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Bridging the Gap with MOOCs: Integrating Languages, Literacies and Content in Plurilingual, Refugee-Receiving Classrooms

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Abstract

This article presents conceptual analysis of two multilingual MOOCs developed within the ILLS-PEC project as a design intervention intended to reframe subject-teacher education for plurilingual, refugee-receiving classrooms. Anchored in Pluriliteracies Teaching for Deeper Learning (PTDL), multiliteracies and Fiction and Content Unified Learning (FACUL), it examines the course's design principles, multilingual task architectures and emerging credentialing mechanisms. At the level of provision, the MOOCs are designed to address a gap in teacher education by reducing linguistic and infrastructural barriers to participation and offering certification of course completion to diverse groups of educators, including those with refugee backgrounds. Informed by participatory design involving stakeholders in partner countries, including input from refugee-community representatives, the courses incorporate accessibility and equity considerations from the outset. Pedagogically, they seek to move beyond monolingual, transmission-oriented models towards design-oriented teaching practices that position learners' full linguistic repertoires, affective experiences and multimodal resources as central to subject learning. At system level, the project is conceptualised asa mediating layer between policy aspirations and everyday practice, offering a potentially scalable model of equity-oriented professional learning whose implementation and impact require future empirical evaluation of impact.

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Key words

MOOCs, refugee-receiving classrooms, inclusive course design, teacher education

1. Introduction

Subject teachers in mainstream classrooms across Europe increasingly teach in plurilingual and refugee-receiving settings, but their degree programmes still largely presuppose teaching contexts in which learners from linguistically homogeneous cohorts and an idealised native-like command of the language of instruction. This mismatch undermines teachers' capacity to integrate language(s), literacies and subject content in ways that support newly arrived and long-term minoritised students, with consequences for educational quality, equity and inclusion.

At system level, schools are confronted with plurilingualism through at least two converging dynamics: on the one hand, European and national language-in-education policies that promote the learning of multiple languages; on the other, intensified migration and forced displacement, which have brought refugee learners, including unprecedented numbers of Ukrainian students in Polish schools, into majority-language subject classrooms. While countries like Germany and Spain have built experience in bilingual programmes and refugee education, mainstream subject-teacher education outside bilingual strands remains overwhelmingly monolingual and rarely addresses disciplinary literacies in a second language or the realities of multilingual, refugee-inclusive classrooms.

This preparation gap is evident in both initial and in-service teacher education. Degree structures for history, science or mathematics often focus narrowly on content, leaving future teachers without conceptual or practical tools for integrating language, multiliteracies and subject learning in linguistically diverse environments. In-service offers, for its part, tends to either reproduce a monolingual norm, or lower expectations for multilingual and refugee learners by treating "refugee education" as an add-on, rather than rethinking pedagogies and assessment through plurilingual and multiliteracies lenses.

The ILLS-PEC project responds to this challenge by developing two open-access MOOCs that explicitly integrate language, literacy and subject teaching within plurilingual, refugee-receiving classrooms. The two MOOCs, one for primary and one for secondary educators are offered in English and translated into Polish, Spanish

and German. They target subject teachers, university students preparing to teach in the majority language, and cultural assistants with refugee backgrounds, and provides around 30 hours of learning with an internationally recognised online certificate. The courses are structured as a five-week learning trajectory that translates theoretical frameworks into concrete, usable tasks, resources and assessment for teacher education.

Week 1 introduces plurilingual and pluriliteracies perspectives through short readings, videos and analysis tasks that ask participants to map classroom and school repertoires and to question how far current practices mobilise or marginalise these resources. The module moves from awareness to curriculum design and reflection, foregrounding meaning-making across languages and modes as a central dimension of subject teaching.

Week 2 deepens this focus by engaging participants in designing and critiquing multimodal materials for content lessons, thereby operationalising multiliteracies as an approach that foregrounds diverse, socially and technologically mediated forms of meaning-making. In doing so, it positions teachers and cultural assistants as designers of learning environments in which images, texts, gestures and digital media are purposefully orchestrated to support subject understanding for diverse learners.

Week 3 centres on Fiction and Content Unified Learning (FACUL), where participants work with fiction-based tasks to explore how subject content, language and literacy can be unified in plurilingual, refugee-receiving classrooms. They use selected episodes from a literary source to approach disciplinary concepts while simultaneously attending to language development and text-based literacies, modelling how fiction can serve as a vehicle for content learning, critical reflection and inclusive participation.

Weeks 4 and 5 shift the focus to diverse learning pathways and multimodal assessment. Through choice-based tasks, differentiation options and language-sensitive supports, participants construct flexible learning trajectories and experiment with assessment formats such as multimodal artifacts, bilingual posters, short video explainers that combine visual, written and audio modes, and small portfolios with guided reflection. These formats embody pluriliteracies and multiliteracies principles while remaining feasible for teacher education and school-based professional development.

The ILLSPEC MOOCs[1] are anchored in Pluriliteracies Teaching for Deeper Learning (PTDL) and biliteracy and multiliteracies approaches, and built on prior work in TEACUP[2] and related Erasmus+ initiatives, as well as the COST Action CLILNetLE[3] initiatives. They aim to reframe subject teaching in diverse classrooms as simultaneously linguistic, literate and disciplinary practice. This article foregrounds innovations in multilingual education and technology-enhanced pedagogies for equity and inclusion. Within this frame, the article conceptualises the MOOCs not primarily as objects of evaluation but as a design intervention at the interface of higher education, teacher professional learning and refugee-inclusive schooling.The aim of this article is to conceptualise the ILLS-PEC MOOCs as a design intervention and to articulate the design principles, task architectures and credentialing mechanisms through which they seek to address persistent inequalities in teacher education for plurilingual, refugee-receiving classrooms.

Rather than reporting a completed evaluation study, we offer a design-oriented project report that reconstructs how these MOOCs translate complex frameworks into a scalable, multilingual professional-learning architecture.

The article proceeds in four steps: first, we situate the project in debates on digital transformation, multilingual education and equity. Second, we introduce the guiding frameworks of PTDL, multiliteracies and FACUL. Third, we reconstruct the MOOCs' design architecture as an intervention addressing identified inequities. Finally, we discuss implications for teacher-education policy and outline priorities for future empirical evaluation.

2. Theoretical framework

2.1 Digital transformation and MOOCs, teacher education and equity

Teacher education often underprepares teachers for multilingual, refugee-inclusive classrooms, while MOOCs represent an ambivalent response: They can scale inclusive professional learning, yet easily reproduce existing inequalities if poorly designed (Darling-Hammond et al., 2017; Laurillard, 2016). Initial and in-service teacher education still largely presupposes a monolingual "ideal speaker", fram-

[1] https://illspec.com/en/

[2] https://teacup-project.eu/site/

[3] https://www.clilnetle.eu/

ing mastery of the language of schooling in quasi-native terms and treating other languages as a problem rather than a resource, a pattern described as a persistent "monolingual habitus" in many European systems (Bergroth et al., 2022). This deficit view is particularly harmful for refugee students, whose multilingual repertoires are rarely built into curriculum, assessment, or everyday pedagogy, despite work on translanguaging and diversity that reconceptualises multilingualism as a resource for learning (García & Wei, 2014; Stewart & Muszyńska, 2025). Research on refugee children's educational experiences in countries of first asylum identifies language barriers, teacher-centred pedagogy and discrimination as challenges with implications for teaching and support after resettlement (Dryden-Peterson, 2016).

Within this landscape, MOOCs and related open online courses have emerged as forms of technology-enhanced professional learning that can address some of these gaps by reaching large numbers of teachers across regions and systems in flexible, low-cost ways (Laurillard, 2016; Walji et al., 2018). The broader MOOC literature shows that participation and completion skew towards already-educated, digitally skilled, often English-proficient learners, so the promise of MOOCs for disadvantaged groups has remained only partially fulfilled (Hollands & Tirthali, 2014; Lambert, 2020).

At the same time, research on MOOCs highlights that questions of access are closely tied to how courses are designed and for whom. Building on Macintyre et al.'s call for more inclusive design and pedagogy, including partnerships with equity group communities, cross-disciplinary collaborations, and the tracking of equity group cohorts within "open to all" programs, we approached our MOOC development as a participatory process rather than a purely technical exercise (Macintyre et al., 2020). Ensuring accessibility in MOOCs is also essential to enable learners with accessibility needs to fully participate and benefit, and Iniesto and Rodrigo emphasise that prioritising accessibility as a principle of social inclusion can enhance the overall effectiveness of online education (Iniesto & Rodrigo, 2024). In line with their recommendation to involve multiple stakeholders through co-creation and participatory design, we worked with diverse partners in each country through online seminars, inviting them to advise on and test the courses. In Poland, for example, this included a Ukrainian cultural assistant who contributed perspectives from refugee learners.

Against this backdrop, offering our MOOC courses in four languages, Polish, Spanish, German and English, directly targets one major source of inequality,

namely the dominance of English and the high language demands that exclude many potential participants. This multilingual provision is intended to reduce linguistic barriers by aligning course languages with the repertoire of teachers and refugee-education practitioners in different national contexts. Our analysis of subject teachers' responses prior to the development indicated that not all potential participants were comfortable studying in English. Providing alternative course languages is therefore intended to support their classes, engagement and completion. In this way, we seek to move closer to the equity promise that early MOOC initiatives articulated but did not fully realise.

Work on language MOOCs further underlines that design choices strongly shape who can participate and how: Learners tend to prefer a balance between constructivist and more guided, instructionist practices, as well as rich, timely feedback, and these preferences vary by sociocultural context, gender and educational stage (Huertas-Abril & Muszyńska, 2022). These findings signal that generic "one-size-fits-all" MOOC designs risk marginalising particular learner groups and that attention to contextualised learning design is essential when positioning MOOCs as equity-oriented professional development. Avoiding the reproduction of inequalities requires deliberate attention to language, technology and recognition in MOOC design and implementation, including multimodal materials, scaffolded academic language, opportunities for local facilitation, and systems that give formal credit to online teacher learning (Laurillard, 2016; OECD, 2020). In this perspective, multilingual provision, open access and credible online certification become crucial design principles rather than technical add-ons. Offering courses and materials in multiple languages with subtitles or parallel resources can widen participation beyond English-dominant elites (UNESCO, 2017; Calafato, 2020). Multilingual, openly accessible and formally recognised MOOCs are not just a new delivery channel; they can act as a structural lever for making teacher education more responsive to linguistic diversity and refugee inclusion and for rethinking digital transformation in teacher-education systems.

2.2 Plurilingual and refugee-inclusive education in subject-content teaching

Plurilingual and pluricultural education has moved from a focus on adding foreign languages to a broader concern with learners' whole linguistic repertoires, identity and participation in socially situated meaning-making (e.g. Council of Europe,

2022; Byram, 2008). Translanguaging and biliteracy perspectives foreground the interconnected linguistic and literacy resources of bilingual and refugee learners, challenging compartmentalised models and monolingual norms in schooling (García & Wei, 2014; Hornberger, 2003; Escamilla et al., 2014). From a multiliteracies stance, literacy is understood as multiple, multimodal and ideological (New London Group, 1996; Cope & Kalantzis, 2015), which foregrounds the need to engage diverse languages, modes and texts when teaching subject content in diverse classrooms.

Work on multilingual and minorised learners has shown how inviting learners' linguistic repertoires and multimodal identity texts into classrooms can support identity affirmation and literacy engagement (e.g. Cummins et al., 2015;). Design-based interventions with Polish teachers of Ukrainian refugee students, for example, demonstrate that a learning-by-doing professional development model can gradually shift practice from monolingual, skills-focused instruction towards biliteracy activities that centre learners' lives and languages (Muszyńska & Stewart, 2025). Such findings echo broader calls for culturally responsive, multiliteracies-informed refugee education that treats learners as multilingual, multimodal meaning-makers rather than as deficient L2 learners (Cooc & Kim, 2023). In many European systems, however, subject-teacher degrees remain largely monolingual and do not prepare future educators to integrate language(s), literacies and disciplinary subject content in multilingual, refugee-receiving classrooms (European Education and Culture Executive Agency & Eurydice, 2023; Štremfel, 2024).

These gaps sit uneasily with international and European commitments to quality, equity and inclusion in education, which require that all learners, regardless of migration status or language background, have meaningful access to curriculum, recognition of their linguistic resources and fair opportunities to demonstrate learning (UNHCR, 2024). When subject teachers are socialised into monolingual models and lack concrete tools for plurilingual, pluriliterate pedagogy, the risk is twofold: maintaining high-stakes expectations while withholding the linguistic and semiotic support needed to meet them, or quietly lowering expectations for refugee and minoritised students (García & Lin, 2017 ; Cummins et al., 2022). Plurilingual, pluriliteracies- and biliteracy-informed approaches, including those trialled in Polish preparatory classes, suggest an alternative: teaching that simultaneously advances disciplinary understanding, leverages students' linguistic repertoires and contributes to more just, inclusive learning environments (Muszyńska & Stewart, 2026; Hornberger & Dueñas, 2019; Cope & Kalantzis, 2015).

3. The guiding frameworks for this article: pluriliteracies, multiliteracies and FACUL

To advance quality, equity and inclusion through multilingual education and technology-enhanced pedagogies, this article mobilises three interrelated design lenses: Pluriliteracies Teaching for Deeper Learning (PTDL), multiliteracies and Fiction and Content Unified Learning (FACUL). These lenses structure the MOOCs' five-week trajectory as an intensive, digitally mediated space for plurilingual, refugee-inclusive teacher learning.

3.1. Pluriliteracies Teaching for Deeper Learning (PTDL) as an overarching frame (Week 1)

Pluriliteracies Teaching for Deeper Learning (PTDL) conceptualises content subject learning as the development of rich, discipline-specific ways of meaning-making across languages, modes and contexts, rather than as the accumulation of decontextualised facts (Coyle & Meyer, 2021; Coyle et al., 2023). Grounded in work by Coyle, Meyer and colleagues, PTDL treats literacy as inherently plurilingual and multimodal, emphasising how cultural and linguistic contexts and social relations shape classroom literacy practices within and beyond schooling (Coyle & Meyer, 2021). In this view, language is not an add-on to subject content but the very medium through which deeper conceptual understanding is constructed, articulated and shared (Coyle et al., 2023).

Week 1 introduces PTDL as the overarching frame for the MOOCs by unpacking core principles that recur throughout the five-week trajectory. Participants are first invited, through an introductory video and embedded quiz, to engage with the concept of pluriliteracies as the ability to communicate effectively across languages, cultures and contexts, and to consider why such capabilities are crucial in contemporary education (Coyle & Meyer, 2021). The module then foregrounds key PTDL dimensions: conceptual understanding, language of learning, cognitive discourse functions and genre awareness (Dalton-Puffer, 2013; Ting et al., 2024), alongside principles such as multimodality, translanguaging, assessment for learning and metacognition, which together define pluriliteracies teaching as an integrated orientation rather than a set of isolated techniques (Coyle et al., 2023). Pedagogically, Week 1 models PTDL through short, interactive learning episodes that link theory and practice. Exemplary tasks show how deep conceptual understanding depends on connecting new ideas to prior knowledge, supporting transfer across topics and making academic language

visible and learnable. Activities such as concept-mapping tasks, polls and practice prompts guide teachers to analyse how cognitive discourse functions (e.g. defining, explaining, hypothesising) and genres manifest in classroom texts, highlighting the interrelationship between disciplinary thinking, language and literacy.

In this way, Week 1 positions PTDL as the shared conceptual backbone for the entire MOOC architecture. It establishes pluriliteracies as a response to monolingual and skills-focused models by insisting on integrated attention to content, language and literacy, and by legitimising learners' full linguistic repertoires as resources for deeper learning (Coyle & Meyer, 2021). Subsequent weeks build on this foundation: multiliteracies and multimodal digital design in Week 2, fiction-based FACUL tasks in Week 3, and the focus on diverse learning pathways and multimodal assessment in Weeks 4 and 5 can all be read as specific enactments and extensions of the PTDL principles introduced in the Week 1 frame.

Across the five-week trajectory, participants engage in sequences that exemplify a design-oriented pedagogy: Week 1 involves concept-mapping, analysing cognitive discourse functions and redesigning classroom texts. Week 2 focuses on redesigning multimodal materials and planning multimodal, plurilingual lessons. Week 3 centers on role-play and inquiry tasks, while Weeks 4-5 ask participants to design differentiated learning pathways and multimodal assessment portfolios. These sequences exemplify pluriliteracies-oriented professional learning in which participants interactively analyse classroom language, redesign tasks and texts, and reflect on how disciplinary concepts, linguistic repertoires and multimodal resources can be integrated into concrete lesson plans and assessment formats, rather than only watching instructional content.

3.2 Multiliteracies as a design lens for multimodal and digital learning (Week 2)

Building on Pluriliteracies Teaching for Deeper Learning (PTDL), which conceptualises disciplinary learning as the development of subject-specific literacies across languages and modes, multiliteracies foregrounds the diverse, socially and technologically mediated forms of meaning making through which these literacies are practised in contemporary societies, and thus offers a powerful lens for designing multimodal, digitally supported learning.

Multiliteracies builds on New Literacy Studies to conceptualise literacy as multiple, multimodal and socially situated, encompassing linguistic, visual, audio, spatial,

gestural and digital modes as well as diverse language varieties in specific social and power contexts (New London Group, 1996; Gee, 1996; Street, 1995). Rather than treating literacy as the mastery of a single, standard form of the national language, it foregrounds how learners draw on their full semiotic repertoires to make meaning across settings, technologies and relationships. Pedagogically, multiliteracies is often described through four interrelated components: situated practice, overt instruction, critical framing and transformed practice, which together shift emphasis from rule transmission to action, design and redesign: learners work from their lived experiences and languages, engage with explicit metalanguage and models, critically interrogate texts and practices, and ultimately transform these resources into new, context-responsive artefacts and ways of acting (New London Group, 1996; Cope & Kalantzis, 2015).

Multiliteracies provides the overarching design lens for Week 2 by framing teacher learning as participation in multimodal, multilingual meaning-making rather than the acquisition of decontextualised literacy skills. Conceptualising literacy education as a struggle for equity, the New London Group argue that any view of literacy must recognise the multiple ways humans communicate, including digital modes, and the cultural and linguistic varieties of literacy that shape meaning-making in contemporary societies (New London Group, 1996). Building on this, Cope and Kalantzis describe a pedagogy of multiliteracies that centres learners' active meaning-making: learners' lived experiences, languages and perspectives become the starting point for authentic, multimodal design and transmediation, while the teacher's role shifts from transmitting standard forms of the national language to orchestrating rich meaning-making environments (Cope & Kalantzis, 2015; Muszyńska, 2024). Week 2 translates these ideas into technology-enhanced teacher learning by introducing multiliteracies and productive diversity through short explainer videos, quizzes and an infographic-plus-audio sequence, and then immediately connecting them to classroom practice in multilingual, refugee-receiving content classrooms. Across activities, participants engage with linguistically and technologically diverse resources that model how visual, audio, gestural, spatial and digital modes can be orchestrated to support subject learning when the language of schooling is an additional language for part of the class. At the same time, tasks such as the "productive diversity" matching activity, the podcast, the Garden-of-Hope AI-generated story, the environmental-issues planning sequence and the HEART-based lesson ideas (Stewart & Muszyńska, 2023) ask teachers and cultural assistants to redesign con-

crete content lessons by opening space for home-language invitations, multimodal information searches and flexible, technology-supported pathways and assessments. In this way, Week 2 operationalises multiliteracies as a technology-enhanced pedagogy for multilingual education, aligning with the focus on digital innovations that advance quality, equity and inclusion by treating learners' linguistic repertoires and multimodal resources as central, rather than peripheral, to content learning. These design choices position multiliteracies as a usable planning frame through which subject teachers and cultural assistants can rehearse designing plurilingual, refugee-inclusive content lessons in digitally mediated environments. They also prepare the ground for analysing how these lenses shape concrete course structures, tasks and assessment practices.

3.3 FACUL as a fiction-based design lens (Week 3)

With FACUL[4], MOOC audiences are introduced to a tool that works as a catalyst to renegotiate the terms of trade between language and content subjects. MOOC participants are first invited to acquaint themselves with the conceptual and theoretical foundations of FACUL which are presented in the form of a podcast followed by a talking head presentation with an ensuing quiz after each section.

Fiction and Content Unified Learning (FACUL) positions narrative fiction with a prominent subject-specific focus as a powerful mediating tool between language, content, and cognition in technology-enhanced classrooms. Developed within the MOOC architecture, FACUL builds on action-oriented and inquiry-based pedagogies by using literary fiction as a resource through which learners acquire disciplinary knowledge, practice academic language, and engage affectively with complex social themes. In refugee-receiving and linguistically diverse classrooms, educators can establish such fiction-based learning environments to support both cognitive and emotional inclusion, integrating content mastery with empathy, intercultural understanding, and critical literacy.

Pedagogically, FACUL draws on insights neuroscience gained on the impact that narratives and storytelling exercise on the construction of knowledge. Fictional contexts embed scientific or other subject-specific concepts within personally meaningful situations. This narrative embeddedness of knowledge enhances accessibility

[4] Extensive information on FACUL will be available in the forthcoming postdoc thesis – Stephan-Alexander Ditze, On the Road to Genotopia – Biotechnology Fiction as a Catalyst for Deeper Learning in CLIL Classrooms

of subject literacies, such as scientific, historical or civic literacy, beyond what decontextualized textbook instruction can offer.

The Week 3 design centres on Philip Roth's *Nemesis* (2010), whose depiction of a fictitious 1944 polio outbreak shows MOOC participants how learners can be invited to both scientific inquiry and ethical reflection on the societal reverberations of public health emergencies. The content of the material chosen makes it particularly suitable for learners with a refugee or migration experience. In the course of its plot, the characters are confronted with various manifestations of in-group-out-group thinking and its societal reverberations. Unlike in a textbook-based classroom scenario, knowledge is not presented, but learners' *knowledges* are taken to the narrative base text as starting points for everyone to join in a process of negotiation of meaning. In addition, the narrative of the base material of Week 3 leaves important questions around the contagion and prevention of the disease open, thus offering authentic opportunities for task-based, fiction-anchored investigation. This segment of our MOOC demonstrates how the course participants can experience the learners' perspective by adopting historical roles, such as health officials, who document community beliefs about the causes of polio. In a second step they are made aware of how students can be empowered to scrutinize various (pseudo-) scientific claims. The test case at hand, shows how the various historical hypotheses on the spread of polio are digitally fact-checked using authoritative biomedical sources (Center for Disease Control, Robert Koch Institute, Institut Pasteur), fostering scientific literacy, digital literacy, critical source evaluation, and plurilingual terminology work. Finally, participants obtain methods on how learners can synthesize their findings in new multimodal artifacts, such as illustrated public health notices, which translate disciplinary content and empathic understanding into communicative action.

FACUL thus integrates fiction-based inquiry, digital multimodality, and critical reflection into a coherent design framework that unites storytelling and science. By embedding disciplinary problem-solving within emotionally charged narratives, it cultivates resilience, rationality, and compassion—qualities vital in crisis-laden societies. In doing so, FACUL complements the multiliteracies lens introduced in Week 2: Both treat learning as design and meaning-making across linguistic, experiential, and technological resources, positioning fiction-based digital learning as a catalyst for inclusive, content-rich education.

Together, PTDL, multiliteracies and FACUL offer a composite lens for rethinking content-subject teaching in classrooms marked by plurilingualism, forced migra-

tion and unequal access to the language of schooling. They stress that disciplinary learning is linguistic and semiotic, and that refugee and minoritised learners' full repertoires must be mobilised rather than mariginalised. The three frameworks function not only as conceptual tools but as ethical commitments. They orient teacher learning towards designing tasks, texts and interactions in which newly arrived and long-term minoritised students can participate meaningfully, demonstrate understanding and see their experiences reflected in the curriculum.

Weeks 4 and 5 revisit and extend the PTDL, multiliteracies and FACUL lenses by shifting attention to diverse learning pathways and multimodal assessment, asking course participants to re-design their own practice in ways that make disciplinary literacies visible and achievable for learners working in L1, L2 and L3.

4. Design architecture and intervention logic of the MOOCs

In this section, we present the MOOCs' design as a form of intervention, focusing on the task design, multilingual pathways and recognition mechanisms rather than on outcome metrics. Methodologically, we adopt a research-through-design perspective. We treat the ILLS-PEC MOOCs as a deliberate design intervention at the interface of higher education, teacher professional learning and refugee-inclusive schooling, and reconstruct their architecture using project documentation, course blueprints and exemplar tasks. This approach foregrounds design as practice: we analyse the courses not as objects of measurements but as concrete design moves that turn theoretical frameworks, policy priorities and equity concerns into workable professional learning trajectories.

The design of the ILLS-PEC MOOCs builds on accessibility and inclusion at scale. Two courses, one for primary and one for secondary educators, are offered in English, Polish, Spanish, and German to support participation across diverse national and linguistic contexts. Each follows a five-week modular format and represents around 30 hours of learning through asynchronous mini-videos, readings, interactive tasks, and guided peer reflection. Multilingual affordances are central to this design. Subtitles, parallel resources, and locally contextualised examples enable participants to navigate the content in a language aligned with their professional repertoire. This multilingual access enacts equity through participation rather than remediation: instead of compensating for a perceived lack of language proficiency, it affirms plurilingualism as a professional asset and condition of authentic learning in a European context marked by mobility and linguistic diversity.

Each module rehearses forms of teacher learning that mirror what participants are expected to enact in their own classrooms. The MOOCs' pedagogical architecture rests on several interlocking principles:

Plurilingual scaffolding: Tasks such as mapping classroom languages, designing bilingual glossaries, and comparing conceptual explanations across languages prompt participants to mobilise both their own and their learners' repertoires for meaning-making.

Multimodal and multiliteracies pathways: Movement between text, image, gesture, sound, and digital tools allows teachers to experience firsthand how multimodality supports disciplinary understanding through multiple modes of meaning-making.

Differentiated task design and assessment: Choice-based assignments, multimodal artefacts, and small formative portfolios model what inclusive, flexible assessment can look like in diverse classrooms.

Digital collaboration and reflection: Discussion boards and shared design spaces simulate professional-learning communities, encouraging sustained engagement rather than one-off participation.

Recognition through open certification: A recognised certificate makes professional learning visible and transferrable and reinforces the idea that equitable access must include legitimate recognition mechanisms.

Together, these elements are designed to advance *pedagogical equity* through scalable, technology-enhanced teacher development.

Across the five-week trajectory, participants not only reflect on theoretical models but also experience how these interconnected frameworks become usable tools for plurilingual, refugee-inclusive classroom design. Through this multilayered architecture, the ILLS-PEC MOOCs embody *design as intervention*: each choice, from multilingual access to multimodal assessment, is intended to widen opportunities to participate in quality teacher education. The following discussion considers how these design moves address systemic equity challenges and what they imply for rethinking teacher-education policy and practice in multilingual Europe.

5. Discussion

The ILLS-PEC design aligns closely with the aims of the project, which seeks to respond to a concrete societal challenge facing subject teachers in plurilingual, refugee-receiving classrooms. The MOOCs address a structural gap in higher-education

provision by creating open, multilingual access to university-level learning for both pre- and in-service educators, including those whose prior education took place outside Europe and those with interrupted or limited formal schooling. By offering two courses in four languages for subject teachers, university students preparing to teach content in the majority language and cultural assistants with refugee backgrounds, the project aims to widen participation beyond the already-advantaged group typically served by global, English-dominant MOOCs.

Within this frame, the architecture deliberately targets the project's key EU priorities: building more inclusive higher-education systems and addressing digital transformation in ways that combine technological readiness with equity and diversity. Multilingual access, plurilingual scaffolding and multimodal assessment are not secondary features but core mechanisms through which the MOOCs support teachers working with refugee learners in majority-language subject lessons. For cultural assistants and educators trained in other systems before arriving in Europe, certificates issued on course completion provide documentation of professional learning that participants can present alongside their existing qualifications and experience.

At the same time, experience with the initial course runs suggests that more robust and formally recognisable credentialing would further enhance impact. While the current model requires a minimum passing score and automatically generates a completion certificate, the project partners now see the value of adding a second layer in the form of verifiable digital badges potentially linked to ECTS credits through appropriate institutional assessment and quality-assurance arrangements. Such a system could make learning outcomes and workload more transparent to employers and institutions, and support the integration of MOOCs into teacher-education pathways, in line with the European approach to micro-credentials.

6. Conclusion

The ILLS-PEC MOOCs conceptualise teacher learning in plurilingual, refugee-receiving classrooms as simultaneously disciplinary, linguistic and multimodal work, and this article has analysed them as a design intervention that seeks to redistribute access to high-quality professional learning. By interweaving PTDL, multiliteracies and FACUL across a five-week, multilingual online trajectory, the courses turn complex frameworks into concrete task sequences, learning pathways and assessment formats that teachers and cultural assistants can directly adapt to their own content lessons.

Structurally, the courses are designed to address a gap in teacher education by reducing linguistic barriers, providing online open access and offering certificates of completion to diverse groups of educators, including those with refugee backgrounds. Pedagogically, they move beyond monolingual, transmission-oriented models towards design-oriented, pluriliteracies-informed practice in which learners' full linguistic repertoires, affective experiences and multimodal resources are treated as central to content learning.

At system level, the project suggests how open, multilingual MOOCs can act as an intermediate layer between policy aspirations and everyday practice, providing scalable, equity-oriented professional learning without waiting for complete programme reform. Ongoing reflection on credentialing, including the potential addition of verifiable digital badges linked to ECTS credits through appropriate institutional arrangements, highlights that access and recognition need to be integrated into design decisions when teacher education is re-imagined for a multilingual, refugee-inclusive Europe.

As a design-oriented project report, this article has focused on how the ILLSPEC MOOCs embody and operationalise pluriliteracies, multiliteracies and FACUL principles in a multilingual online environment, rather than on measuring their impact. Future work will therefore involve systematic empirical evaluation of participant learning, classroom transfer and equity effects across course languages and national contexts.

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