iTEC webinar:

21st century skills in schools

Neuza Pedro, University of Lisbon:
Netgeneration and 21st century skills

Lars Ingesman, UNI•C:
Today's reality and yesterday's school
Net generation: new technologies, new ways of learning
Net-gener@tion: what does is mean?
"There's a new generation around the world that is the first to grow up digital.' (Tapscott, 1999)
“most young people in the United States neither read literature, visit cultural institutions, nor vote. They cannot explain basic scientific methods, recount foundations of history, or name any of their local political representatives”
“They read blogs rather than newspapers. They often meet each other online before they meet in person. They probably don’t even know what a library card looks like. And they’re connected to one another by a common culture.”
So, where do we stand?

- option a
- option b
Digital natives / Digital immigrants

(Prensky, 2001)
They have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys of the digital age.

Today’s average college grads have spent less than 5,000 hours of their lives reading, but over 10,000 hours playing video games.
digital residents / digital Visitants

(White & Le Cornu, 2011)
Do they really act differently?
Attention-deficit/ Hyperactivity disorder (ADHD)

Continuous Partial Attention (Linda Stone, 2009)
They act differently but

‘Do they really think
differently?’
“Our brains grew along with the evolution to match even more advanced use of tools including abstract symbolic, connected and pattern recognition-based thinking.” (Arina, 2007)

( Gary Small, 2009)
Your Brain on Google

Net Naive

Net Savvy

Text

Internet
Your Brain on Google

Net Naive

Net Savvy

Text

Internet
Adults are better on:

- Reading facial expressions
  (interpersonnal face-to-face interactions)
- **Reflection**
  (connections, generalization)
- **Perform more methodically and precisely**
- **Reasoning (not-acting)**

Kids are better on:

- Superior cognitive abilities to make snap decisions and juggle multiple sources of sensory input.
- Understanding graphic representation
  (3-dimensional space)
- **multitasking**
- Parallel information processing
What are the implications for teaching and learning?
“Digital Natives are accustomed to the twitch-speed, multitasking, random-access, graphics-first, active, connected, fun, fantasy, quick-payoff world of their video games, MTV, and Internet are bored by most of today’s education, well meaning as it may be.

But worse, the many skills that new technologies have actually enhanced (e.g., parallel processing, graphics awareness, and random access)—which have profound implications for their learning—are almost totally ignored by educators.” (Prensky, 2001)
“Whenever we find out something about the brain, it’s not very interesting educationally unless we understand its significance in terms of the mind.

The psychology of learning has to be combined with what we discover about the brain in order to make it meaningful”

(Paul Howard-Jones, 2009)
21st-century skills
and
21st-century skilled teacher
21st century skills

Analysis of 17 competencies frameworks

(Pedro, Matos, Pedro & Abrantes, 2011)
(Pedro, Matos, Pedro & Abrantes, 2011)
Digital Literacy Skills [technical domain]

Effective Communication skills

Collaboration & Interpersonal skills

Creativity & Productivity

Reflection & Critical Thinking

Research, strategic planning and problem-solving

Global Awareness & Multicultural literacy

Information management fluency

E-bussiness skills

E-bussiness, Economy and Marketing Literacy

Information management fluency, legal and ethical use of ICT / Privacy and security on web, Productivity and Accountability:

Social responsibility: Citizenship, Health and Civic Literacy, Cross-cultural skills, Global Awareness

Prioritize, plan, and manage actions, Scientific literacy, Research competences, Adaptability, Managing complexity and Risk-taking, Problem Solving and Decision Making

Inquiry and Critical Thinking, Interconnectivity

Metacognition

Inventive thinking, Curiosity, Creativity and innovative attitudes Productivity and Accountability

Leadership and Team Work, Autonomy, initiative and self-directional skills

(Pedro, Matos, Pedro & Abrantes, 2011)
The emergency of change
New theoretical approaches to think about human learning and development are required...
also updated curricula are needed...
... and also new approaches to think about what is a classroom and what is needs to be in the future.
Innovative Technologies for an Engaging Classroom

Designing the future classroom


Today's reality and yesterday's school

21st century skills

Lars Ingesman,
UNi•C

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The philosophical angle to teaching

If One Is Truly to Succeed in Leading a person to a Specific Place, One must First and Foremost Take Care to Find Him Where He Is and Begin There

In order truly to help someone else, I must understand more than he—but certainly first and foremost understand what he understands. If I do not do that, then my greater understanding does not help him at all.

_Søren Kierkegaard, The Point of view for my work as an author, 1859_

So the question is: what characterizes today’s learner, his world and his understanding of the world?
Today’s reality

The **status of information** has changed:

- Rapid development in all areas – information, skills, and competences change and some even outdate fairly quickly.
  What holds true today, does not necessarily hold true tomorrow...

**Shift of focus is needed**

- The focus on information presentation and on fixed bodies of knowledge (read: information for students to recall at an exam) is a thing of the past.

A memorized list of (English) kings and queens is not really valuable knowledge anymore. You may fool someone into thinking that you are well educated, but not for long...
Today’s reality

What characterizes the new status of information?

- Information has, as it were, become a ‘raw material’ in knowledge societies – our societies produce knowledge, new ‘products’, etc. based on information.

- Information is a key asset in most organizations, in particular organizations that need to optimize processes, costs and products to match market needs and reactions.

Data warehouses, BI, CIO etc. are just some indicators of this…
Today’s reality – information competence

Information skills and competences are the key skills and competences that learners need to develop.

Put very briefly this means that focus needs to be on skills and competences related to:

- **Analytical** information processing
- **Contextual** information processing – information is only relevant in context, and its importance/relevance varies depending on the context
- **Independent** information processing – the teacher (or books for that matter) is no longer the source of ‘truth’ or ‘knowledge’ – learners need to be able to continually construct and revise their own knowledge.
Today’s students: where are they?

It is not just the raw material of teaching (information) that has changed. The students have changed, too. They come with a different set of skills. They are used to:

- fast **visual** information processing
- doing many things **simultaneously**: homework, checking messenger or facebook, watching TV or listening to music, texting
- information being found somewhere – it’s not something you have to remember (perhaps not even worthwhile to remember, as it may be different next time you find it...)
- being constantly **online**
- using **social media** and **online communication**
Today’s students: where are they? (cont.)

Technology has become an integral part of their lives – in some ways perhaps even an extension of themselves...

Technology is a natural and essential tool for building up and maintaining social relations – as well as for doing lots of other things..

They are digital natives, in the sense that they are born into a digital context, and that they have never known a life without digital technology.
Today’s students: where are they? (cont.)

They may be digital natives, in the sense that they are born into a digital context.

This, however, does not mean that they have a deeper understanding of the digital world they were born into – some of them may be considered ‘functionally illiterate’ digitally.

And it certainly does not mean that they are information literate, i.e. that they have basic information competencies.
21st century teachers: what is required?

Information competency is a key teacher competence and a key target competence for learners.

Teachers need to develop all the basic aspects of information competency – as well as any new aspects and possibilities that have arisen with digital technology – such as new ways of locating, retrieving, processing and presenting information.

They need to be able to structure learning activities and processes to help students develop the same competencies.
Information competency

The basic elements of information competency are the ability to:

- determine the nature and extent of the information needed in relation to the problem, task or issue in question
- search and access the information needed effectively
- analyze information and its sources critically
- organize, process, relate and incorporate relevant information into one’s general understanding of the issue in question
- use information effectively to accomplish a specific purpose
- understand some of the economic, legal, and social issues surrounding the use of information.
21st century teachers: pedagogical competencies

Teachers need to be able to develop learning activities and processes to help students develop the same competencies:

- **design project-based learning activities** incorporating ICT for data gathering, analysis, presentation, collaboration and communication
- **implement project-based learning activities** – organize classroom, set up groups
- **evaluate and assess student learning** and the effectiveness of the activities
- **select or create** suitable software/resources for the activities
21st century teachers: interpersonal competencies

Teachers need to:

- be able to communicate and collaborate effectively
- be able to use iCT to as a tool to communicate and collaborate. This involves both organizational and interpersonal competencies.
21st century teachers and iTEC scenarios

iTEC scenarios and activities all focus on the key competences and skills mentioned:

- Based on a general description of activities, pilot teachers are required to **design their own learning activities** incorporating ICT for data gathering, analysis, presentation, collaboration and communication.

- Most scenarios and learning stories are built around **project-based activities** with **teamwork** as a key element.

- They require a high degree of integration of technologies, such as IWB, web 2. services, etc.
21\textsuperscript{st} century teachers and iTEC scenarios

A number of iTEC scenarios and activities also try to take as their point of departure external resources and real-life problems:

- Integration of external experts or people
- Integration of external events
- Use of real-life data – data collection outside the classroom
- Use of real-world issues and problems
For further information

WEB:
http://itec.eun.org

EMAIL:
Lars.Ingesman@uni-c.dk
itec-contact@eun.org