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Comparative analysis of critical literacy in lower secondary curricula in Finland, Italy and Spain: implications for CLIL

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ABSTRACT

Critical literacy (CL), which refers to the use of diverse communication media to analyse and critique everyday social practices, has often been credited with advancing inclusion and diversity in schools. However, criticality has been seen as a missing dimension in Content and Language Integrated Learning (CLIL), and the extent to which it figures in mainstream curricular documents is unclear. In this scenario, we aim to determine how CL is represented in lower secondary curricula in different national contexts and subject areas. We examined curricula in history and biology subjects, which are commonly taught through a CLIL approach, in three national contexts: Finland, Italy, and Spain. We used a combination of bottom-up and top-down approaches, complementing an analysis of curriculum documents with a coding process informed by CL and Critical Thinking (CT) theories. The study reveals that CT and CL are present in both biology and history, but are emphasised differently across countries. Biology curricula tend to integrate CL more visibly, while history favours CT despite its disciplinary potential for perspective-taking. These differences highlight the need for greater balance and explicitness in how criticality is represented across subjects, with implications for designing curricula that better support criticality, both in mainstream and CLIL contexts.

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Introduction

Disciplinary literacy (DL) has emerged as a powerful lens for understanding how students learn within and across school subjects. Rather than treating literacy as a set of general skills, DL emphasises that each discipline has its own ways of constructing, validating, and communicating knowledge (Shanahan and Shanahan 2008). To participate meaningfully in disciplinary communities of practice, learners must not only acquire content but also engage with the discursive and semiotic practices through which disciplinary knowledge is produced and legitimised. Crucially, these practices are not acquired incidentally: curricula play a central role in mediating access to disciplinary ways of knowing by defining what counts as valid knowledge, which practices are prioritised, and how learning is sequenced and assessed (Monte-Sano, De La Paz, and Felton 2014; Shanahan and Shanahan 2012).

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This curriculum-mediated view of DL becomes particularly salient in multilingual educational settings such as Content and Language Integrated Learning (CLIL) and English-Medium Instruction (EMI), where subject learning takes place through a foreign/additional language (Llinares and Morton 2017). While the dual demand of processing content and language simultaneously is often framed as a challenge, it also creates opportunities for deeper engagement with disciplinary knowledge. Students articulate ideas, reason through problems, and negotiate meaning using multiple linguistic and semiotic resources (Coyle and Meyer 2021). However, the realisation of such opportunities depends not only on pedagogy but also on how curricula frame disciplinary knowledge, language use, and learner agency.

In response to these realities, bi-/multilingual disciplinary literacies (BMDLs) have been developed, most prominently within the CLILNetLE COST Action. BMDLs conceptualise DL as a dynamic and context-sensitive construct integrating multilingual, multimodal, functional, technological, and critical dimensions (Nikula et al. 2024). This framework foregrounds that graphs, diagrams, and formulas are as central to disciplinary meaning-making as language, and that multilingual resources support flexible engagement with disciplinary problems. At its core, BMDLs position literacy as the capacity to mobilise diverse resources for participation in disciplinary communities of practice. However, the critical dimension remains underdeveloped in both research and policy. Although acknowledged as integral, curricular frameworks rarely make criticality explicit or operationalise it in relation to subject-specific goals. In a recent article, Nikula et al. (2026) conceptualise criticality as comprising two interconnected perspectives: (1) Critical Thinking (CT), which extends beyond reasoning processes (e.g. analysis), and (2) Critical Literacy (CL), which highlights questioning disciplinary authority, examining whose voices are foregrounded or marginalised, and reflecting on the social and ideological conditions of knowledge production and circulation (Lorenzo et al. 2024).

Clarifying the relationship between CT and CL helps to further specify criticality in education. CT is commonly associated with cognitive skills such as analysis, evaluation, and inference (Abrami et al. 2015), whereas CL foregrounds the ideological nature of texts and discourses, emphasising the need to identify bias, recognise power relations, and challenge dominant narratives (Giselsson 2020). While CT provides an essential foundation for disciplined reasoning, CL extends this by situating reasoning within broader social, cultural, and political contexts (Arifin 2024). However, existing research suggests that curricular documents tend to prioritise CT-related competencies, often leaving the socio-political dimensions of criticality underdeveloped (Cananau, Edling, and Haglund 2025).

From this perspective, the limited curricular articulation of criticality is not unique to CLIL but reflects a broader pattern across mainstream education. In CLIL contexts, however, this absence becomes particularly consequential, given the close relationship between language, knowledge construction, and power. Although CLIL frameworks, most notably the 4Cs model of content, communication, cognition, and culture (Coyle, Hood, and Marsh 2010), have made important contributions to bilingual education, scholars have noted that criticality remains underdeveloped or implicit (Sakamoto 2022). Without explicit curricular guidance, CLIL risks treating language as a neutral conduit for content rather than as a semiotic resource that shapes disciplinary meaning, identity, and ideology. At the same time, CLIL offers pedagogical spaces fostering criticality. Inquiry-based, translanguaging, and dialogic approaches support learners in mobilising linguistic repertoires, interrogating disciplinary assumptions, and engaging with multiple perspectives (Stewart et al. 2022). However, for such potential to be realised systematically, curricular frameworks must make criticality visible, intentional, and discipline-specific. Existing national curricula often reference critical reflection or democratic participation only in general terms, without clearly linking these aims to disciplinary knowledge and practices (Morton 2023).

Against this background, the present study investigates how CL is explicitly or implicitly invoked in three national curricula (Finland, Italy and Spain), focusing on history and biology at the lower secondary level (Grades 7–9), and which components of criticality are emphasised in relation to

these subjects. History and biology were selected not only because they are compulsory across the three systems, but also because of their contrasting epistemic orientations: history foregrounds interpretation and perspective-taking, whereas biology emphasises conceptual reasoning and explanatory practices. Together, they provide a productive lens for examining how criticality is framed in disciplinary and curricular terms.

By analysing curriculum documents, the study sheds light on how criticality is positioned, where opportunities for its development are constrained, and how it might be more systematically integrated. While the curricula were not designed for CLIL, they are taught using a CLIL methodology in all three countries, and so it is justified that they are analysed from a CLIL and multilingual perspective. Ultimately, the study contributes to a reconceptualisation of bi-/multilingual disciplinary literacies by incorporating criticality as an operationalised analytical dimension. Such a reconceptualisation can inform curriculum design and instructional practices that support learners not only in engaging with disciplinary knowledge but also in critically examining how that knowledge is produced, legitimised, and circulated.

Background of the study

Disciplinary literacy in education

Disciplinary literacy (DL) recognises that each academic discipline develops its own ways of constructing, communicating, and validating knowledge (Moje 2015; Shanahan and Shanahan 2008). From this perspective, DL is not a generalisable skill but a discipline-specific repertoire shaped by epistemological norms and knowledge-making practices. Learning history or mathematics therefore involves not only acquiring concepts and skills, but also becoming familiar with the conventions through which knowledge is argued, represented, and legitimised (Fang and Coatoam 2013). Importantly, curricula play a structuring role in this process by defining what counts as legitimate knowledge, prioritising particular literacy practices, and rendering disciplinary epistemologies more or less visible through learning goals, assessment criteria, and progression descriptors (Shanahan and Shanahan 2012).

DL is typically contrasted with two related notions (Shanahan and Shanahan 2008). General academic literacy emphasises cross-curricular competencies, while content-area literacy is often reduced to study skills that support comprehension. DL, by contrast, foregrounds the semiotic and epistemic features that define disciplinary knowledge-making. It requires learners to understand why particular genres and modes of representation are privileged, how validity is established, and which epistemic values underpin disciplinary practices. In this way, reading a historical source is fundamentally different from engaging with a scientific text or solving a mathematical problem. Developing DL thus entails learning to think and communicate like disciplinary experts, a process that depends on the extent to which curricula explicitly foreground disciplinary inquiry rather than content reproduction (e.g. Monte-Sano, De La Paz, and Felton 2014).

The conceptualisation of DL has been further expanded by frameworks such as the pluriliteracies approach, which conceives disciplinary learning as a progressive developmental process in which conceptual knowledge and its linguistic and semiotic expression advance interdependently (Coyle and Meyer 2021). A review by Bagalová and Kováčiková (2025) shows how CLIL research has shifted from monolingual perspectives toward integrated approaches embedding disciplinary content in language learning. However, empirical studies indicate that the implementation of DL within CLIL remains uneven and strongly constrained by curricular frameworks. For instance, Guzmán-Alcón and Lorenzo (2025), drawing on survey data from fifty European CLIL teachers, reveal substantial variation in DL practices linked to insufficient training, limited resources, and weak curricular guidance. These findings echo broader concerns that CLIL programmes, though promising in theory, often fall short in practice due to structural and pedagogical constraints, including the absence of explicit curricular support for DL development (Morton 2023).

The COST CLIL Network for Languages in Education (CLILNetLE) has advanced this discussion by proposing BMDLs, an integrative framework encompassing multimodal, multilingual, functional, technological, and critical dimensions (Hüttner, Llinares, and Nikula 2025; Nikula et al. 2024). This framework recognises that DL extends beyond linguistic skills to include mobilising semiotic resources across languages, constructing meaning through graphs, diagrams, or formulas, and participating in disciplinary discourse communities using diverse tools. Within BMDLs, the critical dimension is central. Hüttner, Llinares, and Nikula (2025) position criticality alongside other components, emphasising that disciplinary practices are ideologically situated rather than neutral. Developing DL thus involves analysing texts from multiple perspectives, recognising bias, valuing linguistic and cultural diversity, and deploying semiotic resources to address disciplinary problems (Coyle and Meyer 2021; Hüttner, Llinares, and Nikula 2025; Nikula et al. 2024).

Despite growing theoretical attention, the critical dimension of DL is often articulated as an aspiration rather than embedded systematically in educational practice. While many approaches foreground diversity, equity, and hybridity as central to disciplinary literacies (Coyle and Meyer 2021), curricula rarely specify how criticality should be integrated into disciplinary learning objectives, pedagogical practices, or assessment criteria (Lorenzo et al. 2024). From this perspective, recent work on critical DL highlights the need to interrogate what knowledge is legitimised, how power relations operate within disciplines, and how disciplinary learning is connected to identities, cultures, and social justice (Dobbs, Vetter, and Schall-Leckrone 2024). However, the translation of these theoretical insights into curricular frameworks remains limited. Studies analysing curriculum documents are therefore crucial for understanding how DL, and particularly its critical dimension, is operationalised, constrained, or rendered invisible in formal educational policy, including but not limited to CLIL contexts.

The conceptualisation of critical literacy

Critical literacy is a pedagogical and intellectual tradition rooted in critical theory and sociocultural perspectives, drawing most prominently on Freire (1970). Beyond cultivating higher-order cognitive skills associated with critical thinking, CL emphasises learners' capacity to analyse, critique, and transform the social norms, power relations, and ideologies embedded in texts, discourses, and practices. Freire's critique of the 'banking model of education' warned against treating students as passive recipients of knowledge and called for dialogic, emancipatory pedagogies that empower learners to question received wisdom and act as agents of change. CL is thus both an educational practice and a political stance, foregrounding justice, equity, and democratic participation. As Shor (1999) argues, it involves using language not simply to conform to dominant realities but to imagine and enact alternatives.

The principles of CL have been developed over decades. McLaughlin and DeVoogd (2004) frame their orientation around power, reflection, transformation, and action, stressing the need to disrupt the commonplace, examine multiple perspectives, and adapt strategies to specific contexts. Luke (2012) highlights the urgency of CL in a globalised media landscape where governments, corporations, and institutions manage information flows that obscure vested interests. CL cultivates a view of texts as ideological artefacts rather than neutral conveyors of knowledge, whether schoolbooks, policy documents, or digital media. This recognition can range from a 'weaker' version, which trains students to perceive bias and subjectivity, to a 'stronger' version, which equips them to challenge and transform structures of inequality. Comber (2015) further underscores CL's social justice dimension, arguing that CL pedagogies should problematise structural inequities and power relations in society, including those related to poverty, inequality, and exclusion, thereby positioning issues such as gender inequality, migration, and environmental challenges as central to fostering critical agency.

The notion of criticality encompasses CT and CL, and clarifying their relationship remains crucial for educational research and practice. CT is generally defined as a set of disciplined cognitive

processes, such as interpretation, analysis, inference, evaluation, and explanation, together with dispositions such as open-mindedness, scepticism, and willingness to reconsider views (Abrami et al. 2015). These skills are widely regarded as essential for inquiry, reasoning, and problem-solving across disciplines. On the other hand, CL adopts an explicitly political stance, interrogating how knowledge is produced, whose interests it serves, and how texts construct realities that privilege some groups while marginalising others (Gómez Fernández, Mackay, and Escobar Urmeneta 2021). In brief, CT foregrounds logical coherence and evidence-based reasoning as foundational to criticality, whereas CL asks why certain discourses are authorised as 'truth' and how they reproduce or resist domination in relation to power, ideology, and representation.

Empirical studies highlight both synergies and tensions between CL and CT. Arifin (2024) argues that CL underpins CT by cultivating scepticism and the ability to identify manipulation and bias, skills vital for analytic reasoning. Giselsson (2020), however, warns that CL's relativist stance may overlook logical flaws, undermining CT's analytic rigour. Mulcahy (2008) similarly stresses that while CL is transformative and action-oriented, CT is a disciplined reasoning practice aimed at individual empowerment, with social critique only a possible byproduct. Weng (2023) summarises the distinction by describing CL as a pedagogy of reading both 'the word and the world', combining cognitive engagement with socio-political action. These differences matter for curriculum design, where both constructs should be fostered without collapsing one into the other.

Research into curriculum documents shows that opportunities for criticality vary considerably across subjects and contexts. In disciplines such as history and literature, the emphasis on interpretation, narrative, and perspective-taking naturally aligns with CL (Stewart et al. 2022). By contrast, science subjects often require explicit scaffolding to highlight the constructed nature of knowledge. Ødegaard (2018) illustrates how inquiry-based science, when framed around curiosity, argumentation, and model-building, can open possibilities for CL, provided the inquiry goes beyond surface-level problem solving to address epistemological, ontological, and societal dimensions of science. More broadly, research on bilingual and translingual classrooms demonstrates that when students can mobilise their full linguistic repertoires, they can critique dominant representations and reframe knowledge production in more inclusive ways (Gómez Fernández, Mackay, and Escobar Urmeneta 2021). Yet national curricula often fail to embed CL systematically, leaving criticality to emerge in local practices rather than being sustained as an explicit educational aim.

This gap is especially evident in CLIL, which integrates subject learning with language through the '4Cs' of content, communication, cognition, and culture, yet lacks a crucial fifth 'C': criticality (Sakamoto 2022). CLIL often treats language as a neutral vehicle for subject access, overlooking power relations and identity negotiations in language use. In Japan, for example, CLIL is promoted to boost English proficiency and global competitiveness, reinforcing neoliberal discourses that position English as a universal tool of advancement (Sakamoto 2022). Without explicit attention to criticality, CLIL risks reproducing hegemonic ideologies. Although inquiry- and translanguaging-based CLIL can foster critical reasoning and social critique, enabling students to challenge dominant narratives (Stewart et al. 2022), the lack of explicit curricular attention to criticality remains a missed opportunity, given CLIL's cognitive and socio-political potential.

It is against this backdrop that the present study positions itself. Although CL has long featured in policy frameworks and scholarly debates, its integration into national curricula remains uneven and often implicit. While the importance of fostering critical reflection, democratic citizenship, and social justice is widely acknowledged, limited systematic attention has been paid to how CL is embedded in national policy documents, subject syllabi, CLIL programmes, or assessment frameworks. This study, therefore, investigates how CL is conceptualised across three national curricula, focusing on whether and how it is explicitly or implicitly invoked and which components of criticality are emphasised. The research is guided by two central questions:

(1) How is CL explicitly or implicitly invoked in the curricula documents?
(2) Which components are emphasised in relation to CL in the three national curricula?

Data and method

Research context and data

The data for this study consist of national curricula from three European contexts (Finland, Italy, and Spain) focusing on two disciplinary areas, biology and history, at the lower secondary level. In all three cases, there are no national curriculum documents designed specifically for CLIL. Instead, CLIL often relies on the national curricula, adapting them as necessary. The choice of biology and history reflects their presence as common, compulsory subjects in each context. Their disciplinary orientations are also relevant for examining the intersections of disciplinary and critical literacies: history foregrounds interpretation, perspective-taking, and narrative construction, while biology requires conceptual mastery, argumentation, and explanatory practices. The authors analysed curriculum documents written in their respective national languages, enabling a close reading of the original texts.

It should be noted that 'lower secondary' is conceptualised slightly differently in each country. In Finland it comprises grades 7-9, in Italy grades 6-8, and in Spain compulsory secondary education (CSE) spans grades 7–10 without a lower/upper subdivision. Moreover, the national curricula do not consistently specify objectives by individual grade, but rather by broader stages, groups of grades, or key milestones. For this reason, we analysed all curriculum extracts pertaining to the first three years of secondary education in each context (grades 7–9 in Finland and Spain, grades 6–8 in Italy), including stage-level, grouped, and grade-specific objectives where available. Analysing the same grade numbers across contexts was not possible, particularly in Italy, where grade 9 belongs to differentiated upper secondary pathways with distinct curricula and its objectives are not distinguished from those of other grades. The following sub-sections introduce each national curriculum in greater detail.

Finland

In Finland, the National Core Curriculum for Basic Education (NCCBE) serves as a nationwide framework guiding the development of local curricula and the organisation of teaching in comprehensive schools, that is, in grades 1–9 (Finnish National Agency for Education 2016). Implemented since 2016, the national curriculum document describes the mission and values of basic education, cross-curricular competencies to be taught in every subject, principles of assessment, guidelines for student welfare and school culture, and objectives and content for each subject, including criteria for final evaluation in grade 9. In Finland, the subjects analysed (biology and history) are taught as individual subjects. The objectives and content of each subject are described holistically for the lower secondary level, which means that the national curriculum does not stipulate yearly objectives for grades 7, 8, and 9. When CLIL programs are implemented, the NCCBE guides the development of local CLIL curricula in ways that ensure students in CLIL programs can achieve the same learning goals as those in mainstream education.

Spain

In Spain, the National Curriculum for compulsory secondary education (grades 7–10) is regulated by the LOMLOE (Organic Law 3/2020, of December 29), which came into force in 2021. The curriculum follows an intermediate decentralisation model: the State defines 60% of content, setting essential elements and competences, while autonomous communities retain 40% flexibility to establish basic knowledge ('saberes básicos'). There is no differentiated curriculum for CLIL programmes as the same subject-specific competences and evaluation criteria are maintained. Autonomous communities may only regulate organisational or methodological aspects of bilingual programmes but cannot modify the official curriculum requirements. It is organised around general competences (linguistic, mathematical, digital) and subject-specific competences, supported by basic knowledge and evaluation criteria. For the subjects analysed (biology and history, grades 7–9), history is taught

together with geography. Biology is taught together with geology in grades 7 and 9, and in some communities also in grade 8. Each subject-specific section includes a general introduction, competences, knowledge, and evaluation criteria, sometimes grouped across grades, sometimes specified separately.

Italy

In Italy, the National Curricular Guidelines for Preschool and First Cycle Education, issued by the Ministry of Education, University and Research, are regulated by Ministerial Decree 254 of 16 November 2012 (Ministerial Decree No. 254, 2012). They took effect in 2013, guiding curricula for grades 1–8 (primary and lower secondary). Although new guidelines were released in 2025, they will not take effect until the 2026/2027 school year, meaning the 2012 guidelines were still in force at the time of this study (Erickson 2025). These guidelines are organised by subject and grade level. Overarching aims are described, followed by milestones for the end of primary and lower secondary school, and specific objectives for grades 3, 5, and 8. In grade 8, the science objectives are divided by discipline: physics and chemistry, astronomy and earth science, and biology. This study analyses the overarching science objectives, as well as those specific to biology, alongside the parallel history objectives (see Table 1). In addition to the national curriculum framework providing the overall curricular structure and competency goals for all subjects and grades, CLIL in Italy operates with the national regulations as a teaching approach in which at least one non-linguistic subject should be taught through a foreign language in secondary education.

Method and data analysis

This study utilised methods for document analysis (e.g. Donovalová 2025) and thematic analysis (Bowen 2009). In an iterative procedure, the authors moved between the data, relevant literature on CL, and a coding scheme that conceptualises criticality, until ultimately agreeing on a set of codes applicable across all datasets.

Following guidelines on thematic analysis (Braun and Clarke 2006), we initially followed a bottom-up approach that moved from the text of the curricular documents towards a first set of codes. In our 'data immersion' stage, pairs of authors read curricular documents written in our respective national languages, searching for extracts that could potentially refer to learners' criticality. This step was exploratory rather than analytic: we did not code the data but bolded and highlighted potentially relevant extracts to gain an initial sense of how criticality appeared in curricula, if at all.

Table 1. Data information.

Subject	Country	Finland	Italy	Spain
History	**Language of analysis**	Finnish	Italian	Spanish
	Word count	2,761 [task of the subject, objectives of instruction in history for grades 7-9, key content areas, guidance and support, final assessment criteria]	1,871 [first cycle history intro, lower secondary history, grade 8 history]	8,908 [CSE history and geography intro, CSE history competences, grades 7–9 history: competences & core knowledge]
Biology	**Language of analysis**	Finnish	Italian	Spanish
	Word count	3,168 [task of the subject, objectives of instruction in biology for grades 7-9, key content areas, objectives related to the learning environments and working methods, final assessment criteria]	967 [first cycle science intro, lower secondary science, grade 8 biology]	4,080 [CSE biology and geology intro, CSE biology competences, grades 7–9 biology: competences & core knowledge]

As we compared our findings across pairs, we noticed that some conceptualisations of criticality differed from Nikula et al.'s (2024) description of DL's critical dimension, which emphasises learners' recognition of bias, perspective, power, and privilege in texts. In contrast, curricular documents often highlighted skills such as sifting data and evaluating claims for validity and coherence, which we viewed as related but distinct competencies. We therefore saw a need to differentiate between those skills associated with 'CL', a pedagogical tradition rooted in Freire's (1970) Pedagogy of the Oppressed (see Luke 2012, for an overview), and those aligned with 'CT'.

Drawing on Giselsson (2020), we distinguished key features of CL, CT, and areas of overlap. CT was marked by logical evaluation, evidence-based reasoning, and argumentation; CL by bias and perspective, power and ideology, and social transformation; and overlap by unspecified criticality, inquiry and reflection, and interdisciplinary criticality. These three types of criticality and their features formed the categories and subcategories of the first draft of our coding scheme. When tested on Spanish curricular documents, some subcategories worked as intended, while others overlapped or lacked coverage. Within CT, an additional category was needed for analysing and interpreting data (analytical skills); within CL, an additional category was needed for shifting students' ways of thinking (transformation of individual dispositions); and within overlap, interdisciplinary criticality could not be distinguished from the other categories. We therefore refined the scheme, wrote descriptors, and illustrated each subcategory with examples from the three curricula, arriving at the final version in Table 2.

After reaching an agreement on the coding scheme, the research team applied a deductive top-down coding process (Fereday and Muir-Cochrane 2006) to extracts reflecting any of the aspects of criticality in Table 2. Coding was conducted in pairs established in the data immersion stage using a shared spreadsheet for each country, where extracts appeared in their original language and in English. To ensure consistency and reliability, all coded extracts were systematically cross-checked within the team, with each pair reading the coding of other countries' curricula. Uncertainties and disagreements were resolved through discussion, and in cases of persistent disagreement, external experts in criticality were consulted. Once the coding was finalised, results were quantified in terms of counts and percentages for each category across countries and subjects. Percentages and raw counts were used to account for differences in document length and structure. These results helped identify patterns in the conceptualisation of criticality across curricula.

Table 2. Coding scheme for the analysis of CL and CT in curricular documents.

Category	Subcategory	Description
Critical thinking	Analytical skills	Sifting through data for analysis or interpretation knowledge production activity
	Logical reasoning	Thinking about the consequences or implications of knowledge that is already out there and known ('if … then')
	Logical evaluation	Assessing claims based on validity and coherence
	Evidence-based reasoning	Using data and empirical evidence to support, construct and/or defend claims or arguments
Critical literacy	Bias & perspective	Identifying subjective influences and multiple perspectives in relation to texts (this can be seen through positive and negative bias, omissions and inclusions)
	Power & ideology	Examining how language and other semiotic systems reflect power relations (in terms of including inequalities of race, class, gender, disability, etc.)
	Transformation of individual dispositions	Acting directly on students' dispositions by aiming for them to accept certain values or beliefs (regardless of which way the ideology is going)
	Social transformation	Encouraging activism or social change, acting directly on students' potential actions (regardless of which way the ideology is going)
Overlap/ ambiguity	Inquiry & reflection	Encourages deep questioning but lacks specificity re: the nature of said questioning
	Unspecified criticality	Uses vague terms like 'think critically' without clarification

Results

In this section, we present the results of the analysis of biology and history curricula in Finland, Italy, and Spain (see Table 3).

We begin with an overall analysis of the main categories of criticality, followed by country-specific results. The same structure is then applied to the subcategories of both biology and history in turn. To facilitate interpretation, the categories are distinguished visually throughout the paper: blue is used to indicate CL, red to indicate CT, and purple to represent overlap or ambiguity.

Biology

In the biology curricula, a total of 98 instances of criticality were identified across the dataset. A cross-country comparison shows that most instances came from the Spanish curriculum (64.3%), followed by the Finnish (22.4%) and the Italian (13.3%), likely due to the differences in word count across these three documents (see Table 1). Examining the distribution of the main categories of criticality shows a relatively balanced representation of 'CT' (48.0%) and 'CL' (41.8%), which appeared with similar frequency (see Figure 1). In contrast, the category 'Overlap & Ambiguity' was less common (10.2%).

Comparing the distribution of the main categories of criticality in the biology curricula of the three countries, Figure 2 shows that the general tendency toward a balance between 'CT' and 'CL' is also reflected in the country-specific data. In the case of Italy, however, 'CT' predominates. The category 'Overlap & Ambiguity' was most frequent in the Spanish curriculum (12.7%), followed by the Italian (7.7%) and Finnish (4.8%) curricula.

Turning to the subcategory results, Figure 3 shows that the most frequently used subcategories belong to the overarching category 'CL', namely 'Transformation of Individual Dispositions' (24.5%) and 'Social Transformation' (19.4%). By contrast, the other two dimensions of CL ('Bias & Perspectives' and 'Power & Ideology') were not represented at all. Within the category 'CT', results show that 'Analytical Skills' was the most commonly used subcategory (16.3%), followed by 'Logical Reasoning' (11.2%). Close behind are 'Logical Evaluation' (9.2%) and 'Evidence-Based Reasoning' (9.2%). Finally, some instances of the two subcategories within 'Overlap &

Table 3. Raw counts and percentages of each subcategory by subject and country.

			Biology			History		
			FI	IT	SP	FI	IT	SP
Critical thinking	Analytical skills	Count	4	4	8	3	8	6
		%	18.2	30.8	12.7	12.5	29.6	12.8
	Logical reasoning	Count	3	3	5	0	9	2
		%	13.6	23.1	7.9	0	33.3	4.3
	Logical evaluation	Count	0	0	9	7	0	3
		%	0	0	14.3	29.2	0	6.4
	Evidence-based reasoning	Count	3	1	5	5	2	7
		%	13.6	7.7	7.9	20.8	7.4	14.9
Critical literacy	Bias & perspective	Count	0	0	0	3	1	0
		%	0	0	0	12.5	3.7	0
	Power & ideology	Count	0	0	0	0	0	1
		%	0	0	0	0	0	2.1
	Transformation of individual dispositions	Count	4	2	18	5	1	11
		%	18.2	15.4	28.6	20.8	3.7	23.4
	Social transformation	Count	7	2	10	0	4	12
		%	31.8	15.4	15.9	0	14.8	25.5
Overlap/ambiguity	Inquiry & reflection	Count	1	1	2	1	1	2
		%	4.1	7.7	3.2	4.2	3.7	4.3
	Unspecified criticality	Count	0	0	6	0	1	3
		%	0	0	9.5	0	3.7	6.4
Total		Count	22	13	63	24	27	47
		%	100.0	100.0	100.0	100.0	100.0	100.0

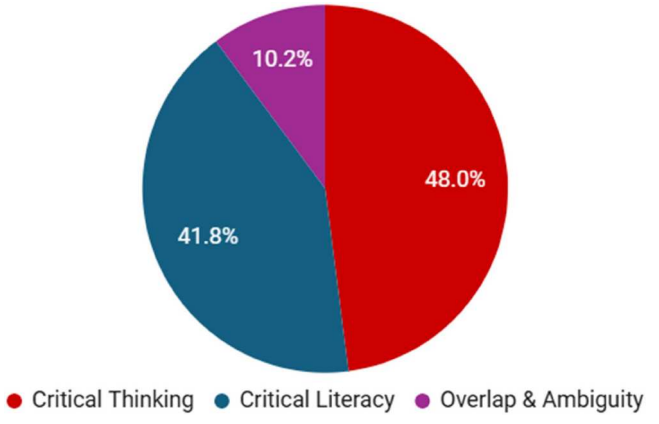

Figure 1. Distribution of main categories of criticality in the biology curricula.

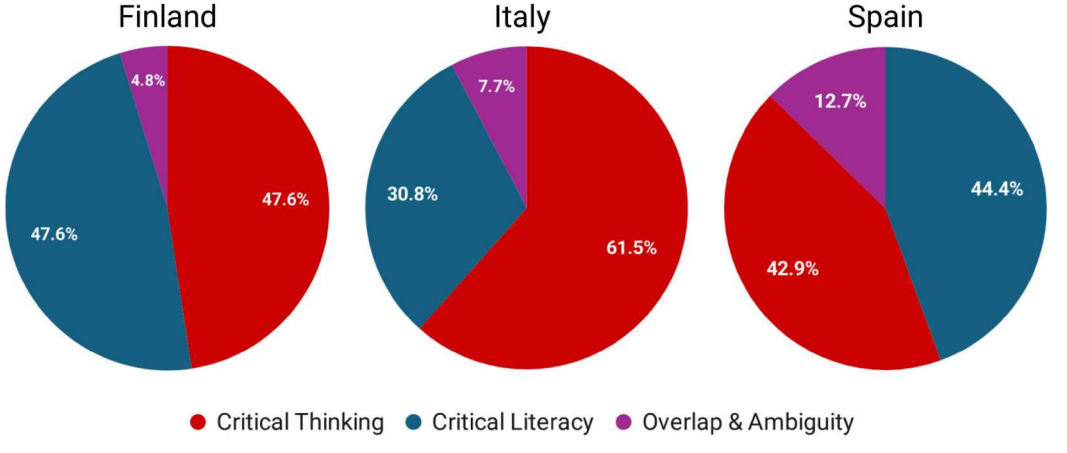

Figure 2. Distribution of main categories in the Finnish, Italian, and Spanish biology curricula.

Ambiguity' were also identified, though to a lesser extent. Specifically, 6.1% of cases were categorised as 'Unspecified Criticality' and 4.1% as 'Inquiry and Reflection'.

Across countries, there are differences in the use of criticality subcategories, in terms of both variety and frequency (see Table 3 and Figure 3 above). The Spanish curriculum includes a total of eight subcategories, followed by the Finnish and Italian curricula with six.

A closer look at each set of country-specific results reveals distinct tendencies. In the Finnish data, the subcategory 'Social Transformation' clearly predominates (31.8%), suggesting an emphasis on fostering students' activism and social change competences related to biological topics in schools. To a lesser extent, but still considerable, efforts are also directed toward 'Analytical Skills' and 'Transformation of Individual Dispositions' (both 18.2%), as well as 'Logical Reasoning' and 'Evidence-Based Reasoning' (13.6%). Regarding the use of vague and unspecified features of criticality ('Overlap & Ambiguity', marked in purple), only minimal evidence was found (4.1%).

When examining the Italian data, it appears that attention is given to fostering students' CT through 'Analytical Skills' (30.8%) and 'Logical Reasoning' (23.1%), which encourage students to sift through data and think about the implications of existing knowledge. Their CL is also developed through 'Transformation of Individual Dispositions' (15.4%) and 'Social Transformation' (15.4%), albeit to a lesser extent.

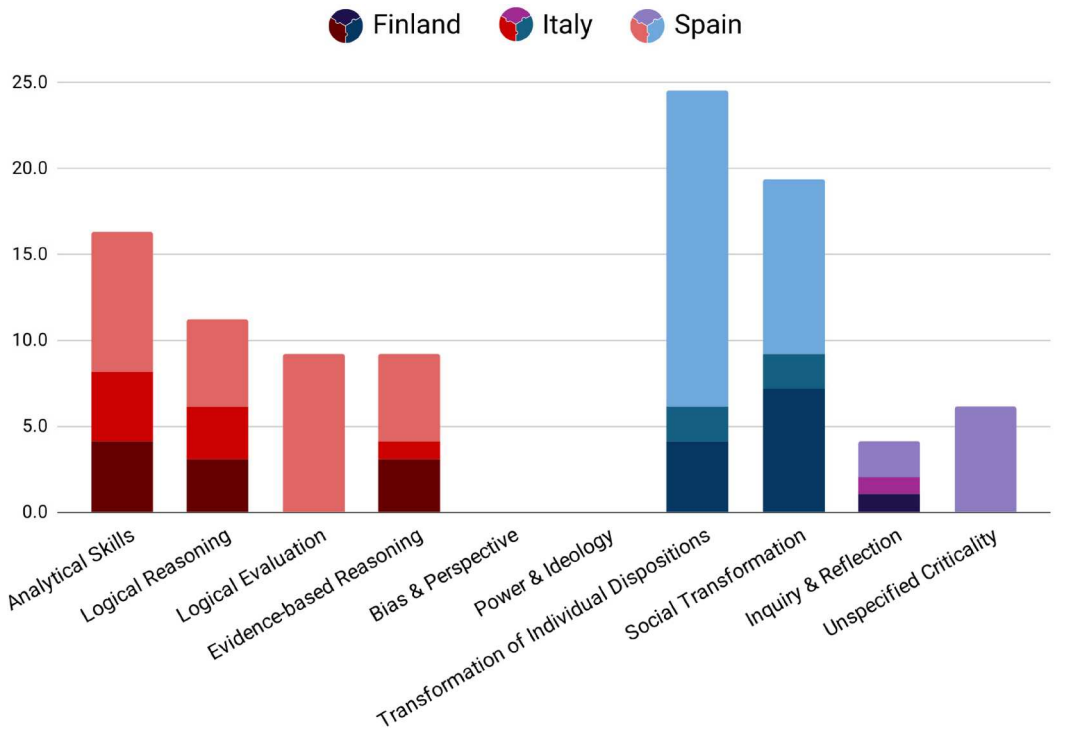

Figure 3. Distribution of subcategories in the biology curricula.

In the case of the Spanish curriculum data, particular emphasis is placed on the 'Transformation of Individual Dispositions' (28.6%), that is, guiding students to accept certain values or beliefs (e.g. preserving diversity of nature, fighting climate change). There is also some emphasis on 'Social Transformation' (15.9%), i.e. activism and social change, in comparable percentages to the Italian curricula. Within CT, all four subcategories are included, with 'Logical Evaluation' (14.3%) being the most prominent, followed by 'Analytical Skills' (12.7%). Regarding 'Overlap & Ambiguity', there is a considerable percentage (12.7%) of such formulations, which cannot easily be categorised as either 'CL' or 'CT'. 'Unspecified Criticality', or the use of vague terms like 'think critically' without further specification, was more common (9.5%) than 'Inquiry & Reflection' (3.2%).

History

A total of 98 instances of criticality were identified across the three history curricula. As in biology, the majority were found in the Spanish curriculum (48.0%), which reflects its higher word count (see Table 3). Similar percentages came from the Finnish (24.5%) and Italian (27.6%) curricula, despite the shorter length of the latter. This suggests that references to criticality may be slightly more concentrated in the Italian curriculum.

Examining the distribution of the main categories of criticality shows that 'CT' dominates to some degree. Approximately half of all instances are related to this category (53.1%), while 'CL' appears less often (34.7%), as illustrated in Figure 4. This distribution indicates greater emphasis on evaluative and analytical thinking processes than on questioning broader power structures and meaning. The category of 'Overlap & Ambiguity', which includes criticality not specific to CT or CL, is clearly smaller (12.2%).

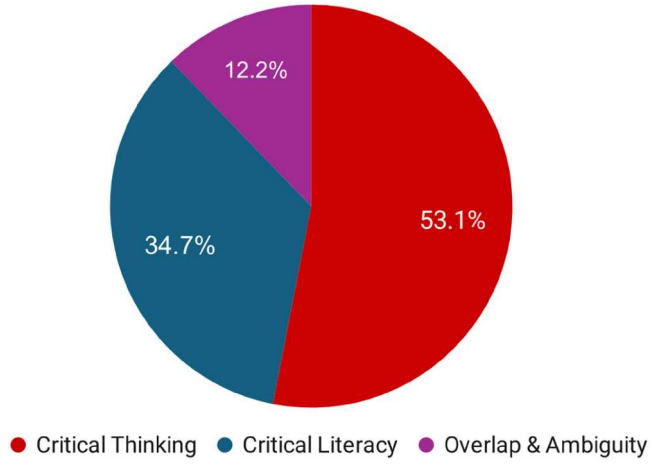

Figure 4. Distribution of main categories of criticality in the history curricula.

Comparing the distribution of the main categories of criticality in the history curricula, Figure 5 shows clear differences in how they address CT and CL. In the Finnish and Italian curricula, CT has a more prominent role than CL. This trend is particularly evident in Italy, where 70.4% of instances related to criticality in history represent 'CT', while 'CL' (22.2%) and 'Overlap & Ambiguity' (7.4%) have a smaller share of the remaining instances. In the Finnish history curriculum, 62.5% of instances are related to 'CT' and 33.3% to 'CL', while only 4.2% represent 'Overlap & Ambiguity'. By contrast, the Spanish history curriculum prioritises 'CL' (51.1%) over 'CT' (38.3%). The Spanish curriculum also has the highest share of instances related to 'Overlap & Ambiguity', with 10.6% of instances highlighting criticality in vague or unspecified ways.

Across all three history curricula, every subcategory of criticality is represented (Figure 6). Within CT, the most frequent are Analytical Skills (17.3%) and Evidence-based Reasoning (14.3%), with Logical Reasoning (11.2%) and Logical Evaluation (10.2%) also present. Within CL, the most frequent are Transformation of Individual Dispositions (17.3%) and Social Transformation (16.3%). By contrast, Bias & Perspective (4.1%) and Power & Ideology (1.0%) appear only marginally, suggesting limited attention to interrogating subjectivity and power in historical texts. Within Overlap & Ambiguity, both Unspecified Criticality and Inquiry & Reflection occur

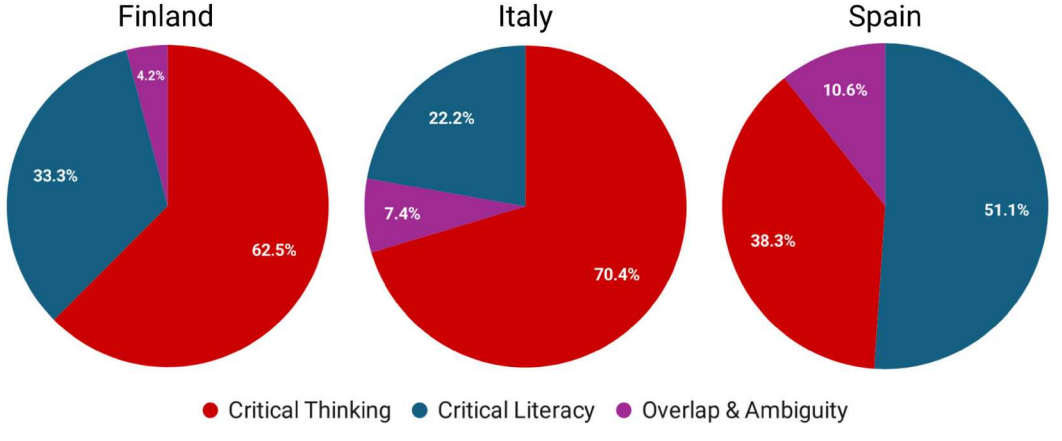

Figure 5. Distribution of main categories in the Finnish, Italian, and Spanish history curricula.

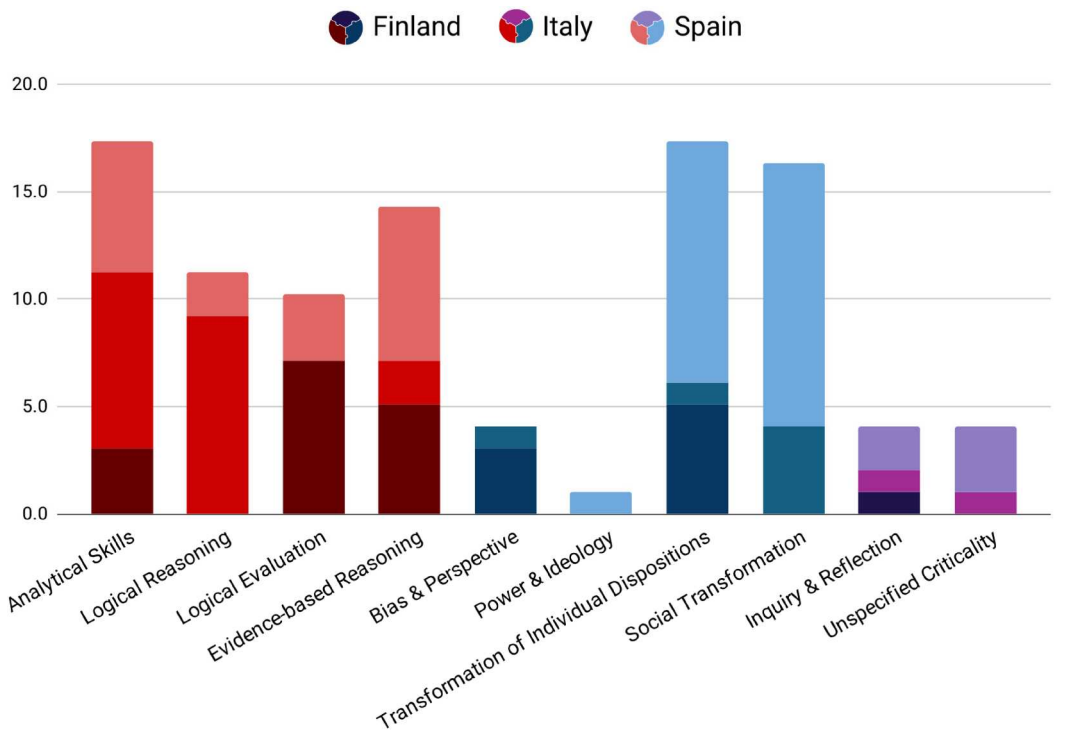

Figure 6. Distribution of subcategories in all the history curricula.

occasionally (4.1% each). Overall, the history curricula frame criticality largely in terms of data analysis and argumentation, with some attention to social engagement, but devote comparatively little space to developing students' ability to identify bias or critique the ideological underpinnings of historical narratives.

From a country-specific perspective, there are slightly different patterns in the use of criticality subcategories, both in terms of variety and frequency. In the Finnish history curriculum (see Table 3), the largest subcategory is 'Logical Evaluation' (29.2%), which falls within the broader category of 'CT'. Thus, the aspect of CT emphasised the most in the Finnish history curriculum is assessing the validity of claims. Other subcategories of 'CT' identified in the data are 'Evidence-based Reasoning' (20.8%) and 'Analytical Skills' (12.5%), which introduce practices of working with data for constructing claims or for analysis, respectively. The subcategory 'Logical Reasoning', which requires thinking about the implications of knowledge, was not present. Within 'CL', only the subcategories 'Transformation of Individual Dispositions' (20.8%) and 'Bias & Perspective' (12.5%) were identified, while 'Social Transformation', which encourages activism or change in society, and 'Power & Ideology', which examines how language and other semiotic systems reflect power relations, were not present. Thus, CL in the Finnish history curriculum aims to affect students' values and beliefs and to help them identify subjective perspectives in texts. Within 'Overlap & Ambiguity', 'Inquiry & Reflection' has a small presence (4.2%), and 'Unspecified Criticality' was not identified. Overall, the Finnish history curriculum highlights cognitive processes and working with data, while aspects of activism and societal change are lacking.

In the Italian history curriculum, two subcategories dominate in 'CT': 'Logical Reasoning' (33.3%), about the implications of knowledge, and 'Analytical Skills' (29.6%), referring to the ability to sift through data to produce knowledge. 'Evidence-based Reasoning' to construct arguments was also present (7.4%), but 'Logical Evaluation' of others' claims was not. Within 'CL', the most common subcategory was 'Social Transformation' (14.8%), and 'Bias & Perspective' and

'Transformation of Individual Dispositions' were mentioned once (3.7%). Students are thus encouraged to drive for change in society, but recognising others' subjectivities and shaping their own are less emphasised. Within 'Overlap & Ambiguity', both 'Inquiry & Reflection' and 'Unspecified Criticality' were also identified once (3.7% each).

In the Spanish history curriculum, the 'CL' subcategories 'Social Transformation' (25.5%) and 'Transformation of Individual Dispositions' (23.4%) are prominent, indicating that the curriculum emphasises change in students' beliefs, values, and actions. By contrast, considerations of 'Power & Ideology' were mentioned only once (2.1%), while 'Bias & Perspective' were not addressed at all. Within 'CT', all four subcategories were included in the history curriculum, with 'Evidence-based Reasoning' (14.9%) and 'Analytical Skills' (12.8%) as the most frequent, thus stressing cognitive processes of knowledge construction. 'Logical Evaluation' (6.4%) and 'Logical Reasoning' (4.3%) play a minor role. Within 'Overlap & Ambiguity', 'Unspecified Criticality' (6.4%) and 'Inquiry & Reflection' (4.3%) also have a small share of the instances of criticality.

Discussion

This study shows that criticality in terms of both CT and CL is present in all three curricula in the biology and history subjects, whether explicitly or implicitly described. The relationship between CT, CL, and 'Overlap & Ambiguity', however, is rather complex as each is invoked differently depending on the subject, subcategory, and country. For example, the Italian curriculum for biology and history and the Finnish curriculum for history more explicitly identify actions related to CT and CL, while 'Overlap & Ambiguity' was present in both subjects in all three curricula (more so in the Spanish curriculum). While for biology all countries manifest a fairly equal distribution between CT and CL, the Italian curriculum has a larger portion of CT. With history, the results indicate a clear emphasis on CL in Spain, whereas in Finland and Italy, CT is more prevalent. This finding suggests that the new reform to provide a more equitable and inclusive education in Spain (Organic Law 3/2020, of December 29) is visible in the national curricula for history and biology. The situation in Finland and Spain indicates an orientation to both CT and CL in national curricula, with CL being incorporated into biology more than history. This is an interesting finding in view of Ødegaard's (2018) observation that CL in biology requires explicit orientation to fundamental questions of science beyond simple problem-solving. Based on our findings, Finland and Spain have found a way to accomplish this for biology, at least at the level of the goals set in the national curricula. For CLIL, this might be noteworthy because science subjects are often perceived as less amenable to critical and socio-political dimensions, particularly when taught through a foreign language. The curricular emphasis on CL in biology in Finland and Spain suggests that national curricula can create space for fostering criticality in CLIL subjects, provided that criticality is explicitly framed as part of disciplinary goals. It is curious, though, how history as a discipline that aligns well with CL (Stewart et al. 2022) does not have a larger CL emphasis in the Finnish and Italian curricula. One reason for this may be that CL is a taken-for-granted aspect of the discipline, one that does not need explication in curricula texts, while another reason for the prevalence of CT is the increased emphasis on knowledge construction.

Turning to the subcategories of CL, the results clearly show that the curricula emphasise 'Transformation of Individual Dispositions' and 'Social Transformation' in both subjects and across all countries, thereby highlighting students' dispositions and actions as being crucial elements of CL. This finding aligns with, for example, Mulcahy's (2008), Luke's (2012), and Comber's (2015) perspectives on CL being an action-oriented practice that equips students to critically read and act on the world in ways that promote social justice, equity, and transformation. However, while there is a small presence of 'Bias & Perspective' and 'Power & Ideology' categories in the history curricula, they are absent in the biology curricula. Such a lack of the two categories creates an imbalance between the four categories and may risk students' learning of how to recognise bias before they are able to make informed, socially responsible actions. Through such an imbalanced

approach, learners are directly taught the 'stronger' perspective of CL without building a foundation first through the 'weaker' one (Luke 2012). This can be dangerous in contexts where undemocratic/unequal values are promoted (e.g. creationist beliefs), leaving learners vulnerable to indoctrination. For a more balanced approach to CL, it would thus be beneficial for all four subcategories to be present in different disciplinary curricula, also beyond those of biology and history.

Although previous research warns against conflating CL and CT (e.g. Giselsson 2020; Luke 2012; Mulcahy 2008), it soon became clear to us that identifying textual instances of CL is not straightforward, as CL and CT are often intertwined. For example, the Spanish biology curriculum states that students will 'analyse the effects of certain actions on the environment and health, based on the foundations of biological and Earth sciences' (logical reasoning), 'to promote and adopt habits that avoid or minimise negative environmental impacts' (social transformation). Despite this overlap, we were able to identify all four subcategories of CT in the data. Analytical Skills was the most frequent, followed by Evidence-Based Reasoning and Logical Reasoning. These findings point to the central role of CT as the foundation for CL: students need well-developed cognitive skills in order to engage critically with texts, perspectives, and social issues.

Based on these findings, we argue that although there are no national-level curricula for CLIL in the three countries in focus, the systematic integration of criticality together with a more language-aware CLIL approach (e.g. Nikula et al. 2016) into mainstream education can advance the cognitive development and socio-political transformation of all kinds of multilingual students across Europe. More importantly, as Sakamoto argues (2022), even for CLIL education, adding the fifth C of criticality is crucial as this will ensure that CLIL becomes transformative, reflexive, and socially just. In practice, this would mean that as disciplinary knowledge is discussed in lessons, it is simultaneously critically viewed, for example, by exploring the motivations for including and emphasising certain content and perspectives while questioning why others are erased or backgrounded. Equally crucial in CLIL is to underscore how learning through another language is never a neutral endeavour: it potentially serves to reproduce hegemonic ideologies unless students are equipped with CL skills to detect and oppose them (Sakamoto 2022).

Adopting a bi- or multilingual approach to DL (Nikula et al., 2026) in both CLIL and mainstream education is paramount for students to develop skills in criticality. As shown by previous research on translingual practices (e.g. Gómez Fernández, Mackay, and Escobar Urmeneta 2021; Stewart et al. 2022), multilingual education not only encourages students to use all of their linguistic repertoires for understanding and challenging prevalent ideologies and hegemonies, but also offers

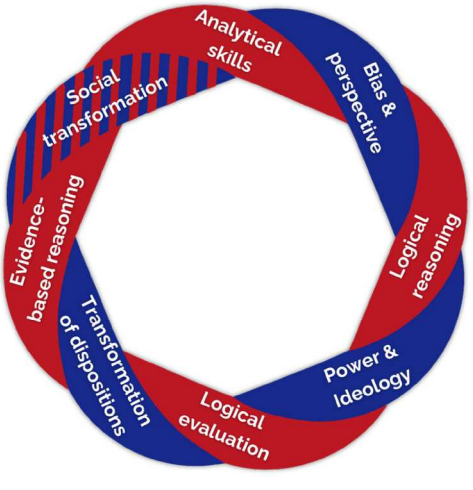

Figure 7. The eight subcategories of CT and CL intertwined in a circular braid.

more inclusive practices and possibilities for students as they take a critical stance on the role language and other media play in discipline-specific knowledge-building. From the viewpoint of multilingual students, be they in CLIL or mainstream education, the challenge is how to scaffold them to do this in an additional language, which is often seen to increase the total cognitive load for students (Dalton-Puffer 2011), in addition to the cognitive processes involved in CT and CL.

Conclusion

By analysing the criticality of the national curricula of two disciplines (i.e. biology and history) in three European countries, we hope to have contributed to the development of CL as an essential element of (BM)DLs. First, our study has answered the call for a clearer distinction and definition of CT and CL in educational practice (Giselsson 2020). We did so by creating four subcategories for each construct, showing the overlap and ambiguity with 2 subcategories, and distinguishing them while showing how their key aspects appear in discipline-specific curricula. While previous research has shown there to be both synergies and tensions between the constructs (e.g. Mulcahy 2008; Weng 2023), we argue that they exhibit a complementary relationship where one cannot exist without the other. This relationship is visualised in Figure 7, where the two constructs with their subcategories intertwine in a circular braid, representing all as essential elements that build on one another. In other words, as one moves forward in a clockwise direction, each subcategory represents a more advanced skill set within a construct, with 'Social Transformation' being the overall aim of CL as a transformative, action-oriented practice focused on social justice, power, and the capacity to reshape the world through diverse media (Luke 2012). As Giselsson (2020) advocates, we can ensure deeper student engagement only by combining analytic rigour, i.e. CT, with social action, i.e. CL. This is what the braid represents.

However, a key limitation of our study is that, by focusing only on national curricula, we cannot know how the curricula goals are implemented in classrooms. For example, it may be that in history lessons, teachers address more issues related to 'Power & Ideology' than the curriculum texts suggest. Another limitation is the coding, since CL and CT often appeared in the same sentence, making subcategory assignment difficult. Although we resolved disagreements through joint analysis, clearer definitions are needed for future research. A more thorough cross-European analysis of different discipline curricula would help validate the coding scheme and its division into CT, CL, and their subcategories.

Since the national curricula in the three countries lack an explicit presence of CL, and until it is made more visible in them, teachers are in a key position to address criticality and to scaffold students to become more aware of it as they implement the curricular goals in their lessons. However, before teachers can help develop their students' skills in criticality, they must first scrutinise their own practices and (language) ideologies through a critical lens, asking themselves questions such as 'Why do I teach the content I teach the way I teach it?' and 'What role does language play in it?' (e.g. Sakamoto 2022; Stewart et al. 2022). To be able to do this, teacher education programs and in-service teacher training sessions are needed to provide the relevant support to teachers, i.e. the knowledge and tools of what criticality entails as shown by our study.

In conclusion, we believe this study offers new insights into how criticality currently appears in national curricula in Europe, while also showing the need for a more balanced approach to CT and CL for both to become more visible and accessible in curricula texts. We also hope to have contributed to theorising the role of CL in the reconceptualisation of DL in European CLIL contexts (Nikula et al. 2026). Our findings highlight that CT and CL are both essential dimensions of criticality, and that this insight should inform the revised reconceptualisation of BMDLs. Finally, we suggest that criticality should be made more explicit in national curriculum documents in order to strengthen their educational impact. The next step would be to explore how the findings of our study are visible in classroom lessons, both of which would provide the empirical evidence for curriculum development and the conceptual foundation of BMDL.

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