



# Deliverable 4.3 Design Fit-for-Purpose Assessment Methods for Learning in Digital Contexts





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# 1. Introduction

Digital literacy has been identified as one of the key competences for lifelong learning. The definition of digital literacy was updated in 2018 when the Council of the European Union updated the key competences for lifelong learning. According to the Council Recommendation (Council of Europe Recommendation 2018/C 189/01, 2018) digital literacy comprises confident, critical and responsible use of digital technologies, as well as engagement in learning, work and social participation. Digital literacy, includes information and data literacy, communication and collaboration skills, media literacy, digital content creation, information security, intellectual property issues, problem solving and critical thinking (European Commission, 2019).

The Dig-2-Inc project is linked to the European Framework for the Digital Competence of Educators<sup>1</sup> (DigCompEdu) as the project aims to enhance digital learning opportunities for students from low socio-economic backgrounds (low-SES) by equipping educators with the necessary digital skills and tools. Through targeted training and the development of micro-credentials and open badges, project supports educators in fostering an inclusive learning environment. This aligns with the DigCompEdu framework, which outlines the essential digital competences educators need to effectively integrate technology into their teaching practices. By promoting continuous professional development and lifelong learning, both the Dig-2-Inc project and the DigCompEdu framework strive to ensure that all students, regardless of their socio-economic status, have access to high-quality digital education. This synergy not only enhances the digital competence of educators but also contributes to a more inclusive and equal educational landscape across Europe.

This report focuses on designing effective assessment methods specifically tailored to digital and hybrid learning contexts. According to Hrastinski (2019) there are two blended learning definitions that are most frequently cited in the literature. Graham (2006) defines blended learning as learning systems combine face-to-face instruction with computer-mediated. Garrison and Kanuka (2004) define blended learning as thoughtful integration of classroom face-to-face learning experiences with online learning experiences. As online and blended learning environments continue to grow, developing assessment strategies that accurately reflect students' achievements and provide a clear picture of their progress is essential. The goal is to introduce innovative assessment approaches that align with intended learning outcomes across different academic levels—course, module, and degree.

The report draws on the collective expertise of partner universities, namely Burgas Free University (BFU), Technical University of Iasi (TUIASI), Guglielmo Marconi University (USGM) and University of Turku (UTU), which bring valuable insights from their experiences in blended and online learning. The resulting framework incorporates diagnostic, formative, summative, and lifelong learning assessments, broadening the spectrum of assessment methods applicable in digital education.

<sup>&</sup>lt;sup>1</sup> More information available https://joint-research-centre.ec.europa.eu/digcompedu\_en





By offering new approaches for evaluating learning in digital and hybrid settings, the report aims to guide educators involved in the development of digital courses. It provides a framework that not only measures academic performance but also supports students' continuous development throughout their learning journey. This comprehensive assessment approach will deepen the understanding of how digital learning can be effectively evaluated, ensuring that students' achievements are accurately captured and supported through innovative assessment practices.

# 2. The assessment framework

An assessment framework is a structured approach that outlines the methods and processes used to evaluate and measure students' learning and performance. It encompasses different types of assessments, such as diagnostic, formative, summative, and lifelong learning assessments. It provides a systematic approach to designing assessments that align with educational goals, curriculum standards, and learning outcomes. The framework serves as a critical tool for ensuring that assessments are purpose-driven and provide accurate insights into students' progress and abilities (Ghaicha, 2016). This framework is especially important in digital and hybrid learning contexts, where traditional assessment methods may need adaptation to effectively measure students' achievements in online and blended environments.

One of the key aspects of an assessment framework is its purpose and goals. These frameworks are designed to assess students' knowledge, skills, and competencies within specific subject areas, ensuring alignment with broader educational standards and learning objectives (Brown, 2022). In addition, effective frameworks include various types of assessments, each tailored to different stages of the learning process. Diagnostic assessments help identify students' prior knowledge and learning gaps before instruction begins. Formative assessments, conducted during the learning process, provide ongoing feedback to help students improve. Summative assessments are typically administered at the end of a course or module to evaluate overall achievement, while lifelong learning assessments assess the ongoing development of skills and knowledge beyond formal education (Ghaicha, 2016).

The development process of an assessment framework involves collaboration among educators, experts, and policymakers. This collective approach ensures that the framework is both comprehensive and adaptable, taking into account current teaching practices, emerging educational standards, and technological advances (Brown, 2022). Furthermore, assessment frameworks provide clear definitions of the content and skills that students need to master. These frameworks offer detailed descriptions of the knowledge and cognitive abilities required for students to address both academic and real-world problems, thus supporting a well-balanced educational experience.





An effective assessment framework also emphasizes flexibility and responsiveness. As educational standards, curricula, and student needs evolve, a responsive framework adapts to these changes, incorporating the latest research and best practices to remain relevant and effective (Intasoi et al., 2020). In addition to cognitive assessments, many frameworks include contextual information such as student, teacher, and school questionnaires. This additional data enriches the understanding of student achievement and provides a broader view of the factors influencing learning outcomes.

In summary, assessment frameworks are essential for guiding the design and implementation of effective evaluation methods in education. They ensure that assessments are aligned with learning objectives, offer meaningful feedback, and support the overall development of students' competencies across various domains.

Chapters 2.1 - 2.4 present more detailed the framework that include diagnostic, formative summative and lifelong learning assessments. These assessment methods are tailored to different stages of the learning process in digital context to create a holistic understanding of student performance.

## 2.1 Diagnostic assessment

Diagnostic assessment is used in the early stages of a learning cycle to identify and evaluate students' prior knowledge, skills, and learning gaps before instruction begins or at the beginning of a course or module. This type of assessment is designed to provide insights into students' existing understanding, allowing educators to customize their teaching to address any identified weaknesses. By identifying areas where students may be struggling or lacking background knowledge, diagnostic assessments enable instructors to plan more targeted and effective instruction. Furthermore, these assessments help in creating personalized learning paths, ensuring that each student's individual learning needs are met. Through diagnostic assessments, educators can establish a solid foundation for the course, addressing learning gaps early on to improve overall academic success.

An example of a diagnostic assessment is a pre-test or quiz, where students are asked to complete tasks or answer questions on a topic before formal learning starts. These tools help gauge students' current understanding, allowing teachers to make adjustments to the upcoming lessons and focus on areas that need reinforcement (Black & Wiliam, 1998). Additionally, diagnostic assessments can include interviews, surveys, or informal observations, offering a broader and more nuanced understanding of a learner's knowledge base and learning style (Bennett, 2011). The flexibility of diagnostic assessment makes it a crucial component in both traditional and digital learning environments, where teachers can quickly identify how best to support students in their learning journey.





## 2.2 Formative Assessment

Formative assessments are ongoing evaluations that occur throughout the learning process, designed to monitor student progress and provide timely feedback to facilitate improvement. Unlike summative assessments, which typically occur at the end of a learning cycle to assign grades, formative assessments are intended to be a continuous tool for enhancing learning. These assessments help instructors adjust their teaching strategies based on real-time insights into student comprehension and performance, allowing for more responsive and effective instruction (Sadler, 1989). The primary goal of formative assessment is not to grade students but to support a deeper and better understanding of the content by bringing out both strengths and areas for improvement. Formative assessments take various forms, each designed to provide insights into students' understanding and progress throughout the learning process. Examples include classroom quizzes, which offer quick feedback on students' grasp of key concepts, allowing instructors to identify areas that may need further clarification. Group discussions also serve as formative assessments, enabling students to articulate their thoughts and engage in peer feedback, fostering a deeper understanding of the material. Written reflections allow students to express their learning experiences and critically evaluate their understanding, providing teachers an opportunity to observe their thought processes and areas of growth. Project drafts are another common formative tool, offering students the opportunity to receive feedback on their work-in-progress, which can guide revisions and improvements before the final submission. By providing continuous feedback, formative assessments encourage self-reflection.

Research findings support the idea that formative assessments significantly impact student achievement and motivation. When students receive timely, constructive feedback, they are better able to understand their learning progress and adjust their efforts accordingly. This approach helps students take responsibility for their learning and engage in reflective practice, which can lead to greater mastery of the subject matter (Wiliam, 2009). In addition, formative assessments foster a collaborative learning environment where students actively engage with the content, their peers, and their instructors. By focusing on continuous improvement, formative assessments promote a learning culture that values feedback and growth rather than mere performance outcomes (Furtak & Ruiz-Primo, 2008). As a result, formative assessments are integral to creating a learning environment that nurtures student development and enhances overall educational effectiveness.

## 2.3 Summative Assessment

Summative assessments are a critical element of educational evaluation, typically carried out at the conclusion of an instructional period—whether at the end of a unit, semester, or course. The primary goal of these assessments is to evaluate and measure learners' achievements in relation to predefined standards or learning objectives, providing a comprehensive overview of the knowledge, skills, and competencies students have acquired over time (Stiggins, 2005). Unlike formative assessments, which offer feedback during the learning process to support improvement, summative assessments provide a final judgment on student performance, often influencing grades or certifications (Scriven, 1991). These assessments are of great importance, with significant





implications for a student's academic progression, and may include a range of evaluative tools such as final exams, standardized tests, end-of-term projects, or research papers (Guskey, 2003). By reflecting students' overall performance, summative assessments play a vital role in educational accountability and serve as a benchmark for academic success (Black & Wiliam, 1998).

Summative assessments come in many different forms and are designed to assess different aspects of a student's learning. One of the most common examples is the final exam, which typically tests a student's overall understanding of the course content. These exams are often comprehensive, covering all the material taught throughout the course, and are frequently used to assign a final grade (Guskey, 2003). Another example is the end-of-term project, which may require students to apply their knowledge in a practical or creative manner, showcasing their ability to synthesize information and solve complex problems. Standardized tests, such as those used for national or international assessments, provide a measure of student achievement against a broader benchmark, often comparing individual performance to that of peers (Scriven, 1991). The thesis can serve as a summative assessment, especially in higher education, where students are required to carry out research that requires critical thinking of their own, and also to demonstrate mastery of academic writing and analysis skills. Each of these assessment types serves as a formal, high-stakes evaluation that contributes significantly to students' final grades and certification.

## 2.4 Lifelong Learning Assessment

Lifelong learning assessments are increasingly recognized as a means to validate and acknowledge learning that occurs beyond traditional formal education. These assessments are essential for recognizing skills and knowledge gained through work experience, voluntary activities, or selfdirected learning. They often involve micro-credentials or certifications that validate an individual's learning achievements at any stage of life. Such assessments enable individuals to demonstrate the value of learning that takes place outside conventional educational institutions and are essential for promoting continuous personal and professional development (Colardyn & Bjornavold, 2004). The growing recognition of lifelong learning aligns with the evolving demands of the workforce, where skills validation is critical for employability and career progression (European Commission, 2018). These assessments can take various forms, such as micro-credentials and digital badges, which offer a way to document specific competencies or achievements in bite-sized, verifiable units. Portfolio assessments and certificates for skills acquired outside traditional academic settings are also common methods of lifelong learning assessment. These alternative credentials allow individuals to showcase their learning journey and competencies in a manner that is recognized by employers and educational institutions (Punie & Kearney, 2017). As the focus on lifelong learning expands, these assessments play a pivotal role in recognizing the diverse ways individuals acquire knowledge and skills, supporting both personal growth and employability.

The Council of the European Union adopted a recommendation on key competencies for lifelong learning in May 2018. The recommendation identifies eight key competencies essential to citizens for personal fulfilment, a healthy and sustainable lifestyle, employability, active citizenship and social





inclusion. The recommendation is a reference tool for education and training stakeholders. It sets up a common understanding of competencies needed today and in the future. The reference framework presents successful ways to promote competence development through innovative learning approaches, assessment methods or support to educational staff. All learners should achieve their full potential. To fulfil their different needs, the recommendation encourages Member States to: provide quality early childhood education and care, improve school education and ensure excellent teaching, further develop initial and continuing vocational education and training, and modernise higher education (European Commission, 2018).

Examples of lifelong learning assessments include micro-credentials, digital badges, and portfolio assessments, all of which serve to validate learning that occurs across various stages and experiences in an individual's life. Micro-credentials and digital badges are increasingly popular for recognizing specific skills or achievements acquired through non-formal and informal learning, such as work experiences, volunteer activities, or online courses (Punie & Kearney, 2017). Digital badges provide a flexible and scalable way to document and showcase competencies that are essential for personal development and employability. These digital credentials serve as verified indicators of accomplishments, skills, and knowledge gained through a variety of learning experiences, including non-formal and informal contexts. By offering a clear and tangible representation of a learner's abilities, digital badges help assess, recognize, and validate skills, ultimately strengthening the learner's profile for potential employers and educational institutions. Portfolio assessments provide a more comprehensive approach, allowing individuals to present a wide range of learning outcomes through curated collections of their work, achievements, and reflections over time (Barrett, 2007). Together, these assessment tools acknowledge the diverse, lifelong nature of learning and support the validation of knowledge and skills acquired outside traditional educational settings, promoting both continuous development and career advancement (Colardyn & Bjornavold, 2004).

The primary distinctions between different types of assessments are based on their purpose and timing within the learning process. Diagnostic assessments aim to identify learning gaps, offering insights into areas where students may require additional support. In contrast, formative assessments are utilized throughout the learning process to guide and inform instruction, enabling both educators and learners to adjust strategies for better understanding. Summative assessments assess the overall achievement of learners, typically at the end of an instructional period, measuring how well they have met specific learning objectives. Lifelong learning assessments extend beyond formal education, acknowledging the continuous value of learning throughout an individual's life and ensuring ongoing skill development in various contexts. This framework clarifies how each type of assessment plays a crucial role at different stages, contributing to the development of knowledge, skills, and competencies throughout an individual's educational path and beyond.





# **3. Experiences and evaluation in blended learning and online studies**

This chapter draws upon the collective expertise of partner universities, namely Burgas Free University (BFU), Technical University of Iasi (TUIASI), Guglielmo Marconi University (USGM), and University of Turku (UTU), each contributing valuable insights from their experiences in blended and online learning environments. Together, these institutions provide a comprehensive framework for assessing student performance in digital education, incorporating diagnostic, formative, summative, and lifelong learning assessments. This framework broadens the spectrum of assessment methods, ensuring a holistic approach to evaluating students in both blended and online contexts.

The first section of the chapter focuses on the application of various assessment methods in digital and blended learning environments. It presents detailed case studies showcasing how diagnostic, formative, summative, and lifelong learning assessments can be effectively implemented online to create a well-rounded understanding of student progress. The chapter will highlight existing tools, and guidelines for adapting these assessments to different courses and modules. It also discusses the challenges encountered in implementing these methods, the solutions developed to address them, and the outcomes achieved. Furthermore, it provides insights into the effectiveness of these assessment strategies in enhancing learning in digital and hybrid environments.

The second section explores novel approaches to learning assessment that move beyond traditional exams and quizzes. It introduces innovative methods such as project-based assessments, peer reviews, e-portfolios, and interactive simulations. Examples from partner institutions will illustrate how these approaches have been implemented and the impact they have had on student learning outcomes. The section will also examine how these methods can be applied at different stages of the learning process and across various types of assessments.

Assessing learning is crucial for teachers to gauge students' understanding and equip them for future education or careers. Technology-enabled assessments streamline this process, saving time and resources compared to traditional paper-based methods. They also provide deeper insights into students' needs, interests, and abilities, allowing educators to personalize learning more effectively. Additionally, technology-enhanced tools support teacher evaluation and professional development. These tools capture video and other evidence of key teaching qualities, such as teamwork and collaboration, creating opportunities for self-reflection, peer feedback, and supervisor evaluation. By leveraging diverse assessment methods, both instructors and students can track progress toward learning objectives, ensuring continuous growth and improvement.





## 3.1 Experiences in assessment methods for digital and hybrid learning

#### Bulgaria

In Bulgaria, there are two main types of assessments used in education: summative assessment and formative assessment. Summative assessment, often referred to as "assessment of learning," evaluates a student's learning, knowledge, proficiency, or success at the end of an instructional period, such as a unit, course, or program. These assessments are generally formally graded and carry significant weight in a student's overall evaluation. Examples include instructor-created exams, standardized tests, final projects, essays, presentations, reports, and final grades.

On the other hand, formative assessment, known as "assessment for learning," aims to monitor student learning and provide ongoing feedback to both students and staff. These assessments help students identify their strengths and weaknesses, allowing them to improve their self-regulatory skills and manage their education more systematically. Formative assessments can be conducted through tutor-led sessions, peer assessments, or self-assessment, and typically carry low stakes, often not contributing to a student's grade. Examples include in-class discussions, clicker questions, low-stakes group work, weekly quizzes, 1-minute reflection writing assignments, homework assignments, and surveys.

Combining summative and formative assessments can greatly enhance student learning outcomes. Instructors can explore various methods to integrate these assessments effectively, such as informal/formal, immediate/delayed feedback, embedded in lesson plans/stand-alone, spontaneous/planned, individual/group, verbal/nonverbal, oral/written, graded/ungraded, openended/closed responses, teacher/student initiated, process/product-oriented, brief/extended, and scaffolded/independently performed assessments. Over-reliance on summative assessment provides grades but little feedback for improvement. In contrast, formative assessments foster a safe learning environment and offer valuable feedback before summative assessments. Balancing both types of assessments is crucial for effective educational practices.

#### Romania

Higher education in Romania has been gradually embracing digital transformation, with online assessment becoming an increasingly important tool for evaluating student learning. The COVID-19 pandemic accelerated the adoption of online assessment methods, bringing numerous benefits but also highlighting significant challenges.

Romanian universities utilize platforms like Moodle, Microsoft Teams, and Google Classroom for exams and assignments. These platforms support various online assessment formats, including multiple-choice quizzes, essays, case studies, and oral exams conducted via video conferencing tools. Some universities have integrated online assessments into standardized tests, such as entrance exams and end-of-semester evaluations.

Gheorghe Asachi Technical University of Iasi, for example, used computerized tests for semester exams and the final exam even before the pandemic. They also employ Moodle and Google





Classroom for managing learning and assessment aspects, focusing on automated grading for objective assessments. Online assessments allow students to complete exams and assignments from anywhere, making education more accessible, especially during pandemic restrictions.

One advantage of educational platforms is automated grading systems, which provide instant feedback to students using quizzes and tests. Online platforms enable students to submit written assignments, which can be graded manually later, allowing for a comprehensive evaluation of their skills. Additionally, online tools foster critical thinking and self-reflection by enabling students to assess their own work or that of their peers. This is particularly useful in courses emphasizing collaboration and teamwork.

Video conferencing tools like Zoom and Microsoft Teams are used for oral assessments, especially for specialty topics. Online platforms can also assess specific competencies required for professional certifications or licensure, particularly in engineering. These methods are used by the ministry to certify specialists in civil engineering areas.

The efficiency of online education is primarily determined by the quality of the instructional paradigm that grounds it. Through the teaching-learning process, students build their knowledge and skills through interaction with teachers and peers.

#### Italy

Unimarconi University in Italy, as an online institution, has adopted various assessment methods to evaluate student learning and academic progress. These assessments have evolved over time, particularly in response to external circumstances such as the COVID-19 pandemic. Currently, Unimarconi employs both summative and formative assessments, leveraging a combination of inperson and online methods. Furthermore, the university integrates artificial intelligence (AI) tools to enhance the assessment experience for both students and professors.

Summative assessments at Unimarconi serve as final evaluations of students' knowledge and skills at the end of each module. Written exams, initially conducted in person at the university's main headquarters, transitioned to online formats during the COVID-19 pandemic, requiring students to use two webcams for monitoring. Oral exams, conducted in presence and during the pandemic via an online platform, involve group sessions where students take turns answering questions posed by the professor, covering the entire syllabus studied throughout the course. Since the easing of pandemic restrictions, Unimarconi has implemented a hybrid assessment model, with some exams remaining online while others have returned to in-person formats. Notably, the final thesis defence is conducted in person, similar to traditional universities.

In addition to summative assessments, Unimarconi incorporates formative assessment strategies to continuously support student learning. Each lesson features interactive quizzes on the online platform that help students reinforce their understanding of key concepts. Students engage in self-assessment by responding to reflection questions at the end of each lesson, prompting critical thinking and deeper comprehension of course materials. Unimarconi employs an innovative Al-





enhanced platform that aids both students and professors. Professors can generate diverse test formats using AI tools, while students can seek clarifications and receive AI-generated responses. Feedback from Unimarconi students highlights one of the main challenges of an online university: the lack of human interaction. Unlike traditional in-person learning environments, online education often leads to feelings of isolation due to the absence of spontaneous conversations and direct engagement. This can make it difficult for students to clarify doubts, exchange ideas, and stay motivated. To address this issue, Unimarconi has implemented an AI-powered platform designed to enhance student support and engagement. This intelligent system allows students to ask questions related to lesson content, providing clear and simplified explanations of complex topics. The AI adapts its responses to different learning styles, ensuring that concepts are conveyed in a way that is easier to understand. To maintain accuracy and reliability, the AI-generated responses are strictly based on the official course materials provided by the professors, safeguarding the integrity of the information and ensuring that students receive correct and relevant explanations without the risk of misinformation.

#### Finland

At the University of Turku, the assessment of studies is based on the learning outcomes defined in the curricula, utilizing a variety of methods such as exams, assignments, essays, learning diaries, and tests. For e-learning, assessment methods may include learning tasks, online discussions, and e-exams. The e-exam service allows students to take exams flexibly at times that suit them, and the assessment of exam answers is generally carried out in accordance with the Code of Conduct. At the Open University, the assessment of studies is based on curricular objectives, and students receive feedback on their progress during their studies. The University of Turku supports the pedagogical competence of its teachers and the development of teaching methods in various ways, ensuring that students receive sufficient feedback on their learning to support the achievement of learning objectives.

In digital and hybrid learning environments, Moodle and Webropol can be used at the University of Turku to identify students' existing knowledge, skills, and misconceptions before instruction begins. These electronic tools can conduct online quizzes and surveys that quickly gauge students' prior knowledge and readiness for new content. Formative assessment is an ongoing process that provides students with continuous feedback throughout their learning experience, helping them identify both their strengths and areas where improvement is needed. Common methods of formative assessment include self-assessment, peer review, and teacher feedback. Echo360, a video platform for educational videos, supports formative assessment by enabling teachers to view statistical tools that assess a single video recording or a student's activity on the course area, as well as how the videos are viewed. Additionally, the entire Echo course area can be evaluated based on activity and statistics.

Summative assessment occurs at the end of a course or module, aiming to evaluate a student's overall competence based on predefined learning objectives. This type of assessment is generally used to assign final grades or determine whether the student has met the necessary learning





outcomes. Examples of summative assessments include traditional written tests or online assessments, projects, essays, and reports. The University adapts assessment strategies to suit the needs of online and blended learning environments, ensuring that learning is effectively measured regardless of the mode of delivery. To provide a holistic evaluation of student learning, the University of Turku employs a variety of assessment methods across different disciplines. This diversity ensures that students have opportunities for self-reflection and supports a range of learning strategies, guaranteeing fairness and transparency in the assessment process.

Feedback systems at the University of Turku employ a wide range of assessment methods tailored to both blended and online learning contexts. These include traditional exams, project-based assessments, peer reviews, and interactive assignments that evaluate critical thinking, creativity, and problem-solving abilities. Continuous feedback is emphasized to support student development throughout their courses, allowing instructors to provide timely guidance and improve learning outcomes. To ensure that its educational practices meet students' needs, UTU regularly conducts surveys to collect feedback on various aspects of the student experience, including assessment methods. Feedback is gathered from university students with different methods and at different points of their studies, as well as from university graduates.

Course feedback is gathered in different ways in the departments and faculties, either spontaneously as a discussion between students and the teacher during the course, with a feedback form at the end of the course, or as an electronic survey using tools such as Moodle or Webropol. At its best, feedback can be used immediately to improve the realization of the course. A survey at the beginning of the studies is carried out in spring and is aimed at degree students who began their studies that academic year. The survey gathers information about students' experiences on student life, studies, teaching, and counselling, and its results are used to develop counselling and other support services at the beginning of the studies.

The National Student Feedback Survey is aimed at students who have achieved their Bachelor's degree or have studied four years in fields that do not have the Bachelor's degree, such as medicine. The survey is carried out in all universities, and students can access the questionnaire via an online link. The survey provides information about learning and teaching, and the University can use it as a basis for developing education and other operations. The survey is also part of the universities' funding model in Finland, and the results can be found at the Vipunen - Education Statistic Finland portal (https://vipunen.fi/en-gb). Career monitoring surveys follow the situation of graduates for a longer period, producing information about the quality of employment, career development, and the relevance of education in the labour market. These surveys are carried out by the Career Services as part of the Aarresaari network (https://www.aarresaari.net/?lang=en), which covers all the Academic Career Services of Finnish universities. The target group of master's degree career monitoring includes all persons who graduated with either a second cycle university degree or a concluding first cycle university degree five years earlier. The labour market integration of doctors is examined three years after graduation, with data collected each autumn. These results can also be





found at Vipunen, and part of the results affects universities' funding via the universities' funding model in Finland.

In addition, the University of Turku participates in various thematic surveys conducted by organizations such as the Finnish Education Evaluation Centre. Different organizations also collect feedback from students. Recognizing the importance of effective assessment in blended learning environments, UTU invests in faculty development programs that equip educators with the skills necessary for designing engaging learning experiences, managing both virtual and in-person classrooms, and utilizing digital tools. This focus on professional development ensures that assessment methods are not only innovative but also grounded in best pedagogical practices, enhancing the overall quality of education at UTU.

## 3.2 Novel approaches for learning assessments

#### Bulgaria

In Bulgaria, online summative assessment is a structured evaluation conducted digitally to measure a learner's understanding and proficiency at the end of a course or unit. It typically includes multiplechoice questions, essays, or practical tasks designed to assess knowledge, skills, and application. These assessments provide educators with insights into student performance and help determine final grades or competency levels. Online summative assessments offer flexibility, instant feedback, and data-driven analysis, ensuring a fair and efficient evaluation process.

Summative assessments are defined by three main criteria. Firstly, they aim to determine if students have learned the expected material through tests, assignments, or projects. Secondly, they are given at the end of an instructional period to evaluate learning progress, assess educational program effectiveness, measure improvement goals, and inform course-placement decisions. Thirdly, summative assessments are generally recorded as scores or grades that contribute to a student's permanent academic record, such as on report cards.

Summative assessments differ from formative assessments, which provide feedback to improve instruction and student learning in real time. Common examples of summative assessments include tests, final exams, reports, papers, and end-of-class projects. Summative assessments also include standardized tests, end-of-unit tests, end-of-term or semester tests, and standardized tests used for college admissions, such as the SAT or ACT, and end-of-course evaluations like Advanced Placement or International Baccalaureate exams. Culminating demonstrations of learning, such as e-portfolios of student work and capstone projects, are evaluated by teachers and presented by students at the end of the course, semester, or year.

Summative assessments typically occur at the end of a course or module, mainly to evaluate a student's long-term retention of information. While usually given at the end, some can also serve a diagnostic purpose by utilizing data from online grading systems to identify students who may





struggle in certain areas. Occasionally, students may retake summative tests, with results used to prepare them for future attempts.

Digital formative assessment in education includes tools such as student e-portfolios, social media, digital textbooks, mobile learning, classroom polling, and digital games. Research by Looney (2019) indicates that digital learning and assessment can significantly enhance student learning. Approaches to formative assessment vary across countries and educational cultures, reflecting diverse research traditions. Digital formative assessment can boost student motivation and learning, but its effectiveness depends on proper implementation and alignment with teaching goals.

Formative assessment is a dynamic process where teaching and learning are adapted based on assessment results (Clark, 2010). Black and Wiliam (2018) emphasize that any theory of formative assessment must be embedded within a broader pedagogical framework. They propose a model influenced by pedagogy, instruction, learning theories, and subject disciplines.

Advantages of digital learning environments include real-time feedback, personalized learning, immersive environments, mobile tools for "anytime-anywhere" learning, complex problem-solving, self-and peer-assessment, access to resources, educational data collection, and seamless integration of formative and summative assessments. These environments also allow learners to design their own learning goals and strategies.

Digital formative assessment involves evaluating student progress using elements of the digital learning environment. This assessment provides feedback to adjust teaching and learning activities. It is considered formative when both teachers and learners use evidence of learning to adapt the next steps in the learning process.

Looney's (2019) typology categorizes digital formative assessment tools and platforms, highlighting their use in supporting student learning, tracking progress, and encouraging interaction. In online learning, maintaining academic integrity requires careful consideration of assessment formats, cognitive skills, and grading structures.





Typology	The digital learning environment	Student-centred learning and assessment	Student collaborative learning and assessment
Personalised learning platforms • e-portfolios	Students' learning environments, use of multi-modal materials/tools	Student-directed, reflection, self- assessment.	Peer assessment, collaborative projects, etc.
• Digital storytelling	Students' learning environments, use of multi-modal materials/tools	Student-directed, reflection, selfassessment	Peer assessment, collaborative storytelling, etc.
• Social media (blogs, wikis)	Students/teachers identify areas for online discussion. Integrated with other tools (e- textbooks, mobile learning, etc.)	Peer feedback	Discussion boards, Facebook, blogs and wikis, text messages and other social media to support peer collaboration and assessment
Online resources	Internet-based resources to support student research	Teacher scaffolding to develop student research skills.	Peer assessment, collaborative research project
E-textbooks	Multi-modal materials/tools to demonstrate and model content/interactivity	Student self-pacing; Automatically differentiated (adaptive) or differentiated by the teacher (nonadaptive)	Discussion boards, Facebook, blogs and wikis, text messages and other social media to support peer collaboration and assessment
Mobile learning	Situated learning, immersive and interactive	Automatically differentiated (adaptive)	Text messages and social media to support collaborative learning and assessment
Polling, interactive white boards	Classroom polling to check student understanding, guide and adapt classroom discussions according to student understanding	Contingent teaching (non-adaptive: teachers adapt/differentiate content according to identified needs)	Opportunities to support peer learning; opportunities for collective and contingent decision- making
Rubrics	Teachers can create or find scoring rubrics that outline standards to assess student progress and learning needs. These rubrics can be analog or made with online tools, and analog rubrics can also evaluate digital learning products.	Students may use scoring rubrics to identify their progress and adjust learning strategies.	Students may use scoring rubrics for peer assessment or to assess the quality of their collaborative work

 Table 1. Typology of digital formative assessment tools, platforms and modes (Source: Looney, 2019)





#### Romania

To address the challenges of assessment that supports learning while minimizing risks, it's recommended to use a variety of assessment methods throughout the semester and in the final exam. Universities must ensure they provide the necessary conditions and resources for effective implementation, ensuring equitable access for all students, including those with disabilities or special educational needs, to free and adequate IT tools and digital platforms. Institutions should also provide assistive technologies where needed to create an inclusive assessment environment (Jafarov & Aliyev, 2024; Thompson et al., 2023).

Based on experiences in Romania, innovative assessment methods beyond traditional exams and quizzes can significantly enhance student learning outcomes. Project-based assessments involve students working on complex projects over an extended period, promoting collaboration, creativity, and application of knowledge. This method has been shown to improve student motivation and achievement as they see the relevance of their learning to real-world scenarios.

Peer reviews, where students assess each other's work, foster critical thinking and self-reflection. This approach enhances understanding and retention of material, as students engage deeply with the content. E-portfolios, which involve students compiling a digital portfolio showcasing their work and progress over time, provide a comprehensive view of student learning and development, encouraging continuous improvement.

Interactive simulations allow students to participate in scenarios that mimic real-world situations, applying their knowledge in practical contexts. This method develops critical thinking and problemsolving skills, better preparing students for real-life challenges.

These innovative assessments can be applied at various stages of the learning process. Formative assessments, such as continuous assessments like quizzes, polls, and peer feedback, help monitor progress and provide immediate feedback. Summative assessments, including final evaluations such as projects, presentations, and simulations, demonstrate mastery of learning outcomes.

Examples of implementation include short quizzes after lectures to assess understanding of content using tools like Google Forms and Kahoot, group discussions to activate critical thinking and collaboration using media technologies, team presentations evaluated by peers using Google Classroom, and online platforms offering immediate grades to guide students.

Research shows that these methods lead to deeper learning, greater retention of content, and improved student engagement. They also help students develop essential skills for life, such as critical thinking, communication, and problem-solving. By integrating these innovative assessment methods, educational institutions can create a more dynamic and inclusive learning environment that supports continuous improvement and caters to diverse student needs.





#### Italy

Based on the experience of Italian universities, to further enhance the assessment strategies at online universities, several innovative approaches could be integrated. Gamification and simulationbased assessments can make learning more engaging by incorporating game-based techniques and simulations. For example, business students could participate in virtual business simulations to apply theoretical knowledge in realistic scenarios. Peer-assessment and collaborative evaluation encourage students to evaluate each other's work through peer reviews, fostering critical thinking and self-reflection. This approach can be effectively used in project-based assignments and discussions.

E-portfolios allow students to compile a digital portfolio showcasing their work, progress, and reflections over time, providing a more comprehensive evaluation of their learning journeys beyond single-exam performances. Al-driven adaptive assessments can utilize existing AI tools at Unimarconi to create assessments that adjust the difficulty of questions based on a student's performance, ensuring a personalized learning experience.

Real-world case studies and problem-based learning can replace traditional exams, assessing students through case studies and problem-solving exercises that mirror real-world challenges relevant to their fields of study. In disciplines such as medicine, engineering, and architecture, virtual reality (VR) and augmented reality (AR) tools can be used to create immersive assessment environments, allowing students to demonstrate practical skills in a controlled digital space.

#### Finland

Finnish universities have embraced blended and online learning, reshaping assessment methods to enhance engagement and learning outcomes. Digital platforms facilitate formative assessment by tracking student progress and providing continuous feedback. Universities prioritize peer and selfassessment, fostering critical thinking and reflective learning, while project-based and competencybased assessments emphasize practical applications of knowledge over traditional exams.

International collaborations, such as the ENVISION\_2027 Erasmus+ project, contribute to refining hybrid teaching strategies. The University of Turku's ViLLE platform (https://en.learninganalytics.fi/ville), recognized with the UNESCO Prize for ICT in Education, provides interactive assessments through quizzes, simulations, and personalized feedback. Universities also utilize LMS platforms like Moodle and Canvas for managing assignments, online quizzes, and tracking student progress, integrating both formative and summative assessments.

Innovative approaches to assessment include gamification and simulation-based learning. Get a Life, a work-life simulation developed by the Finland Futures Research Centre at the University of Turku, helps students explore future career and life scenarios, fostering decision-making and futures thinking. Simulations are particularly effective in business and healthcare education, where students can engage in realistic, controlled environments.





Projects such as FINCODA (https://www.fincoda.eu/) and SINCOE (https://sincoe.turkuamk.fi/) at Turku University of Applied Sciences support digital assessment strategies, integrating innovation pedagogy and competency evaluation in online learning. Meanwhile, DigiCampus (https://digicampus.fi/#) provides a shared platform for universities to collaborate on joint studies, MOOCs, and cross-institutional courses, broadening access to online education.

Finnish universities emphasize constructive feedback as a cornerstone of assessment, ensuring students receive timely insights to improve their learning strategies. Student surveys help refine teaching and assessment methods, maintaining their relevance and effectiveness. Collaborative learning and peer review remain integral, encouraging active participation and deeper engagement with course content. By integrating these diverse assessment strategies, Finnish higher education institutions prepare students for real-world challenges, ensuring they develop essential skills for the future.

# 4. Summary and conclusions

Effective assessment methods are fundamental in blended learning and online education, allowing educators to evaluate student progress and enhance learning outcomes. Technology-enhanced assessments streamline the evaluation process, saving time and providing deeper insights into student needs. Additionally, digital tools support teacher evaluations and professional development by enabling self-reflection, peer feedback, and supervisor reviews.

Across different educational systems, summative and formative assessments play a crucial role. Summative assessments, such as standardized exams and final projects, evaluate student learning at the end of a course, while formative assessments, including quizzes, peer reviews, and selfassessments, offer continuous feedback to support learning. A balanced combination of these methods ensures comprehensive student development. The integration of technology in assessment has significantly improved the efficiency and accessibility of evaluations in blended and online learning. Institutions worldwide are increasingly embracing digital solutions to enhance learning outcomes, provide instant feedback, and create personalized educational experiences.

However, challenges remain, such as ensuring academic integrity, maintaining student engagement, and addressing the lack of human interaction in online settings. Higher education institutions have responded by incorporating AI-driven support systems to mitigate these issues. Additionally, robust feedback mechanisms help refine assessment strategies and improve student learning experiences. Moving forward, a thoughtful balance between summative and formative assessments, coupled with innovative digital tools, will be crucial in shaping effective and equitable learning environments. Continuous faculty training and the adaptation of emerging technologies will further enhance the assessment process, ensuring that students receive meaningful feedback and opportunities for growth in both blended and fully online education settings.





Innovative approaches to learning assessments are transforming education, particularly in online and blended learning environments. Traditional summative assessments, such as multiple-choice tests, essays, and practical tasks, remain essential for measuring student proficiency at the end of a course. However, digital assessment tools are increasingly enhancing flexibility, efficiency, and engagement in the evaluation process.

Formative assessments, which provide ongoing feedback, play a crucial role in adapting teaching methods to student needs. These include e-portfolios, peer reviews, digital games, and interactive simulations that foster critical thinking and problem-solving skills. Project-based learning and peer assessments have been shown to improve student engagement and understanding. Similarly, universities are integrating AI-driven adaptive assessments, gamification, and simulation-based evaluations to create more dynamic learning experiences.

Some universities have pioneered the use of digital platforms to manage both formative and summative assessments. They emphasize peer and self-assessment, project-based evaluations, and competency-based learning to better prepare students for real-world applications. Additionally, innovative assessment tools such as work-life simulations and virtual reality environments are being adopted in disciplines like business and healthcare.

The collected experiences in blended learning and online studies in Bulgaria, Romania, Italy and Finland presented in Chapter 3 did not provide many examples of diagnostic assessment used to identify students' existing knowledge, skills, and possible misconceptions before instruction begins. However, the results highlighted many innovative tools that could be used for diagnostic assessment in digital and hybrid environments, such as online quizzes, surveys and as interactive simulations. It is also noteworthy that lifelong learning assessment, which focus on developing and evaluating skills that support continuous learning beyond formal education, were rarely mentioned in the presented experiences. To develop lifelong learning assessment and reflection on skills and knowledge acquired beyond formal education, as well as develop digital badges and micro-credentials recognizing and validating these skills. Additionally, HEIs could develop gaming and simulations to help students to demonstrate work and learning in real-life settings.

A key consideration for online assessments is ensuring academic integrity. Strategies such as randomized quiz questions, deeper cognitive engagement, flexible testing conditions, and gradual grading structures help create fair and effective evaluation systems. By incorporating a variety of assessment formats, institutions can provide more personalized and meaningful feedback, reducing student stress and promoting deeper learning. The integration of novel assessment methods enhances the quality and effectiveness of online and blended education. Digital formative and summative assessments, when implemented thoughtfully, provide richer insights into student learning while fostering engagement and self-reflection.





Successful online assessment strategies require a balance between structured summative evaluations and continuous formative feedback. Institutions that leverage technology—such as AI-driven assessments, gamification, and interactive simulations—can create more engaging and fair learning environments. Furthermore, adopting best practices, including flexible testing conditions, gradual grading structures, and interactive peer assessments, ensures that students receive meaningful support throughout their academic journey.

As education continues to evolve, universities must remain adaptive, continuously refining assessment strategies to meet the diverse needs of learners. By integrating innovative digital tools and prioritizing constructive feedback, institutions can better prepare students for future academic and professional success in an increasingly digital world.





## References

Barrett, H. C. (2007). Researching electronic portfolios and learner engagement. Journal of Adolescent & Adult Literacy. Vol. 50, No. 6, Electronic Portfolios (Mar., 2007), pp. 436-449 <u>https://doi.org/10.1598/JAAL.50.6.2</u>

Black, P., & Wiliam, D. (1998). Assessment and Classroom Learning. Assessment in Education. Assessment in Education, 5, 7-74. <u>http://dx.doi.org/10.1080/0969595980050102</u>

Black, P. & Wiliam, D. (2018) Classroom assessment and pedagogy Assessment in Education: Principles, Policy & Practice, Vol. 25, No. 6, pp. 551-575, https://doi.org/10.1080/0969594X.2018.1441807

Brown, G. T. L. (2022). The Past, Present, and Future of Educational Assessment: A Transdisciplinary Perspective. Frontiers in Education. https://doi.org/10.3389/feduc.2022.1060633

Cedefop (2022). Microcredentials for labour market education and training: first look at mapping microcredentials in European labour-market-related education, training and learning: take-up, characteristics and functions. Luxembourg: Publications Office. Cedefop research paper, No 87. <u>http://data.europa.eu/doi/10.2801/351271</u>

Clark, I. (2010) Formative Assessment: There is nothing so practical as a good theory. Australian Journal of Education, Vol. 54, No. 3, pp. 341-352. https://doi.org/10.1177/000494411005400308

Colardyn, D. and Bjornavold, J. (2004), Validation of Formal, Non-Formal and Informal Learning: policy and practices in EU Member States1. European Journal of Education, 39: 69-89. https://doi.org/10.1111/j.0141-8211.2004.00167.x

European Commission. (2018). Key competences for lifelong learning. EU Education and Training. https://op.europa.eu/en/publication-detail/-/publication/297a33c8-a1f3-11e9-9d01-01aa75ed71a1/language-en

Furtak, E. M., & Ruiz-Primo, M. A. (2008). Making students' thinking explicit in writing and discussion: An analysis of formative assessment prompts. Science Education, 92(5), 799-824. https://doi.org/10.1002/sce.20270

Ghaicha, A. (2016). Theoretical Framework for Educational Assessment: A Synoptic Review. Journal of Education and Practice. <u>https://eric.ed.gov/?id=EJ1112912</u>





Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. Internet and Higher Education, 7, 95–105. https://doi.org/10.1016/j.iheduc.2004.02.001.

Graham, C. R. (2006). Blended learning systems: Definition, current trends and future directions. In C. J. Bonk & C. R. Graham (Eds.), The handbook of blended learning: Global perspectives, local designs (pp. 3–21). San Francisco: Pfeiffer

Guskey, T. R. (2003). How Classroom Assessments Improve Learning. Educational Leadership,60(5),6-11.assets/31887 book item 31887.pdf

Hrastinski, S.(2019) What Do We Mean by Blended Learning?. TechTrends 63, 564–569. https://doi.org/10.1007/s11528-019-00375-5

Intasoi, S., Junpeng, P., Tang, K.N., Ketchatturat, J., Zhang, Y., & Wilson, M. (2020) Developing an Assessment Framework of Multidimensional Scientific Competencies. International Journal of Evaluation and Research in Education, Vol. 9, 4, 963-970 <a href="http://doi.org/10.11591/ijere.v9i4.20542">http://doi.org/10.11591/ijere.v9i4.20542</a>

Jafarov, S., & Aliyev, Y. (2024). Assessment Methods in Blended Learning Environments. Journal of Management World, 2024(4), 505-515. https://doi.org/10.53935/jomw.v2024i4.443

Looney, J.(2019) Digital Formative Assessment: A review of the literature. Retrieved from: http://www.eun.org/documents/411753/817341/Assess%40Learning+Literature+Review/be02 d527-8c2f-45e3-9f75-2c5cd596261d

Punie, Y., editor(s), Redecker, C., European Framework for the Digital Competence of Educators: DigCompEdu, EUR 28775 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-73718-3 (print),978-92-79-73494-6 (pdf), doi:10.2760/178382 (print),10.2760/159770 (online), JRC107466.

Sadler, D. R. (1989). Formative assessment and the design of instructional systems. Instructional Science, 18(2), 119-144. <u>https://doi.org/10.1007/BF00117714</u>

Scriven, M. (1991). Chapter II: Beyond Formative and Summative Evaluation. Teachers College Record, 92(6), 19-64. <u>https://doi.org/10.1177/016146819109200603</u>

Stiggins, R. (2005). From Formative Assessment to Assessment for Learning: A Path to Success inStandards-BasedSchools.PhiDeltaKappan,87(4),324-328.https://doi.org/10.1177/003172170508700414





Thompson Z., Yoon H., Booth P. (2023) Dispersed assessment: A novel approach to enhancing student engagement during and beyond Covid-19, The International Journal of Management Education, Volume 21, Issue 2, 2023, 100811, ISSN 1472-8117, <a href="https://doi.org/10.1016/j.ijme.2023.100811">https://doi.org/10.1016/j.ijme.2023.100811</a>

Wiliam, D. (2009). An integrative summary of the research literature and implications for a new theory of formative assessment. In H. L. Andrade & G. J. Cizek (Eds.), Handbook of formative assessment (pp. 18-40). Routledge. https://doi.org/10.4324/9780203874851





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### **Deliverable 4.3**

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