

Diagnostic Tools For Developing Future Teachers' Professional Competence In The Context Of Higher Education Internationalization

Egamberdiyev Oyatillox Alisher o'g'li

PhD Researcher, Fergana State University, Uzbekistan

E-mail: eoyatillox@gmail.com | ORCID: <https://orcid.org/0009-0006-9557-9386>

Abstract. The internationalization of higher education changes the expected profile of a future teacher: professional competence must now combine sound pedagogical knowledge with intercultural communication, digital-information literacy, global professional collaboration, and reflective adaptability. The purpose of this study is to substantiate an integrated set of diagnostic tools for assessing and supporting the development of these competencies in pre-service teachers. The study used a targeted integrative review and framework-synthesis method. Twelve foundational and current academic and institutional sources on higher education internationalization, teacher competence, intercultural competence, digital competence, global citizenship, and formative assessment were analysed.

Keywords: higher education internationalization; future teachers; professional competence; diagnostic tools; intercultural competence; digital competence; formative assessment; teacher education.

Internationalization is no longer limited to physical mobility or the presence of foreign students. It increasingly affects curriculum content, learning outcomes, assessment practices, institutional partnerships, digital learning environments, and the professional roles for which universities prepare graduates. Knight conceptualizes internationalization as a process of integrating international, intercultural, or global dimensions into the purposes and functions of post-secondary education. Later work on internationalization of the curriculum and Internationalization at Home emphasized that these dimensions should be embedded in the learning experience of all students, including those who do not participate in mobility programmes. For teacher education, this shift has a direct consequence: the competence of a future teacher must be demonstrated not only through subject and pedagogical knowledge, but also through the ability to work with culturally diverse learners, evaluate information critically, use digital technologies responsibly, collaborate across professional and cultural boundaries, and continuously improve practice through reflection.

International frameworks support this broader understanding. The OECD treats professional competence as a combination of knowledge, affective-motivational characteristics, professional judgement, and teaching approaches, while the TALIS Teacher Knowledge Survey operationalizes general pedagogical knowledge through domains related to instruction, learning, and assessment. DigCompEdu adds a structured account of educators' digital competence, including professional engagement, digital resources, teaching and learning, assessment, learner empowerment, and the facilitation of learners' digital competence. UNESCO's recent guidance on global citizenship and artificial intelligence further expands teachers' responsibilities toward ethical digital participation, critical engagement with information, human-centred use of technology, and lifelong professional learning.

The methodological problem is that these expectations are often assessed separately. Knowledge tests may capture what a student knows but not how that knowledge is enacted in a multicultural or digitally mediated classroom. Self-assessment can support reflection, but it cannot alone establish demonstrated competence. Portfolio assessment provides rich evidence, yet without explicit criteria it can become descriptive rather than diagnostic. Consequently, a valid diagnostic system for internationalized teacher education should combine direct performance evidence, expert judgement, and reflective evidence. The research problem addressed in this article is therefore the lack of an integrated diagnostic logic that links the multidimensional nature of future teachers' professional competence with appropriate assessment tools and developmental feedback. The purpose of the study is to substantiate a theoretically coherent set of diagnostic domains, indicators, and tools for assessing and developing future teachers' professional competence in the context of higher education internationalization. The study asks two questions: (1) which competence domains

should be represented in such diagnostics, and (2) how should evidence from different tools be combined so that assessment supports both reliable judgement and further professional development?

This study employed a targeted integrative review and framework-synthesis design. The method was selected because the research objective was not to estimate an intervention effect but to integrate established constructs from several related fields into a diagnostic architecture suitable for teacher education. The analytical corpus consisted of twelve foundational and current sources published between 1998 and 2026. Sources were selected purposively according to four criteria: direct relevance to higher education internationalization, teacher professional competence, intercultural/digital competence, or educational assessment; peer-reviewed publication or publication by an authoritative international organization; conceptual or methodological significance; and applicability to pre-service teacher education.

The analysis proceeded in three stages. First, each source was coded for (a) the competence construct being assessed, (b) observable indicators of performance, (c) recommended or implied assessment method, and (d) the developmental function of assessment. Second, conceptually overlapping indicators were clustered across sources. Third, the clusters were reorganized into a parsimonious set of domains that could be assessed using complementary methods. This synthesis was guided by four principles: construct validity, multimethod triangulation, developmental orientation, and contextual sensitivity. Construct validity requires alignment between the competence claimed and the task used to assess it. Multimethod triangulation requires that important judgements be supported by more than one evidence source. Developmental orientation means that diagnostic results should produce actionable feedback, not only a grade. Contextual sensitivity recognizes that internationally relevant competence must be interpreted in relation to local curricula, languages, institutional conditions, and professional standards.

The proposed diagnostic architecture is conceptual rather than a validated psychometric instrument. No primary data from human participants were collected. Accordingly, the results below should be understood as a theoretically grounded framework that requires subsequent expert validation, pilot testing, reliability analysis, and criterion-related validation before high-stakes use.

The framework synthesis resulted in five interrelated diagnostic domains. The first, pedagogical-design competence, represents the ability to translate professional knowledge into coherent, learner-centred, inclusive, and assessable teaching. It should therefore be diagnosed through tasks that require lesson planning, selection of methods, adaptation to learner diversity, and interpretation of assessment evidence, rather than through factual recall alone. The second, intercultural-communicative competence, concerns respectful and effective interaction across cultural and linguistic differences. Deardorff demonstrated that intercultural competence is best assessed through a combination of qualitative and quantitative evidence, including observation and judgements by self and others. In teacher education, this principle can be operationalized through critical-incident cases, role-play, reflective interviews, and observation of culturally responsive communication.

The third domain, digital-information competence, extends beyond technical tool use. DigCompEdu and UNESCO frameworks indicate that professional digital competence includes the selection and critical evaluation of resources, digital assessment, ethical participation, data-informed teaching, and responsible use of emerging technologies such as artificial intelligence. Direct performance tasks are therefore more informative than technology-use questionnaires alone. The fourth domain, collaborative-global professional engagement, reflects the ability to work productively in teams, participate in international or intercultural projects, communicate professional ideas, and contribute to shared educational problem-solving. This domain connects internationalization to everyday professional practice rather than treating it as an additional activity. The fifth domain, reflective-adaptive competence, captures the capacity to evaluate one's own decisions, use feedback, identify professional learning needs, and modify practice in response to evidence. This domain is essential because competence in dynamic internationalized environments is developmental rather than static.

Table 1.

Diagnostic domains, indicators, and recommended evidence sources

Diagnostic domain	Observable indicators	Primary diagnostic tools	Evidence output
Pedagogical-design	Plans coherent, inclusive lessons; selects methods	Scenario-based pedagogical test; lesson-	Lesson plan, scored teaching episode,

	purposefully; uses assessment evidence; adapts instruction to learner needs.	plan rubric; microteaching observation; assessment-design task.	decision rationale, assessment artefact.
Intercultural-communicative	Communicates respectfully across differences; interprets culturally sensitive situations; designs inclusive interaction; manages ambiguity.	Critical-incident cases; role-play; observation rubric; reflective interview; peer/expert judgement.	Case response, interaction record, observer ratings, reflective explanation.
Digital-information	Selects and evaluates digital resources; verifies information; uses digital/AI tools ethically; applies technology to teaching and assessment.	Authentic digital task; e-portfolio; source-evaluation task; DigCompEdu-informed self/mentor rubric.	Digital product, annotated sources, portfolio evidence, mentor judgement.
Collaborative-global	Works effectively in diverse teams; contributes to joint projects; communicates professional ideas; demonstrates global professional awareness.	Collaborative project rubric; peer assessment; project presentation; expert review of contribution.	Team product, contribution log, presentation, peer/expert ratings.
Reflective-adaptive	Identifies strengths and gaps; interprets feedback; justifies revisions; sets evidence-based professional development goals.	Reflective journal; self-assessment rubric; portfolio defence; feedback-response task; interview.	Reflection entries, revised artefacts, development plan, defence/interview evidence.

A central design rule of the proposed system is that no domain should be judged from a single instrument. At least two complementary methods should be used for each domain, and at least one should require direct performance. For example, intercultural competence should not be inferred only from a self-report scale, and digital competence should not be inferred only from frequency of technology use. The assessment unit is therefore not a test score but an evidence set.

To integrate evidence, scores from instruments that use different scales can first be transformed to a common 0–100 metric. A domain score may then be calculated as the mean of its standardized indicators only after minimum evidence requirements have been met. An overall Professional Competence Index can be calculated as the mean of the five domain scores if the programme has demonstrated acceptable reliability and if no domain is omitted. At the developmental stage, interpretation should rely on anchored descriptors rather than unvalidated numerical cut-offs. Three pedagogically meaningful levels are proposed: Adaptive (performance is mainly reproductive and depends on external guidance), Productive (the student applies knowledge independently in typical and moderately variable situations), and Transformative (the student makes justified, context-sensitive decisions, integrates multiple competence domains, and improves practice on the basis of evidence). These descriptors require local calibration through empirical studies before being used for certification.

Figure 1 summarizes the diagnostic cycle. Internationalized professional expectations are translated into the five domains, assessed through multiple evidence sources, and interpreted through triangulation. The resulting feedback is then converted into individual or programme-level development goals and followed by re-assessment. This cyclical logic makes diagnostics part of competence development rather than an endpoint.

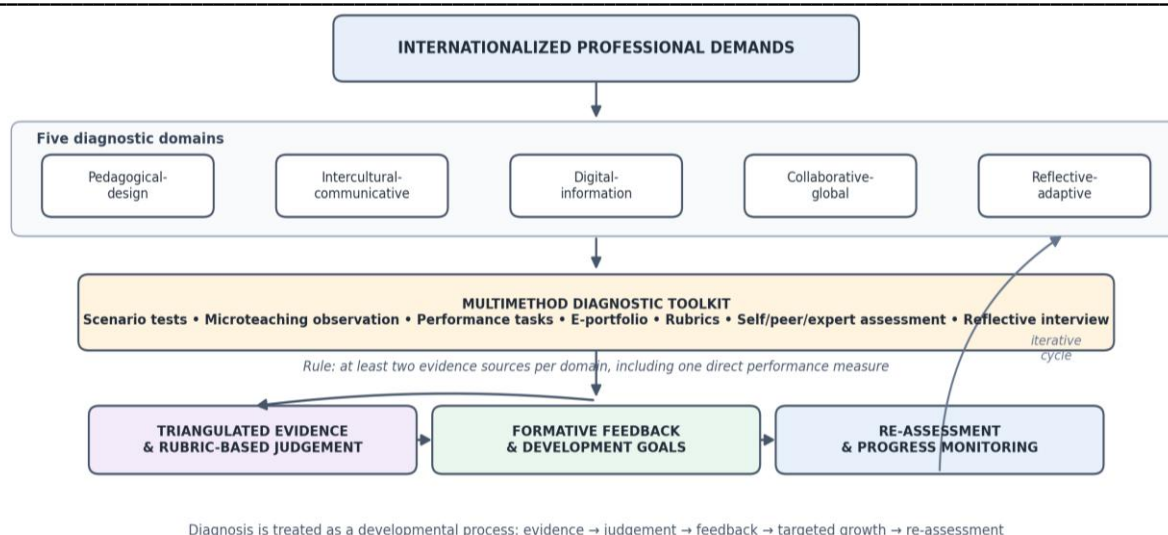


Figure 1. Integrated diagnostic cycle for future teachers' professional competence under higher education internationalization

The proposed framework is consistent with international research in three important respects. First, it treats teacher competence as multidimensional and performance-oriented. The OECD's work on teaching as a knowledge profession distinguishes professional knowledge from judgement and enacted teaching approaches; this supports the use of tasks that reveal how pre-service teachers reason and act, not only what they can recall. Second, the framework gives intercultural competence an explicit diagnostic place. This is essential in internationalized higher education because exposure to international content or mobility does not automatically produce intercultural competence. Deardorff's work is particularly relevant here: it emphasizes process, observable outcomes, and the need to combine different assessment methods. Third, the framework incorporates digital-information and ethical technology use as professional rather than purely technical competence, which corresponds to DigCompEdu and UNESCO's recent guidance.

The model also draws on formative assessment theory. Black and Wiliam showed that assessment becomes educationally powerful when evidence is used to adjust teaching and learning. In the proposed system, diagnostic information is therefore incomplete until it leads to feedback, goal-setting, or task redesign. Self-assessment has an important but carefully delimited role. Andrade's review indicates that self-assessment is especially valuable when it is formative and connected to criteria and self-regulated learning. It should therefore be used to make professional reasoning visible and to develop reflection, while direct observation and artefact-based evidence provide external checks. Rubrics are similarly useful when criteria describe the quality of learning rather than mere task completion.

For teacher education institutions, the main practical advantage of the framework is alignment. Internationalization strategies often remain at the institutional level mobility statistics, partnerships, foreign-language programmes while student assessment continues to focus on conventional local course outcomes. The proposed domains create a bridge between internationalization and the curriculum by specifying what internationally responsive professional competence can look like in observable student performance. This is compatible with Leask's emphasis on internationalized learning outcomes and with Beelen and Jones's argument that international and intercultural dimensions should be purposefully integrated into the curriculum for all students. Several limitations must be acknowledged. The framework is a conceptual synthesis and has not yet been psychometrically validated. Domain boundaries may overlap, particularly between intercultural communication, collaboration, and reflection. Moreover, diagnostic tasks require contextual adaptation to subject specialism, national standards, language of instruction, and institutional resources. The next research stage should therefore include expert review (for example, Delphi validation), cognitive interviewing with students, pilot administration, analysis of internal consistency where appropriate, inter-rater reliability for rubric-scored tasks, and examination of convergent and criterion-related validity. If the framework is used longitudinally, measurement invariance and sensitivity to growth should also be investigated. These steps are necessary before numerical thresholds are interpreted as high-stakes competence levels.

Higher education internationalization requires teacher education programmes to diagnose a broader professional profile than conventional knowledge testing can capture. The study substantiated a five-domain diagnostic architecture comprising pedagogical-design, intercultural-communicative, digital-information, collaborative-global, and reflective-adaptive competence. Its central methodological principle is triangulation: professional competence should be inferred from a structured combination of direct performance, expert observation, artefacts, and reflective evidence rather than from a single test or self-report measure. The proposed tools scenario tasks, microteaching, observation rubrics, e-portfolios, collaborative projects, critical-incident cases, reflective interviews, and self-, peer-, and expert assessment can be embedded in existing teacher education courses without turning internationalization into a separate discipline. The diagnostic cycle also strengthens the formative function of assessment by linking evidence to feedback and repeated professional development. For implementation, institutions are advised to (1) map programme learning outcomes to the five domains, (2) develop analytic rubrics with observable indicators, (3) require at least two evidence sources per domain, (4) train assessors and check inter-rater agreement, and (5) validate level descriptors with local student data. The framework thus offers a theoretically grounded basis for transparent and development-oriented diagnostics while leaving empirical calibration to subsequent research.

REFERENCES

1. Andrade, H. L. A critical review of research on student self-assessment // *Frontiers in Education*. – 2019. – Vol. 4. – Article 87.
2. Beelen, J., Jones, E. Europe calling: A new definition for internationalization at home // *International Higher Education*. – 2015. – No. 83. – P. 12–13.
3. Black, P., Wiliam, D. Assessment and classroom learning // *Assessment in Education: Principles, Policy & Practice*. – 1998. – Vol. 5, No. 1. – P. 7–74.
4. Brookhart, S. M. *How to Create and Use Rubrics for Formative Assessment and Grading*. – Alexandria, VA: ASCD, 2013.
5. Deardorff, D. K. Identification and assessment of intercultural competence as a student outcome of internationalization // *Journal of Studies in International Education*. – 2006. – Vol. 10, No. 3. – P. 241–266.
6. : Definition, approaches, and rationales // *Journal of Studies in International Education*. – 2004. – Vol. 8, No. 1. – P. 5–31.
7. Leask, B. *Internationalizing the Curriculum*. – Routledge, 2015.
8. Miao, F., Cukurova, M. *AI Competency Framework for Teachers*. – Paris: UNESCO, 2024.
9. OECD. *TALIS Teacher Knowledge Survey 2024: Conceptual and Assessment Framework*. – OECD Publishing, 2025.
10. OECD. *Results from the Teacher Knowledge Survey: What Teachers Know about General Pedagogy*. – OECD Publishing, 2026.
11. Redecker, C. *European Framework for the Digital Competence of Educators: DigCompEdu* / Y. Punie (Ed.). – Luxembourg: Publications Office of the European Union, 2017.