

Gauging Teachers' Needs with Regard to Technology-Enhanced Formative Assessment (TEFA) of 21st Century Skills in the Classroom

Citation for published version (APA):

Rusman, E., Martínez-Monés, A., Boon, J., Rodríguez-Triana, M. J., & Villagrà-Sobrino, S. (2014). *Gauging Teachers' Needs with Regard to Technology-Enhanced Formative Assessment (TEFA) of 21st Century Skills in the Classroom*.

Document status and date:

Published: 22/12/2014

Document Version:

Peer reviewed version

Document license:

CC BY-NC-ND

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

<https://www.ou.nl/taverne-agreement>

Take down policy

If you believe that this document breaches copyright please contact us at:

pure-support@ou.nl

providing details and we will investigate your claim.

Downloaded from <https://research.ou.nl/> on date: 28 May. 2021

Open Universiteit
www.ou.nl





e-Assessment for learning

Gauging Teachers' Needs with Regard to Technology-Enhanced Formative Assessment (TEFA) of 21st Century Skills in the Classroom

Ellen Rusman, Alejandra Martínez-Monés, Jo Boon,
María Jesús Rodríguez-Triana, Sara Villabrá-Sobrino

CAA 2014, Zeist, The Netherlands, 1st of July 2014



CARDET
CENTRE FOR THE ADVANCEMENT OF RESEARCH
& DEVELOPMENT IN EDUCATIONAL TECHNOLOGY



Open Universiteit
www.ou.nl





e-Assessment for learning

Outline

- Background of 21st century skills and TEFA
- Barriers and conditions for implementation in schools:
 - Case from the Netherlands
 - Case from Spain
- Conclusions and further work



e-Assessment for learning Skills for living, learning and working in society

<http://www.futuristspeaker.com/2011/11/55-jobs-of-the-future/>



Future jobs that don't exist today

<http://novellcounseling.org/overcoming-information-overload/>



<https://interlocutorstheology.files.wordpress.com/2014/06/global-cfos.jpg>



CARDET
CENTRE FOR THE ADVANCEMENT OF RESEARCH
& DEVELOPMENT IN EDUCATIONAL TECHNOLOGY



CYPRUS PEDAGOGICAL INSTITUTE



Open Universiteit
www.ou.nl



Different 21st Century skill frameworks

(Voogt and Pareja Roblin, 2010, p. 18)

Mentioned in <i>all</i> frameworks	Mentioned in <i>most</i> frameworks (i.e., P21, EnGauge, ATCS and NETS/ISTE)	Mentioned in a <i>few</i> frameworks	Mentioned only in <i>one</i> framework
<ul style="list-style-type: none"> - Collaboration - Communication - ICT literacy - Social and/or cultural skills; citizenship 	<ul style="list-style-type: none"> - Creativity - Critical thinking - Problem solving - Develop quality products / Productivity (except in ATCS) 	<ul style="list-style-type: none"> - Learning to learn (ATCS, EU) - Self-direction (P21, En Gauge, OECD) - Planning (En Gauge, OECD) - Flexibility and adaptability (P21, EnGauge) <p>Core Subjects:</p> <ul style="list-style-type: none"> - Mathematics; communication in mother tongue; science (EU, P21, ATCS); - History and arts (P21 and ATCS) 	<ul style="list-style-type: none"> - Risk taking (En Gauge) - Manage and solve conflicts (OECD) - Sense of initiative and entrepreneurship (EU) - Interdisciplinary themes (P21) - Core Subjects: economics; geography; government and civics (P21)



e-Assessment for learning

“We no longer have to go to school to acquire knowledge – so what’s school for?” **Thirty years ago, teachers challenged students to write a paper with five cited sources. Today the difficulty is narrowing it down to five. Information is everywhere – now students need to learn to create meaning, which requires a much different skill set.**”(Tony Wagner, Harvard)



<http://www.6seconds.org/2013/05/13/educating-change-leaders/>





e-Assessment for learning

It means we need to rethink the tools we use and the types of problems we ask students to solve.



Teaching in the 21st Century, Sonja Delafosse

<http://www.youtube.com/watch?v=075aWdZUIM>



CARDET
CENTRE FOR THE ADVANCEMENT OF RESEARCH
& DEVELOPMENT IN EDUCATIONAL TECHNOLOGY



CYPRUS PEDAGOGICAL INSTITUTE



Open Universiteit
www.ou.nl



And rethink the way we are assessing performances

...

[Source image: Ministry of education New Zealand:](http://assessment.tki.org.nz/Using-evidence-for-learning/Gathering-evidence/Topics/Formative-and-summative-assessment)

<http://assessment.tki.org.nz/Using-evidence-for-learning/Gathering-evidence/Topics/Formative-and-summative-assessment>

The garden analogy

If we think of our children as plants...

Summative assessment of the plants is the process of measuring them. It is interesting and important to compare and analyse measurements but, in itself, this does not affect the growth of the plants.

Formative assessment, on the other hand, is the equivalent of feeding and watering the plants appropriate to their needs – directly affecting their growth.





e-Assessment for learning

<http://www.hemsleyfraser.com/us/global-solutions/elearning/pages/technology-enhanced-learning.aspx>



And think about the role technology can play supporting these processes



CARDET
CENTRE FOR THE ASSESSMENT OF RESEARCH
& DEVELOPMENT IN EDUCATIONAL TECHNOLOGY



CYPRUS PEDAGOGICAL INSTITUTE



Open Universiteit
www.ou.nl

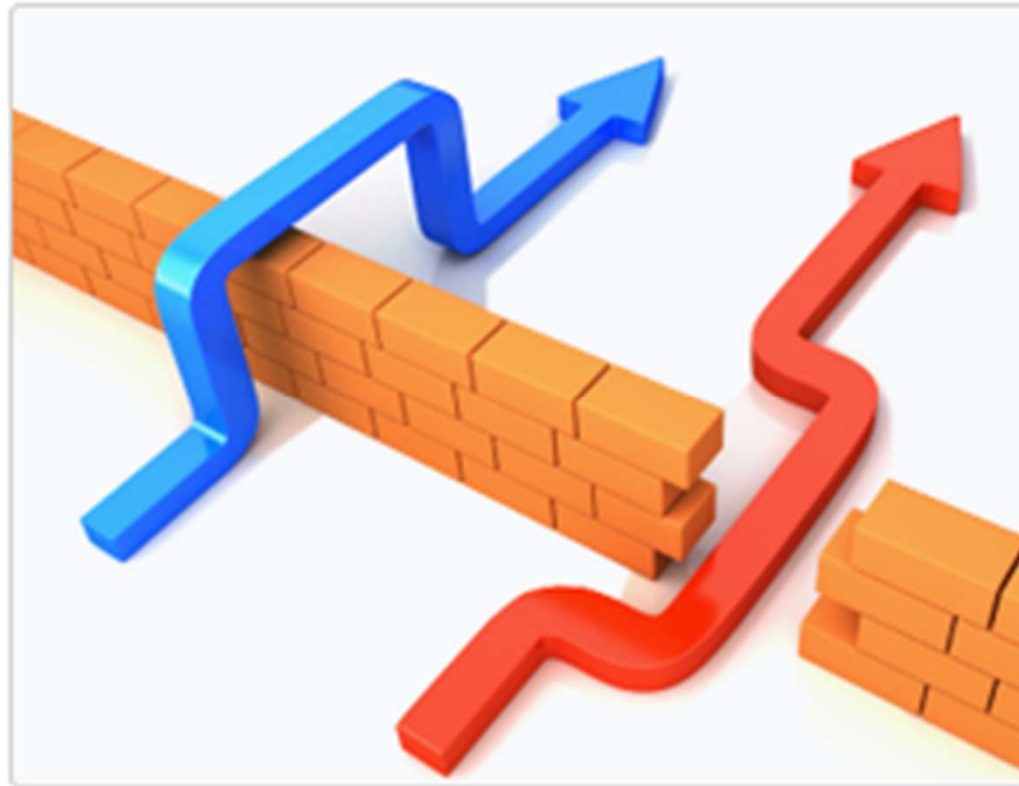


Implies changes in schools

- In learning objectives
- Learning activities
- Assessment methods
- And ways that ICT can support learning (and assessment) processes



What are conditions and barriers experienced by teachers for implementing TEFA of 21st century skills in schools?





e-Assessment for learning

The Dutch case

The screenshot shows a webinar interface. The main content area displays a diagram titled 'Kernvakken' (Core Subjects) with a semi-circular structure. The diagram is divided into sections: 'Leven - betrokken' (Life - engaged), 'Leren - nieuwsgierig' (Learning - curious), 'Sociale en culturele vaardigheden' (Social and cultural skills), 'Samenwerken' (Collaborating), 'Probleem oplopend vermogen' (Problem-solving skills), and 'Taal & Rekenen' (Language & Mathematics). Below the diagram, the text reads 'Webinar 21st century skills' and 'Over het expliciet maken van 21st century skills in het onderwijs' (About explicitly making 21st century skills in education), presented by 'Olaf de Groot'. The 'Kennisnet' logo is visible in the bottom right corner of the content area.

On the right side, there is a 'Video' window showing a speaker and a 'Chat' window with the following messages:

- gaan ze beginnen.
- Mazja Mesle: Dag allemaal
- I gri: Goede middag allemaal
- Monique Mulders: goedenmiddag!
- Suzanne Deutekom: dag allemaal, zin in mijn eerste webinar
- Peter van der Laar: halo
- Jane G: halo Justyna en Rachel! zitten bij elkaar!
- Henk Weerman: Goedenmiddag
- Ben Wilbrink: Deze 21st century skills worden typisch gepresenteerd alsof ze niet over enige inhoud gaan. Dat is best interessant, want onderwijs gaat juist over inhoud. Toch?
- Tamara Mulderij: goedenmiddag!
- Wicole Van Rijbergen: Goedenmiddag allemaal, ook voor mij mijn eerste webinar, ben benieuwd!
- Eric Kleipool: goedenmiddag
- Harm Hofstede: ik heb geluid
- Eric Kleipool: er is geen geluid
- Danielle Beukman: Nu wel :)
- Arno Coenders: alles werkt prima hier
- Eric Kleipool: nu wel
- Femke van Ooijen: @Eric: inmiddels wel!

<http://www.youtube.com/watch?v=cYz3UkspvY&list=PLQ19hXCook1OZARMTuQ5YJTGwWYJGcQDg>





e-Assessment for learning

Analysis of chat logs

- 37 participants: teachers, educational consultants, researchers
- 250 theme-related entries (from 443 entries)
- Entries coded by coding scheme



e-Assessment for learning

Top 5 mentioned themes



<https://www.foneangels.co.uk/wp-content/uploads/2013/08/top5.jpg>



Implementation (86)

- How to approach implementation? (e.g. level, commitment)
- How to implement relevant learning activities? (e.g. saving time, role of ICT)
- Preconditions (e.g. availability of tablets)
- Timeline for change

Examples:

- *“when children would get more digital instruction, the teacher saves time which can be used to support acquisition of new skills”*
- *“could implementation of 21st Century Skills happen at individual [teacher] level or can it only happen at large scale?”*
- *“what is the time line to accept the concept of 21st Century Skills as a familiar concept within education?”*

Meaning of 21st century skills (57)

- Background, definition(s) and models
- Relation between and stress on specific skills

e.g.

“on their own these skills already counted in the 20th century (think about all ‘innovative schools’). To me the ICT component provides another perspective with regards to pace, scale and organization”

Other examples:

- *“aim of ATCS21 (Microsoft, Intel, Cisco) is to integrate a lot of ICT within education, and their first strategy is to do so with digital tests and assessments. I find this a dangerous development.”*
- *“21st Century Skills spans more than just media literacy”*

Teacher skills and professionalization (39)

- Competences that teachers need for implementing 21st century skills:

e.g.: “do we, teachers, actually have these skills ourselves? To say it with other words, how can you teach pupils something, that you don’t master yourself?”

Other examples:

- *“kids need to learn how to solve problems, teachers need to learn to leave this to the kids”*
- *“many teachers lack knowledge about the digital world”*

Relation between 21st century skills and domain content (34)

- Skills can be learned separately from content or integrated with content and each other?
- Are skills generic/transferable or domain-specific?

Examples:

- *“these 21st Century Skills are typically presented if they are not about any content. That’s quite interesting, as education is just about content.”;*
- *“several skills, like research skills and collaboration, are definitely not domain specific”*



e-Assessment for learning

“domain specific content can as well stay like it is, skills are just another didactic approach”



CARDET
CENTRE FOR THE ADVANCEMENT OF RESEARCH
& DEVELOPMENT IN EDUCATIONAL TECHNOLOGY



CYPRUS PEDAGOGICAL INSTITUTE



Open Universiteit
www.ou.nl



- Remarks on objectives and (potential) results of introducing 21st century skills in schools
e.g. ..:” are there already objectives that need to be reached by education?”

Examples:

- *“are these objectives smart [specific, measurable, acceptable, reachable, time specific] ?”;*
- *“core learning objectives are also well achievable by means of different didactics. That we already know decennia from research. Think for example about collaborative learning”*

Findings of analysis (1)

- No national agreements and frameworks to support implementation at school curriculum level (e.g. performance indicators, taught in combination with domain-related content or not)
- Uncertainty of how ICT can facilitate adoption of 21st century skills in schools

Findings of analysis (2)

- Doubt whether teachers' competences are sufficient? (especially with regard to ICT use)
- Meaning of 21st century skills and assessment in practice

- 2 teacher workshops about “eAssessment of 21st century skills”
- 37 teachers at different locations



Workshops implementation (1/2)

- What the teachers had to do:
 - Use eAssessment approaches and tools
 - Evalcomix: Design and assessment with rubrics
 - Customized Blogger-based portfolios
 - ... to produce learning designs aligned to the assessment needs

Workshops implementation (2/2)

- A **secondary school teacher** was invited to describe his experience in aligning 21st century skills with observable items in the design of learning activities



e-Assessment for learning

Evaluation - Question

- What are the conditions and barriers experienced by teachers for implementing TEFA of 21st century skills in schools?



e-Assessment for learning

Evaluation – Data sources

- Observations of f2f discussions
- Pre and post-workshop questionnaires

Dia 31

- 1 incorporarí alguna foto de los talleres (están en los informes del EREM)
Sara L. Villagr Sobrino; 12-5-2014



e-Assessment for learning

First results

- 21st century skills:
 - Teachers identified the potential of the approach to measure **collaborative learning**
 - but ... they did not state anything about any other skill



e-Assessment for learning

First results

- Teachers assessed positively the **participation of the school teacher**
 - *“I appreciate that everything was based on the experience of a colleague that has already applied it”* [Final-Questionnaire-WS1].

First results

- eAssessment tools (1/3)
 - The teachers perceived the potential of the **tools** for **sharing and reuse**:
 - *“These instruments can be useful to share with other colleagues” ... but ... “it is difficult to reach consensus about the indicators with the rest of the teachers”* [Discussion, Workshop 2]
 - *“It takes time to elaborate them, but it is worthy at mid-term. It can be applied in multiple occasions with slight modifications”* [Discussion, Workshop 2]

First results

- eAssessment tools (2/3):
 - Evalcomix complied with the selection criteria
 - But it was not positively valued by the participants
 - Usability issues
 - Use of concepts that were not familiar to teachers
 - Its benefits are not evident when the learning is not mediated by ICT technologies

First results

- eAssessment tools (3/3)
 - “The **product** itself, Evalcomix, **needs to be improved**. These improvements should be done in two directions: on the one hand, **making all the system more intuitive**, it should not require more than 10 minutes to learn; on the other hand, **the labels** should go hand in hand with the (educational) design, words like “attributes” **are not in our teachers vocabulary**” [Final-Questionnaire-WS1].

First results

- Main obstacles identified by the teachers:
 - “[The main problem is]...
 - ... *Internet access and the expertise on computer and technical issues*”
 - ... *the lack of technological resources in the school, the fact that we sometimes do not know how to use them ...* [Discussion, Workshop 2]
 - “*The assessment instruments are too detailed for the application I foresee in the classroom*” [Diss-Workshop 1];

8 C's effecting implementation (Surrey & Ely, 2007)

1. **Sense of urgency/dissatisfaction with status quo:** indeed, but seems externally motivated
2. **Knowledge and skills existing:** doubt, especially ICT-related
3. **Availability of resources:** not yet, e.g. ICT facilities are insufficient, guidelines for implementation absent/vague
4. **Availability of time:** only one remark about saving by rearranging activities of teachers

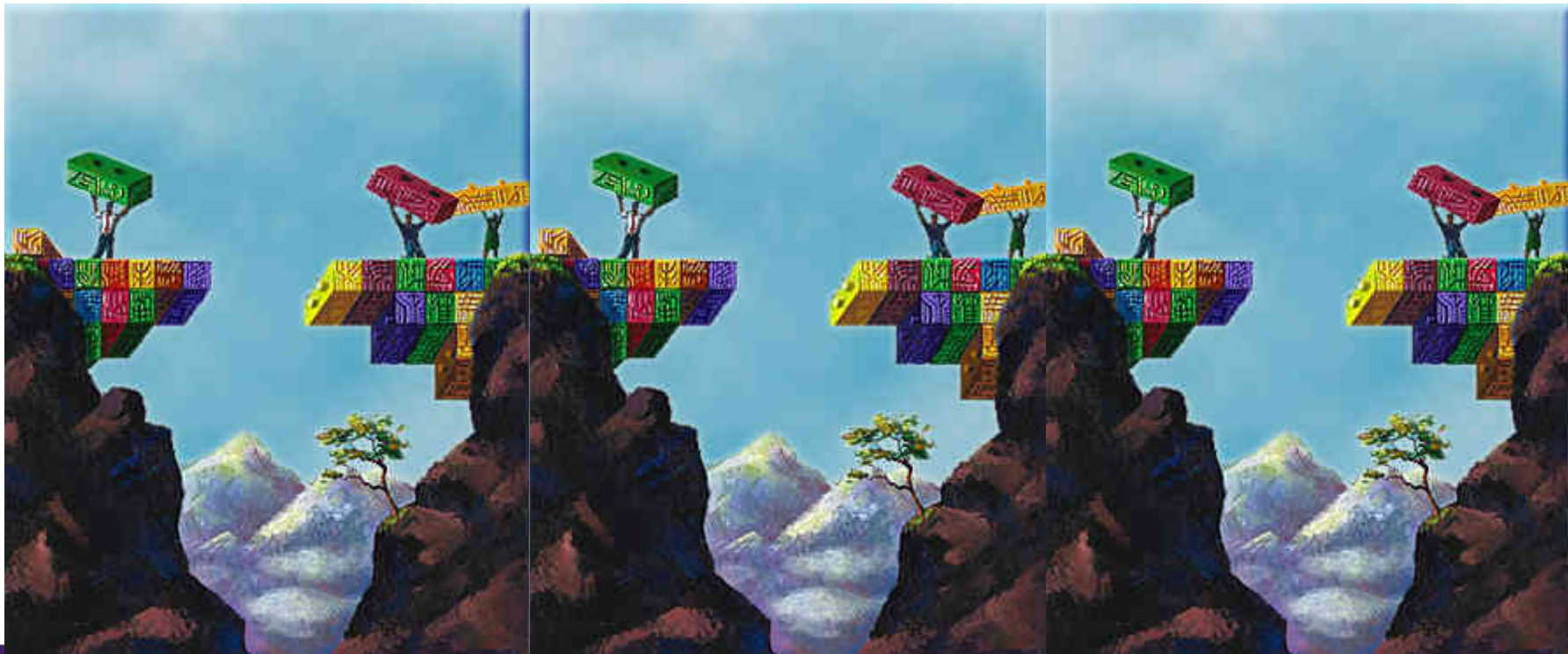
8 C's effecting implementation (Surrey & Ely, 2007)

5. **Rewards or incentives:** only intrinsic, when students improve, no other incentives mentioned
6. **Participation:** not all stakeholders, e.g. policy at national level, policy at school level unclear, only some teachers in individual initiatives
7. **Commitment:** teachers seem committed (see advantages), but are struggling
8. **Leadership:** objectives not clear, low support at different hierarchical levels



e-Assessment for learning Bridging 'implementation gaps'

<http://blogs.atask.com/mind-the-gap-the-difference-between-knowing-and-doing/>



Conclusions for PREATY approach

- Fostering a change in the mentality of teachers by exchanging experiences and ‘joint venture-approach’ in workshops/community
- Offer usable tools to start with on a small scale in small projects and activities
- Offering examples of implementations and stories of teachers (connecting to teachers’ practices, facilitate reflection on own practice)



e-Assessment for learning

More info on PREATY:

- www.preaty.org (project website)
- www.facebook.com/PREATYassessment (community)
- <http://tefa21stcenturyskills.blogspot.nl> (info about our workshop at CAA)



e-Assessment for learning

The present activity/work was carried out as part of the Preaty project.

<http://preaty-project.eu>

This project is partly funded by the European Commission
LLP-1-2012-1-GR-COMENIUS-CMP
Project number: 526965



Lifelong
Learning
Programme

Partners are:

University of Piraeus Research Center, Greece
Center for the Advancement of R&D in Education, Cyprus
Politecnico di Milano, Italy
University of Valladolid, Spain
Cyprus Pedagogical Institute, Cyprus
Open Universiteit, Netherlands
Vocational Training Center EUROTRAINING SA, Greece

