



Assessment practices for 21st century learning: review of evidence

Executive Summary



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ABOUT THE NESET II

NESET II is an advisory network of experts working on the social dimension of education and training. The European Commission's Directorate-General for Education and Culture initiated the establishment of the network as the successor to NESSE (2007-2010) and NESET (2011-2014). The Public Policy and Management Institute ([PPMI](http://www.ppmi.lt)) is responsible for the administration of the NESET II network.

EXECUTIVE SUMMARY

The social and economic transformations of contemporary knowledge societies demand new ways of thinking and learning. Knowledge alone is not sufficient; a broader range of skills and abilities is needed to navigate a moving landscape characterised by the increasing importance of information and communications technologies (ICTs), the decline of functional skills-based professions, and increasing competition. These skills and competences are no longer associated with certain academic disciplines, but are transversal and multi-dimensional in nature. The European key competence framework identified eight key competences supported by seven transversal skills necessary for personal fulfilment, active citizenship and all-rounded development in the 21st century, which are currently being further revised.

While the implementation of the key competence framework has been on the agenda of all Member States, policies and practices for the assessment of these competences have yet to be fully implemented in EU countries' efforts to integrate competence-based education into school curricula.

Assessing key competences and transversal skills is a challenging task, as they refer to complex constructs that are not easily measurable. Although assessment policies that support the assessment of traditional key competences such as maths, languages and science have largely been implemented, they are often limited to the contexts provided by the subject matters with which they are most closely associated, and rarely assess related attitudes. Cross-curricular competences and transversal skills are harder to associate with individual subjects and to reflect in specific learning outcomes. An innovative approach to assessment practices is needed to grasp the complexity and multiple roles of modern learning.

This report reviews international research to demonstrate how European education systems can improve their assessment practices to measure and support students' acquisition of key competences and transversal skills. It addresses the following questions:

- What are the different roles and purposes of classroom assessment?
- How can classroom assessment better support '21st century learning and teaching', and what are the key conditions for aligning current assessment practices with the development of key competences?
- What specific classroom assessment practices are effective to assess the full range of students' abilities and outcomes?
- What key recommendations can be made that can serve as important (first) steps to improve current policies on educational assessment?

One of the limitations of this review is the scarcity of European-based research that looks into the effectiveness of different assessment approaches when assessing non-traditional competences and transversal skills. That said, there are many innovative practices and inspiring approaches to assessing students' learning, both emerging and being tested, which the authors document in this review. However, we also acknowledge the limitations of the examples provided and the lack of empirical evidence on their effectiveness, where applicable.

Key findings

- **The field of educational assessment is currently divided and fragmented** into differing and often competing paradigms, methods and approaches: formative versus summative, norm-referenced versus criterion/standards-referenced, internal versus external, measurement versus judgement, etc. However, at the same time more and more education stakeholders realise that assessment is a process which aims to document learning as well as to feed and improve it, and therefore needs to be guided by theories, models, and evidence (see section 2.1).
- Apart from conceptual and instructional considerations, all assessment practices used in the classroom have to adhere to overall technical requirements, such as **being valid and reliable**. Assessments and the qualifications they underpin are increasingly important because they may affect individuals' access to life chances – especially in employment and continuing levels of education. There is growing awareness of the importance of assessment and certification processes to be equitable, fair and inclusive. Hence, in addition to validity and reliability, **transparency, equity and freedom from bias** are key requirements of effective assessment (see section 2.2).
- **The successful implementation** of assessment methods covering a broad range of key competences **depends on a number of separate but interlinked conditions** at classroom, school and system level:
 - **Operationalising key competences in terms of learning outcomes** is a necessary foundation for consistent assessment practices.
 - The effective use of assessment results and assessment practices depends on **teachers' assessment literacy and ability to appropriately integrate assessment data in their teaching**, which in turn requires teacher education programmes (both initial teacher education and continuing professional development) ensure comprehensive preparation of teachers in this field (see chapter 3).
- Research demonstrates that **there is no single method that would fully measure key competences and transversal skills, nor serve as a best practice for student assessment**. Several methods and types of assessment need to be used to assess various skills comprehensively. The effectiveness of a method depends on its purposes and design, as well as on schools' and teachers' capacity to use it. At the same time, there is no universal combination of methods that would serve as a recipe. Teachers can be rather flexible in their choice of methods as long as these assessment approaches serve multiple purposes and follow the principles of validity, reliability and equity.
- Our review demonstrated that **standardised assessment methods such as tests and multiple-choice assessments are often used for the assessment of certain key competences, such as digital competence, languages, mathematics, and science**. Well-designed tests and multiple-choice questionnaires can also assess higher order skills, such as critical thinking or social and emotional competences.
- **Performance-based assessment has the potential to measure and foster wide-ranging competences and higher-order skills**, since it encompasses different assessment techniques and integrates a feedback mechanism. The key strengths of performance-based assessment include its focus on the learners' personalised needs, clear definitions of the learning goals, and timely feedback.

- Due to their collaborative nature, **peer- and self-assessments** can be effective in enabling students' 'deep learning'¹ and self-regulation, and **are important elements of an integrated assessment framework to be used in classrooms**. Research suggests that peer- and self-assessments are particularly useful in developing non-traditional competences, such as initiative and entrepreneurship, learning to learn and social competence, as well as transversal skills such as critical thinking, creativity, problem-solving, risk assessment, decision-taking, and constructive management of feelings.
- **The use of ICT in assessment** allows to **deliver traditional assessment faster and more effectively** and at the same time offers opportunities to **change the way competences are assessed**, finding effective solutions for assessing non-traditional competences.

Key policy implications and recommendations

Our review suggests several steps, the implementation of which can help improve current education assessment policies and ensure that they grasp the full range of students' abilities and outcomes (see Chapter 5 for more details).

The main lessons and recommendations of this report are listed below.

- **The different functions of classroom assessment must be seen in synergy** with each other and be built into comprehensive assessment frameworks. Integrating different approaches to assessment can allow finding a balanced and consistent practice for assessing key competences.

Recommendations

- Policy-makers and schools should promote and employ an **integrated approach towards classroom assessment**, capitalising on the benefits and opportunities of summative, formative and diagnostic assessment to fit the multi-dimensional nature of key competences and transversal skills.
 - Assessment practices need to **document learners' competences and help develop them** informing teachers' practices and curricula focus.
 - When designing an integrated assessment framework, teacher and policy-makers should **find a balance between reliability and validity of assessment approaches according to the assessment purpose**. In this respect, employing both summative methods (which have stronger reliability), in combination with formative methods that strengthen the overall validity of the assessment approach, is important.
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- **Defining key competences in terms of detailed and concrete learning outcomes is necessary for consistent assessment practices**. In an attempt to emphasise key competences and learning outcomes in education policy across Europe, many education stakeholders initially focused on 'traditional' key competences in a limited range of subject areas rather than looking at higher order skills throughout the curriculum. Nevertheless, learning outcomes defined in curricular documents, education standards or legislation increasingly cut across subject boundaries and refer to key

¹ Deep learning refers to collaborative learning through reflection in action and on action (Fullan and Langworthy, 2014). The goals of deep learning are to provide students with competences and dispositions necessary to become 'creative, connected, and collaborative life-long problem solvers and healthy, holistic human beings' (Ibid, p. 2).

competences. Making learning outcomes specific can help to adapt learning and assessment practices.

Recommendations

- **Key competences should be clearly defined in relevant policy documents and/or school curricula**, including a wide range of clear, concrete and detailed learning outcomes linked to teaching practice, taking into account cognitive and non-cognitive components.
 - There is a need to transform teachers' attitudes and practices in the classroom in order to 'unpack' the competences to be taught and assessed.
- Teacher education (at ITE, induction and CPD level) should provide teachers with a common understanding of key competences and relevant assessment practices to assess student learning. **Integrating assessment practices at the ITE level and during practice** in schools can help increase teachers' assessment literacy and their skills to integrate assessment data into their teaching. **Collaborative learning environments can be effective tools to support teachers** at all stages of the teacher education continuum. School leaders and staff, school networks, municipalities, regional and national authorities can all be influential in supporting and monitoring teacher learning communities (TLCs) to reflect upon and enhance the effectiveness of assessment practices.

Recommendations

- **Teacher education systems should support teachers** at all stages of their careers to **effectively put into practice classroom assessment methods** that help to assess key competences and improve student learning.
 - ITE, induction and CPD programmes should focus on a **broad range of complementary assessment methods for formative and summative purposes** to enhance teachers' assessment competences.
 - **Collaborative learning environments, such as teacher learning communities (TLCs), should be promoted at all stages of the teacher education continuum** to support teachers' professional development and assessment competences.
- At the policy level, **there is a need for a clear vision and strategy for educational assessment where national and local approaches serve clearly defined purposes** with aligned assessment formats. There is a need to develop clear goals and reference points to guide student assessment at the classroom level.

Recommendations

- Schools should be provided with comprehensive guidance concerning valued learning outcomes in national curricula and standards.
- Education policy needs to strike a balance between formative and summative assessment, utilising the benefits of both, without over-relying on one particular method.

- Although standardised assessments have proved to be effective in assessing a number of key competences, they **can face challenges in evaluating non-traditional competences and transversal skills if narrowly focused solely on the content of the subject being assessed**. New technology has the potential to enhance the functionality of standardised assessments and their effectiveness in assessing cross-curricular competences.

Recommendations

- The assessment framework developed at school level should allow teachers to **draw on multiple sources of evidence** in order to form the best judgment on students' achievement level.
 - Schools' capacity to use **the potential of ICTs for developing sophisticated assessment instruments should be better supported**, where standardised assessments could also be used for formative purposes.
 - For standardised assessments to be effective, they should include the following items: **structure and content that reproduce real-life contexts authentically; multiple steps requiring a chain of reasoning and a range of competences; and a range of formats allowing responses that require different competences**.
- Performance-based assessment can serve both summative and formative purposes. They are seen as more effective than standardised tests in capturing more complex performances and processes. By employing a variety of techniques, such as holistic scoring rubrics, project-based assessment and portfolios², this approach can help assess a larger variety of competences and skills and better respond to individual learners' needs evaluating a learner's progress from his or her starting position.

Recommendations

- **Portfolios, holistic scoring rubrics and formative feedback can be helpful for formulating goals, monitoring student progress and assess broad competences**. The systematic development of these methods should be supported.
 - **Clear definitions and a scale for competence development need to be included in performance-based assessment methods**, taking into account the specific context to ensure its effectiveness.
- Peer and self-assessment is considered to be a powerful tool to engage students in active learning, reflection and raise their motivation and academic standards. However, for these methods to be effective, there is a need for careful planning and accurate teachers' feedback to enhance students' self-regulated skills for them to meaningfully engage into assessment practices.

² Portfolio assessment is a systematic and longitudinal collection of student work that shows his or her learning process, progress and performances (Frejd, 2013; Pepper, 2013).

Recommendations

- **Peer-and self-assessment as both assessment and learning process** should become an essential component of classroom's integrated assessment practices.
- Criteria to judge performance in relation to national goals and learning outcomes should be better clarified and illustrated when using formative assessment methods, in particular peer- and self-assessment.
- There is a need for further **policy and research support for the development of toolkits on self-assessment practices, especially for non-traditional competences and transversal skills.**

- Although technology-based assessment is receiving more and more interest from researchers, practitioners and policy makers, **only first and second-generation e-assessments such as computer-based standardised tests, multiple-choice assessments and adaptive tests are widely applied at classroom level.** Not yet systematically implemented, innovative personalised embedded assessment practices, using complex tools such as learning analytics, game-based assessment and intelligent tutors provide ample opportunities to assess transversal skills, **such as problem-solving, critical thinking and creativity.**

Recommendations

- Although technologies play an important role in contemporary classrooms, they should be carefully implemented. **Using technology-based assessments for formative assessment purposes should be accompanied by effective feedback and scaffolding mechanisms.**
- **Policy makers should promote the introduction of innovative tools** in the classroom and integrate specific training into teacher education programmes. Relevant teacher training and transformation of traditional teaching and assessment approaches is crucial, for ICT tools to be effectively embedded into classroom practices and positively affect learning.
- Innovative assessment tools should build on **active students' engagement** in the assessment process for them to be effective.
- **Apart from standardised e-assessment methods, the pool of e-assessment toolkits in Europe is rather fragmented and their effectiveness needs further research.** Practitioners would benefit from a more systematic application of technology-based tools into the curricula across EU Member States.

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