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WP4-A8 Guidelines

Guidelines for remote assessment in STEM

REMOTE
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REMOTE: Assessing and evaluating remote learning practices in STEM

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Guidelines

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This work has been developed by the partnership of the Erasmus+ co-funded project 'REMOTE: Assessing and evaluating remote learning practices in STEM'

Foreword

The REMOTE Project

The **REMOTE project** aims to **enhance the quality of remote learning and assessment in STEM disciplines**, adapting to emerging technologies like AI, Big Data, Blockchain, AR/VR, and IoT. It develops and tests tools to uphold high educational standards for online teaching and learning, with a particular focus on remote assessment, ensuring reliability even in emergency situations. The project also emphasises blended learning, gender equity, and support for students with special needs, promoting inclusive, transparent, and effective digital assessment methods to accurately measure learning achievements.

The project aims to achieve the following key objectives:

- **Enhance online education quality**, with a strong focus on e-assessment, ensuring remote learning is as effective as in-person instruction.
- **Support QA agencies** in evaluating remote assessment methods through clear Guidelines for transparency and reliability of outcomes.
- **Assist HEIs** in developing, implementing, and monitoring e-assessment strategies, ensuring that assessments are fair, reliable, and aligned with educational goals.

The drafting of the Guidelines

The Guidelines are developed by **a consortium of HEIs and EQAAs from Italy, Spain, and Portugal (ANVUR, AQU, A3ES)**, under the leadership of ANVUR. Drawing on expertise from previous projects like SMART-QUAL[1] and TESLA[2], the REMOTE participants focus on quality management systems and e-assessment technologies to ensure the Guidelines are practical and effective. The collaboration aligns the Guidelines with the needs of higher education institutions and quality assurance agencies, with QA agencies providing specialized insights on quality assurance processes, integrating both national and international best practices.

[1] SMART-QUAL (https://smartqual.eu/)
[2] TeSLA Project – Adaptive trust e-assessment system (https://tesla-project.eu/)

The focus of the Guidelines

The **COVID-19 pandemic** has accelerated the shift towards digital education, highlighting the need for **scalable, user-friendly platforms and tools** that support diverse and fair assessment formats while also revealing system limitations. At the same time, the **opportunities offered by hybrid approaches**, which integrate online and in-person assessments, have emerged as a balanced solution that leverages the strengths of both modalities.

These Guidelines on remote assessment aim to support the transition to online and blended learning, ensuring high-quality and impactful education in STEM, but also across disciplines.

1. Purpose and methodology

The guidelines serve both HEIs and EQQAs in the implementation of robust practices in remote assessment. The key purposes are described below.

- **Assessment and evaluation:** Develop tools and methods to measure student progress in remote and hybrid learning, ensuring proper assessment of learning outcomes and providing benchmarks for improvement.

REMOTE WP2-A1. Report: Current Status of Assessment Practices in STEM Remote Learning 2023.

- Mixed student reactions: some appreciated flexibility, others struggled with digital formats.
- Risk of academic dishonesty in online settings.
- Difficulty in replicating hands-on lab experiences remotely.
- Need for adaptable assessment formats (open-book exams, virtual proctoring, group projects).
- Recommendation: combine online and in-person methods for better balance.

REMOTE WP2-A2. Crowdsourcing screening of on-going assessment and evaluation activities.

"The evolution of STEM fields, with an increasing reliance on advanced tools like artificial intelligence, suggests a shift in learning approaches and a decreased emphasis on traditional calculations and a greater focus on critical thinking skills." (Interview, 17/05/2023)

“It will adapt to a more sophisticated hybridity and as identity conditions are guaranteed, face-to-face and online will continue to be combined.” (Interview, 6/07/2023)

“New technologies have trouble with taking away some of the classical divides in our societies [……] those that are forced into this kind of perhaps cheap, McDonaldized type of technological offerings, which will, yes, it will give them some qualification, but it will not give them a job where they can increase their social mobility in society.” (Interview, 18/04/2023)

REMOTE WP3-A4. Survey data analysis*.

Students’ concerns:

- Loss of community belonging.
- Unclear assessment feedback.
- Inadequacy of assessment methods.

Teachers' concerns:

- Insufficient training in remote teaching and evaluation.
- Limited student-teacher interaction.

Possible proposed solutions:

- Periodic in-person meetings to foster community.
- Enhancing digital assessment tools and interaction mechanisms.

* Included 550 students, 180 teachers from 4 universities

REMOTE WP4-A7. Integration Report.

- Flexibility and academic rigor to be balanced by assessment methodologies.
- More standardized benchmarks for remote learning are needed.
- Continuous feedback system to enhance student learning and motivation.
- Personalization and interactivity aimed at "skill development pathways" to reduce plagiarism and improve student engagement.
- STEM Disciplines fields require more advanced digital learning tools to ensure effective and practical assessment of skills.
- Digital inclusion meaning equal access to technology to ensure learning opportunities for all, especially for students with disabilities or from disadvantaged backgrounds.

- **Continuous improvement:** Equip HEIs and EQAAs with methodologies and tools to adapt, monitor, and enhance remote learning and assessment practices, addressed to all institutions within the project' scope and eventually to other HEIs across Europe.

REMOTE WP2-A2. Crowdsourcing screening of on-going assessment and evaluation activities.

"We just want to have a learner who appreciates diversity, embraces the new ways of learning, the new ways of systems that are out there." (Interview, 30/03/2023)

"There will be a demand for more individual adjustments, and I think that this is an area where you could find where technology actually can play a huge role because it is impossible to have this kind of adjustment in the classical physical format that we used to have in universities." (Interview, 18/04/2023)

"Over time, new teachers will already have incorporated the new tools and it will be easier to move forward in this change." (Interview 6/07/2023)

REMOTE WP3-A4. Survey data analysis*.

Key dimensions:

1. Resource availability (accessibility to materials, equity issues).
2. Technical responsiveness (platform performance, interaction).
3. Training (lecturer preparation, institutional support).
4. Online assessment (adequacy, feedback, quality of education).
5. Social dynamics (sense of community, gender issues, academic integrity).

*Included 550 students, 180 teachers from 4 universities

REMOTE WP4-A7. Integration Report.

- External Quality Assurance Agencies (EQAAs) play a key role.
- Assessment needs to be adaptive and engaging.
- Hybrid learning is expected to dominate.
- New accreditation frameworks should include digital competency evaluation.
- AI will enhance assessment but not replace human judgment.

- **Equity and fairness:** Ensure assessment methods are free from gender biases, particularly in STEM disciplines, and promote equal access to quality education and assessment for all students, independently of gender and including those with special needs.

REMOTE WP2-A1. Report: Current Status of Assessment Practices in STEM Remote Learning 2023.

- No significant differences were found in students' perception of online assessment based on gender.
- Female students tend, however, to demonstrate a higher adaptability to digital learning methods.
- Male students generally considered online assessments less fair than face-to-face methods.
- Resilience of female students during remote learning, especially in STEM, highlights the importance of gender-equitable educational practices.

REMOTE WP2-A2. Crowdsourcing screening of on-going assessment and evaluation activities.

"Considering the online remote assessment procedure methodology, to me, they are neither affected by the gender or by the status" (Interview, 2/05/2023)

"Probably the introduction to new technologies will help women in reducing the difference in acquiring knowledge that sometimes is incompatible with something that a woman can do and we absolutely not, such as having a son." (Interview, 4/05/2023)

"In terms of accessibility, if we don't ensure the proper skills for students and teachers to use the digital tools, then we can actually hinder the participation of certain groups and especially the disadvantaged groups." (Interview, 16/05/2023)

REMOTE WP4-A7. Integration Report.

- Digital inclusion meaning equal access to technology to ensure learning opportunities for all, especially for students with disabilities or from disadvantaged backgrounds
- Access and equity remain critical issues

- **Long-term implementation:** Develop a roadmap to help EQAAs implement the Guidelines over time, supporting HEIs' governance, staff, and researchers in maintaining effective and up-to-date online assessment practices.

REMOTE WP2-A1. Report: Current Status of Assessment Practices in STEM Remote Learning 2023.

- **Digital Assessment Roadmap** crucial to develop guidelines for EQAAs to ensure the long-term quality of digital assessments
- **Sustainability and Eco-Friendliness** of remote assessment which can reduce environmental impact and should be integrated into long-term strategies for sustainable education
- **Hybrid Learning** as a sustainable approach to ensure accessibility while maintaining quality education and reducing infrastructure costs, avoid overcrowding, and increase enrolment while improving flexibility for students
- **Technological Infrastructure** improvement to provide universities with reliable and accessible platforms Recommendation: combine online and in-person methods for better balance.

REMOTE WP2-A2. Report*.

- Future universities will blend AI-driven and interactive learning
- More reliance on virtual and hybrid models
- Assessment will shift towards personalized, competency-based approaches
- STEM disciplines will integrate more digital tools and simulations
- Risk of increasing digital divide
- Need for robust frameworks to ensure learning quality
- Recommendations:
    - Invest in digital literacy
    - Develop guidelines for AI-based assessment

** 33 international experts interviewed focused on trends in university teaching, assessment, and student needs*

REMOTE WP2-A2. Crowdsourcing screening of on-going assessment and evaluation activities.

“In 20 years, I hope to see that the boundaries between online and face-to-face are blurred.” (Interview, 30/03/2023)

“The university of the future will be for sure a university where we will have the formal learning as we know it today, but we will actually have a recognition of non-formal learning.” (Interview, 16/05/2023)

“We will be thinking about assessments less and less like a distinct process from teaching and learning.” (Interview, 3/07/2023)

The Guidelines draw on prior research and previous findings from the REMOTE project.

They align with the European Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), ensuring that e-assessment practices meet established quality standards and are consistent with broader educational policies.

2. A fast-changing landscape

2.1. The development of online teaching and learning

The rapid evolution of online education has transformed higher education, incorporating distance learning, online courses, and blended formats (Huertas et al., 2018; Gonçalves et al., 2020). From early **correspondence courses** to **computer-based learning systems** like PLATO (1960s) and **online conferencing tools** (1980s), digital education has steadily advanced. The 1990s saw the rise of fully online universities, followed by the expansion of **hybrid and online programmes** in the 2000s, enabled by high-speed internet and digital platforms. The emergence of MOOCs further democratized education, and the COVID-19 pandemic accelerated the digitalization of teaching and learning.

One of the main advantages of online education is its **flexibility**, offering access to diverse learners, including underrepresented groups. Digital platforms support **personalized learning**, enabling adaptive content, hybrid assessments, and continuous feedback. Virtual campuses enhance interaction, resource accessibility, and student engagement, while also streamlining administrative and teaching processes. Universities leverage technology to offer customized learning pathways, integrating tools like flipped classrooms, gamification, and

flexible study options, ultimately improving educational quality and student satisfaction.

Within the REMOTE project countries—Italy, Spain, and Portugal—online teaching provisions have seen significant growth, particularly in response to the increasing demand for flexible education.

In **Italy**, higher education is undergoing significant changes in online teaching and learning. According to the ANVUR Report (2023), distance learning universities now account for 11.5% of the student population, with graduates from online programmes rising from 1.7% a decade ago to 10% in 2021/22. Online programs are concentrated in economic, legal, and social sciences (45.6%), followed by STEM disciplines (25.5%), arts, humanities, and education (22.1%), and healthcare/agro-veterinary fields (6.7%), primarily related to sports sciences. In 2021/22, 149 online programmes were offered, supported by 61,000 faculty members (70% professors, 30% researchers). Despite the increasing popularity of online programmes—particularly among older students—significant challenges persist, such as high student-teacher ratios and the prevalent reliance on temporary faculty. In response, ANVUR has revised its quality assurance protocols. A recent Ministerial Decree (no. 1835/2024) now requires in-person exams, except in specific cases, mandates that at least 20% of teaching activities be live, and sets a minimum ratio of one full-time professor per 50 students in online universities.

In **Portugal**, until 2019, distance learning in higher education was mostly offered by the Portuguese Open University (Universidade Aberta). However, in 2019, Portugal introduced a legal framework for distance higher education (Decree-Law no. 133/2019) which not only regulates and standardizes distance learning in higher education, but also establishes the criteria for higher education institutions, other than Universidade Aberta, to offer degrees through distance learning. Since then, up until 2022, traditional universities and polytechnic institutes have expanded their offerings, with a total of 42 new higher education programs being accredited in the distance learning format, with 79% of these being offered by private institutions. These new programs range from a variety of scientific areas including social sciences, business, and law (50% of the accredited programs), followed by arts and humanities (17% of the accredited programs).

Portugal's online higher education offerings include a total of 88 higher education programs, with 53% of these being master's degrees. Approximately 52% of the existing distance learning programmes are offered by Universidade Aberta, which mainly serves students above 21 years of age.

Spain has also experienced significant growth in online higher education. Both public and private universities have expanded online offerings: in 2022/23, six non-presential universities (one public, five private) accounted for 19.1% of new bachelor's enrolments, primarily attracting students over 22 years old (57.7%).

Online programmes are concentrated in arts, humanities, social sciences, and law (65%), while hands-on disciplines like health sciences and engineering remain predominantly presential (La Universidad Española en Cifras, 2021/22). Female participation in private non-presential universities surpassed 61%, and enrolment among 18-21-year-olds increased, reflecting greater acceptance of online education. In 2021/22, non-presential universities enrolled 17.3% of the total student population. On the one hand, ANECA, Spain's National Quality Assurance Agency, has introduced an international seal for non-presential and hybrid teaching, evaluating programme design, technology use, and student experience (ANECA Report, 2019). On the other hand, AQU Catalunya, the Catalan University Quality Assurance Agency, has published a document (Duart &Basart, 2023) that aims to provide guidance to universities and assessment committees on how they should approach the design, implementation, and assessment of online degree programmes.

2.2. Future perspectives and challenges

Online education continues to evolve, tackling challenges while integrating new technologies. Key issues include academic integrity, student engagement and well-being, and digital infrastructure limitations, particularly in STEM disciplines. Online assessment requires robust tools to ensure fairness and accuracy, while educators need training and institutional support to maximize digital platforms.

Technological advancements offer potential solutions: AI enables personalized learning and automated feedback, while AR/VR (augmented/virtual reality) enhances hands-on training (REMOTE Project Report A7, 2024). The rise of micro-credentials and modular learning supports skill-based education, fostering lifelong learning and industry collaboration.

Inclusivity, accessibility, and sustainability remain priorities, with adaptive platforms and multilingual tools improving equitable access and universities adopting eco-friendly practices (Huertas et al., 2018). However, quality assurance frameworks must evolve to assess AI-driven tools, and digital disparities in underserved regions need to be addressed to prevent educational inequalities (Foerster et al., 2019; Gaidelys et al., 2022).

3. Assessment approaches and methods in online teaching and learning

3.1. General concepts

Assessment is a fundamental part of education, involving the systematic collection and analysis of evidence to evaluate student learning, instructional effectiveness, and educational quality (Stiggins, 2005). It serves multiple purposes, including measuring achievement, identifying learning gaps, guiding instruction, providing feedback, and ensuring accountability.

Assessment falls into two main categories:

- **Formative assessment** is an ongoing process aimed at providing continuous feedback to improve student learning and teaching strategies. It includes quizzes, drafts, peer reviews, and class activities and fosters self-regulation, reflection, and metacognitive skills, which are essential for the job market (Yorke, 2003; Nicol & Macfarlane-Dick, 2006; Winstone & Boud, 2020).
- **Summative assessment** evaluates student achievement at the end of an instructional period, focusing on accountability and certification of learning (Black & Wiliam, 1998). It includes final exams, term papers, and projects, contributing significantly to final grades. These assessments must align with learning objectives to comprehensively measure knowledge and skills.

According to timing, assessments can be classified into two categories, both encompassing traditional methods as well as innovative strategies (Weleschuk et al., 2019; SSG, 2020; Guangul et al., 2020; Al-Maqbali & Al-Shamsi, 2023; Gupta et al., 2023):

- **Synchronous assessments**, taking place in real-time, allowing for immediate interaction and feedback. They include activities such as live lectures, webinars, video conferences, and virtual classrooms.
- **Asynchronous assessments**, that are conducted at the learner's own pace, using tools like pre-recorded lectures, reading materials, assignments, and discussion boards to facilitate flexible learning.

3.2. Types and strategies of e-assessment

Assessing distance courses poses unique challenges, particularly in **STEM disciplines**, which rely on **practical, problem-solving**, and **hands-on learning**.

Online assessments utilize diverse **methods and formats**, offering **flexibility and scalability** while ensuring **academic integrity**, **student engagement**, and **accurate skill evaluation**. Main categories, based on the assessments' primary focus, include:

- **Assessments focused on verifying knowledge**. These assessments primarily measure foundational knowledge and comprehension, often assessing recall, understanding, and structured reasoning. Examples include oral online questioning and presentations; written assignments such as essays, papers, and reports; open-questions and multiple-choice questions; quizzes and concept mappings.

- **Assessments focused on verifying practical skills and competencies**. These assessments emphasize the ability to apply knowledge in practical, real-world contexts and demonstrate mastery of specific skills. Examples include creating models or technical reports; simulations, role-playing, and scenario-based exercises; interactive activities such as group projects or knowledge co-creation.

- **Assessments focused on creativity and innovation**. These assessments evaluate students' ability to use knowledge in creative ways, encouraging originality, problem-solving, and interdisciplinary thinking. Examples include creative projects and portfolios; AR/VR tasks; game-based assessments; scenario-based simulations.

Regardless of the **assessment type**, a well-structured system should evaluate:

- **Understanding and interpretation**. The ability to explain, summarize, and identify relationships between concepts, ensuring comprehension beyond memorization.

- **Application of knowledge**. The capacity to apply learning in real-world contexts, solving problems and making informed decisions.

- **Critical analysis and evaluation**. The ability to assess information independently, defend reasoning, and navigate complex issues.

- **Synthesis and creativity**. The competence to integrate ideas across disciplines, explore new approaches, and make meaningful connections.

Table 1: Main online assessment types

Type of assessment	Best for	Pros	Cons	Tech enhancements
Oral and video assessments	Evaluating conceptual understanding, design explanations, lab results	Helps verify originality, allows for personalized feedback	Time-intensive for both students and instructors	AI speech analysis, live Q&A components
Online quizzes and automated tests	Basic knowledge checks, concept understanding, quick feedback	Immediate feedback, scalable, easy to grade	Risk of cheating, limited to multiple-choice or short-answer formats	AI proctoring, randomized question banks, adaptive testing
Remote proctored exams	High-stakes assessments requiring strict academic integrity	Mimics traditional exams, deters cheating	Privacy concerns, technical issues, accessibility problems	Live or AI-based monitoring, lockdown browsers, behaviour recognition
Open-book & take-home exams	Assessing application of knowledge rather than memorization	Encourages problem-solving and research skills	Harder to control collaboration and external help	Plagiarism detection software, time constraints
Online lab simulations and virtual labs	Practical STEM learning (chemistry, physics, biology, engineering)	Hands-on experience without physical labs, cost-effective	May lack real-world complexity, requires internet access	AR/VR labs, remote access to real lab equipment
Coding and technical assignments	Computer science, engineering, mathematics	Authentic skill-based assessment, highly interactive	Time-consuming grading, potential for code sharing	Auto-grading tools, version control tracking, AI-based plagiarism detection
Project-based and problem-based assessments	Engineering, applied sciences, group collaboration	Encourages deep learning, teamwork, and innovation	Difficult to assess individual contributions	Peer assessment tools, video presentations
e-portfolios and reflective journals	Tracking student progress over time, self-assessment	Encourages metacognition, great for long-term projects	Subjective grading, time-consuming to review	Automated feedback systems, digital badges
Peer and self-assessment	Encouraging collaborative learning and critical thinking	Develops evaluation skills, provides diverse feedback	Requires training for students to assess effectively	AI-assisted feedback suggestions, rubric-based automated scoring
AI-based and learning analytics approaches	Personalized assessments, real-time performance tracking	Adaptive learning, predicts student struggles	Privacy concerns, requires extensive data processing	AI-based automated grading, personalized learning pathways

Each assessment method has strengths and weaknesses, and the best approach depends on the subject matter, learning objectives, and technological infrastructure. Most effective distance STEM assessments use a **blend of methods** to balance engagement, academic integrity, and scalability.

3.3. Scenarios where e-assessments are not feasible / not recommended

While e-assessments have transformed higher education, their applicability remains limited in contexts requiring hands-on skills, specialized equipment, or real-world conditions. Key challenges include:

- **Healthcare and clinical training**, where students must develop practical competencies such as physical examinations and surgical techniques. While virtual simulations aid theoretical learning, they cannot fully replicate patient interaction, tactile feedback, or real-time decision-making.
- **Laboratory-based sciences** (e.g., chemistry, biology, engineering), where hands-on experiments are essential for understanding materials, processes, and equipment operation. Virtual labs provide reinforcement but lack the experiential learning and problem-solving of physical labs.
- **High-stakes assessments** (e.g., professional certifications) require secure environments to ensure fairness and prevent cheating. While online proctoring offers solutions, risks related to fraud and technological failures remain (Jones & Inglis, 2003; Crisp, 2007).
- **Low-tech or remote settings**, where limited digital infrastructure makes implementing e-assessments difficult.

Hybrid approaches combining digital tools with practical, in-person experiences may help bridge the gap.

3.4. Current status and challenges of e-assessment practices

The **integration of e-assessmen**t in higher education presents several challenges, including:

- **Technological infrastructure**. Reliable digital platforms, stable internet connectivity, and technical support are essential. Interruptions can disrupt assessments, affecting their credibility and efficiency.

- **Academic integrity**. Online assessments increase the risk of plagiarism and identity fraud. Mitigating this requires secure platforms, advanced authentication, and innovative assessment designs that emphasize critical thinking over memorization.
- **Digital literacy**. Limited familiarity with digital tools can hinder assessments. Institutions must provide comprehensive training and ongoing support to ensure smooth implementation.
- **Equity and accessibility**. Students with disabilities or limited technology access must be accommodated through universal design principles and targeted support, ensuring inclusive participation.

Additional challenges arise in remote and low-tech environments, where limited digital infrastructure restricts e-assessment feasibility.

4. The Quality Assurance of remote assessment

4.1. The QA of online teaching and learning provisions

Quality assurance (QA) in online teaching and learning is essential to ensure that academic standards are met, and meaningful, effective educational experiences are provided. The European Association for Quality Assurance in Higher Education (ENQA) has developed a set of considerations and recommendations to guide institutions in their QA practices for e-learning, that align with the ESG and emphasize the importance of integrating QA into institutional strategies (Considerations for quality assurance of e-learning provision, Considerations-for-QA-of-e-learning-provision.pdf[3]).

Institutions should integrate e-learning provisions within their overall QA policies, aligning programmes with national qualification frameworks, defining clear learning outcomes, and adopting innovative pedagogical approaches. A student-centred approach is crucial, focusing on flexibility, diverse learning methods, and strong support systems, tailored to the needs of online learners.

Staff development is essential for QA in online education. Institutions must ensure that teaching staff receive adequate training in digital pedagogies and have access to the necessary tools and resources to effectively engage with students. Administrative staff should also be adequately trained.

[3] https://www.enqa.eu/wp-content/uploads/Considerations-for-QA-of-e-learning-provision.pdf

External QA processes complement internal efforts by validating institutional practices and ensuring compliance with broader standards. Evaluations should focus on aspects such as the effectiveness of VLEs, the alignment of programmes with institutional objectives, and the overall impact on student learning. QA practices must evolve alongside technological and educational innovations, ensuring that online education remains accessible, inclusive, and effective for diverse learners.

4.2. General principles of assessment

In distance learning, since learning no longer takes place in a controlled environment like a classroom, it is essential to design assessment tools that test not only theoretical preparation but also the ability to work independently, manage time effectively, and use digital technologies efficiently. Thus, advanced assessment methods should integrate interactive and participatory approaches. Traditional tests can be complemented with online discussions, peer reviews, collaborative projects, and tasks that require real-world application of knowledge. One example of this approach is problem-based learning, where students tackle complex scenarios and find practical solutions, demonstrating not only theoretical knowledge but also analytical, synthetic, and creative skills.

An effective assessment system should then be built upon at least the following four key pillars:

- **Validity**. The chosen method must measure what it claims to assess without distortions. For example, teamwork skills should be evaluated through collaborative projects rather than multiple-choice quizzes.
- **Reliability**. Results should be consistent and reproducible, requiring clear evaluation criteria, detailed rubrics, and Guidelines to minimize subjectivity.
- **Flexibility**. Assessments should adapt as much as possible to different learning styles and student needs, allowing various formats such as written tests, oral presentations, or practical projects.
- **Fairness and inclusivity**. All students must have equal opportunities, with accommodations for learning difficulties, disabilities, or technical barriers in online assessments.

4.3. Remote standards for on-line assessment

The following standards provide a comprehensive framework for e-assessment. They are "They are explicitly indebted to the work carried out by the Tesla project, adopting both its framework and core contents, while proposing an expansion of the number of standards considered, along with an update of the indicators and the documentation necessary to support their verification. The resulting proposal emerges from the outcomes of the activities carried out within the Remote project. Aligned with the ESG, the Remote standard ensure quality, integrity, and inclusivity in online assessments. Covering institutional policies, assessment methods, technology, and learner support, they help higher education institutions enhance digital assessment strategies and assist QA agencies in evaluating their effectiveness.

The **TeSLA** project proposes quality assurance standards to support educational institutions in designing and enhancing e-assessment. It applies to various learning environments by adhering to interoperability standards. Large-scale pilots have been conducted to evaluate and ensure the reliability of the **TeSLA** system given its innovative nature, the current gap in e-assessment, and the increasing interest in online education. **TeSLA** study discusses student experiences, implications, and future directions in e-assessment using multiple systems based on authentication and authorship systems such as face and voice recognition, keystroke dynamics, forensic analysis, and plagiarism detection.

Source : https://tesla-project.eu/index.html

STANDARD 1

Institutional policies on online teaching, learning and assessment

The institution adopts appropriate policies to ensure that online teaching, learning, and assessment conforms to ethical standards and is embedded in the organisational culture and values. Online educational offer and e-assessment should also be aligned with the institution's pedagogical model, as well as academic and legal regulations. Achievement of objectives is verified on a regular basis.

INDICATORS

1. Through appropriate policies, the institution provides guidance on:
   - e-Assessment organization and administration.
   - Protection against academic fraud, including plagiarism detection and identity verification.
   - Accessibility for learners with disability, limited technology, or low-tech educational environments.
   - Adequate and timely technical support for both learners and teaching staff.
   - Training for students and staff on ethical conduct, responsible AI use, and academic integrity in e-assessment.
2. The institution's policy framework governs the introduction and responsible use of new technologies, including AI and adaptive learning tools, to maintain the expected quality, fairness, and reliability of e-assessment.
3. A policy and a code of practice is provided for electronic security measures to govern electronic security measures, data privacy, and ethical use of learner data. These policies cover:
   - Privacy, security, and consent in data collection and processing.
   - Purpose and scope of learning analytics and AI-driven assessment decisions.
   - Cybersecurity measures to protect sensitive learners and institutional data.
   - Ensuring transparency and fairness in AI-based grading and automated feedback.
4. The institution has a development plan which includes an e-assessment strategy detailing responsibilities, roles, and procedures, as well as

mechanisms for regular review and quality assurance of e-assessment practices.

MINIMUM EVIDENCE REQUIREMENTS

- Evidence of a quality assurance policy outlining mechanisms, instruments, and responsibilities to monitor system functionality, user feedback, performance evaluations, and compliance with quality standards.
- Evidence of institutional assessment regulations, covering a) accessibility policies for learners with disabilities and equity considerations (e.g., low-tech environments, connectivity challenges); b) regulations on alternative digital assessment methods and pedagogical models, ensuring alignment with quality standards and academic integrity.
- Evidence of a policy for regular e-assessment reviews and updates, ensuring a cyclical approach based on: a) stakeholder feedback (students, faculty, QA bodies); b) performance data and technological advancements; c) compliance with pedagogical and academic standards.
- Evidence of policy for the sustainable provision of the technological system including a) regulations for data security and privacy protection (aligned with European and national regulations); b) cybersecurity policies and risk management frameworks; c) long-term financial planning to ensure the system's continued functionality.
- Evidence of policy and Guidelines for external sourcing of the technological system and vendor agreements, including a) compliance with data protection and security standards (GDPR, ISO certifications); b) contractual agreements defining service levels, data ownership, and institutional control over assessment technologies; c) performance evaluation mechanisms for external providers.

STANDARD 2

Assessment objectives and methods (fitness for purpose)

The institution has clearly defined assessment objectives and varied assessment methods. Assessment objectives are aligned with the institution's educational goals and pedagogical models. E-assessment methods foster pedagogical innovation, rigorously determine the level of achievement of learning outcomes, and assure a timely and fair assessment of learning. Besides being consistent with learning activities and resources, assessment methods should be flexible and adapt to the diversity of both learners and educational models.

INDICATORS

1. Assessment objectives are clearly documented, openly communicated, and accessible to learners and teaching staff through institutional platforms, course syllabi, and learning management systems (LMS).
2. Learners and teaching staff receive detailed information, training, and orientation on e-assessment methods and grading criteria, ensuring clarity and accessibility.
3. E-assessment objectives and methods align with innovative pedagogical approaches and accommodate diverse learners. The institution encourages varied assessment formats (formative, continuous, summative), ensuring inclusivity for students with disabilities and those with limited technological access.
4. E-assessment methods are consistently implemented across programmes and faculties, ensuring reliability and fairness in evaluating student achievement of learning outcomes.
5. Structured feedback on e-assessment methodologies is regularly collected from learners and teaching staff through surveys, focus groups, and learning analytics, ensuring continuous improvement.
6. The institution has structured processes for the periodic review of e-assessment methods, considering stakeholder feedback, technological advancements, and best practices in pedagogy and assessment.
7. A diverse range of assessment methods (formative and summative) is implemented, and they are integrated to enhance engagement and learning reinforcement.
8. Where applicable, students are given flexibility in choosing assessment formats that align with their learning preferences.

MINIMUM EVIDENCE REQUIREMENTS

- Information materials on e-assessment objectives are readily accessible via institutional websites, LMS platforms, and official communication channels (emails, guides, webinars), with regular updates.
- Availability of Guidelines for teaching staff, that provide clear instructions on assessment methods, design of e-assessment materials, and innovative pedagogical approaches (including examples of best practices, and information on training resources and professional development opportunities on digital pedagogy and assessment integrity).
- Evidence of policies for the alignment between teaching methodologies, learning outcomes, e-assessment objectives, and methods (including policy documents, periodic review reports, and references to compliance with national/international quality frameworks).
- Evidence of guidance for learners on assessment methods and criteria (through learning guides, online resources, and interactive tutorials within LMS platforms).
- Evidence of feedback on e-assessment satisfaction, collected through surveys, focus groups, and analytics from both students and teaching staff.
- Evidence of transparent appeal procedures, with clear Guidelines on how to contest assessment results and a structured resolution process.
- Reports from review panels/groups of experts analyzing feedback from stakeholders and providing suggestions; papers and reports on new pedagogical models and technological developments.

STANDARD 3

Transparency and integrity

Measures and processes are in place that ensure transparency and integrity in the implementation of e-assessment. Special attention is paid to the provision of a secure e-assessment system, protective measure of learner authentication and anti-plagiarism technologies.

INDICATORS

1. Guidelines on assessment objectives, criteria, and procedures are readily accessible to all learners and staff through institutional websites, LMS platforms, and student handbooks. These materials are regularly updated to reflect policy changes and best practices in e-assessment.
2. Assessment feedback and results are communicated transparently and within a defined timeframe to ensure timely academic progression. Students receive clear explanations of their performance and have opportunities to request clarification or additional feedback.
3. The institution maintains a comprehensive technology plan to ensure fair and secure e-assessment practices, integrating a) learner authentication measures (e.g., biometric verification, ID validation); b) anti-plagiarism tools and proctoring systems to prevent academic misconduct; c) data protection and privacy compliance mechanisms (aligned with national and international standards).
4. The institution enforces academic integrity policies with a clear code of conduct for learners. Guidance on good practices is provided through orientation sessions, digital literacy training, and ethics workshops.
5. The institution guarantees data integrity and security through a) encryption and access controls to safeguard student assessment records; b) regular audits and cybersecurity measures to prevent unauthorized access and data breaches.
6. The institution adheres to national and international data protection regulations (e.g., GDPR, national higher education laws) in all e-assessment procedures. Regular compliance reviews and audits ensure continued adherence to evolving privacy standards.

MINIMUM EVIDENCE REQUIREMENTS

- Evidence of the public availability of assessment objectives, criteria, and procedures.
- Evidence of guidance for learners on technologies that monitor their behavior.
- Evidence of policies ensuring the alignment of teaching methodologies, expected learning outcomes, e-assessment objectives, and e-assessment methods.
- Evidence of the use of tools such as plagiarism detection software, secure platforms for test delivery, and authentication measures (e.g., proctoring systems, identity verification).
- Code of conduct on academic integrity, including regulations and sanctions.
- A record of incidents and mitigation actions related to system capacity (e.g., failed connections, technical support requests).
- A record of detected and mitigated security incidents.
- Evidence of the implementation of procedures ensuring personal data protection.

STANDARD 4

System requirements, technical responsiveness, tools and resources

The institution uses appropriate technologies for an effective e-assessment and the enhancement of e-learning. The technical infrastructure is aligned with the different e-assessment methods employed. Adequate resources are allocated for running the e-assessment system and requests for technical support are processed promptly.

INDICATORS

1. Procedures are in place to ensure a) ease of use for all learners including those with special needs, disabilities, varying technical backgrounds, or different hardware profiles; b) regular updates to reflect technological advances; c) support for a variety of e-assessment methods and tools.
2. The institution's technical infrastructure and operating systems provide adequate coverage and alignment with the different e-assessment procedures.
3. The institution's technical infrastructure ensures full accessibility for learners with disabilities.
4. The system is designed to operate effectively with the maximum number of users in the learning units.
5. All e-assessment tools and platforms undergo sufficient testing before deployment.
6. Adequate human and technical resources are allocated to ensure the uninterrupted operation of the system, including technical support and system update.

MINIMUM EVIDENCE REQUIREMENTS

- Evidence of guidance for learners on the use of learning tools and digital technologies, ensuring accessibility and usability.
- Comprehensive documentation outlining infrastructure requirements, including system coverage and testing procedures to ensure the technical functionality of e-assessment methods.
- Records of system upgrades, demonstrating the processes in place for continuous technological improvements and adaptation to new e-assessment needs.
- Resource plans detailing the allocation of human, technical, and financial resources for the management, maintenance, and sustainability of the e-assessment system.
- Feedback surveys from students and staff, covering aspects such as ease of use, accessibility, system reliability, and privacy concerns.

STANDARD 5

Scientific disciplines tailored and adaptable tools

The institution ensures that digital tools and assessment methodologies employed in scientific disciplines are adaptable, discipline-specific, and capable of addressing diverse learning and evaluation needs. These tools must align with pedagogical objectives, technological advancements, and principles of academic integrity, fostering an inclusive and effective learning environment.

INDICATORS

1. The institution provides a range of adaptable digital tools tailored to different scientific disciplines, ensuring that assessments align with the specific nature of each subject (e.g., virtual laboratories, coding environments, computational simulations).
2. The selection and implementation of digital tools are guided by discipline-specific requirements, ensuring they support practical applications, immersive simulations, and collaborative research.
3. Digital tools are regularly updated and assessed for their effectiveness in achieving pedagogical objectives, maintaining academic integrity, and ensuring accessibility. Updates align with technological advancements and best practices in higher education.
4. Provisions are in place to ensure equitable access to digital tools, particularly for students with disabilities or those requiring additional support, through assistive technologies and adaptive learning strategies.
5. Systematic training and technical support are provided for faculty and students to maximize the effective use of digital tools in scientific learning and assessment. This includes learning analytics and feedback mechanisms.
6. Mechanisms for data-driven evaluation and continuous refinement of digital tool integration are established, leveraging learning analytics, student engagement tracking, and automated feedback loops.

MINIMUM EVIDENCE REQUIREMENTS

- Institutional policy documents detailing the selection criteria, alignment with educational objectives, and integration process for discipline-specific digital tools used in e-assessment.
- Reports from periodic reviews evaluating the effectiveness, academic integrity, and adaptability of digital tools used in scientific assessment, ensuring they meet pedagogical and technological standards.
- Documentation of faculty development programs, student training sessions, and technical support services, demonstrating efforts to enhance digital tool usage in scientific disciplines.
- Feedback reports from students and instructors, assessing the impact of digital tools on learning outcomes, student engagement, and usability, with recommendations for improvements.
- Examples of discipline-specific implementations of adaptable tools, such as AI-driven assessment platforms, virtual labs, coding environments, and interactive simulations, showcasing their role in scientific learning and evaluation.

STANDARD 6 **Information and support for learners**
The institution ensures that learners receive clear, accessible, and comprehensive information and support, enabling effective engagement with digital learning environments and assessment tools. Support mechanisms are designed to enhance the student experience, address diverse needs, and promote academic success in remote and hybrid education settings. Services include academic guidance, technical support, counselling, orientation, tutoring, and facilitation to foster an inclusive and supportive learning environment.

INDICATORS

1. Students receive clear and structured guidance on digital learning tools, e-assessment methods, and institutional expectations, ensuring informed participation in online education.
2. Training resources and orientation sessions are provided to familiarize students with digital platforms, remote learning practices, and e-assessment tools.
3. A centralized platform or resource repository is available for students to access essential materials, including guidelines, tutorials, FAQs, and troubleshooting tools.
4. Technical support teams provide real-time assistance, troubleshooting, and system guidance, ensuring seamless access to digital platforms.
5. Academic support services include tutoring, mentoring, digital literacy training, and facilitation, helping students develop the necessary skills for online learning and assessment.
6. Orientation programmes introduce students to digital learning environments, institutional policies, and available support services, ensuring smooth integration into online education.
7. Academic and personal counselling services are available to support students' well-being and academic success, addressing both educational and personal challenges.
8. Orientation programs reinforce student understanding of digital learning expectations, institutional resources, and available support networks.
9. Regular feedback is collected from students to evaluate the effectiveness and adequacy of information and support services, with mechanisms in place for continuous improvement.

MINIMUM EVIDENCE REQUIREMENTS

- Documents outlining student support policies, detailing digital learning resources, academic counselling, tutoring services, and accessibility provisions for online learners.
- Records of student participation in training sessions, onboarding programs, and support services, demonstrating engagement with institutional resources.

- Surveys and reports analyzing student feedback on support services, accompanied by action plans detailing improvements made in response to identified needs.
- Examples of assistive technologies, accessibility tools, and alternative learning formats, ensuring equitable access for students with disabilities, diverse learning needs, or technological constraints.
- Records of initiatives promoting student well-being, community engagement, and academic success, including peer support programs, mentoring schemes, and digital engagement activities.

STANDARD 7

Teaching staff training and technical support

The institution ensures that teaching staff receive comprehensive training and ongoing technical support to effectively engage with digital learning environments, integrate online assessment methods, and enhance the quality of remote and hybrid education. Institutional policies and resources are designed to develop faculty digital competencies, promote pedagogical innovation, and provide responsive technical assistance to support high-quality teaching and assessment.

INDICATORS

1. Faculty members receive structured training on digital pedagogy, online assessment strategies, and the effective use of learning management systems (LMS) to enhance teaching and assessment in digital environments.
2. Institutions provide regular workshops, certification programs, and peer-learning opportunities to ensure faculty proficiency in digital teaching methodologies and encourage knowledge sharing.
3. A dedicated technical support team offers real-time assistance, troubleshooting, and ongoing guidance on the use of educational technologies, ensuring uninterrupted faculty support.
4. Faculty have access to digital toolkits, user manuals, and self-paced online courses, supporting continuous skill development in educational technology.

5. Faculty receive training to implement alternative assessment methods and accommodate diverse learning needs in digital environments, ensuring inclusive and equitable e-assessment practices.
6. Institutions conduct regular evaluations of faculty training programs, collecting feedback to refine content, delivery, and support services, ensuring continuous improvement.

MINIMUM EVIDENCE REQUIREMENTS

- Institutional training policies and guidelines detailing faculty development programs for digital teaching, online assessment, and the integration of educational technologies.
- Records of faculty participation in training sessions, certification programs, and professional development workshops, demonstrating engagement and skill development.
- Technical support logs and response time reports, ensuring the availability of timely assistance and troubleshooting for teaching staff using digital tools.
- Reports on faculty feedback and evaluations of training programs, highlighting areas for improvement and evidence of enhancements in digital teaching competencies.
- Case studies and documented best practices, showcasing successful implementations of innovative digital teaching strategies and e-assessment methods in different academic disciplines.

STANDARD 8

Methods to support peer interaction (students) and networking opportunities (learners)

The institution implements strategies and digital tools to facilitate peer interaction and networking opportunities, fostering a collaborative and engaging learning environment. These methods aim to enhance student engagement, promote knowledge exchange, and support the development of professional and academic networks.

INDICATORS

1. Digital platforms and communication tools are integrated into learning environments to support structured and informal peer interaction, including discussion forums, collaborative workspaces, and virtual study groups.
2. Courses incorporate collaborative learning activities, such as peer assessments, group projects, and problem-based learning, to enhance student interaction and teamwork.
3. Virtual networking opportunities are provided through webinars, guest lectures, mentorship programs, and alumni engagement initiatives, fostering academic and professional connections.
4. Institutions support student-led communities, clubs, and interest groups, encouraging networking and collaboration beyond formal coursework.
5. Feedback mechanisms are in place to evaluate the effectiveness of peer interaction and networking strategies, ensuring continuous improvement based on student experiences.
6. Inclusivity measures are implemented to guarantee equitable access to peer interaction opportunities for all students, including those in remote or hybrid learning settings.

MINIMUM EVIDENCE REQUIREMENTS

- Institutional policies and Guidelines outlining peer interaction and networking strategies in digital learning environments.
- Documentation of digital tools and platforms used to support collaboration, such as LMS-integrated forums, video conferencing tools, and shared workspaces.
- Records of student participation in peer-led activities, mentorship programs, and networking events, demonstrating engagement and interaction.

- Reports assessing the impact of collaborative learning activities, including student feedback on networking initiatives and areas for improvement.
- Case studies showcasing best practices, highlighting successful student engagement and professional networking strategies in online and hybrid education.

STANDARD 9 **Accessibility and equitable access to technologies and resources**
The institution ensures that all students, regardless of their background, location, or individual needs, have equitable access to digital learning environments, technologies, and resources. Measures are implemented to promote inclusivity, remove barriers, and support diverse learning requirements.
INDICATORS 1. Digital learning platforms and assessment tools comply with accessibility standards, ensuring full support for students with disabilities. 2. Students have access to essential learning technologies, including hardware, software, and stable internet, with provisions for those facing financial or geographical barriers. 3. Institutional policies include strategies to accommodate students with disabilities, ensuring access to assistive technologies and alternative assessment methods. 4. Learning materials are designed for accessibility, incorporating text-to-speech options, captioned videos, adaptable fonts, and screen reader compatibility. 5. Support services provide assistance for students in accessing and using digital resources, including technical helpdesks and dedicated accessibility support teams. 6. Regular assessments and feedback mechanisms are in place to ensure continuous improvement in accessibility and inclusivity within digital learning environments.
MINIMUM EVIDENCE REQUIREMENTS

- Institutional accessibility policies and compliance reports, ensuring alignment with national and international accessibility standards.
- Documentation on available assistive technologies and digital resource accommodations, including tools for students with disabilities.
- Reports on student access to technology, detailing initiatives aimed at addressing digital equity, such as device loans, internet access support, and alternative learning formats.
- Student feedback surveys evaluating the accessibility and inclusivity of digital learning environments, with evidence of actions taken based on feedback.
- Training materials and guidelines for faculty on creating and maintaining accessible learning content, ensuring inclusive teaching practices.

STANDARD 10 **Information management and storage**
The institution adopts appropriate policies to ensure that online teaching, learning, and assessment conforms to ethical standards and is embedded in the organisational culture and values. Online educational offer and e-assessment should also be aligned with the institution's pedagogical model, as well as academic and legal regulations. Achievement of objectives is verified on a regular basis.

INDICATORS

1. Institutional policies and compliance reports demonstrating alignment with national and international data protection regulations (e.g., GDPR, FERPA), ensuring secure management, storage, and processing of student and faculty data.
2. Documentation of authentication protocols used in digital learning platforms and assessment tools, detailing measures to prevent unauthorized access and ensure data security.
3. Reports on data storage solutions, including reliability measures, redundancy systems, and disaster recovery mechanisms to prevent data loss and breaches.
4. Access control policies specifying role-based permissions for students, faculty, and administrative staff, ensuring confidentiality and appropriate data access.
5. Retention and deletion policies defining timeframes for data storage, archiving, and secure disposal, ensuring compliance with regulatory requirements.
6. Audit reports and risk assessments evaluating data management effectiveness, including measures to identify and mitigate security risks.

MINIMUM EVIDENCE REQUIREMENTS

- Institutional policies and compliance reports demonstrating alignment with national and international data protection regulations (e.g., GDPR, FERPA), ensuring secure management, storage, and processing of student and faculty data.
- Documentation of authentication protocols used in digital learning platforms and assessment tools, detailing measures to prevent unauthorized access and ensure data security.
- Reports on data storage solutions, including reliability measures, redundancy systems, and disaster recovery mechanisms to prevent data loss and breaches.
- Access control policies specifying role-based permissions for students, faculty, and administrative staff, ensuring confidentiality and appropriate data access.
- Retention and deletion policies defining timeframes for data storage, archiving, and secure disposal, ensuring compliance with regulatory requirements.

- Audit reports and risk assessments evaluating data management effectiveness, including measures to identify and mitigate security risks.

STANDARD 11

Student-lecturer interaction and students' evaluation feedback adequacy

The institution ensures that student-lecturer interaction is structured, meaningful, and effectively supported by digital tools, while also guaranteeing that students receive timely, constructive, and comprehensive feedback on their performance. These practices aim to enhance learning engagement, academic success, and continuous improvement.

INDICATORS

1. Digital platforms and communication tools support real-time and asynchronous student-lecturer interaction, ensuring accessibility and responsiveness.
2. Clear guidelines define the frequency and modalities of student-lecturer communication, including office hours, discussion forums, virtual meetings, and structured feedback sessions.
3. Lecturers provide timely, structured, and constructive feedback on assessments, ensuring clarity, specificity, and actionable recommendations for student improvement.
4. Mechanisms are in place for students to seek clarification, request additional feedback, and engage in academic discussions, ensuring open and accessible communication.
5. Multiple communication channels (e.g., discussion forums, live webinars, ticketing systems, chat, emails, virtual office hours) are available to facilitate student-lecturer interaction.
6. Institutional policies promote formative feedback strategies, encouraging continuous student progress rather than relying solely on summative evaluation.
7. Regular surveys and feedback mechanisms allow students to evaluate the adequacy and usefulness of lecturer feedback, with results informing continuous improvements.

MINIMUM EVIDENCE REQUIREMENTS

- Institutional policies and guidelines on student-lecturer interaction and feedback, defining communication expectations, response times, and feedback quality standards.
- Documentation of communication channels and tools, such as LMS messaging, virtual office hours, discussion boards, and webinars, ensuring structured and accessible interactions.
- Monitoring tools and reports tracking student participation in interactive activities (e.g., forum contributions, webinar attendance, office hour engagements) to assess the frequency and quality of student-lecturer interactions.
- Records of assessment feedback timelines and lecturer response rates, demonstrating adherence to institutional guidelines for timely and structured feedback.
- Survey reports and student feedback evaluations on the quality of lecturer interaction and feedback adequacy, with evidence of adjustments or improvements based on results.
- Examples of best practices in formative assessment and structured feedback mechanisms, highlighting effective strategies for supporting continuous student progress.

STANDARD 12

Public information

The institution ensures that accurate, transparent, and accessible information about its academic offerings, digital learning environments, and assessment procedures is publicly available. This information supports students, faculty, and external stakeholders in making informed decisions regarding educational opportunities and institutional policies. It also fosters trust and supports informed decision-making among students, faculty, and external stakeholders.

INDICATORS

1. Institutional websites and official communication channels provide clear, updated, and accessible information on curricula, expected learning resources, learning objectives, assessment policies, and student support services.
2. Publicly available documents outline institutional policies on digital learning, academic integrity, assessment methods, and quality assurance, ensuring transparency.
3. Information on accessibility provisions, technical requirements, and digital tools is clearly communicated to both students and faculty, supporting inclusive digital learning.
4. Clear guidelines on credit transfer policies, recognition of prior learning, and pathways to further education or employment are made easily accessible to students.
5. Public reports and summaries of institutional evaluations, student feedback surveys, and quality assurance reviews are regularly published to demonstrate transparency and institutional accountability.
6. Grading policies, exam formats, criteria for formative and summative assessments, and feedback mechanisms are publicly available, along with documents outlining the student appeals process for assessment decisions.
7. Contact points and support services for inquiries related to online learning, assessment, and institutional policies are well-defined, easily accessible, and regularly updated.
8. Regular updates and reviews ensure that all publicly available information remains current, relevant, and aligned with institutional developments and regulatory requirements.

MINIMUM EVIDENCE REQUIREMENTS

- Institutional websites, student handbooks, and publicly available policy documents, providing clear information on curricula, assessment policies, digital learning provisions, and student support services.
- Reports on assessment practices, learning outcomes, and quality assurance reviews, demonstrating institutional transparency and commitment to academic standards.
- Documentation of student support services and clearly defined contact points for inquiries related to online learning, assessment policies, and institutional regulations.
- Records of periodic updates to publicly available information, ensuring content remains current, accurate, and aligned with institutional and regulatory developments.
- Student and stakeholder feedback reports, evaluating the clarity, accessibility, and usability of institutional information, with evidence of actions taken based on feedback.

4.4. Recommendations for QA Agencies

Quality Assurance (QA) agencies play a critical role in ensuring that e-learning and e-assessment practices align with institutional and educational standards. The following recommendations outline operational considerations for integrating QA of e-learning provisions and e-assessment into existing QA frameworks, ensuring transparency, consistency, and rigor in distance-learning education. Given the specificity of STEM disciplines, where assessment often involves practical, problem-solving, and applied knowledge, QA agencies must adopt tailored approaches when evaluating the effectiveness and integrity of digital assessments.

1. Integration of QA for e-learning and e-assessment into existing QA processes

QA agencies should establish dedicated assessment criteria for e-learning provisions and digital assessment tools, ensuring they align with broader institutional quality assurance policies. This includes:

- Incorporating specific e-assessment guidelines into institutional reviews.
- Defining benchmarks for evaluating digital assessment methodologies and alignment with learning outcomes.
- Requiring evidence of academic integrity measures, such as AI proctoring, plagiarism detection, and learner authentication.

2. Acknowledgment of the specific needs of e-learning in review processes

Different disciplines require specific approaches that consider their teaching and learning characteristics, as well as their unique assessment needs. STEM

disciplines require QA approaches that account for practical applications, laboratory simulations, and computational assessments. QA agencies should:

- Assess whether virtual labs, simulations, and technical assignments effectively replicate hands-on experiences.
- Verify that institutions provide adaptive tools for computational learning, such as coding environments, engineering design simulations, and real-time data analysis tools.
- Ensure that digital learning platforms support collaborative problem-solving and interdisciplinary integration.

3. Motivations for blended assessment approaches

Blended assessments, which combine online and in-person components, are crucial in STEM education to balance theoretical knowledge with practical skills. QA agencies should:

- Require institutions to justify blended assessment choices, outlining pedagogical reasons and expected learning outcomes.
- Establish evaluation criteria for blended assessments, ensuring that online components enhance, rather than replace, practical training.
- Verify that institutions provide secure and equitable access to in-person and digital assessments, particularly for students in remote or low-tech environments.

4. Inclusion of reviewers with e-learning expertise in peer review teams

The effectiveness of QA reviews relies on subject-matter expertise. To improve assessment quality, QA agencies should:

- Include specialists in e-learning technologies and digital assessment in review panels.
- Require periodic training for QA reviewers on digital pedagogy, learning analytics, and AI-based assessment tools.
- Encourage collaboration with technical experts to assess the scalability, security, and usability of e-assessment platforms.

5. Clear criteria for assessing learning outcomes

To maintain consistency across digital and traditional assessment methods, QA agencies should define clear, measurable criteria for evaluating student learning outcomes. This includes:

- Ensuring that assessment methods test critical thinking, problem-solving, and application of knowledge, rather than rote memorization.

- Requiring data-driven assessment through learning analytics, tracking student engagement, performance trends, and skill mastery.
- Evaluating whether institutions provide alternative assessment formats (e.g., oral questioning, interactive assignments, peer evaluations) to accommodate diverse learning styles.

6. Transparency in reporting

QA agencies should enhance accountability by ensuring that evaluation reports on e-assessment and digital learning:

- Clearly outline assessment methodologies, quality indicators, and compliance with educational standards.
- Provide specific recommendations for improving digital assessment practices, especially in STEM-related courses.
- Require institutions to publish summaries of QA findings, allowing stakeholders to track improvements in e-assessment strategies.

7. Appeals procedures

Institutions should have formal mechanisms to contest QA evaluations related to e-learning and e-assessment. QA agencies should:

- Develop a structured appeal process for institutions to challenge QA decisions if assessment methodologies or outcomes are misrepresented.
- Ensure that appeals are reviewed by experts in e-learning and digital pedagogy, guaranteeing fairness and accuracy in decision-making.
- Encourage institutions to provide additional evidence of compliance, such as updated assessment frameworks, pilot results, or peer review findings.

5. Appendix I: Alignment of e-assessment guidelines with the ESG part I and part II

ESG 2015 part 1	ESG 2015 part 2	REMOTE standards for on-line assessment
Policy for quality assurance & part 1 of ESG **Standard:** Institutions should have a policy for quality assurance that is made public and forms part of their strategic management. Internal stakeholders should develop and implement this policy through appropriate structures and processes, while involving external stakeholders.	**2.1. Consideration of internal quality assurance** **Standard:** External quality assurance should address the effectiveness of the internal quality assurance processes described in Part 1 of the ESG.	**1. Institutional policies on online teaching, learning and assessment** **Standard:** The institution adopts appropriate policies to ensure that online teaching, learning, and assessment conforms to ethical standards and is embedded in the organisational culture and values. Online educational offer and e-assessment should also be aligned with the institution's pedagogical model, as well as academic and legal regulations. Achievement of objectives is verified on a regular basis. **5. System requirements, technical responsiveness, tools, and resources** **Standard:** The institution uses appropriate technologies for an effective e-assessment and the enhancement of e-learning. The technical infrastructure is aligned with the different e-assessment methods employed. Adequate resources are allocated for running the e-assessment system and requests for technical support are processed promptly.
ESG 2015 part 1	**ESG 2015 part 2**	**REMOTE standards for on-line assessment**

Design and approval of programmes **Standard:** Institutions should have processes for the design and approval of their programmes. The programmes should be designed so that they meet the objectives set for them, including the intended learning outcomes. The qualification resulting from a programme should be clearly specified and communicated, and refer to the correct level of the national qualifications framework for higher education and, consequently, to the Framework for Qualifications of the European Higher Education Area	**2.2. Designing methodologies fit for purpose** **Standard:** External quality assurance should be defined and designed specifically to ensure its fitness to achieve the aims and objectives set for it, while considering relevant regulations. Stakeholders should be involved in its design and continuous improvement.	**2. Assessment objectives and methods (fitness for purpose)** **Standard:** The institution has clearly defined assessment objectives and varied assessment methods. Assessment objectives are aligned with the institution's educational goals and pedagogical models. E-assessment methods foster pedagogical innovation, rigorously determine the level of achievement of learning outcomes, and assure a timely and fair assessment of learning. Besides being consistent with learning activities and resources, assessment methods should be flexible and adapt to the diversity of both learners and educational models.

ESG 2015 part 1	ESG 2015 part 2	REMOTE standards for on-line assessment
Student-Centred learning, teaching, and assessment **Standard:** Institutions should ensure that the programmes are delivered in a way that encourages students to take an active role in creating the learning process, and that the assessment of students reflects this approach.		**5. Scientific disciplines tailored and adaptable tools** **Standard:** The institution ensures that digital tools and assessment methodologies employed in scientific disciplines are adaptable, discipline-specific, and capable of addressing diverse learning and evaluation needs. These tools must align with pedagogical objectives, technological advancements, and principles of academic integrity, fostering an inclusive and effective learning environment. **11. Student-lecturer interaction and students' evaluation feedback adequacy** **Standard:** The institution ensures that student-lecturer interaction is structured, meaningful, and effectively supported by digital tools, while also guaranteeing that students receive timely, constructive, and comprehensive feedback on their performance. These practices aim to enhance learning engagement, academic success, and continuous improvement.
ESG 2015 part 1	**ESG 2015 part 2**	**REMOTE standards for on-line assessment**

Student Admission, progression, recognition, and certification **Standard:** Institutions should consistently apply pre-defined and published regulations covering all phases of the student "life cycle", e.g., student admission, progression, recognition, and certification.		**6. Learner information and support** **Standard:** The institution ensures that learners receive clear, accessible, and comprehensive information and support, enabling effective engagement with digital learning environments and assessment tools. Support mechanisms are designed to enhance the student experience, address diverse needs, and promote academic success in remote and hybrid education settings. Services include academic guidance, technical support, counselling, orientation, tutoring, and facilitation to foster an inclusive and supportive learning environment.

ESG 2015 part 1	ESG 2015 part 2	REMOTE standards for on-line assessment
1.5. Teaching staff **Standard:** Institutions should assure themselves of the competence of their teachers. They should apply fair and transparent processes for the recruitment and development of the staff.		**7. Teaching staff training and technical support** **Standard:** The institution ensures that teaching staff receive comprehensive training and ongoing technical support to effectively engage with digital learning environments, integrate online assessment methods, and enhance the quality of remote and hybrid education. Institutional policies and resources are designed to develop faculty digital competencies, promote pedagogical innovation, and provide responsive technical assistance to support high-quality teaching and assessment.

ESG 2015 part 1	ESG 2015 part 2	REMOTE standards for on-line assessment
Learning resources and student support **Standard:** Institutions should have appropriate funding for learning and teaching activities and ensure that adequate and readily accessible learning resources and student support are provided.		**9. Accessibility and equitable access to technologies and resources** **Standard:** The institution ensures that all students, regardless of their background, location, or individual needs, have equitable access to digital learning environments, technologies, and resources. Measures are implemented to promote inclusivity, remove barriers, and support diverse learning requirements. **8. Methods to support peer interaction (students) and networking opportunities (learners)** **Standard:** The institution implements strategies and digital tools to facilitate peer interaction and networking opportunities, fostering a collaborative and engaging learning environment. These methods aim to enhance student engagement, promote knowledge exchange, and support the development of professional and academic networks

ESG 2015 part 1	ESG 2015 part 2	REMOTE standards for on-line assessment
1.7. Information Management **Standard:** Institutions should ensure that they collect, analyse, and use relevant information for the effective management of their programmes and other activities.	**2.5. Criteria for outcomes** **Standard:** Any outcomes or judgements made as the result of external quality assurance should be based on explicit and published criteria that are applied consistently, irrespective of whether the process leads to a formal decision	**10. Information management and storage** **Standard:** The institution ensures that digital learning and assessment data are managed securely, stored in compliance with legal and ethical standards, and accessible to authorized users while maintaining data integrity and confidentiality. Information management policies support transparency, accountability, and the protection of student and faculty data.
Public information **Standard:** Institutions should publish information about their activities, including programmes, which is clear, accurate, objective, up-to date and readily accessible.	**2.5. Criteria for outcomes** **Standard:** Any outcomes or judgements made as the result of external quality assurance should be based on explicit and published criteria that are applied consistently, irrespective of whether the process leads to a formal decision	**12. Public information** **Standard:** The institution ensures that accurate, transparent, and accessible information about its academic offerings, digital learning environments, and assessment procedures is publicly available. This information supports students, faculty, and external stakeholders in making informed decisions regarding educational opportunities and institutional policies. It also fosters trust and supports informed decision-making among students, faculty, and external stakeholders.
ESG 2015 part 1	**ESG 2015 part 2**	**REMOTE standards for on-line assessment**

1.9. On-going monitoring and periodic review of programmes	2.6. Reporting	3. Transparency and integrity
Standard: Institutions should monitor and periodically review their programmes to ensure that they achieve the objectives set for them and respond to the needs of students and society. These reviews should lead to continuous improvement of the programme. Any action planned or taken as a result should be communicated to all those concerned.	**Standard:** Full reports by the experts should be published, clear and accessible to the academic community, external partners, and other interested individuals. If the agency takes any formal decision based on the reports, the decision should be published together with the report.	**Standard:** Measures and processes are in place that ensure transparency and integrity in the implementation of e-assessment. Special attention is paid to the provision of a secure e-assessment system, protective measure of learner authentication and anti-plagiarism technologies.

ESG 2015 part 1	ESG 2015 part 2	REMOTE standards for on-line assessment
Cyclical external quality assurance **Standard:** Institutions should undergo external quality assurance in line with the ESG on a cyclical basis	**2.3.. Implementing processes** **Standard:** External quality assurance processes should be reliable, useful, pre-defined, implemented consistently and published. They include - a self-assessment or equivalent; - an external assessment normally including a site visit; - a report resulting from the external assessment; - a consistent follow-up. **2.4 Peer-review experts** **Standard:** External quality assurance should be carried out by groups of external experts that include (a) student member(s)	**1. Institutional policies on online teaching, learning and assessment** **Standard:** The institution adopts appropriate policies to ensure that online teaching, learning, and assessment conforms to ethical standards and is embedded in the organisational culture and values. Online educational offer and e-assessment should also be aligned with the institution's pedagogical model, as well as academic and legal regulations. Achievement of objectives is verified on a regular basis.
	2.7 Complaints and appeals **Standard:** Complaints and appeals processes should be clearly defined as part of the design of external quality assurance processes and communicated to the institutions.	

6. Appendix II: Glossary

Academic integrity	Commitment to honesty, fairness, responsibility, and adherence to ethical standards in the academic environment, which includes avoiding plagiarism, cheating, and falsification of data.
Accessibility	The design and implementation of online assessment tools and platforms in a way that ensures they are usable by all learners, especially students with disability or from remote and low-tech environments.
Asynchronous teaching	A mode of instruction in which students engage with course content and complete assignments independently and at their own pace, without the requirement to be online simultaneously with the instructor or other students.
Automated proctoring	Technology-driven method of monitoring students during online exams or assessments, using AI and software tools to ensure academic integrity.
Blended learning	Educational approach that combines traditional face-to-face classroom instruction with online learning components, allowing for a mix of in-person teaching and digital resources or virtual activities.
Contract cheating	A form of academic dishonesty consisting in the students' practice of outsourcing their e-assessment, such as exams, assignments, or projects, to a third party (often for a fee).
Distance/remote learning	An educational method in which students receive instruction and complete coursework remotely, typically relying on technology to facilitate communication between teaching staff and students.
E-/online learning	A form of distance learning that specifically occurs through the internet, in which students engage with course materials, participate in discussions, and complete assignments using digital platforms.
Electronic Assessment System (EAS)	A digital platform or software used to conduct, manage, and evaluate assessments in educational settings, often including features such as automated grading, secure exam proctoring, and data analytics.
E-tivity	An online-based learning activity or task which takes place in virtual environments or through online platforms and is designed to engage students in interactive and collaborative, and reflective learning.
Formative assessment	An ongoing, interactive type of e-assessment designed to monitor and support students' learning progress throughout a course or programme by providing real-time feedback.
"Key Featured" Questions	Assessment items designed to focus on the most important concepts, skills, or competencies within a given subject or topic, typically highlighting critical learning objectives or key areas of understanding.
Learner authentication	The process of verifying the identity of a student or learner to ensure that the individual completing an assessment or engaging in other educational activities is indeed the enrolled or authorized person.
Learning management system (LMS)	A software application or platform designed to administer, deliver, and track educational content and learning activities, enabling to create and organise courses, distribute resources, and assess student performance.
Live proctoring	A process of real-time monitoring of a student during an exam or assessment by a human proctor, typically through video and audio surveillance, to verify that he/she is not engaging in any form of cheating or academic dishonesty.

Massive Open Online Course (MOOC)	An online educational program designed to offer accessible and scalable learning opportunities to many participants, typically characterised by flexibility, wide range of course offerings, and free or low-cost enrollment.
Mobile-Based Assessment (MBA)	A type of e-assessment which resorts to mobile devices to conduct, manage, and deliver assessments, enabling students to complete evaluations and receive feedback through smartphones, tablets, or other portable devices.
Modified Essay Questions (MEQ)	An assessment format consisting in a series of interconnected questions based on a case scenario, requiring students to demonstrate their critical thinking, problem-solving, and applied knowledge.
Online Peer Assessment (OPA)	A process in which students evaluate and provide feedback on the work or performance of their peers through an online platform and the support of digital tools that facilitate the submission, review, and feedback process.
Open-Ended Questions (OEQ)	Assessment items that require learners to provide detailed, free-text responses, allowing them to articulate their knowledge and reasoning, as well as to demonstrate their understanding and critical thinking.
Problem-Based Questions	Assessment items designed to assess learners' ability to apply theoretical knowledge to practical situations by presenting a real-world or hypothetical scenario that requires students to analyse, evaluate, and solve complex problems.
Proctored exams	E-assessments designed to prevent cheating, verify the identity of the test-taker, and ensure the integrity of the testing process, which is monitored by a human proctor or through technology-driven tools.
Recorded proctoring	A form of remote exam supervision where the test-taker's actions are monitored and recorded during the assessment, typically using video and audio surveillance, along with screen activity tracking.
Summative assessment	A type of e-assessment designed to evaluate a learner's overall achievement and cumulative knowledge at the end of an instructional period, such as a course or program, often through exams, final projects, or standardised tests.
Synchronous teaching	A mode of e-teaching in which both the instructor and students are engaged in the learning process at the same time, in real-time, typically through live interactions such as virtual classes, video conferences, or in-person sessions.

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