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Competency Frameworks and MOOC Design: A Framework for Language Teacher Education

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ABSTRACT

This article examines the structural tension between professional competency frameworks and the pedagogical architecture of MOOCs in the specific context of language teacher education. Drawing on a comparative document analysis of major competency frameworks (CEFR Companion Volume, DigCompEdu, EAQUALS, and national FLE frameworks) and critical scholarship on MOOC design, the study employs a six-dimensional analytical grid to identify systematic points of convergence, tension, and structural incompatibility between the two corpora. The frameworks were selected on the basis of their institutional recognition, their relevance to language teacher education, and their broad uptake in the field; the MOOC literature was selected through a targeted review of empirical and conceptual studies addressing large-scale digital learning in professional and teacher education contexts. The analysis reveals that the complexity and situated nature of professional competencies in language teaching exceed what fully massive online environments can support in their standard configuration. The article proposes a theoretical and methodological contribution in the form of a four-step conceptual alignment mechanism that differentiates between competencies teachable at scale and those requiring situated practice, guided interaction, and authentic assessment. This mechanism, applied to the language teacher education context, articulates how existing principles of competency based education and instructional design can be systematically combined to determine the conditions under which MOOCs may contribute to competency development. The article argues that alignment is conditional and requires redesign, hybridization, and a competency-oriented logic that extends beyond the MOOC itself.

KEYWORDS

Competency Frameworks

MOOCs

Teachers Training

Competency-based Education

Instructional Design

Hybrid Learning

Introduction

Digital transformation has substantially reconfigured the professional expectations placed on teachers. In many educational systems, policy now requires not only that teachers develop digital skills, but that they actively integrate those skills into their pedagogical practice. Despite recognized expertise in technical, pedagogical, and content knowledge (TPACK), teachers frequently encounter institutional constraints, resource deficits, and an absence of sustained professional support (Wagner et al. 14). Frameworks for digital competence such as the UNESCO digital competence framework or DigCompEdu offer structured guidance for digital teaching and learning, but are never neutral documents: they simultaneously orient practice and

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risk narrowing professional autonomy by implying that technology integration must conform to a predetermined trajectory (Mcgarr).

The development of digital competence among teacher educators is, however, deeply contingent on local conditions: cultural context, institutional leadership, and the availability of professional learning support all play a determining role (Carpenter). Research documents a recurrent deficit in many national systems insufficient institutional backing and the absence of conditions that would allow teachers to serve as digital mentors and role models for future educators (Lindfors et al. 6, 11, 13; Amhag et al. 2). These conditions bear directly on teachers' professional identity, as practitioners must navigate the tension between established practices and a rapidly evolving digital environment. That tension shapes not only how technical skills develop but also the higher-order, transformative dimensions of digital competence that remain undertheorized in much of the field (Nagel et al. 3). Sustained, systemic support for faculty development is accordingly a structural requirement for enabling teachers to teach, mentor, and conduct research in digital settings (Aithal and Aithal 40).

These tensions are not specific to the digital era. Questions of quality, scale, diversity, and professionalism constitute enduring debates in teacher education. The definition of the "good teacher" remains contested, with many researchers calling for evidence-informed approaches to professional development (Ingvarson and Rowe 13). In certain national contexts, widening access to teacher preparation has involved the recruitment of underqualified or contract staff, with documented negative consequences for educational equity and quality (Pandey 10). Student population diversity places increasing demands on pedagogical differentiation, while overly prescriptive professional norms risk constraining teacher agency rather than supporting it (Shaw 236). The rapid expansion of artificial intelligence further challenges inherited conceptions of professional standards and teacher identity (Rütti-Joy et al. 2), intensifying the longstanding tension between system-level imperatives and high-fidelity, context-sensitive teacher education (Abdallah and Abdallah 140). These structural tensions become particularly consequential when professional competency frameworks are mobilized within large-scale digital training environments such as MOOCs.

MOOCs have been of particular interest, notably given that they may comprise new forms of teacher learning. Several universities have used MOOCs as part of their teacher education programs for pre-service and in-service teachers. For example, MOOC implementations have reportedly had promising results in content knowledge acquisition and pedagogical and technological content knowledge development (Donitsa-Schmidt 8). They are popular among learners because they are often more available and flexible for people with busy working lives (Bettiol 2).

The complexity of this alignment problem intensifies when MOOCs are called upon to support competency-based language teacher education, a form of professional preparation that must be authentic, situated, and socially embedded, and that involves the integration of knowledge, skills, and professional attitudes grounded in practice (Mackay et al. 9). Research in professional education fields, including medical and engineering education, consistently identifies immersion, iterative feedback, and reflective adjustment as the central conditions for competence development (Matsas et al. 905). Moving from knowing to doing requires authentic, context-sensitive practice environments (Wong 2), and this shift implies pedagogical models oriented toward sustained feedback, critical reflection, and professional engagement rather than content delivery alone (Hatcher et al. 232). It is precisely this requirement that generates the central tension this article seeks to analyze. This article addresses three interrelated research questions: (1) What are the structural conditions that competency frameworks for language teacher education require of a learning environment? (2) In what ways does the standard MOOC

architecture respond to or fall short of these conditions? (3) Under what analytical conditions can partial, conditional alignment between competency frameworks and MOOCs be theorized? To address these questions, the article employs a comparative document analysis organized through a six-dimensional analytical grid, and proposes a four-step theoretical mechanism for alignment that is intended to guide instructional design decisions in hybrid teacher education settings.

Methodology

The study employs a comparative document analysis based on two complementary corpora. The first corpus comprises publicly available professional competency frameworks for teachers and language educators, specifically: the CEFR Companion Volume (Council of Europe, 2020), the DigCompEdu framework (Redecker, 2017), the EAQUALS Profiling Grid for Language Teachers (2013), and the French national framework for teacher professional competencies (Bulletin officiel, 2013). These frameworks were selected on three criteria: (a) their official or institutional status in teacher education; (b) their direct relevance to language teacher education, particularly in the FLE context; and (c) their broad uptake in research and policy on teacher competency. The second corpus consists of empirical and conceptual scholarship on MOOCs, selected from peer-reviewed literature addressing large-scale digital learning in professional education and language teacher training contexts, with preference given to studies examining pedagogical design, learner outcomes, assessment, and scalability constraints. To enable systematic comparison across the two corpora, a six-dimensional analytical grid was developed. The grid was constructed by identifying, across both corpora, the recurrent pedagogical and epistemic requirements articulated in competency frameworks and the recurrent structural features and constraints described in the MOOC literature. Points of convergence (dimensions where MOOC affordances align with framework requirements), tension (partial alignment, requiring design adaptation), and structural incompatibility (dimensions where the MOOC format is fundamentally ill-suited to framework expectations) were then mapped for each dimension. The grid is organized as follows:

- Epistemological orientations: This dimension examines whether frameworks favor transmissive pedagogy, activity-based learning, or socio-interactional learning, and whether they hold explicit or implicit views of knowledge.
- Pedagogical mechanisms: It contrasts the learning tasks and practices envisioned in teacher education with those in many MOOCs.
- Expected learning outcomes: This dimension explores the core skills, professional attitudes, and knowledge emphasized in teacher education models and their relationship to MOOCs.
- Forms of guidance and support: It assesses the roles of mentorship, feedback, modeling, scaffolding, and teaching presence, and the feasibility of scaling these supports in larger cohorts.
- Contextualization demands: This dimension highlights the importance of situated practice and responsiveness to learners, which massive environments often struggle to address.
- Assessment logics: It analyzes the types of assessment practices promoted in each corpus and the advantages and limitations of large-scale digital assessment delivery.

Table 1
Comparative Analytical Mapping of Competency Framework Requirements and MOOC Design Constraints in Language Teacher Education

Analytical Dimension	Competency Frameworks (CEFR-CV, EAQUALS, National FLE)	MOOCs (FLE, TESOL, Applied Linguistics)	Notes / Constraints
Linguistic Competence	Core skill; underpins all teacher actions; focus on accurate language use and awareness of linguistic structures (Little 2020)	Easily taught at scale via video lectures, readings, quizzes	High scalability; low need for interactive adaptation
Interactional Competence	Emphasizes situated classroom interaction, turn-taking, adaptive discourse management (Ou and Gu 2021)	Difficult to teach at scale; limited synchronous practice	MOOCs rely on forums, peer interaction, or bot-assisted discussion; low authenticity
Didactic Competence	Lesson planning, scaffolding, corrective feedback; requires active teacher engagement (Kaendler et al. 2014)	Partial transmission via content delivery; some task facilitation possible	High-level pedagogical judgment constrained; automated quizzes cannot fully replicate real-time feedback
Mediation Competence	Managing cross-linguistic/cultural communication, explanatory feedback, task facilitation (Calvert and Sheen 2014)	Limited; peer-based or AI support provides partial scaffolding	Situated practice necessary; MOOCs struggle to simulate real intercultural interactions
Intercultural Competence	Understanding and responding to cultural differences; promoting plurilingual communication (Little 2020)	Partially addressed through discussion boards or scenarios	Heterogeneous learners; asynchronous interaction limits depth
Reflective / Professional Judgment	Reflection-in-action; moment-to-moment pedagogical decisions; assessment of own teaching practice (Donitsa-Schmidt and Topaz 2018) (Moorhouse et al. 2021)	Difficult; limited capacity for authentic reflection on real classroom events	MOOCs support reflection on hypothetical cases, but lack real-time situational context

The application of the grid to both corpora allows us to analyze the gap between the rich professional expectations constructed in the teacher training sphere and the pedagogical limitations characterizing MOOCs. This analysis provides the empirical basis for locating the difficulties in achieving alignment and the theoretical model for reconciling the two ecosystems, as presented in the last section of this chapter. The analysis is theoretical and documentary in nature and does not involve empirical data collection.

Findings

Why Do Competency Frameworks Demand Rich and Multifaceted Learning?

Competency frameworks also require deep and rich learning, because they define professional competence as the complex composition of knowledge, skills, dispositions, and judgment, and of their application in authentic professional situations. Competency frameworks across domains reject the reduction of professional competence to declarative knowledge and see professional competence as socially-embedded, situated, and developmental. They define learning environments that must include practice, interaction, reflection, and professional identity formation.

First, the analyzed models define professional competence as an integrative, holistic construct involving cognitive, behavioral and affective aspects. Specifically, professional competence is conceptualized as the ability to mobilize knowledge, skills and dispositions in an integrated way in a given situation, and not as possession of knowledge elements. In computing fields, for example, some competency frameworks explicitly integrate disciplinary knowledge, practice, and professional attitude, because all three aspects are required together to prepare learners for the complexity of practice (Raj et al. 8).

Second, competence is not only about knowledge, it is practiced in context, through social interactions and reflection. Empirical studies show that professional knowledge is built and reformed in authentic complex contexts. Lave and Wenger's findings on social interaction in apprenticeship have been replicated in competency formation for novice pharmacists, where competence is performed during consultations, formed socially during practice and reflection, and is integrated through discussions of theory, self-reflection, and identity development in situated interactions (Whitaker and Reimer 3). This is also supported by findings regarding cultural competence, as professional competence is constructed through socially and contextually oriented practice, not as a set of decontextualized knowledge (Danso 11).

Theoretically and empirically, competence is also considered to be a process of cognitive and social aspects. Models describing communication competence include reflections and anticipation as well as sensitivity to contextual variables and show that competence is cognition in a social setting (Duran and Spitzberg 13). Expanding this further, experiential theories of learning in the social sciences also stress the interdependence of theory, practice and reflection in relational contexts, reinforcing the idea of competence developing through authentic and active participation in social practice (Dyke17). Taken together, these theories of learning help illuminate why competency frameworks require learning through practice and interaction rather than in isolation from them.

Third, competency frameworks explicitly or implicitly assume a set of professionalization processes that require rich learning conditions. Modeling gives learners the opportunity to observe expert practice, internalize professional standards and norms, and form a professional identity (Bélisle et al. 3). It has been stated that guided practice is an effective method of learning, because tasks with scaffolding and expert feedback allow learners to gradually increase their skills and grow in confidence (Frank et al. 3). The importance that feedback (i.e.

formative feedback) has for developing competence is often mentioned in relation to self-regulated learning as well as to evaluative judgement and professional development (Rung and George).

Collaboration, also an integral process, is a salient feature of competence development in team and interprofessional settings, hence frameworks focus on collaborative learning, dialogue, and shared responsibility as well as on the enabling and constraining influence of contextual and organizational factors (Goldman et al. 8) (Karimi and Farivarsadri 13). Reflexive judgement, involving a continuous interplay between experience, feedback and reflection, enables practitioners to navigate uncertain and unpredictable situations. Embedding reflexive judgement through reflection transforms experience experience into learning and develops identity and adaptive expertise (Bélisle et al. 6).

Technology and instructional design research show that activity- and process-oriented learning models provide better opportunities to adapt to the needs and context of learners. This is also supported by research on faculty development which stresses the role of reflective and transformational ways of learning for supporting personalized faculty development (Nair et al). Descriptions of personalized faculty development further illustrate the inadequacy of one-size-fits-all faculty development approaches for competency development. They help to explain why competency frameworks are predicated on a context of individualized support, feedback, and reflection.

Why Do MOOCs Struggle to Address These Demands?

This means that MOOCs have often found it difficult to implement the requirements of such competency-based frameworks due to the institutional and technological rules and guidelines which structure MOOCs. Such frameworks often envision MOOCs as broadcast, video and text-based delivery systems where openness and accessibility dominate over individualization and personalization. The ever-expanding scope of MOOCs allows for the dissemination of wide-ranging knowledge but limits the support of frameworks that focus on complex, process-oriented learning outcomes (Ip et al. 3).

MOOC designs typically only allow for a few learning resources (short video lectures, quizzes and assessments) that could scale and are technically feasible, but that don't allow for the collaborative and authentic learning experiences considered pedagogically appropriate (Glance). In practice, most MOOCs are characterized by low social presence. With the majority of peer interactions being asynchronous in discussions that do not incorporate dialogic interaction and co-construction, the knowledge-building principles of modeling, guided practice, collaborative problem-solving, and contextual feedback (Poquet et al. 44) have not been fully implemented in learning environments.

The problem of assessment is particularly acute; competency frameworks often require active, trustworthy, context-sensitive assessment to achieve the goals of professional learning and judgement, while MOOCs tend to rely heavily on automated testing and peer assessment. One of the few practical forms of feedback in an extremely large environment, peer assessment has raised fundamental questions over its validity, reliability and formative effectiveness (Xiong and Suen 11). Automated assessment is also problematic: it enforces a narrowed focus, targeting knowledge that is easily measurable, rather than complex interactions and situated skills.

More broadly, recent analyses of digital learning ecosystems emphasize that large-scale personalization and automation, while offering new opportunities for access and engagement, tend to reconfigure pedagogical relations in ways that marginalize ethical mediation, professional judgement, and human guidance. In this perspective, the persistence of a human-centered role for educators is not a residual constraint but a structural requirement for sustaining meaningful learning and professional development in AI-augmented environment (Ben Khajjou et al 121).

To function at large scale, MOOCs are less likely to include more complex collaborative learning activities, and instead consist mostly of individual learning activities and forum interactions. The MOOC research in this area tended to avoid resource-intensive pedagogies, favoring transmissive pedagogies through which knowledge could be disseminated and coordinated globally (Zhan et al. 2287). Additionally, course durations may be shortened or course content compressed to maximize retention by students, limiting in-depth learning and mastery (Ferguson and Clow) (Donitsa-Schmidt and Topaz7).

Another important issue is the impact of dropout on aligning MOOCs with competency frameworks. Although predictive models and intervention approaches have been developed to address dropout, including learning analytics and neural networks (Qiu et al. 3), these approaches do not always consider the motivational and engagement-related issues associated with online courses at scale. MOOCs require high levels of learner self-regulation, with learner progress and persistence in courses in the hands of the learners. However, research shows that this assumption is not true of all learner types, with those who prefer structured support and pedagogical scaffolding being put at a disadvantage (Milligan and Littlejohn 1).

Together, this suggests that the pedagogical shortcuts needed to achieve scalability-standardization of content, automated assessment, decreased facilitation, learner autonomy and self-direction-are structurally ill-suited to the development and assessment of complex professional competencies. This structural tension also explains why MOOCs are effective for knowledge transfer, but misaligned with competency frameworks that require situated practice, prolonged engagement and reflexive judgement (Wulf et al. 2).

These limitations do not, however, exhaust the possibilities of the MOOC format when redesigned or embedded in broader pedagogical architectures. Several emerging developments merit consideration on their own terms. Adaptive learning systems that dynamically adjust content and support based on learner performance data move toward the personalization competency-based education requires. AI-supported mentoring environments now show capacity for generating individualized, criterion-referenced feedback at scale addressing one of the most persistent deficits of conventional MOOCs. Immersive simulation technologies offer partial proxies for the situated professional practice that competency frameworks demand, particularly for interactional competencies. Finally, small-group and hybrid MOOC variants that integrate synchronous peer interaction with large-scale content delivery suggest that the MOOC format is not fixed but configurable. These developments do not dissolve the structural tensions analyzed here, but they substantially reframe the question: the challenge is no longer whether MOOCs can support competency development in principle, but under which conditions and in combination with which complementary interventions this becomes achievable.

Why is Alignment Theoretically Difficult?

The misalignment between competency frameworks and MOOCs cannot be framed as a problem of logistics or technical issues. Rather, it is the fundamentally different epistemological, pedagogical and assessment logic of these two educational models that make them seemingly irreconcilable.

These fundamental differences become particularly visible when examining the pedagogical conditions required for competence development which implies the internalization of mental models through modeling, guided practice, feedback and gradual taking over of responsibility. However, this requires a sustained pedagogy with carefully structured trajectory of learning outcomes, whereas the pedagogical models of MOOCs are typically based on learner autonomy, self-paced learning and minimum instructor presence. Empirical research suggests that learners within MOOCs are expected to undertake a high degree of self-regulation and receive limited pedagogical scaffolding, which impedes their learning of complex skills (Milligan and Littlejohn 118). Additionally, motivation and engagement studies report about the cognitive, emotional, and motivational barriers that many learners face in MOOCs (Terras and Ramsay 6).

Assessment is another area of disconnection. Competency-based education demands authentic, contextualized and often qualitative assessment of performance over time, informed by the judgment of experts, and supplemented by formative feedback. In contrast, it has been shown that MOOCs rely on summative assessment through automated quizzes, peer grading and standardized projects. Despite adaptations for large cohorts, these approaches are not designed to assess integrated professional competence and research on MOOC assessment indicates that validity and reliability, as well as assessing complex competencies requiring expert judgement, are key challenges. Systematic reviews also highlighted a stronger emphasis on cognitive and behavioral outcomes that can be easily standardized, over a focus on affective, reflective and practice-based outcomes that are prominent in competency frameworks (Xiong and Suen 12; Wei et al 8). While peer assessment may support engagement, the variability and lack of domain-specific expertise in peer feedback raises doubts as to the adequacy of peer assessment as an assessment method in competency-based learning (Staubitz et al 3). Implementing individualized assessment involving the use of competency profiles is challenging both from a technical and a pedagogical point of view (Paquette et al).

These epistemological, pedagogical, and assessment tensions point toward the misconceived view of alignment like a technical issue. MOOCs in a learning context are structurally designed for scalability, openness and learner self-direction, and their empirical design utilizes short instructional segments, automated feedback and limited tutor facilitation (Glance et al). Given these structural characteristics, forms of guided practice, contextualized feedback and authentic assessment remain the hallmark of competency-based systems, so someone cannot simply translate them online. If pedagogical approaches and institutional practices do not reconceptualize overall, technology cannot resolve assessment-related tensions (Xiong and Suen 124; Milligan and Littlejohn 8).

Not all professional competencies seem to be subject to these tensions to the same extent. In analyzing the compatibility of language-teacher competencies with massive online teaching using the ensemble of epistemological, pedagogical, and assessment constraints detailed above, we find that some competencies may have more or less compatibility with massive online teaching. Competencies describing declarative knowledge, conceptual knowledge, or awareness can be well-trained in large-scale MOOC designs, with the use of content delivery and automated learning activities. In contrast, those competencies describing situated social interaction, momentary pedagogical decisions, classroom management, or reflexive

professional judgement, which rely on continuing support, situated feedback, and authentic practice opportunities, are less suitable for MOOC designs. More generally, rather than blocking alignment entirely, misalignment likely affects the gradient of teachability at scale. The table below thus shows some of the skillsets that can be foundational in a language-based teaching and learning exercise, along with a simplified architecture of MOOCs.

Table 2

Scalability of Professional Teacher Competencies in MOOCs

Competency	Teachable at Scale	Requires Situated Practice	Notes / References
Linguistic knowledge / grammar			(Jitpaisarnwattana et al. 7) ; (Donitsa-Schmidt & Topaz 10) ; (Julia et al. 3, 4)
Didactic / theory			(Hollebrands et al. 1, 9) ; (Gil-Jaurena and Domínguez 4, 17)
Interactional management			(Bozkurt et al); (Moorhouse et al 10)
Pragmatics			(Le) ; (Bozkurt et al.) ; (Zhang et al. 2, 18)
Mediation			(Little 1, 2, 3) ; (Wei et al. 11, 12)
Reflective linguistic judgment			(Zhu and Bonk) ; (Elsayary 2)
Oral interaction / spoken performance			(Huang & Chen 5) ; (Van Der Zee et al.)
Intercultural competence			(Little 1, 3, 5); (Hollebrands and Lee 13)

Color key:

Highly scalable Partially scalable Moderately non-scalable Non-scalable

Not applicable

Seen this way, the difficulty of alignment does not emanate from shortcomings in design so much as the competing rationales that support two heritages of education, situated professional competence and the mass provision of knowledge.

Contribution: A Theoretical Model for Alignment

Following the identification of structural misalignments between competency frameworks and MOOCs, this section proposes a theoretical and methodological model to clarify the conditions under which conceptual alignment may be envisaged. Rather than addressing technical optimization or platform-specific solutions, alignment is approached as a pedagogical and methodological issue. By articulating principles of competency-based education with

established models of digital learning design, the proposal examines how competencies may be addressed within, alongside, or beyond the MOOC format. The contribution is analytical and prescriptive, without empirical implementation.

Competency-Based Education Principles as Design Constraints

Competency-based education presents significant challenges in digital environments, particularly in MOOCs. Competency frameworks conceptualize professional practice as an integrated and progressive construction of knowledge, skills, attitudes, and judgement in context. MOOCs, by contrast, are largely organized around standardization, automated assessment, mass delivery, and content transmission. This structural divergence places alignment at the center of debates on online teacher professionalization.

Alignment cannot be reduced to mapping competencies onto course objectives. It requires coherence between intended learning outcomes, pedagogical activities, and assessment modalities oriented toward professional performance. In MOOCs, learner heterogeneity combined with limited interaction and feedback further constrains the implementation of authentic and formative learning processes.

Backward design foregrounds expected professional action rather than content sequencing. Learning is planned by defining competencies to be demonstrated in authentic situations and then organizing learning experiences accordingly. Learning units function as means to professional judgement rather than as autonomous content blocks. This logic conflicts with the linear, content-driven organization of most MOOCs, where progression is structured around predefined thematic sequences.

Authentic tasks require learners to perform activities resembling real professional practice, mobilizing integrated knowledge, skills, and judgement. While central to competency development, such tasks are difficult to implement at scale. The massive and automated nature of MOOCs limits the design, monitoring, and feedback of context-sensitive activities, resulting in a necessarily selective and partial enactment of professional practice.

Sequencing competencies involves organizing learning so that professional capabilities develop progressively from simple to complex actions. This cumulative progression supports integrated competence. In MOOCs, however, content is typically organised thematically rather than hierarchically by competence, disrupting developmental continuity and fragmenting skill acquisition.

Formative feedback enables learners to refine professional performance through iterative guidance aligned with professional standards. In MOOCs, the scale of participation and reliance on automated or peer-based assessment significantly restrict the provision of timely, context-sensitive feedback. As a result, the systematic cultivation of complex competencies through formative processes remains limited, underscoring a fundamental tension between competency-based education and massive digital delivery.

Table 3

Alignment Matrix/Table Draft

CompetencyPrinciple	Pedagogical Requirement	MOOC Constraint	Relevant Design Model
Backward design	Start from expected professional action	Linear, modular course structure	TPACK
Authentic tasks	Engage learners in real-world professional activities	Limited scalability and individualized guidance	CoI / Activity Theory
Sequencing of competencies	Progressively build integrated skills	Thematic module organization may disrupt developmental trajectory	DBR / TPACK
Feedback and formative evaluation	Provide timely, context-sensitive guidance	Automation and massiveness restrict personalized feedback	DigCompEdu / CoI

Competency-based education's pedagogical requirements often clash with the structural constraints of MOOCs. Frameworks such as backward design, authenticity, sequencing, and formative evaluation reveal these tensions, showing how professional learning trajectories fragment in linear, content-driven courses. Authentic tasks expose the limits of scaling complex practices, sequencing highlights disrupted cumulative development, and feedback demonstrates the challenge of sustaining iterative, expert-guided growth.

These frameworks serve not only as design guides but as diagnostics of misalignment, clarifying where MOOCs can support knowledge and skill acquisition and where hybrid or complementary approaches are needed. This analysis underpins the alignment mechanism proposed in the following section, combining selective massive delivery, mentoring, authentic tasks, and iterative assessment to approximate competency-based outcomes.

Instructional Design Frameworks for Thinking Alignment in Digital Contexts

Competency-based education's pedagogical requirements for professional development intersect with structural constraints of these large digital contexts. A set of design frameworks shows how to analyze and navigate structural constraints by shaping the ways that MOOCs can be used in support of learning within such constraints. While the models do not specify solutions, they illustrate the relationships among learning goals, learning activities, assessment, and technology in a digital learning environment.

Together, backward design, authenticity, sequencing, and formative evaluation expose the tension between the professional outcomes of our course design and the linear, content-driven, and teacher-centered management of the MOOC. We show how trajectories with a professional performance focus tend to be split thematically, even within a single articulation of the course. Authentic tasks alert us to the challenges of scaling complex, context-sensitive, professional practices and the shortcomings of off-the-shelf, modular, standardized automated course

products. Sequencing alerts us to the cumulative development of practice that is weakened by modular digital architectures. Finally, feedback and formative evaluation expose the limits of mass delivery, as iteration and expert judgement are critical components of professional growth and reflection.

More than just implementation models, these frameworks provide a diagnostic of structural misalignment between competency-based education and MOOCs, clarifying where MOOCs may be successfully applied for knowledge acquisition and skills practice, and where hybrid, selective or complementary course designs are necessary to align with the development of workplace-related continuous professional competence. This analysis serves as the basis for the alignment mechanism proposed in the next section, in which selective massive delivery, mentorship, authentic tasks, and multiple rounds of assessment are combined to approximate outcomes achieved through competency-based education.

A Theoretical Mechanism for Alignment

Taking as a basis competency-based education and instructional design approaches, this section presents a theoretical conceptual model for mapping professional competency frameworks to MOOCs. While not intending this model to be read as a strict architecture, we hope to provide conceptually-based guidance on how we might structure the inevitably loose translation of messy, situated competencies to the constraints of massively delivered online instruction. This chain of decomposition, selective mapping, non-massive component integration, and competence-aligned assessment provides a model to describe orderly processes in which systematic alignment can be analyzed theoretically.

The first step deals with dividing a competence into its constituent parts. Pedagogically speaking, this means identifying those parts that can be learnt in a massified and heavily digitized environment, and those parts that require more individual or situationalised approaches. Decomposing competencies seeks to avoid reifying the MOOC as a learning platform for learning tasks outside its affordances, and to define what competencies can be learned in a massively distributed way. That is, the decomposition may support identifying which parts of the competency may be done massively distributed via the electronic platform and which may not, but need to be done differently.

The second step focuses on the mapping between the decomposed competencies and the MOOC's digital platform, and the learning functions it can support. From a pedagogical perspective, the challenge is to identify what tasks and activities can be efficiently delivered on a large scale and are compatible with the professional competencies to be developed. The grounding of the mapping is its intended use of the MOOC. This step solves the problem of scalability not by attempting to capture all components of competence within the black box of the MOOC, but rather by clarifying which dimensions of professionalization could be implemented on a large scale to be in line with the competency framework.

The third step highlights the limitations of addressing the full range of competence development within the MOOC format and the need for complementary learning interventions. From a pedagogical point of view, it stresses identifying those components of competence that need to be cultivated by personalized support, context-sensitive training, or eased interaction that cannot be easily digitalized. In order to overcome the limitations of MOOC designs, which may not fulfill the whole design, the combination of massive and non-massive design allows to embed MOOCs as tools into a hybrid MOOC. In this way, a mixed version of the hybrid MOOC is created which should cover the whole learning design, yet retaining the integrity of the competency framework.

A further step is to ensure that assessment techniques are congruent with the competencies expected. The issue is that learners need to learn suitably authentic, context-rich skills that validate performance in the workplace. Pedagogically, this entails devising assessment forms outside the platform, while competence-aligned assessment closes the loop of the learning process by putting the outcome of instruction to work in meaningful assessment. It helps overcome the limitations of automated and standardized assessment in MOOCs and addresses the key issue of how measurement and credibility can be given to the development of competence. This is only achieved through the use of assessing methods that pay justice to the complexity of professional practice.

What distinguishes this mechanism from existing frameworks such as backward design or the Community of Inquiry model is not the novelty of its principles but the specific operation it performs: the systematic decomposition of professional competencies by their scalability gradient, their conditional mapping onto MOOC affordances, and the explicit integration of non-massive components at points of structural incompatibility, a diagnostic and allocative procedure, not a generalized design philosophy. To illustrate, consider a MOOC for FLE teacher training addressing "didactic competence" the capacity to plan lessons, scaffold learner production, and deliver corrective feedback. Step one (decomposition) separates its declarative components (scaffolding principles, feedback typologies) from its performative ones (real-time classroom interaction). Step two (mapping) assigns the former to the MOOC via video instruction and automated knowledge checks. Step three (non-massive integration) designates the latter for a mentored micro-teaching practicum with peer group and expert feedback. Step four (competency-aligned assessment) replaces the automated quiz with a portfolio in which the trainee analyzes their recorded session against the framework's descriptors. This configuration retains the MOOC's scalability for knowledge acquisition while preserving the authenticity and reflexivity that competency development requires, an arrangement neither component could achieve independently.

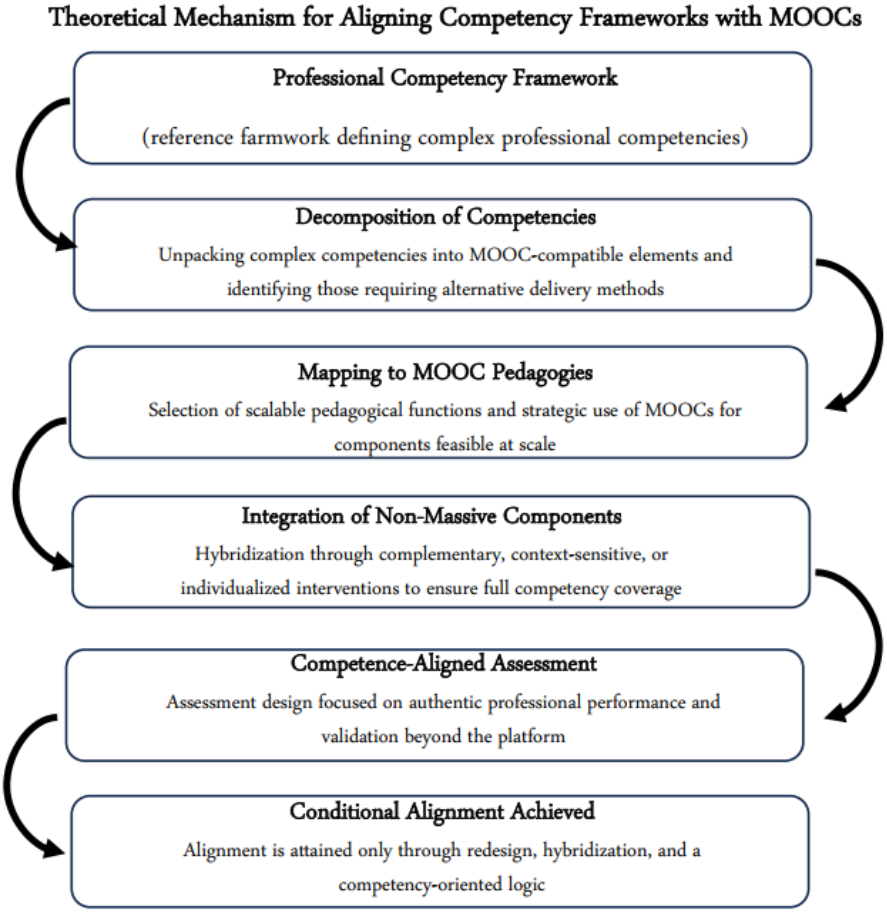


Fig 1. Theoretical mechanism for aligning professional competency frameworks with MOOCs

Conclusion

Our analysis reveals that this tension is not contingent, nor reducible to questions of effectiveness of pedagogical design, or technological maturity. It is a tension between two contrasting rationales for education: that of situated construction and validation of professional competence, on the one hand, and that of large-scale access to codified knowledge and self-directed participation, on the other hand. From this viewpoint, the alignment problem needs to be understood as a theoretical, structural problem.

According to its epistemological assumptions, pedagogical architectures and assessment logics, this article shows that the formation of competence presupposes forms of mediation such as guided practice, contextual feedback and expert judgment that are only marginally compatible with the dominant MOOC model. The persistence of the tensions outlined in the literature, despite several surges in pedagogical and technological innovations, suggests that the solutions currently proposed are limited to the periphery of the problem rather than addressing it head-on. In this sense, any attempt to improve the design of MOOCs without questioning their basic principles only reinforces this false sense of alignment.

The theoretical model developed in this paper does not seek to resolve this incompatibility through technical optimization. It seeks to reframe the problem through a combination of competency-based education principles with established instructional design models for digital

learning to investigate the analytical conditions where partial and situated forms of alignment may be achieved. This has positioned MOOCs not as stand-alone instruments for developing professional competence but as (a series of) modules embedded in hybrid professional development ecosystems that maintain the principles of authenticity, progression, and assessment.

The present model does not claim empirical validation or offer transferable course designs. Its contribution is analytic: it delimits the conditions under which partial alignment between competency frameworks and MOOCs is theoretically defensible. For practitioners, four orientations follow. First, competency decomposition should be a mandatory preliminary stage, conducted jointly by subject-matter experts and instructional designers. Second, a hybrid component should be planned for every competency dimension requiring situated practice. Third, assessment instruments should be designed outside the platform, not constrained by automated grading tools. Fourth, MOOC platforms should be periodically audited against the competency frameworks they claim to address.

Emerging technologies as adaptive learning systems, AI-supported tutoring, and immersive simulation platforms are beginning to shift the boundary between what can be achieved at scale and what requires small-group conditions, altering the competency-scalability gradient on which the alignment problem rests. Future research should examine whether they enable forms of alignment the current MOOC architecture cannot support, since designing professional training for language teachers in digital environments is not a problem to be solved once, but an ongoing analytical and pedagogical practice.

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