An Adaptive Trust-based e-assessment System for Learning

Social dimension of e-learning – Addressing challenges through QA

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Athens
12nd-13th December 2016

Funded by the European Union

Agreement Number: 688520
Content

• (e) Learning
• TEL
• (e) Assessment

• Problem not solved

• TeSLA project
• Role of QA
• Trusted learning from e-assessment
(e)Learning

- The teaching and learning process is conducted (totally or partially) through the **net**
- Use of ICT **tools** and resources
- Teacher as a **facilitator**
- Learner: **autonomous**, responsible, **(pro)active**.
- Personalised and continuous feedback
Technology for Enhancing Learning

- **Wide range** of LMS & VLE
- From repository (content-based) to **learning environment** (activity-based).
- Contains communication, collaborative, creation, assessment, and/or external tools.
- Some of them promote the **social dimensional** by providing additional spaces.
- Usually contains an **assessment system to publish marks**.
E-assessment is a continuous electronic assessment process where information and communication technology (ICT) is used to present, solve, record and evaluate assessment activities (Crisp, 2007).

This includes an end-to-end assessment process from the perspective of:

- learners and tutors,
- learning institutions,
- awarding bodies,
- and the general public (JISC, 2007).
Considerations on e-assessment

 ✓ Summative, continuous and formative assessment models coexist

 ✓ Activities easy to correct (i.e. tests, multi choice exams) or automatic correction activities proliferate. But a personalized feedback must be mandatory.

 ✓ Continuous assessment combined with final exams.

 ✓ Blended/Online universities maintain on-site final exams. It is considered the most reliable way to verify students identity.
Unsolved: Authentication and Authorship

Challenge for a trusted e-assessment
Traditional exam/assessable activity [crime_scene]

Crime Scene

Trad copy

Final examination

Question 1
Name: Maria OK!
Online exam/assessable activity [trad_copy]
Traditional exam/assessable activity [unlimited_imagination]
Traditional exam/assessable activity [solution]

Solution???
We need a real solution

✓ Flexible system that supports diverse assessable learning activities and assessment models

✓ A system that verifies the identity of students (authentication & authorship) and prevents from illegitimate behaviours (i.e. cheating, plagiarism)

✓ A scalable solution (that can be massively deployed), not invasive (no privacy issues) and reliable

Security measures can promote trust (among teachers, students, institution) increasing the assessment quality and the final certification.
An Adaptive Trust-based e-assessment System for Learning
Consortium

18 Partners

8 Universities  3 Quality Agencies  4 Research Centers  3 Enterprises
Main objective

To define and develop **an e-assessment system**, which ensures learners **authentication and authorship** in online and blended learning environments while avoiding the time and physical space limitations imposed by face-to-face examination.

The TeSLA project will cover teaching and learning processes as well as quality, ethical, legal and technological aspects.
Some specific objectives

O1. Analyse and design the most appropriate learning activities for e-assessment.

O2. To introduce tools and resources in the learning activities that capture learners’ data.

O3. Conduct several pilots for ensuring the authentication and authorship of the learners during the e-assessment processes.

O4. Provide a core version of the TeSLA e-assessment system free of charge for educational institutions, and a professional and commercial version.

O5. Hold a set of training workshops for teachers for enhancing e-assessment processes.
Tools and resources

**Authentication:** digital certificate, face recognition, keystroke dynamics, voice recognition, time stamp.

**Authorship:** plagiarism tool and forensic analysis. Linguistic techniques comparing creations from the same user and with Internet sources.
Work Packages

WP 1. Project Management (UOC).
WP 2. Requirements and modeling of the educational model (UOC).
WP 3. Data privacy and ethics (Namur).
WP 4. Quality assurance in online higher education (AQU).
WP 5. Design and implementation of trusted assessment mechanisms (Lplus).
WP 6. Integration of the framework in learning environments (Watchful).
WP 7. Design and development of pilots (SU).
WP 8. Pilots evaluation (OU).
WP 9. Communication, dissemination, liaisons and exploitation (protOS).
TeSLA
Trust system for e-assessment.

**ADAPTATION**
Educational institutions.
Different e-assessment models.

How to do it?
**Tailored to:**
- Learning platforms.
- Teaching and learning models.
- Scalability.

**PRIVACY**
Protect users and institutional data respecting European and national legislation.

How to do it?
**Applying privacy within:**
- Educational institutions.
- Teachers.
- Stakeholders.

**QUALITY**
Establish quality criteria for an e-assessment framework.
Audit and advise on Higher Education quality.
Respect ethics and cultural factors.

How to do it?
**Ensuring quality through:**
- Quality agencies.
- European Expert advisers.
- Large scale pilot tests.

**INNOVATION**
Transfer technologies from other fields to education.
Apply learning analytics for e-assessment.

How to do it?
**Enhancing:**
- Teaching and learning processes.
- e-assessment models.
- Technologies from several disciplines.

**TRUST**
Ensure:
- Authorship.
- Authentication.

How to do it?
**Using technologies:**
- Keystroke dynamics.
- Voice and facial recognition.
- Natural language analysis.
- Digital signature.
- Time stamp.
WP 4. Quality assurance in online higher education

✓ Analyse the European Standards and Guidelines (ESG) taking into account the characteristics of online provision of educational offers by institutions and degree programmes.

✓ Identification of the elements to be considered in the system, in terms of academic activities, competence evaluation, assessment models and the guarantees provided by technological systems.

✓ Propose a set of quality indicators that will be used to assess the performance and achievements in the pilots and verify the quality aspects of the pilots.

✓ Define a framework for quality assurance for e-assessment.
Pilots scheme

1st Pilot
Small educational pilots
Course 2016/17 1S
Goals
To test
the communication protocol among partners for pilots execution.
To test
the implementation protocol at partner level.
To select
the most suitable activities for the e-assessment process at subject level.
Impact
1 Pilot
7 Institutions
≈ 600 students
≈ 75 students/institution

2nd Pilot
Medium Test-Bed pilots
Course 2016/17 2S
Goals
To test
the modular technologies on an isolated manner in activities
Facial and Voice Recognition
Key Stroke Dynamics
Digital Signatures
To test and define
the authorship and authentication instruments
To test
the Time Stamp
Natural Language
Plagiarism Techniques.
Impact
4 Pilots
Minimum 7 Institutions
≈ 125 students/institution/pilot
≈ 3,500 students

3rd Pilot
Large scale pilots
Course 2017/18
Goals
To test
the full integration of the TeSLA system and its scalability.
To test
modular technologies and the European e-assessment framework.
To verify
the reliability of the authentication and authorship.
Impact
2 Large Scale Pilots
Minimum 7 Institutions
They can choose some technologies of the whole system
Stage 1
≈ 6,000-7,000 students
Stage 2
≈ 10,000-14,000 students

An Adaptive Trust-based e-assessment system for learning

TeSLA
Adaptive trust-based e-assessment
Preliminary results

- **Pedagogical**
  - Educational framework
  - E-assessment patterns
  - Pedagogical technical requirements

- **Privacy/ethics**
  - Agreement document (legal, ethical aspects)

- **Quality**
  - Quality indicators pilots’ evaluation

- **Technical**
  - Technical specifications (tools, plugins, security techniques)
  - Transferability to a standardised model

- **Pilots’ design**
  - Common guidelines
  - Currently running

- **Pilots’ evaluation**
  - Evaluation measures
  - Questionnaires
  - Focus groups
Thank you!

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