Supporting teachers to develop their pedagogical practices using technology

Sue Cranmer and Cathy Lewin

Futurelab and Manchester Metropolitan University

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Background

- Use of ICT in classrooms is low (EACEA P9 Eurydice, 2011) and where it is used does not always lead to a change in pedagogical practices (Law, 2009; Shear, Novais et al, 2010)
- Need to mainstream e-learning in national policies (EC, 2012)
- Technology can act as lever for pedagogical innovation (Law, 2008)
Innovative Technologies for Engaging Classrooms (iTEC)

- Large-scale, high-profile, European project from Sep 2010 – August 2014 with up to 1000 teachers (from 17+ countries) trying out new ideas in the classroom, over 5 cycles
- Targeted at lower-secondary and upper-primary levels
Innovative Technologies for Engaging Classrooms (iTEC)

- Ideas for ‘future classrooms’ involving student-centred pedagogical approaches, new assessment approaches and new digital tools (e.g. smartphones, widgets, web 2.0, tablets)

- iTEC focuses on sustainable mechanisms for supporting wide-scale adoption of innovation
Objectives

- To introduce innovative teaching approaches (grounded in realities of everyday practices)
- To increase the use of technology in the classroom
- To produce meaningful pedagogical scenarios
- To make technologies interoperable and discoverable
- To mainstream innovative outputs/processes
Innovation

- Difficult to define: based on subjective assessments – accounting for context essential (Kozma, 2003)
- Must lead to positive value (Fullan, 2007)
- In iTEC can be technological or pedagogical or both
- Innovation can involve technologies that are not ‘new’
- Can be incremental (build on existing practices) or be disruptive (fundamental change)
Project Workplan 1

11 work packages

<table>
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<tr>
<th>WP1 &amp;11</th>
<th>Coordination and mainstreaming - European Schoolnet</th>
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<tbody>
<tr>
<td>WP 2-5</td>
<td>Creation of pedagogical scenarios, learning stories and activities</td>
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<td>WP6</td>
<td>Training and support of teachers</td>
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<td>WP 7-10</td>
<td>Creation and curator of tools for supporting the development of the scenarios</td>
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Innovative Technologies for an Engaging Classroom
Project cycle

2010 Sep
Oct
Nov
Dec
2011 Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
Dec
2012 Jan
Feb

Scenarios

WP2
WP3
WP4
WP5

Pre-pilots

Pilots

Evaluation

Scenario focus group
stimulus material
WP2 Futurelab: Development of scenarios

- Starting point of the project
- Plan of work: “short narrative descriptions of preferable learning contexts which are set within a model learning environment”.
- Intention was to inspire teachers to change practice supported by tools and training
- Not lesson plans
How are scenarios made?

- The building blocks of the scenario are trends in education, society, technology - challenges/possible changes to education.
- These trends are derived through research and consultation including with young people themselves!
- The scenarios are built collaboratively by educationalists; academics; technologists, policy makers and young people.
- They are built around a vision of the future classroom combining technical possibilities, teacher realities, and policy and strategy objectives.
- Used as the inspiration for iTEC Learning Stories and Learning Activities
How are scenarios made?

Scenarios underpinned by an adaptation of the Delphi method:

- Group of experts and stakeholders identified at the beginning of the project
- Series of prescribed steps, work together to construct scenarios
- Aim is to represent the interests of the group and are designed to encourage and support the group to move to new practices
### WP 2: ROLE AND TIME COMMITMENT FOR ALL PARTNERS IN DEVELOPING THE SCENARIOS IN CYCLE 2

<table>
<thead>
<tr>
<th>WP2 partner</th>
<th>Other partners</th>
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#### T2.1 Stakeholder Identification and survey design

- **Task:** Stakeholder Identification and survey design
- **Details:**
  - **Task:** All partners need to identify a description of stakeholders and the commitment to developing the scenario.
  - **Step 1:** All partners need to define the scope for developing the scenario.
  - **Step 2:** All partners need to develop a vision for the project and the development of the scenario.
  - **Step 3:** All partners need to develop a plan for the development of the scenario.

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#### T2.2 Descriptions of educational change

- **Task:** Descriptions of educational change
- **Details:**
  - **Task:** All partners need to develop a description of the change and the steps to be taken.
  - **Step 1:** All partners need to develop a plan for the development of the scenario.
  - **Step 2:** All partners need to develop a vision for the project and the development of the scenario.

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#### T2.3 Stakeholder engagement and storage

- **Task:** Stakeholder engagement and storage
- **Details:**
  - **Task:** All partners need to engage stakeholders and store the information.
  - **Step 1:** All partners need to develop a plan for the development of the scenario.
  - **Step 2:** All partners need to develop a vision for the project and the development of the scenario.

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#### T2.4 Analytical reflections on stakeholder responses

- **Task:** Analytical reflections on stakeholder responses
- **Details:**
  - **Task:** All partners need to reflect on the responses received from stakeholders.
  - **Step 1:** All partners need to develop a plan for the development of the scenario.
  - **Step 2:** All partners need to develop a vision for the project and the development of the scenario.

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#### T2.5 Workshops to create mini scenarios

- **Task:** Workshops to create mini scenarios
- **Details:**
  - **Task:** All partners need to create mini scenarios through workshops.
  - **Step 1:** All partners need to develop a plan for the development of the scenario.
  - **Step 2:** All partners need to develop a vision for the project and the development of the scenario.

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#### T2.6 Stakeholder engagement in mini-scenario ordering

- **Task:** Stakeholder engagement in mini-scenario ordering
- **Details:**
  - **Task:** All partners need to order the mini-scenarios.
  - **Step 1:** All partners need to develop a plan for the development of the scenario.
  - **Step 2:** All partners need to develop a vision for the project and the development of the scenario.

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**WP 2 Partners' Commitment**

Select destination and press ENTER or choose Paste
Workshops

- Process always started with the trends
  - challenges and possible changes to education
1. Audio/feedback on the VLE

Comments on alternative suggestions for title:

Using video or audio-recording equipment to record feedback given to a piece of student work. The recordings are uploaded to the VLE. Students are given extra-credit if they access the recordings and if they can demonstrate that they acted on the recommendations. The recordings give clues and direct students to additional resources (books, web-based, etc.).

Advantages: quicker and more efficient (and more personalised) way of providing feedback, increased chance of students acting on feedback.

CORE PURPOSE: Using video or audio-recording equipment to record feedback given to a piece of student work. The recordings are uploaded to the VLE. Students are given extra-credit if they access the recordings and if they can demonstrate that they acted on the recommendations. The recordings give clues and direct students to additional resources (books, web-based, etc.).

Advantages: quicker and more efficient (and more personalised) way of providing feedback, increased chance of students acting on feedback.

NARRATIVE OVERVIEW:

Ms. L is familiar with the VLE and is interested in new approaches to assessment for learning through technology. She agrees with her head teacher to start a pilot project that will attempt a radical change in the way feedback is given to students, and in how students act on such feedback. Students in a number of classrooms are involved in the pilot. Over a semester, Ms. L agrees with her students on two or three feedback targets. During these weeks, holistic feedback about students' overall performance up to that point will be provided. Ms. L will tailor the feedback to individual students, but such feedback will not be given during times consuming and potentially embarrassing face-to-face sessions. Instead, it will be recorded and uploaded to the VLE. This will allow Ms. L to save a large amount of time.

The feedback produced is stored in audio or video form on the VLE - or on the IITEC resource - students can only see the feedback that concerns them by logging into the system with their credentials. They can do so in their own time and in the privacy of their homes if they wish. The feedback stored on the VLE is accompanied by a number of ‘recommendations’ made by Ms. L, e.g. “read these papers”, “research the following websites”, “complete this quiz only when you feel ready”, etc.

The aim of this new approach to feedback is to help clarify what good performance is (goals, criteria, expected standards), by providing opportunities to close the gap between current and desired performance, and allowing students to use the feedback to produce improved work. The system could easily allow the teacher to create a ‘generic’ feedback, applicable to all students, in which criteria and expected standards are stated. Students will be able to access this part of the feedback as a ‘refresh’ in their own time. In addition to the part of the feedback that is tailored to them and hence only visible by them, the VLE could allow the teacher to make marks and edit recordings which have public, accessible by all sections and personal sections. The system could also allow other teachers to add their recommendations and make suggestions to encourage cross-curricular learning and assessment. Ms. L can track whether the students have acted on the recommendations. She and her head teacher are thinking of expanding the program to the whole school, and they are planning to use the permanent audio records to showcase the school’s good work during future school inspections.

ACTIVITIES

Students need to learn how to give feedback to each other (could start with fixed processes / comments).

Comments on narrative/other feedback:

Question: How innovative is this? Make 2-way communication. Students feedback to teachers too.

Feedback needs to be more immediate, not every few weeks.

Marking should take place of regular feedback.

What is the benefit of this? Maybe record voice to face?

POSSIBLE APPROACHES TO TEACHING AND ASSESSMENT

Teachers will use a different style of feedback - may rely more on group feedback.

Self assessment - assess videos against criteria, peer assessment.

PEOPLE & ROLES

Students - must improve, so will need to give feedback to each other.

Teacher - can give whole class feedback and individual feedback recordings.

Feedback - could make student criterion.

Teacher - needs expectations clear.

ENVIRONMENT

Class - students can work from home.

Feedback needs to be given against security.

RESOURCES (including technologies)

Weblinks, videos, etc.
Awareness raising and promotion across activities / school community: games created by students in different levels. Use Scratch or similar program.

ECO-games - how school community can reduce carbon use & output.

Vision (aspirations & aims)

Environment

School clusters

Website - each cluster has its own website/page.

Resources (incl. technologies)

Web page + technical support

Inquiry - scaffolding, support

Video/multimedia presentations

Online collaboration: Skype

People and roles

Teachers - always all levels + subjects + schools

Students - games + students

Parents - students

Organisers & other teachers

Interactions (incl. technologies)

Access levels + schools

Collaboration between schools in different countries & local areas

Cooperation between schools

Collaboration between students - web page & videos.
A breath of fresh air

ASPIRATION STATEMENT:
To achieve traditional learning objectives through exciting means, while developing independent learners

NARRATIVE OVERVIEW:
The students go out to explore the school grounds tasked with a problem or challenge. They have to either capture authentic data, or explore how concepts can be applied in the real world.

Ms Rossi, a science teacher, has been liaising with the geography teacher and they have noticed that their students need to develop a more in-depth understanding of the local natural environment and wildlife. Ms Rossi has also noticed that although her class works well as individuals, they would benefit from more group learning. She decides to get the group to work collaboratively on a problem based activity to do with nature and the local environment. When deciding on a specific activity for the class she liaises with the geography teacher to ensure the chosen activity could also support learning in geography. She sets her class the challenge of finding out why the population of ladybirds has decreased in the school grounds over the last year.

Carmen, a student, goes outside with her group to collect real data to help the class’s investigation. Each group member has a different role and a different instrument to capture authentic data. Carmen uses her mobile phone to capture images of the areas where most ladybirds live, whilst others in the group record the temperature and survey habitats. Ms Rossi lets the students work together in groups so she can take the role of observer and coach. This helps her understand what skills the students need to practice. She notes down what skills the students need to develop to help her design future learning activities. She realises the group need more training on using instruments without disturbing wildlife, and also how to set specific group goals.

After gathering a series of photos Carmen comes back to class with her group and they share their data and findings with each other. They get some specific support from Ms Rossi on how to use a software package to draw conclusions from the group’s numerical data. Having drawn their conclusions, the group choose to create a short film from their photos and data to share their findings with other students in the class. They work together using laptops and a web tool to create a short digital film explaining what they found. Carmen and another student upload their photos while the rest of the group write a script to present their findings. They each record a part of the presentation script and use the automatic editing software on the web tool to create the film. This film is posted on the school’s learning platform for the class to view for homework, and also for students in a geography class, who are doing similar work, to comment on. The group also decide to post it on the public area of the learning platform so they can show their parents/carers when they get home.

TECHNOLOGY / RESOURCES:
Internet enabled mobile devices, learning platform, cameras (could be a mobile phone), film editing software, spreadsheet or other numeric analysis software
Aalto University: Scenarios to learning activities

Transforming the future classroom scenarios WP2 into design challenges and developing into learning activities that can be tested with a pre-pilot focus group of teachers in classrooms across twelve countries.
Cycle 3 Learning Stories

- **Redesigning School (RS):** This LS requires students to think about spatial design and the different motivations of people who use the space. A new space for future use is designed based on identified current challenges in relation to school-based activities.

- **Visualizing the plant surface (VPS):** This LS requires students to design a guided walk that highlights aspects (wildlife, buildings/monuments/geographical features) of the local environment for community members or tourists. The final walk should be based on geocaching, a location-aware smartphone game, Google map or printed map, or QR codes.

- **Designing a physics simulation (DPS):** This LS requires students to design a simulation that can be used to teach a physics concept (e.g., friction) to other students. The simulation can be virtual or physical.

- **Designing a math learning game (DMG):** This LS requires students to design a math learning game to teach a maths concept (e.g., simple geometry) to younger students. Students are asked to consider what younger students might find challenging and what they might find engaging.
• Students are presented with an initial design brief linking the tasks to curriculum topics, students form teams and refine the design considering purpose and initial design challenges (TeamUp, blogs, Google sites, corkboard.me)

• Benchmark: based on who they are designing for and what they are designing, students collect exemplars of the artifact they are trying to design, share the resources and analyse them, refining their design brief further (social bookmarking, AudiBoo, Instagram, Dropbox, Google Docs)

• Students create a prototype and refine the design brief (collaboration tools, Prezi, Sketchup)

• Students meet with 3-4 potential users, present prototypes and elicit feedback, analyse feedback, and refine design brief (AudioBoo, Instagram, Dropbox, Google Docs, Corkboard.me)

• Students create final design prototype, draw on recorded reflections and consider how identified challenges were overcome, finalise blog and present work to their peers (blogs, Dropbox, Google Docs, Google Sites, Prezi, SketchUp)

• After the end of each of the above Learning Activities, post and share audio updates of perceived challenges (TeamUp, VoiceThread, AudioBoo, Bambuser)
Video Florence, Italy

http://www.youtube.com/watch?v=EAfZdLctkDk
The impact of iTEC on learning, teaching and sustaining innovation
# Evaluation approach

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<td>Teacher survey; Case study; Multimedia stories</td>
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<tr>
<td>Process</td>
<td>Focus group; Teacher survey; Case study; Interview</td>
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<tr>
<td>Sustainability</td>
<td>National case study</td>
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<tr>
<td>Technology</td>
<td>Teacher Survey; Teacher focus group;</td>
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Data

1169 TQs

16 national case studies

10 teacher focus groups (C4)

107 case studies

82 multimedia stories

79 sets of raw data

iTEC - Designing the future classroom
iTEC outputs

- Library of scenarios, Learning Activities, Learning Stories
- Scenario development process - toolkit
- Learning activity development process toolkit
- Suite of CPD modules (face-to-face, online) that can be localised/adapted
- iTEC technologies (prototypes)
  - Widget store
  - Composer
  - Widgets (TeamUp, ReFlex)
Key messages to date

- The impact of iTEC on students and teachers in the classroom
- Innovation in classroom practices
- The role of Learning Stories and Learning Activities in sustaining classroom innovation
- The impact of the scenario development process
iTEC has positively impacted in the classroom on:

**Students’**
- Knowledge, skills and understanding
- 21\textsuperscript{st} Century skills
- Motivation, engagement and attitudes

**Teachers’**
- Technology-supported pedagogy
- Digital competence
- Motivation, engagement and attitudes
Conditions for success

- Access to reliable and sufficient infrastructure
- Appropriate school ICT policies
- Pedagogical and technical support for teachers
- Teacher pedagogical and digital competence
- Positive attitudes at all levels towards change
- Suitable digital learning resources
Innovation in the classroom through iTEC

The difference between the maths lessons and the other lessons is that in these lessons we work a lot with Geogebra, with Facebook, and with Glogster and we record things and in other lessons we don’t. In the other lessons the most we can do is some work on the computer once in a while. (Portugal, student, C2)

- Pedagogically-led approach
- Increased effective use of ICT
- Introduced innovative technologies and tools
Example: tools and services used in C3
Sustainability: Learning Stories and Learning Activities

iTEC Learning Stories and Learning Activities provide concrete examples, emphasize innovation and flexibility, and encourage teachers to become learning designers.

I am convinced that iTEC is an innovation not only here, in our school, but also throughout Hungary. Finally, we have something useful in hand as we don’t have Learning Stories like that, which give us guidelines, step-by-step description and ideas. I feel strongly that this is something that fills a gap. So I’m pretty sure this will lead to more and more joining us who will incorporate modern technologies and use them in a deliberate way. (Hungary, ICT co-ordinator, C2)
iTEC Learning Stories and Learning Activities

“Today’s simple lesson plans that we use consist of just books, notebooks and other class materials. This learning story has created lessons plans which are full of discovering, thinking, creating and achieving success as well as [centred] in the real world around us.” (Turkey, teacher)

“I think the main enabler is... the iTEC structure itself: the Learning Story/Learning Activities paradigm/structure. Teachers feel inspired and engaged by this kind of structure, and also they feel themselves as part of a wider community of ‘early adopters’.” (Italy, NPC)
Sustainability: the impact of the scenario development process

The scenario development process:

– is widely viewed as innovative
– supports curriculum planning
– brings a wide range of stakeholders together
– highlights new pedagogies and new technologies
– standardises approaches to developing and documenting good practice
– provides flexibility to respond to local, regional or national issues
Sustainability: individual/institutional level

- Participating countries will continue to disseminate library of resources and toolkits

- The Austrian National Coordinators and teachers have found the new ideas, encapsulated within the Learning Activities to be of greatest benefit in achieving their personal goals. The emphasis on innovation and flexibility (opportunities to experiment), have been most inspiring, with new elements such as bringing in external experts as an example. (AT)

- The scenario development toolkit is seen as a real asset in Hungary...it is seen to facilitate a professional approach to developing and documenting best practice. (HU)

- The concrete benefits [the interviewee] sees arising from iTEC is that it encourages schools to start with a pedagogical scenario rather than focus on technology. He believes that this could be the main reason why iTEC will be successful, “because it gives the teachers and the schools the ammunition to work with technology from a pedagogical perspective.” (BE)
Sustainability: regional/national level

- Still viewed as a pilot project (evidence of impact) (FI, HU, IT, LT)
- Level of influence over policy making varies (challenging in CZ, EE, FI, TR)
- Top-down approach (policy directive) not appropriate in some countries (BE, HU, SK, UK)
- Object of iTEC fits with national strategies in some countries (AT, BE, EE, FI, FR)
For further information

WEB:
http://itec.eun.org

EMAIL:
itec-contact@eun.org
c.lewin@mmu.ac.uk
s.cranmer@lancaster.ac.uk

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