diversity in education: Evolving from multilingual education to functional multilingual learning. In *Managing Diversity in Education* (pp. 204–222). https://doi.org/10.21832/9781783090815-014

Șișianu, A., & Pușcașu, A. (2024). Methods of Assessing Students' Knowledge in English Language Lessons. *JOURNAL OF SOCIAL SCIENCES*, *7*(3), 234–242. https://doi.org/10.52326/jss.utm.2024.7(3).16

Skutnabb-Kangas, T. (2013). *Linguistic Genocide in Education–Or Worldwide Diversity and Human Rights?* Routledge. https://doi.org/10.4324/9781410605191

Skutnabb-Kangas, T., & Phillipson, R. (with Rannut, M.). (1994). *Linguistic human rights: Overcoming linguistic discrimination*. de Gruyter.

Slembrouck, S., Van Avermaet, P., & Van Gorp, K. (2018). Strategies of Multilingualism in Education for Minority Children. In P. Van Avermaet, S. Slembrouck, K. Van Gorp, S. Sierens, & K. Maryns (Eds.), *The Multilingual Edge of Education* (pp. 9–39). Palgrave Macmillan UK. https://doi.org/10.1057/978-1-137-54856-6_2

Smeins, E. M., Wildenburg, K., & Duarte, J. (2022). The Use of Digital Tools in Pre-Service Teachers' Professional Development Towards Linguistic Diversity in Primary Education. *Sustainable Multilingualism*, *21*(1), 166–196. https://doi.org/10.2478/sm-2022-0017

Soto, L. D., Smrekar, J. L., & Nekcovei, D. L. (1999). Preserving Home Languages and Cultures in the Classroom: Challenges and Opportunities. *Directions in Language and Education*.

Spolsky, B. (2003). *Language Policy* (1st ed.). Cambridge University Press. https://doi.org/10.1017/CBO9780511615245

Stockwell, G., & Reinders, H. (2019). Technology, Motivation and Autonomy, and Teacher Psychology in Language Learning: Exploring the Myths and Possibilities. *Annual Review of Applied Linguistics*, *39*, 40–51. https://doi.org/10.1017/S0267190519000084

Stohler, U. (2006). The acquisition of knowledge in bilingual learning: An empirical study on the role of language in content learning. *VIEWS-Vienna English Working Papers*, *15*(3), 41–46.

Sundqvist, P., & Sylvén, L. K. (2016). *Extramural English in Teaching and Learning: From Theory and Research to Practice*. Palgrave Macmillan UK. https://doi.org/10.1057/978-1-137-46048-6

Surmont, J., Struys, E., & Somers, T. (2015). Creating a framework for a large-scale implementation of Content and Language Integrated Learning: The first steps. *European Journal of Language Policy*, *7*(1), 29–41. https://doi.org/10.3828/ejlp.2015.3

Swain, M. (1995). Three functions of output in second language learning. In G. Cook & B. Seidlhofer (Eds.), *Principle and practice in applied linguistics: Studies in honour of H. G. Widdowson* (pp. 125–144). Oxford University Press.

Tamtik, M., & Colorado, C. (2022). Multi-level governance framework and its applicability to education policy research–The Canadian perspective. *Research in Education*, *114*(1), 20–44. https://doi.org/10.1177/00345237221140141

Tender, T., & Vihalemm, T. (2009). "TWO LANGUAGES IN ADDITION TO MOTHER TONGUE" – WILL THIS POLICY PRESERVE LINGUISTIC DIVERSITY IN EUROPE? *Trames. Journal of the Humanities and Social Sciences*, *13*(1), 41. https://doi.org/10.3176/tr.2009.1.03

Thomas, W., & Collier, V. (2002). *A National Study of School Effectiveness for Language Minority Students' Long-Term Academic Achievement*. https://escholarship.org/content/qt65j213pt/qt65j213pt.pdf

Thorne, S. L. (2013). Digital literacies and language learning. In J. E. Lee & P. C. Ziegler (Eds.), *Language learning in a digital world* (pp. 43–62). John Benjamins Publishing Company.

Thorne, S. L., Black, R. W., & Sykes, J. M. (2009). Second Language Use, Socialization, and Learning in Internet Interest Communities and Online Gaming. *The Modern Language Journal*, *93*(s1), 802–821. https://doi.org/10.1111/j.1540-4781.2009.00974.x

Universal Declaration on Cultural Diversity, General Conference 2nd November 2001. (2001). United Nations Educational, Scientific and Cultural Organization. https://www.ohchr.org/en/instruments-mechanisms/instruments/universal-declaration-cultural-diversity

Van Avermaet, P., & Sierens, S. (2010). Taaldiversiteit in het onderwijs: Van meertalig onderwijs naar functioneel veeltalig leren. In Van Avermaet, Piet, K. Van den Branden, & L. Heylen (Eds.), *Goed gegokt? Reflecties op twintig jaar gelijke-onderwijskansenbeleid in Vlaanderen* (pp. 45–64). Garant.

Van De Craen, P., Surmont, J., Ceuleers, E., & Allain, L. (2013). How policies influence multilingual education and the impact of multilingual education on practices. In A.-C. Berthoud, F. Grin, & G. Lüdi (Eds.), *Multilingualism and Diversity Management* (Vol. 2, pp. 353–372). John Benjamins Publishing Company. https://doi.org/10.1075/mdm.2.16cra

Van de Guchte, M., Batenburg, E. V., & Weijen, D. V. (2022). Enhancing target language output through synchronous online learner-learner interaction: The impact of audio-, video-, and text-chat interaction on learner output and affect. *TASK. Journal on Task-Based Language Teaching and Learning*, *2*(2), 218–247. https://doi.org/10.1075/task.21003.guc

Van de Guchte, M., Schols, M., & Van Weijen, D. (n.d.). Rethinking foreign language education: Experiences with the potential of GenAI for oral interaction. *New Insights on Learning (Foreign) Languages with and through AI*.

van den Akker, J., Fasoglio, D., & Mulder, H. (2010). *A curriculum perspective on plurilingual education* (Guide for the Development and Implementation of Curricula for Plurilingual and Intercultural Education). Council of Europe. https://rm.coe.int/16805a1e57

Van den Branden, K. (2022). *How to teach an additional language: To task or not to task?* John Benjamins Publishing Company; Amsterdam.

Van Der Wildt, A., Van Avermaet, P., & Van Houtte, M. (2015). Do birds singing the same song flock together? A mixed-method study on language as a tool for changing social homophily in primary schools in Flanders (Belgium). *International Journal of Intercultural Relations*, *49*, 168–182. https://doi.org/10.1016/j.ijintrel.2015.10.002

Van Lier, L. (Ed.). (2004). *The Ecology and Semiotics of Language Learning: A Sociocultural Perspective* (Vol. 3). Springer Netherlands. https://doi.org/10.1007/1-4020-7912-5

Van Oss, V., Van Avermaet, P., Struys, E., & Vantieghem, W. (2022). An empirical validation study of Spolsky's language policy model. *Current Issues in Language Planning*, *23*(1), 77–95. https://doi.org/10.1080/14664208.2021.1907060

Van Raemdonck, M. (2024). *Beyond one language: An intervention study in supporting teachers to create multilingual policies in secondary classrooms* [Dissertation, Ghent University]. http://hdl.handle.net/1854/LU-01J9KFR26JJHEXNW6KW6E90XGM

Veerman, E., Danbury, E., Duarte, J. D. S., Volman, M., & Gaikhorst, L. (2025). A systematic review of empirical studies into multilingual pedagogies and their outcomes in primary education. *Journal of Multilingual and Multicultural Development*, 1–26. https://doi.org/10.1080/01434632.2025.2472862

Vygotsky, L. S. (1980). *Mind in Society: Development of Higher Psychological Processes* (M. Cole, V. Jolm-Steiner, S. Scribner, & E. Souberman, Eds.). Harvard University Press. https://doi.org/10.2307/j.ctvjf9vz4

Wessel-Powell, C., Buchholz, B. A., & Brownell, C. J. (2019). Polic(y)ing time and curriculum: How teachers critically negotiate restrictive policies. *English Teaching: Practice & Critique*, *18*(2), 170–187. https://doi.org/10.1108/ETPC-12-2018-0116

Wode, H. (1999). Immersion teaching: A European perspective. In F. R. Garotti (Ed.), *L'immersione linguistica: Una nuova prospettiva* (pp. 78–94). FrancoAngeli,.

Woumans, E., Surmont, J., Struys, E., & Duyck, W. (2016). The Longitudinal Effect of Bilingual Immersion Schooling on Cognitive Control and Intelligence*. *Language Learning*, *66*(S2), 76–91. https://doi.org/10.1111/lang.12171

Yang, D., & Baldwin, S. J. (2020). Using Technology to Support Student Learning in an Integrated STEM Learning Environment. *International Journal of Technology in Education and Science*, *4*(1), 1–11. https://doi.org/10.46328/ijtes.v4i1.22

Zhang, X., & Zhou, M. (2023). Information and digital technology-assisted interventions to improve intercultural competence: A meta-analytical review. *Computers & Education*, *194*, 104697. https://doi.org/10.1016/j.compedu.2022.104697

Zhao, K., Ye, X., Zhang, Y., & Wienold, T. (2021). Developing Language Operative Capacity in a Subsidiary of a German MNC in China. *Círculo de Lingüística Aplicada a La Comunicación*, *86*, 55–67. https://doi.org/10.5209/clac.75495

Zschomler, S. (2019). 'Language Is Your Dignity': Migration, Linguistic Capital, and the Experience of Re/De-Valuation. *Languages (Basel)*, *4*(3), 64-. https://doi.org/10.3390/languages4030064