

The logo graphic for iTEC consists of several overlapping, semi-transparent purple squares of various sizes and orientations, arranged in a cluster in the top left corner.

# iTEC

Designing the future  
classroom

## “Discovering, thinking, creating”: Findings of the 3rd iTEC evaluation

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# Outline

- ▶ Overview of implementation in Cycle 3
- ▶ Classroom impact - benefits
- ▶ Sustainability: continued use by teachers
- ▶ Wider impact: dissemination/uptake within and beyond participating schools
- ▶ Impact: the iTEC process

# 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 (eg 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 (eg simple geometry) to younger students. Students are asked to consider what younger students might find challenging and what they might find engaging.

### Design Brief

- 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

### Contextual Inquiry

- Observation: students decide who and what to observe, conduct observation and analyse data, refining design brief further
- 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

### Product Design

- Students create a prototype and refine the design brief

### Participatory Design Workshop

- Students meet with 3-4 potential users, present prototypes and elicit feedback, analyse feedback, and refine design brief

### Final Product Design

- Students create final design prototype, draw on recorded reflections and consider how identified challenges were overcome, finalise blog and present work to their peers

### Reflection

- After the end of each of the above Learning Activities, post and share audio updates of perceived challenges

# Cycle 3: Another Success Story

- ▶ 18 countries participated to different degrees
- ▶ 334 questionnaires received from individual teachers representing 403 of the 573 classrooms involved
  - 130: Redesigning school (RS)
  - 54: Visualising the planet surface (VPS)
  - 36: Designing a physics simulation (DPS)
  - 100: Designing a maths learning game (DMG)
  - 14: Other
- ▶ 36 CSRs, 16 sets of interview data, 20 multimedia stories, 9 videos

# 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, Case Study Report)

*“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)

# The benefits of iTEC for teaching and learning ...

To improve learning outcomes

To develop teacher competences

To bring about innovation

To increase effective technology use

To introduce innovative digital tools into the classroom

To change classroom practices

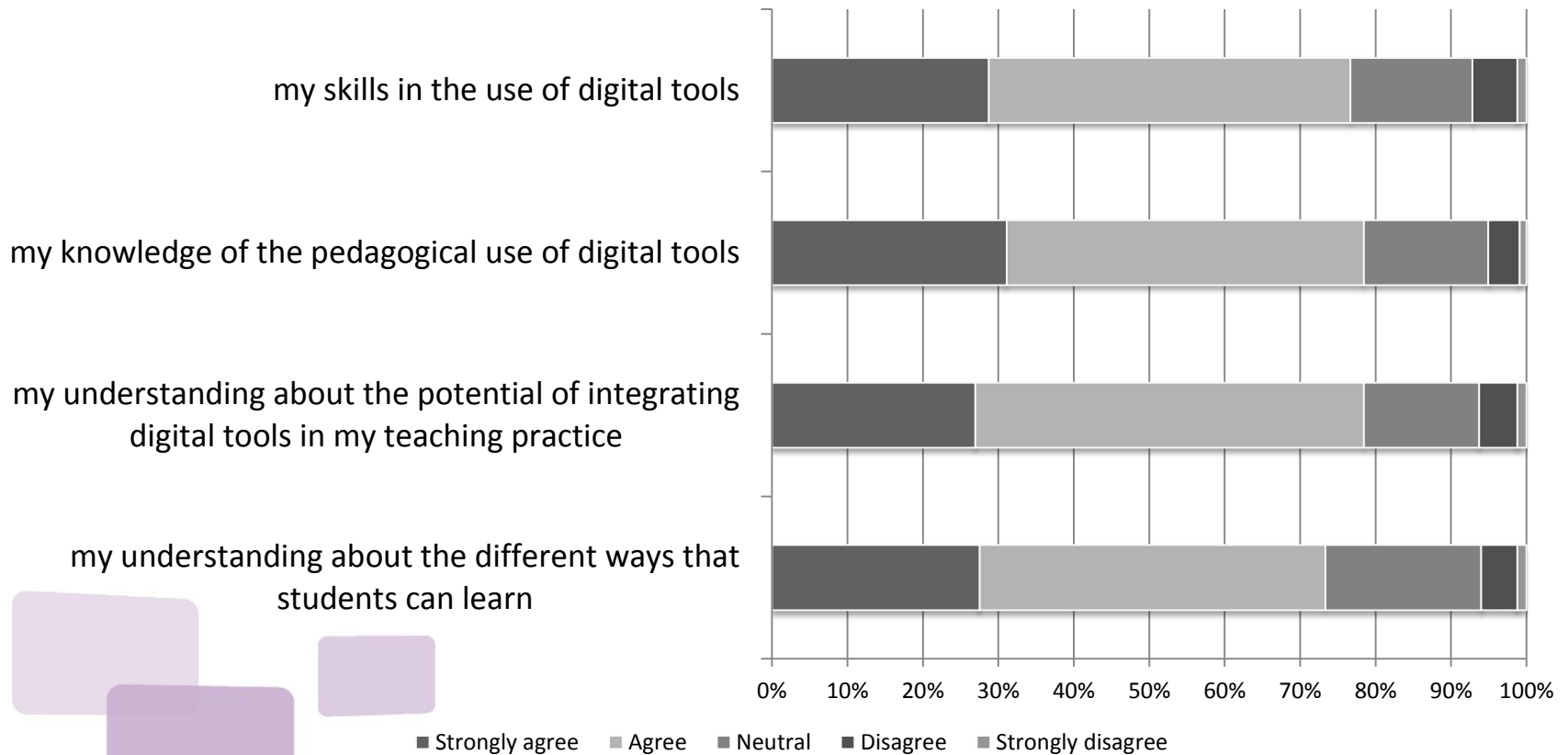
# To improve learning outcomes

- ▶ Increased student motivation was identified as the **main** benefit by 20% of teachers (BE, FR, LT, NO).
- ▶ Three out of five teachers felt that there was a positive impact on attainment.
- ▶ Four out of five teachers felt that students developed 21<sup>st</sup> Century skills:
  - Digital literacy, creativity, autonomy, collaboration, communication and design skills



# To develop teacher competences

## The implementation of the Learning Story has developed...



# To bring about innovation

- ▶ The majority of teachers were very confident or confident that the iTEC resources have the potential to lead to innovation in the classroom (with over 20 different reasons given from increased student motivation to increased creativity in the classroom).
- ▶ An ‘innovative approach to learning’ was identified as the **main** benefit by 21% of teachers (AT, EE, ES, FI, LT, NO, PT, SK)



# Innovation Potential

Learning Story	Majority of teachers confident	Majority of teachers positive but cautious	Small number of teachers disagree
Redesigning School (n = 130)	AT, BE, IS, LT, SK, ES, TR, UK	CZ, FI, DE, HU, IT	1 BE, 1 LT, 1 TR
Visualising the planet surface (n = 54)	FR, IS, ES, TR	FI, DE, HU, NO, PT,	1 FR
Designing a physics simulation (n = 36)	HU, SK, ES, TR	AT, FR, DE, IT, PT, UK	
Designing a math learning game (n = 100)	AT, HU, IT, LT, PT, TR	CZ, EE, FI, FR, DE, NO, SK, ES, UK	1 EE, 1 NO
Other (n = 14)	IS, IT, UK		

“It’s **different** from usual lessons; it’s **another way** of looking at physics” (France – student)

“They learnt maybe because they created exercises, sort of ones they had **never created before.**” (Hungary – teacher)

“They learn history in a **different way .**”(Hungary – teacher)

“We have worked **much more** than previously **across disciplines .**”(Norway – teacher)

“We learn **more easily** and in a **fun way .**”(Portugal – student)

“The teacher **changed her pedagogy** in this learning story, students have **more freedom** to work on their own.” (Slovakia – CSR)

“I noticed that we **learn better** and **more easily** in this lesson. We are just trying to learn by listening in the normal school lessons.” (Turkey – student)

# To increase effective technology use

- ▶ Four out of five teachers used at least four different types of digital tools: most commonly data capture devices, communication tools, media authoring tools, digital resources and collaboration tools
- ▶ Thus there was an increased use of technology in the classroom to support teaching and learning
- ▶ Many students commented that using technology themselves was something they had not done previously



# To introduce innovative digital tools into the classroom

- ▶ Three out of five teachers indicated that they used digital tools they had not used before (eg Scratch, Sketchup, blogs)
- ▶ Blogs were seen to be beneficial: for sharing ideas and resources, supporting assessment, developing communication skills and facilitating authentic publication
- ▶ The introduction of new digital tools was identified as the **main** benefit by 14% of teachers (FR, NO, PT).

*“A few [teachers] worked with game design and tried game-based learning in their classrooms. [One school] worked with different technologies in mathematics (GPS, measuring width, length, diagonals). [Other schools] had good results from their project, making guided tours with QR-codes and digital storytelling.”*  
(Norway, NPC)

*“The devices are being used a lot. What we see now is that students use them more to create things than only use them to look up or produce texts.”* (Belgium, Head Teacher Interview)

*“For example, before the project, in ICT class, they’ve used blogs but not with a real use, the project has allowed them to really see what it means to publish information and work through a blog, they could see how many people would visit them and really understand that their information was public.”* (Spain, ICT Co-ordinator Interview)



# To change classroom practices

- ▶ Technology-enabled pedagogical change – more commonly incremental than radical
- ▶ Increase in technology-supported reflection (underpinned by LAs)
- ▶ Technology also facilitated other pedagogical change: independent /autonomous learning, self-reflection, group work and collaboration, new ways of interaction, design processes, peer-tutoring, authentic learning, active learning
- ▶ Some teachers identified increased collaboration (19%, CZ, EE, ES, HU, IT, PT, SK) and increased student autonomy/independence as the main benefit (12%, ES, HU, IT, PT, TR).

# Examples of classroom change

## Assessment

- Technology enabled reflection through blogs
- Learner response systems – instant feedback

## Communication and collaboration

- Blogs increasing teacher-student communication, peer tutoring and peer feedback
- Facilitating group work through Facebook, dropbox and blogs

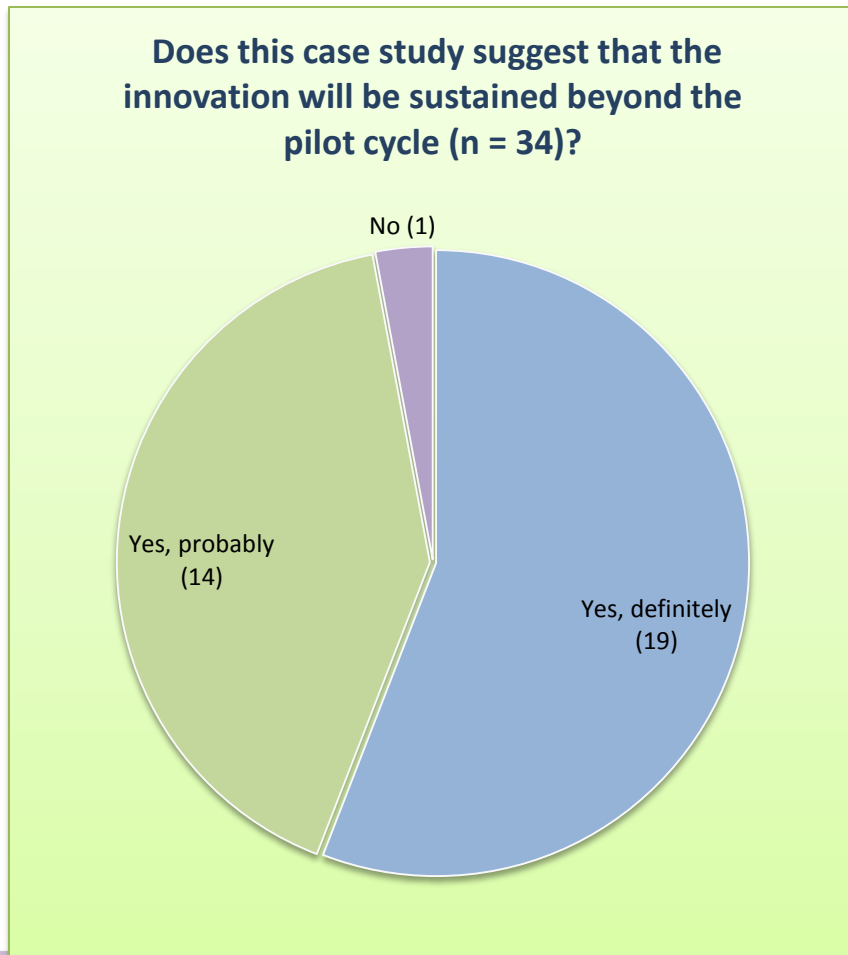
## Designing and making

- Using a range of digital tools to support the entire design process (eg Scratch) rather than only undertake research and present findings

## Independence

- Facilitating student autonomy and engagement more easily through technology (eg using blogs to support self-reflection enabling students to refine their ideas)

# Classroom Impact: Sustainability



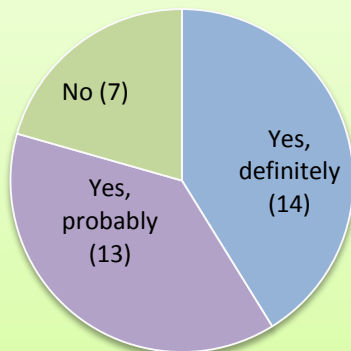
- ▶ 50% of teachers responding to the survey said that they would definitely implement the LS/LAs again
- ▶ 46% said they probably would
- ▶ Only 4% said they would not

# Wider Impact: Early Indicators

- ▶ 56% of teachers would definitely recommend iTEC to others, 40% would probably recommend iTEC, only 4% would not

*“Yes, we are organising a small workshop during the winter holidays [for other teachers]... and [name of teacher] is going to talk about the ITEC project.” (Estonia, Headteacher Interview)*

**Does this case study suggest that the innovation will be transferred to other classes within the school or to other schools (n = 34)?**



*“There were some primary-school teachers who found this iTEC programme really interesting, and they could imagine making a similar trail for the primary school, with various assignments to do in the forest and such. And I think this will be really exciting, if we can succeed in producing those kinds of ripple effects in-house, to have others latching on.” (Norway, Teacher Interview)*

# Impact: The iTEC Process

- ▶ The scenario development process has led to the generation of Learning Stories and Learning Activities that have inspired teachers to change their pedagogy (ranging from incremental to radical) through integrating a wide range of ICT into daily practices.
- ▶ The iTEC resources have been a key enabler of this process together with the training and support offered by NPCs.
- ▶ An increasing number of teachers have been involved in iTEC over the first three cycles and there is some evidence of take-up by other teachers.

# For further information

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