
# RESEARCH AGENDA

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# INTRODUCTION

This Research Agenda aims at sharing materials and reflections on digital tools to enhance cultural and heritage education in primary schools within the context of 21st Century learning skills.

6 Institutions from 4 different Countries have been working together to identify pending research questions on digital resources and methods in cultural and heritage education and to draft an overview of the state of the art.

This Research Agenda will be constantly updated online at the following url:
http://wiki.diche-project.eu/

## Context

The DICHE project's aim is to integrate digital resources and opportunities in primary education in general, and in cultural and heritage education in particular.

The project has the following priorities:

1. Enhancing digital integration in learning, teaching, training and youth work at various levels: By developing a research agenda, university professors and teachers are provided with a theoretical framework for the use of digital tools in education, especially in cultural and heritage education. Moreover, the agenda can be the basis for new academic research, yielding new insights into the use of digital resources in education. Moreover, by developing and disseminating a menu of teaching scenarios for cultural and heritage education, which involve the use of digital resources, (prospective) teachers gain access to a set of practical scenarios that they can immediately use in class. In other ways, by making the set of scenarios available to prospective teachers and other teachers, the project enables digital integration in learning and teaching at primary schools. Last, the project's objective is to come up with a set of recommendations for the development and integration of digital resources in cultural and heritage education for the long run and for a more immediate use in the classroom of the scenarios menu developed in this project, based on the outcomes of the project's pilot phase.

2. Developing basic and transversal skills using innovative methods: The aim of integrating digital resources and opportunities in education (especially in the field of cultural and heritage) has to be seen in the light of 21st century learning. In their work titled "21st Century Skills: Learning for Life in Our Times" (2009), Trilling & Fadel create a framework of transversal skills necessary to prepare society for the complex realities of the 21st century. The

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skills critical thinking, creativity, communication and collaboration –the 4 C's – are incorporated in the menu. The scenarios allow children to reflect critically on cultural and heritage issues and to collaborate and communicate in groups in order to come up with creative solutions to the posed problems. In addition to transversal skills, through different assignments that are part of the scenarios, teaching scenarios also pay attention to basic skills such as writing and mathematics.

3. Strengthening the profile of teaching professions: As part of the project, prospective teachers are educated about the use of teaching scenarios that involve widely available digital resources. Moreover, the aim is to implement the courses in the regular curriculum of prospective university professors (mostly after the project). Additionally, through dissemination, teaching scenarios become available for other teachers in the EU. By instructing teachers on when and how to use digital resources in their teaching (additional output of this project), the teacher profile is strengthened.

The project is innovative as it brings together 3 fields:

1. cultural and heritage education, to experiment with
2. digital integration and innovation, in
3. primary education.

The methodology applied in this project is based on the logic of converting a theoretical basis for digital innovation in cultural and heritage education into a practical menu of teaching scenarios and digital resources, testing the menu and using the test outcomes to enrich the theoretical basis.

## Purpose

By developing the DICHE project Research Agenda, universities, teachers and educators are provided with a theoretical framework for the use of digital tools in cultural and heritage education.

The DICHE project Research Agenda can be the basis for new academic research, yielding new insights into the use of digital resources in education. These new insights can be brought into practice, which is the way the Research Agenda enhances digital integration in learning, teaching, training and youth works.

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The DICHE project Research Agenda has to be seen in the light of the 21st century learning, with the aim of providing innovative methods for the development of basic and transversal skills.

It includes:

- pending academic **questions** and matters that require additional research;
- overview of the state of the art;
- a Literature Review about the possibilities for the enhancement of 21st century learning skills;
- DICHE partners' case studies about the use of digital tools in cultural and heritage education;
- a list of digital resources already available and linked to each case study;
- a quick overview of Educational systems for each DICHE partners' country;
- an audio/video glossary on 4C's: Creativity, Communication, Critical thinking and Collaboration.

## Target of the document

The DICHE project Research Agenda is intended to provide a theoretical basis about the use of digital tools in cultural and heritage education and each part is usable for all people interested in this matter

The main target groups of the DICHE project Research Agenda are the following:

- Researchers;
- Teachers;
- Educators.

Pending Research questions, the state of the art of digital integration and innovation in classrooms and the Literature review about 21st century skills serve as a theoretical basis for Researchers to develop new academic research. In fact, this points of the DICHE projects' Research Agenda aims at presenting available research on 21st Century skills, summing up different academic studies and results.

Partners case studies and the collection of digital resources can help Teachers and Educators in the creation of an innovative learning pathway, where the main focus is the development of communication, collaboration, critical thinking and creativity skills.

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Educators are also provided by a quick overview of Educational systems of each country (Italy, United Kingdom, Netherlands and Belgium), thanks to which they can understand different uses of digital tools in different educational and cultural systems.

The audio/video glossary can be useful to everyone who wants to know different points of view about the development of 4C skills through cultural and heritage education.

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## Context for a definition of of 21st century learning skills: the KSAVE MODEL

DICHE project's partners have agreed to use a specific model of skills classification, KSAVE model, thanks to which the conception of 21st century skills was widespread in the scientific community.

This diagram defines 10 skills grouped into 4 categories, as follows:

Ways of Thinking

Creativity and innovation
Critical thinking, problem solving, decision making
Learning to learn, metacognition

Ways of Working

Communication
Collaboration (teamwork)

Tools for Working

Information literacy (includes research on sources, evidence, biases, etc.)
ICT literacy

Living in the World

Citizenship – local and global
Life and career
Personal & social responsibility – including cultural awareness and competence

The model has been developed from a re-conception of key skills, linked to a new and contemporary idea of knowledge and use of technologies. Information and communication have modified people's life and work: in the 21st century society sharing information, collaborating with other people, using digital tools are part of routine work. On the other hand, the economic and employment worlds change every day and people have to solve complex problems, to adapt their knowledge in different contexts and to create new knowledges and technologies for a future productivity. KSAVE model innovatively groups in a modern way a set of Knowledge, Skills, Attitudes, Values and Ethics, which a 21st Cen-

tury citizen needs to have.

DICHE project considers KSAVE model an important theoretical approach to 21st century skills definition.

In particular, all project activities will be created to enhance the '4C' skills, a set of skills (Critical thinking, Creativity, Communication and Collaboration) already defined by Trillin.& Fadel (2009) as cross-sectional skills that are necessary to make society ready for the complex realities in the 21st century.

Specific angle from Belgium

The Flemish model of defining key competences strikes very well with the the definition and selection of key competencies as described by OECD in the executive summary of its DeSeCo project (2005), relevant competences are described there as:

- The ability to use knowledge and information interactively: this requires critical reflection on the nature of information itself – its technical infrastructure and its social, cultural, and even ideological context and impact.
- The ability to relate well to others: individuals are able to respect and appreciate the values, beliefs, cultures and histories of others in order to create an environment where they feel welcome, are included and thrive.
- The ability to act within the big picture: understand patterns and have an idea of the system in which they exist (i.e. understand its structures, culture, practices, and formal and informal rules and expectations and the roles they play within).

This can be translated in concrete subjects such as global awareness: learning from and working collaboratively with individuals representing diverse cultures, religions and lifestyles in a spirit of mutual respect and open dialogue in personal, work and community contexts and understanding other nations and cultures, including the use of other languages. Learning and innovation skills comprise understand and effectively utilise the most appropriate media creation tools, characteristics and conventions, expressions and interpretations in diverse, multi-cultural environments to create media products. Learners are expected to work effectively in teams, respecting cultural differences and working effectively with people from a range of social and cultural backgrounds, leveraging social and cultural differences to create new ideas and to increase both innovation and quality of work.

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Culture education and 21th century skills

During a national meeting on June 11. 2015 of all organisations involved in 'Quality Cultural Education', Mr. Hans van Dael was one of the presenters. He is working at BMC, a private company specialised in consultancy in the public domain.

His focus is on development of schools as organisations. He was reporting about his experiences while studying a whole bunch of policy papers written by primary schools in the Netherlands, on behalf of the ministry.

He learned that 21th century skills pop up in almost all policy papers: in primary education this appears to be a 'hot topic'. But – to his own surprise – in no case these 21th century skills were connected to the field of culture or cultural education. So for schools it does not seem to be evident to link culture to 21th century skills.

## Research Questions

To define the focus of our main activity, we are identifying a set of research questions to be explored during the whole duration of the project.

- Which digital approaches can enhance the connection between 21 learning skills and cultural heritage?
- How should teachers' competences (defined as a mix of knowledge, skills and attitude) be developed to ensure an effective pedagogical use of digital approaches?
- Which teachers and prospective teacher's practices can promote 4C's students development?

## Literature Review

The following section aims at presenting available research on 21st Century skills. It sums up different academic studies and results, highlighting the most relevant publications on digital tools used to improve cultural and heritage education, especially in primary schools.

### Ways of thinking

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## Creativity and Innovation

The role of creativity and innovation is without dispute essential, even if it is still inadequately taken into consideration by development policies in the Western world. As Siøvoll (Skogen – Siøvoll, 2010) says, the declaration of the European Year of Creativity and Innovation (2009), during the global financial crisis, reinforced the idea of a strong connection between creativity and innovation. Their use is considered essential to develop new ways of knowledge, new opportunities and new ideas. Siøvoll (Skogen – Siøvoll, 2010) underlines the necessary role of education in the promotion of creativity and innovation, whose potential result could be the entrepreneurship promotion.

P21 - The Partnership for 21st Century Learning[1] proposes a definition of 'creativity' echoing Stein (1953): "a novel work that is accepted as tenable or useful or satisfying by a group in some point in time". Here they stress the importance of two characteristics, 'novelty' and 'usefulness', both involved in creativity. And suggests as reference also a definition provided by other scholars who emphasize that 'a creativity product must be surprising and non-obvious' (Amabile, 1996; Boden, 2004; Simonton, 2012).

In his an extensive research programme 'Culture in the mirror', professor Barend van Heusden (Groningen University), in his theoretical framework[2], defines 'creativity' as 'the ability to use memories in a non-obvious way'. So a creative person is someone who can bridge the difference between memory and reality in a new and unlikely way – for example

[1] P21, The Partnership for 21st Century Learning (formerly the Partnership for 21st Century Skills) founded in 2002 in US, has published a 4Cs Research Brief Series on key aspects of conceptualizing, developing, and assessing Creativity, Critical Thinking, Collaboration, and Communication. The series is edited by Helen Soulé, Executive Director at P21, and Jonathan Plucker, Neag Endowed Professor of Education at the University of Connecticut.
P21's Report also suggests 'where to find additional research':
Creativity Research Journal (http://www.tandfonline.com/loi/hcrj20#.UydVME1OWM8)
Journal of Creative Behavior (http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)2162-6057)
Psychology of Aesthetics, Creativity, and the Arts (http://www.apa.org/pubs/journals/aca)
Empirical Studies of the Arts (http://www.baywood.com/journals/previewjournals.asp?Id=0276-2374)
Gifted Child Quarterly (http://gcq.sagepub.com)
Roeper Review (http://www.tandfonline.com/loi/uror20#.UydVqE1OWM8)
Thinking Skills and Creativity (http://www.journals.elsevier.com/thinking-skills-and-creativity)
[links checked on 23rd October 2015]

[2] This research aims at developing a theoretical framework for a culture education curriculum and to translate this framework into an outline, and tools, that allow teachers and schools to develop a culture education curriculum, which fits their specific needs. The theoretical framework is quite complex. In a nutshell:
'Culture in the Mirror' starts from a broad definition of 'culture'. This is culture: the cognitive process in which memories are used to deal with an ever-changing actuality. Only human beings are able to bridge the gap between memory and daily reality - because the reality is constantly new for us - by using four cognitive strategies:
- Perception: experience, remember, know, recognise, observe
- Imagination: invent, create, play, imagine, put oneself in someone else's situation
- Conceptualisation: interpret, label, name, estimate, evaluate, classify
- Analysis: explore, connect, think logically, test

by developing new techniques or calling things differently. This is why 'imagination' is seen as a major ingredient of any successful cultural education programming. Talking about 'imagination' would be worth remembering the reflections suggested by Van Boxtel when she points to the importance to teach pupils to explore heritage from different perspectives and she mentions the 'multi-perspectivity'. When pupils look at heritage and historical events, they inevitably need their imagination to project their minds into the past. Students have to look beyond their own framework to be able to imagine themselves back in time. Van Boxtel[3] does not only suggests students to put themselves in the time and place of one position in history, but of all parties involved. By using their imagination in that way, they practice a multi-perspective approach. This is also linked to 'critical thinking' somehow.

P21's Report on 'Creativity' focuses also on how can teachers make students more creative. And fundamentally the answer is that 'the development of creative competence results from an interaction between person and environment (Beghetto & Kaufman, 2014; Kozbelt, Beghetto, & Runco, 2010). With respect to the person, creativity researchers have highlighted several interrelated factors, including openness to experience (Feist, 2010), confidence in one's own creative ability (Bandura, 1997; Beghetto, 2006), task motivation (Amabile, 1996; Hong, Hartzell, & Green, 2009), domain knowledge and expertise (Ericsson et al.,1996), willingness to take sensible risks (Beghetto, 2009; Sternberg, 2010), and resilience in the face of criticism (Simonton, 2010; Sternberg & Lubart, 1995)'. 'With respect to the classroom, research suggests that learning environments play at least as great a role in student creativity as students' personal characteristics (e.g., Niu, 2007; Runco, 2014)'. And we can't avoid underlining the influence of teachers' instructional practices

**Digital storytelling and creativity**

Robin (2008) remarks that 'digital storytelling allows computer users to become creative storytellers through the traditional processes of selecting a topic, conducting some research, writing a script, and developing an interesting story'.
And again: 'Perhaps the greatest benefit in the classroom may be found when students are given the task of creating their own digital stories, either individually or as members of a small group'

[3] "Heritage, education an historical conciousness. Longing for a tangible past" – a recent publishing of the programme 'Heritage Education, Plurality of Narratives and Shared Historical Knowledge' at the Erasmus University, led by Carla van Boxtel.

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**21st Century Skills or Bildung?**

Recently the LKCA made some critical remarks regarding too much focus on 21st century skills. In the publication 'Culture turning over' they present an interesting inventory of trends and actual issues that may influence cultural education in the (near) future. They present 18 key issues. Issue number 2 is called: '21st Century skills or Bildung? '. This is what they write:
'The strategical options are:
a. Investing in creative and innovative skills for the 21st century.
b. Investing in broad education, and cultural awareness.
The present attention for creativity can be linked to the used approach of education, targeting at our economy, and looking upon innovation as the motor to sustain our prosperity.
On the other hand there is a growing interest in 'Bildung' , the developing and reflective function of education. This process of developing a personality can be enhanced by cultural education'.
Creativity and innovation is about disturbing the status quo, getting rid of cultural 'luggage' and the here and now. Bildung requires knowledge about what happened before, understanding of your own culture in relation to other cultures. It both creates and confirms identities, of individuals as well as groups. So should cultural education be confirming or disturbing?
21st century skills are mainly focused on cognitive skills . This ongoing unilateral emphasis on cognition is responsible for a large number of people losing the connection with society. At the same time it underestimates the value of skills that call upon the physical, the mental and the sensory aspects. These types of skills can be provided by the educational qualities of sports and cultural education, based on learning by doing and experiencing. Hence a more equal position of non-cognitive competences in education can contribute to a better balance in the development of young people, raise their self-confidence and include those who otherwise fail in the cognitive rat-race.
So Bildung and a broad education contribute to shaping personalities and call upon non-cognitive learning skills that are most needed by society. Bildung also stands for reflection

## Critical Thinking, Problem Solving, Decision Making

As for all the other Reports of the 4Cs Research Brief Series, P21[4] starts from definitions and models, touching the most well known milestones from Dewey's early attempt in 1910, passing through Bloom's Taxonomy (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956; Krathwohl, Bloom, & Masia, 1964) and the six 'hierarchical' categories of the cognitive domain: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation, to

[4] P21's Report also suggests 'where to find additional research':
Thinking Skills and Creativity (http://www.journals.elsevier.com/thinking-skills-and-creativity)
Cognitive Psychology (http://www.journals.elsevier.com/cognitive-psychology/)
The Critical Thinking Community (http://www.criticalthinking.org/)
[links checked on 23rd October 2015]

arrive to Krathwohl's later revision (2002), where the process is less hierarchical and the cognitive domain has been split into two dimensions: the Knowledge dimension (with categories representing factual, conceptual, procedural, and metacognitive knowledge) and the Cognitive Process dimension (remember, understand, apply, analyze, evaluate, create). What P21 argues is that 'Reflective, analytical, evaluative, and deliberate skills and characteristics are common themes across these definitions, conceptualizations, and theories'.

The Laboratory for experimental pedagogy (LPS) based at the Department of Education – UNIROMATRE has been working, since 2010, on research focusing on the enhancement of students' critical thinking skills to foster the development and promotion of the critical use of technology in education. A series of departmental projects, coordinated by LPS researchers, have been funded from 2011 to achieve these aims (Poce et. al. 2011, 2012, 2014).

The topic of the project Contributi per la definizione di una tecnologia critica (Contributions to the definition of critical technology), is the verification of the effectiveness of a didactic model, proposed online to a group of undergraduate students of the BSc in Education – Faculty of Education Sciences - University Roma Tre, with the aim of increasing their critical thinking skills. The ability to evaluate critical thinking skills is essential in facing the urgent need for renewal and innovation, especially in education, and establishing policies aimed at increasing social welfare. As Paul and Elder (2002, p. 230) state: "everyone thinks, it is our nature to do so. But much of our thinking, left to itself, is biased, distorted, partial, uninformed or downright prejudiced. Yet the quality of our life and that of what we produce, make, or build depends precisely on the quality of our thought". The research, Contributions to the Definition of a Critical Technology is set within this context and, and as well as implemented in higher education, aims to project its results into different settings, so that the results can contribute to improving other areas, such as lifelong learning and enhancing development in various fields of knowledge. The analyses carried out within the above mentioned project aimed chiefly to identify directions on the design of effective teaching tools, and they also entailed the use of a content analysis model able to measure the critical thinking contribution provided by the students, when they were engaged in the production of written text, even in an informal setting. The issue related to the analysis of the texts produced online by the students has already been discussed on several levels. Marra et al. (2004) carry out an investigation of the analysis models available and identify the one developed by Newman, Webb and Cochrane (1997), as the most comprehensive to evaluate the quality of online interactions, implemented within a discussion forum active for students of Education Sciences at the Missouri State University.

An adapted version of the above model was employed to assess critical thinking contribution by the students in the texts provided during the online interview proposed to those

who used the podcasts of the modules of Research Methodology and Theory and Practice of Writing (Faculty of Education - Roma Tre). Therefore, the experience conducted within the project induces researchers to develop the model further, extending its application also to other sectors of knowledge. It is interesting, in fact, to be able to observe if a model, which induces students to reflect on the classic texts, analysed with the modalities described above, improves critical thinking and written production, even in contexts where traditionally it is not common practice to read further works whose character is essentially humanistic. We are referring to contexts such as medical school or engineering, for which students are required to put at stake their capacities of creativity, timeliness in decision-making, production of reports on the state of the patients or on the analysis of a problem. The OECD document "Investing in Human and Social Capital" (2010, p. 2) states that, due to the economic crises, "cuts have been carried out in education and, in particular, in higher education, as well as in vocational education and training, early childhood education and Care". Notwithstanding this aspect, unemployed workers and people in weak economic sectors are also looking to education and training opportunities to improve their position on the labour market and this caused a paradoxical situation where higher education and vocational institutions have to face a large demand with reduced resources. As the OECD remarks, some Countries reacted introducing specific measures to invest in skills development, research and innovation, being aware that budget cuts in education will harm those who are most vulnerable and are promoting policies to improve equity in learning opportunities. It has been realized that organisations to be productive and grow should become learning organizations (Laurillard, 2008, p.35), places which promote tools concerned with the improvement of individual and, consequently, the same organization learning.

If we focus on heritage education, we can't avoid to mention Van Boxtel when stresses the importance of directly experiencing heritage education, talking about museums. Meeting the objects does not only make history tangible to the students, it also makes students feel involved. They imagine how things were and feel connected to people in the past. This feeling of 'connectedness' stimulates the motivation of the student to learn. So by stimulating their intrinsic motivation, heritage experience enhances history education. On the other hand Van Boxtel notices this same feeling of connectedness may be a barrier for good history learning though. When identifying oneself strongly with someone/somewhere in the past, it becomes difficult to keep the analytical distance which is so much required for studying history. She criticize, for example, museums trying to raise visitor numbers through spectacular immersive exhibitions, because it is hard for visitors to combine this total experience of immersion with multiple viewpoints. Hence Van Boxtel argues for a balanced use of heritage in education: using imagination to evoke motivation, but at the same time beware of one-dimensional interpretations. She always stresses the importance of 'multi-perspectivity': heritage contributes to a collective identity, but this implies that it can exclude as well. Often heritage has been abused to celebrate the past in order to stress the unity of a nation today or even for the benefit of certain political powers. Therefore Van Boxtel suggests to look at the meaning of heritage from different per-

spectives.

**COOPCULTURE's angle**

One of the most effective contexts where a museum educator can stimulate and observe a student's use and development of the ways of thinking proposed by the KSAVE model is that of **contemporary art** permanent collections and temporary shows.

We have experienced that contemporary art, because of its specific tendency to flee from pre-established definitions, is a particularly fertile context to show students the product of someone who practices "thinking out of the box", that the interpretation requires "thinking out of the box" as well and that there is no wrong answer. Various of COOPCULTURE operators have reported that school students from various social backgrounds, age groups and geographical origins have similar reactions: it takes them a while to understand and trust that they are not in the usual teaching/learning frontal scheme and that they are allowed and encouraged to express themselves through free mental associations. After giving students an introduction on the historical background that is behind a specific artwork and the interpretation given by critics, they are then invited to judge the piece for themselves. This is when an extremely interesting reaction happens: the students realize that the judgment on contemporary art is completely liable, that this field presents fundamental questions that cannot find an only answer. What is art? What is beauty? What makes an artist?

The fact of realizing that your own answer is as good as anyone else's causes an empowering effect that shows youngsters that the ways of culture are not all pre-defined. More in general, visiting different contexts such as various kinds of museums and archeological sites, and therefore indoors and outdoors, modern and ancient, traditional and innovative, causes students to become aware that this environment is a further cultural tool that they can use. They learn how a cultural site works, how it is organized and what tools it offers

But how best to assess critical thinking in educational contexts? P21 reports that 'researchers generally agree that assessments should be based on simulations that approximate real-world problems and issues and that reflect "authentic" problems, contexts, and performances' (Bonk & Smith, 1998; Halpern, 1998).

Is crucial a reflection on the assumption that 'explicit instruction appears to be a key component to teaching critical thinking skills successfully. Marin and Halpern (2011) found evidence that students who were explicitly taught critical thinking skills (i.e., the students knew they were taking a critical thinking course) performed better than students who were simply taking a course with the skills embedded within it'.

**Digital Storytelling and critical thinking**

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Reflecting on the story-circle process of the digital storytelling methodology, as Sadik argues, the interaction between students, the flow of ideas and thinking aloud encourage students to foster active learning, in which users discover and address gaps in their understanding when explaining concepts to others (Kafai et al. 1997; Tyner 1998).

Also Sadik reminds that 'Jonassen and Carr (2000) believe that in order to help students to construct their knowledge, they should be actively involved in learning with the help of ICT tools'.

As Sadik highlights, 'students were encouraged to think more deeply about the meaning of the topic or story and personalize their experience and also clarify what they knew about the topic before and during the process of developing and communicating their stories. The well-chosen points of view, unconventional content and varied resources indicate that students did not just report facts and concepts connected to the subject, but reflected on their own thoughts and engagement with the subject, visually and aurally'.

As suggested by Porter, 'the digital storytelling process helps us transform isolated facts into illuminated, enduring understandings. By "living in the story," we make information come emotionally alive. By exploring "lessons learned," we go beyond telling about content to find its deeper meaning'.

**Problem solving and digital storytelling**

As underlined by Sadik, 'Jonassen and Hernandez-Serrano (2002) suggested three ways to support learning using stories. First, they can be used as exemplars of concepts or principles being taught by direct instruction. Second, they can be used as problem cases to be solved by students. Third, stories can be used as advice for students, for helping them learn to solve problems'

## Leaning to learn, metacognition

The concept of metacognition was introduced by Flavel (1976) as "knowledge that takes as its object or regulates any aspect of any cognitive endeavor" (Brown & Campione, 1981, p. 521). The use of this term stressed the separation between knowledge about cognition and regulation of cognition. All activities in which the learner manages his/her own thinking behavior (such as self-interrogation and self-checking skills) are metacognitive activities.

Meichenbaum, Burland, Gruson & Cameron (1985) consider different technique to study and assess metacognitive activities in children, such as the use of interview and thinking-aloud technique, often in one-to-one situations. In general, students learn more when their metacognitive skills are well developed. Graesser et al. (2005) state that there are many difficulties among learners when they do not possess adequate proficiency in metacognitive skills, such as lower level of comprehension. Therefore, metacognition is a key to successful learning. Baker (2002) says that metacognition should be placed in the center of learning environment to support learner's movement toward independence and success.

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Metacognition is strictly linked to learning to learn skills and, in general, citizenship.

Learning to learn has been included among the 8 key competences by European Parliament in 2006. It has been variably defined and explored by different researchers: Morin (1999) states that knowledge of one's knowledge is a prerequisite for clarity of mind and is a necessary principle for education; Goleman (1999) says that the most important knowledge is knowing how to learn. Tuijnman & Van Der Kamp (1992) define learning to learn as not only a concept, but an educational objective.

**Digital Storytelling and Learning to Learn**

It is important to underline the influence of storytelling on students' motivation and its effectiveness to unveil new interests, especially if we are looking for tools 'to help enhance the learning attitude and motivation of EFL children with learning difficulty', as Lee states.

In a paper about teaching of 'digital histories' to university students, Coleborne and Bliss (2011) focus on the use of digital storytelling in 'history education based in experiential learning'. They also emphasize the role of emotions in that process arguing that digital storytelling 'promotes the telling of stories with emotional meaning': 'Social scientists, among them geographers and historians, are taking the roles played by emotion and the concept of 'embodiment' seriously in research. Attention to emotion is directing researchers' awareness to alternative ways of knowing, being and doing in the world, and the ways in which emotional relations are shaping society and space'.

Robin (2008) depicts an interesting flow from data to knowledge elicited by the digital storytelling methodology: 'When students use technology such as digital storytelling, they learn to "convert data into information and transform information into knowledge" (Cradler, McNabb, Freeman, & Burchett, 2002, p. 3). Also, "even though few research studies on the effectiveness of digital storytelling have been conducted, numerous findings have been reported on the benefits of multimedia projects in which students have shown an increase in research skills, Digital Storytelling increased organizational skills, and a greater interest in the content being taught (Paull, 2002; Salpeter, 2005)."

## Ways of Working

### Communication

As the P21 Reports of the 4Cs Research Brief Series states, communication has not yet attracted the same research attention than the other 21st Century skills, instead the focus has been quite often on teacher-to-student communication.

The P21 Framework 'emphasizes effectively using oral, written, and nonverbal communication skills for multiple purposes (e.g., to inform, instruct, motivate, persuade, and share

ideas); effective listening; using technology to communicate; and being able to evaluate the effectiveness of communication efforts - all within diverse contexts.

Would be worthwhile a specific focus on Computer-Mediated Communication (CMC), defined as 'communication between individuals using computers, while separated in time and/or space (Romizowski & Mason, 1996)', and especially on student-to-student CMC (Swan, 2002). P21 proposes a reflection on students' use of avatars in online communication and starting from Kritz's and Shonfeld' s assumptions (2012), wonders 'if similarities between students and their avatars would facilitate learning'. 'Other researchers have examined trust and liking between participants (Lim & Reeves, 2007; Witmer & Singer, 1998), and presence (the feeling of being in a certain environment even when not physically there, Lombard & Ditton, 1997) (Bracken & Skalski, 2006, 2009) with the use of avatars. Ward and Sonneborn (2009) have explored the use of avatars for creative expression, another of P21's 4Cs'.

**Common sense Media**

Erin Wilkey Oh - Executive Editor, Education Content Common Sense Education -pinpoints 'the risks around data privacy and student safety, which can create tension between the need for students to have real-world experiences with digital communication practices and the desire to keep kids safe under the watchful eye of a teacher.

'A growing area of interest in the field of communication education is media literacy. Media literacy is defined as "the ability to understand, analyze, evaluate and create media messages in a wide variety of forms" (Aufderheide & Firestone, 1993; Thoman, 2003)'.

**Technology and education**

Little more than half a century has gone by, since scholars began to talk about technology with regards to education. What later became an impetuous development originated: on one hand from the definition of a series of formal models of learning and communication, on the other from the emergence of the trend to use innovative tools, mostly – in the early stages – of the audio-visual type, for didactic purposes.

In the following decades, these two aspects, the formal and the instrumental, had a scarcely coordinated and very uneven evolution. In particular, a peculiar emphasis was put on the support of the educational potential of the instrumental proposals, too often based on short-term analogies and suggestions. The aura of positive effects associated to the headway made by the new technology for communication (television first and the IT and telematics resources later) was made to spread to the instrumental resources. It goes without doubt that such aural effects were further amplified to a decisive extent by the growing interest of those – national and, especially, multinational – firms which were interested in breaking into the education market. It would be all too easy to draw a catalogue of the many proposals, which followed, for which people did not hesitate, also with the valid and more or less interested support of the social communication media, to recognize the starting point of a palingenesis, which would modify the framework of education (Vertecchi, in POCE, 2012).

# RESEARCH

Nobody wondered whether there are connections between the regression of the linguistic competences and the fall of alphabetic communication in social life, nor anybody questioned the consequences that the replacement of real experiences with virtual ones has on the acquisition of autonomy and on the increase of the ability to do and understand. The key point is in fact that new skills are needed, because traditional skills learnt at school or at university are disappearing and are not deemed useful in facing the needs for innovation and growth that society today demands: "recent trends show sharp increases in the demand for task input requiring complex communication (…). Similar increases have occurred in the demand for non routine analytical skills, involving solving problems for which there are no rule based solutions, and requiring individuals to develop skills of problem solving and inquiry based learning throughout their education" (OECD, 2010, theme 2, p. 5).

**Digital Storytelling and communication**

As highlighted by Coleborne and Bliss (2011), Patrick Lowenthal (2009) argues that the process of digital storytelling 'provides teachers with the chance to 'amplify the student's voice', especially the quieter students who do not speak up so readily in class'

## Collaboration (teamwork)

In a literature review about 'how working in teams of various sizes helps individuals achieve certain cognitive outcomes', P21 uses as example 'Vygotsky's (1978) Zone of Proximal Development, which represents the gap between what an individual student can learn on their own versus the level of learning if they were to work under the guidance of an adult or group of peers'. 'P21 Framework's definition of collaboration [...] emphasizes (a) demonstrating the ability to work effectively and respectfully with diverse teams; (b) exercising flexibility and the willingness to be helpful in making necessary compromises to accomplish a common goal; (c) assuming shared responsibility for collaborative work; and (d) valuing the individual contributions made by each team member'.

'With the huge advances in mobile technology over the past decade, many students now have numerous ways to access information and collaborate with peers (Bush & Hall, 2011). Although research on the effectiveness of, for example, synchronous and asynchronous technology-mediated collaboration is not common in K-12 settings, there is evidence that a research base will grow over the next few years'.

In online education, the most useful strategy for stimulating students' active participation is undoubtedly the collaborative type. Such strategies involve two complementary activities: interpersonal communication and co-construction of artifacts. (Trentin in POCE, 2015)

Giving students, for example, the task of collaboratively creating an artifact which represents the synthesis of a study activity, has often been found to facilitate their aggregation into learning groups; the process of construction captures group members' attention and enhances synergic action, opinion exchange and argumentation when decisions need to be made and divergences within the group need to be solved. Collaborative activities are used to improve motivation and enthusiasm. Contributi per la definizione di una tecnologia critica (Contributions to the definition of critical technology) project results show that the presence of an on-line tutor, who moderated the discussions, encourages the participation of the students who appeared less active in the online discussion environment (social support). Through the collaborative learning developed thanks to online discussions and the subsequent writing of the group essay, it was possible to achieve complex objectives related to the application, analysis and synthesis of cross sectional concepts and competencies, such as critical thinking, or related to the field of communication, cooperation and problem solving (Poce 2012).

Regarding assessment, P21 underlines a challenge: 'One difficulty with assessing collaboration is determining exactly what aspect is being assessed. Which is more important, individual or group outcomes following the collaboration, or an individual's ability to work with other team members?

**Digital Storytelling and collaboration**

As suggested by Pedersen (1995), 'storytelling is the original form of teaching', but if we compare to conventional storytelling, 'digital storytelling audiences are viewed not only as listeners but also as learners who can interact and shape the story (Dorner et al. 2002)'.

It's important to specify that during the digital storytelling process the audience is never passive. Listeners are always involved in a sort of feedback-loop that is part of the digital storytelling approach as mutual learning (storytelling and story-listening have equal 'status' in the process). As Coleborne and Bliss (2011) confirm, 'the story circle is a vital component of the workshop process where the students connect with each other to share their stories prior to creating them', it is that stage of the process that gives a chance to define digital storytelling as 'a way of building group rapport through emotional exchange and sharing ideas'.

Vinogradova (2011), reflecting on the importance of collaboration in the digital storytelling process, writes that 'the community of practice within the classroom begins to develop as students help each other with their early narratives, and it continues to develop as students eventually produce the stories using video editing software'. Yet 'the digital story project allows students to focus on a personal story in a collaborative context in which each student brings to the classroom community skills that are needed by others as everyone works to create a multimodal project requiring narrative, image, sound, and technology elements'.

In his pilot study run in some Egyptian classes, Sadik observed that 'although teachers spent a lot of time using grouping in flexible ways to take advantage of computer availability and meet the objectives of storytelling integration, a minority of students (20%) worked in groups most of the time'. And this is a statement

to be considered before approaching this methodology.

**Benjamin Boom's Collaboration**

In contrast with the importance of collaboration is a paper by Benjamin Bloom where – as underlined by Nesta Report (2012) - he 'suggested that one–to–one teaching is the most effective way to learn. He found that children who were taught individually performed significantly better than children who were taught in a conventional classroom setting. Technology can support dialogue between learner and teacher, particularly when they are not in the same location; or when they are unable to communicate with each other at the same time'.

**A focus on dialogue and interthinking**

Dialogue is considered to be of major importance for education. It functions on the first place as a learning tool. Research had provided empirical support for Vygotski's claim of the relationship between thought language and social activity (Mercer, 2008). Besides, it is considered to be a necessary (21st Century) skill, while in our reflective society, there is an increasing need for people to work with knowledge together. Thirdly, it is seen as an educational aim by itself. Dialogue is an important part of present day cognitive development. One needs continuous dialogue to work with multiple perspectives and ultimate uncertainty. At the Marnix Academie they distinguish dialogue and interthinking (Damhuis, 2015). The question is, more specified, how to arrive at interthinking, when starting out with dialogue? We consider dialogue to be a very broad and a very specific term at the same time. People indicate quite different concepts with it. Is it talk between two persons only, or also in a larger group? Besides, in some practices (like in classroom) dialogue consists often of strictly controlled exchanges that are mainly for knowledge testing. In contrast, educational purposes often strive for open exchanges, where knowledge construction takes place.

So dialogue may have many features, some of those we want to specify are indicated with 'interthinking' (Mercer, Littleton, Wegerif, Howe, Rojas-Drummond et all). There are several terms and phrases available for interthinking, as you can see in the summary below:

- productive collective thinking (Mercer & Littleton 2007, p.2)
- effectively thinking together (Mercer & Littleton 2007, p.17)
- productive dialogue (Littleton & Howe 2010, p.6)
- Thinking Together (website University of Cambridge)
- dialogue between different voices (Wegerif 2013, p.29)
- collaborative thinking through talk (Littleton & Mercer 2013).

For the purpose of the DICHE project the last one clarifies the essential features most conveniently: collaborative thinking between through talk. This kind of thinking becomes visible (or audible) through talk.

Littleton and Mercer (2013) distinguish three different kinds of talk in the classroom. During disputational talk, there is a lot of disagreement between the members of the group. Each pupil just makes its own decisions, without trying to pool resources or to offer constructive criticism. There are often a lot of interactions of the 'Yes it is! – No it is not!' kind. The atmosphere between the participants is competitive rather than cooperative. This kind of talk is not useful for interthinking (2013, p. 15-16). The second kind of talk is the cumulative talk, during which pupils repeat and elaborate on each other's ideas, but they do so in an uncritical way – they simply accept and agree with what other participants say. Still, pupils use talk, but not

in a way to evaluate the ideas of the other participants carefully. The atmosphere between the participants is competitive, rather than co-operative. This kind of talk is sometimes useful in a phase of interthinking (2013, p.16) The last kind of talk Littleton and Mercer distinguish is the so called exploratory talk (or: accountable talk (Resnick, 1999), collaborative reasoning). During this kind of talk, the participants engage each other's ideas critically, but constructively. So the ideas of the different pupils are treated as worthy of consideration; they ask each other questions and answer them, they ask for reasons and give them. Besides, the members of the group try to reach agreement at each stage before progressing. To an observer of the group, reasoning is 'visible' and 'audible' in the talk (2013, p.16). There is an atmosphere of trust, in which the group tries to seek agreement for joint decisions.

- Throughout the DICHE project, the Marnix Academie wants to stimulate exploratory talk as much as possible.
- Exploratory talk can be used during lessons in cultural and heritage education and can be seen as an instrument by which children give meaning to cultural heritage.
- Exploratory talk is especially important think critically, one of the main aspects of 21st century learning.

Wedgerif (2013) describes in a more philosophical way the current shift from dialogic space in the age of the internet, as he puts it. According to Wedgerif, this shift takes place from a single classroom oriented space to more open dialogic spaces. 'Dialogues that carry learning might appear to be contained physically within the walls of the classroom but actually they participate within a global dialogue of humanity (p.12)'. Based on this idea, new digital innovations are significant in embodying the deeper reality of this global dialogue, and bringing this reality into the classroom and into apparently private lives in a way that has the potential to dissolve the illusion of physical separation.

- Dialogue/interthinking in working with 'digital innovation': what's different (or not)?

The research group Interaction and language policy at the Marnix Academie has developed a training by which students and teachers are taught how to stimulate interthinking between the teacher and the pupils and between the pupils. The Combilist Checklist (Damhuis, De Blauw & Brandenbarg, 2004) stresses the role of the teacher in stimulating interaction between children. Such a teacher employs interaction strategies: she takes great care in creating space and depth for the interthinking dialogue: (1) she creates space on the speaking floor, for instance *by not asking questions all the time, and by giving listening responses to encourage a pupil to continue*; (2) she asks for explanations and reasons to create in-depth discussion of the topic.

Damhuis and Sytema (2011) also give practical advises to stimulate interaction during lessons in the humanities courses. First of all, it is important to choose in advance specific moments to interact with pupils. During these interthinking dialogues, the teacher accompanies the learning process, rather than being the ultimate expert. Besides, she asks less questions during such interactive conversations and stimulates the conversation by asking. Finally, the teacher starts discussion with a so called powerful problem, that provokes children to think and that creates a temporary disbalance in their idea which activates thinking. For instance: 'We should not preserve the fortresses of the Dutch Waterline anymore, it costs us a fortune each year!'

- In what ways can teachers provoke children to think before, during and after working with cultural heritage?
- In what way can this be incorporated in the teachers' guidelines for the use of the digital toolbox and/or teaching scenario's?

- What kind of training do teachers need in order to be able to stimulate interthinking in their classrooms?

## Tools for Working

### Information literacy and ICT literacy

As argued in one of the P21 research reports, 'just because kids are digital natives does not ensure a proficiency in digital literacy and online communication. For example, Schaffhauser (2015) states that of those same groups of kids who spend 35 hours a week on digital media 58 percent have "low" technology skills, skills they need to be effective at school and work.

As showed by the NESTA Report 2015 about attitudes and opportunities for digital creativity across the UK, 'we risk another generation growing up as passive digital consumers rather than confident digital makers'. One of the challenges analyzed by Nesta is that 'increasing confidence and effective teaching in this subject will require continued investment in professional development for teachers'.

In a Report published in UK in 2012 by Nesta about 'proof, promise and potential of digital education', has been underlined that 'no technology has an impact on learning in its own right; rather, its impact depends upon the way in which it is used'. This Report is particularly interesting to depict the UK scenario, because they reviewed an extensive range of informal literature, including personal blogs and teacher networks. The importance of the role of teachers has been repeatedly emphasized, especially 'in supporting learners to convert information into knowledge' if we consider the huge amount of information available now online to learners.

As underlined by Bernard R. Robin (2008), 'noted neuroscientist Michael Merzenich (2007), a professor at the University of California at San Francisco's Keck Center for Integrative Neurosciences, went on to say that simply adding computers to conventional teaching strategies is an unsophisticated approach that, it is not surprising, adds very little to students' experiences in the classroom'.

Also Robin stimulates a deeper reflection on the relationship between contents, teaching strategies and technologies: "We have seen that multimedia projects in general, and digital storytelling specifically, can be used to engage and motivate both teachers and students. This technology, although powerful, is currently being used in K–12 and higher education classrooms with an emphasis on technical skills and without the greater level of

thought and consideration to the subject matter, the teaching strategies, and the real world needs of today's classrooms.

As Hicks (2006) suggested, this framework might be helpful in guiding teachers to apply their knowledge in the classroom by providing "the ability to think about and use technology in critical, creative, and responsible".

**A focus on distance learning**

In the 20th Century a continuous sequence of announcements, all centered on the use of new solutions for the communication of educational messages, took place. The availability of new instruments led immediately up to its use for educational purposes. Development in distance learning corresponded with the matching of communication tools and online technologies most recent solutions. Still, after an accurate reflection, it should have been obvious that education is not only a matter of communication. Analysis of distance learning processes would have been essential to realize what is continuity and what is a difference, as regards the teaching modalities, that have been developed in the historic evolution of the formal education system practice. Instead, the run-up to solutions for communication, the demolition of the category of time in the message exchange, the possibility to transfer both texts and images and sounds, the tendency to show off messages, have been the starting point for imitative teaching.

Distance learning didactics, which nowadays is called online to emphasize the technological solution's importance for communication in respect to the message, is essentially based on searching analogies within the new proposals and the practice of traditional teaching. A traditional set of instruments has been adapted trusting the suggestion power by the new instruments, without wondering if the complex conditions, which characterize the learning processes on the cognitive, emotional and social level, continued operating also in the new virtual contexts, once the initial motivation push was over. (Vertecchi in POCE, 2015)

Nowadays, with the introduction of newly developed tools for e-learning is possible to reach a new, higher level of customization both in distance and in face-to-face education. One of the main aims of learning process, even if at a distance, should be to guarantee the maximum homogeneity in the results, regardless of context and curricular conditions (Agrusti in POCE 2015). The learner's failure is then interpreted not as a generic fault but rather as an inadequate result due to the different areas of knowledge that that student has gone through before taking the test (Vertecchi, 1993, p. 108). For this reason, following the logic of the philosopher Clauberg, the new e-learning goal has to be seen as a necessary adaptation of educational message to each student characteristics (Vertecchi et al., 2010b, p. 21).

The experience also suggests the possibility of enriching with additional tools a computerized assessment system that uses both lexical and linguistic (in a wider sense) indicators to intervene in different comprehension difficulties.

**Digital Storytelling and IT skills**

As underlined by Sadik reflecting on digital storytelling (2008) and quoting Harris (2005) "meaningful inte-

gration of technology is achieved when students are able to select technology tools to help them obtain information in a timely manner, analyze and synthesize the information and present it professionally".

As reported by Sadik after his pilot work, 'digital storytelling provided a unique opportunity for students to acquire new media literacy and IT skills including capturing and editing digital photos, recognizing different image formats, recording and using audio clips, searching the Web for text and images and using Photo Story to edit, produce and save their stories for playback in their computers or VCD/DVD players'.

**Visiting a cultural site**

Through a visit to a cultural site students learn to use the tools that the place uses to communicate its content:

A) traditional media

- information tags
- billboards with text
- tables and diagrams
- catalogues / guide book

B) ICT

- museum web-site
- apps
- interactive kiosks

The technology "frenzy" has brought companies to experiment with various technologies inside museums and cultural sites. A mistake that is often made is that of focusing on the newest technology in fashion to then find how to use it in a museum context, instead of starting a project from the user's point of view: the use of technology must respond to the user's need.

Some examples of technology that have proven to be useful in cultural sites are:

- AR – augmented reality
- 3D models
- mapping projections
- QR codes

This because the general public is getting more and more used to a communication style, through various media, that is highly focused on visual material. The sight is the main sense and the images rule our world. In museums, explaining history, architecture, art, etc. through images proves to be very effective through images.

## Living in the world

## Citizenship – local and global

# RESEARCH

The main purpose we have is educating the individual in his/her own dimension of active citizen, able to comprehend and defend his or her own ideas and rights. Education is strictly linked to citizenship, whose definition is the effective engagement of people in their communities and in broader society. This engagement requires that citizens develop a big range of knowledge, skills and disposition: investigating, communicating, participating, negotiating, and taking responsible action. Effective citizenship flows from good citizenship education. Three internal themes are the centre of citizenship education: social and moral responsibility, community involvement and political literacy.

In a more multi-cultural and digital society social-cultural competences will become crucial, so reflective skills are more needed than ever. This implies more attention to cultural heritage and a cultural historical approach in other subjects in school. In conclusion, cultural education has an important role within the entire curriculum, in achieving the broad targets of schools by both being disturbing and by enhancing reflection.

**Digital Storytelling and citizenship**

An interesting factor underlined by Emu et al. (2012) is that 'students who participated in the digital storytelling approach came away with a deeper understanding of one another's ethnic, racial and socio-economic backgrounds. The knowledge about other students enhanced the understanding and respect for one another in the class'.

Porter argues that – when students use the digital storytelling approach in the classroom - 'authors combine their personal messages with the lessons learned to provide a compelling call to action'.

**An example from the UK: BBC News School Report**

One example of a successful experience that would be properly placed in the 'category' "Living in the world' but that has also demonstrated to enhance more than one skill, is the national project "BBC News School Report" . Students from around 1.000 Schools across the UK, using materials and tutorials from the BBC Project website, worked in group [see Ways of working: Collaboration (teamwork)], supported by teachers and BBC staff, to develop their journalistic skills [see Ways of working: Communication]. They searched information about international, national or local news to work on [see Living in the world: Citizenship – local and global and see Tools for working: Information literacy], took notes of their comments [see Ways of thinking: Critical thinking], prepared the interviews and learned how to edit and create a news report [see Tools for working: ICT literacy]. Feedback from students and teachers about this long-standing project – this year at its 10th edition – has been always very positive.

Teachers have access to a set of resources online with a description of objectives and activity to be run at different stages (see the table below with the list of activity).

| ACTIVITY | APPROXIMATE DURATION |
|---|---|

# RESEARCH

| | |
|---|---|
| 1. Video - What is news | 2 mins 30 secs plus discussion time |
| 2. Video - How do journalists find news? | 3 mins plus discussion time |
| 3. Activity - What is News and Source Checking | 15 mins |
| 4. Video - Finding news masterclass | 3 mins 32 secs plus discussion time |
| 5. Activity - Meet the Audience | 10 mins |
| 6. Quiz - Finding news | 10 mins |

**Museums and citizenship**

An example from Italy: "Roma Caput Mundi"

The staff of CoopCulture widely agrees that children that have been given the habit of visiting museums and cultural sites by their families and by their schools are more aware of the importance of their heritage, otherwise we wouldn't be in this field! It is tangible that even children that seem bored and don't enjoy it, if anything end up widening their point of view on the world, noticing that many different cultures exist and the dignity that their own heritage has along with the others'. Our goal is to avoid boredom and have children discover how much they can enjoy exploring a cultural site, because this enhances and consolidates the cognitive fallout of the experience.

Adults are obviously approached differently but the goals and phases are very similar. A project called "Roma Caput Mundi" was an amazing occasion to talk about global community and create awareness on one's own culture, other cultures and the possibility to share and enrich both. The Archeology Dep. of Rome organised an exhibition on how Ancient Romans were able to integrate the various populations they had conquered. They understood that this would become a strong point, by having everyone feel part of the Empire, they would then defend it as their own. Our project consisted in inviting immigrant communities to visit the exhibition at the Colosseum with a museum educator from our staff - that had previously been trained by experts of the University for Foreigners of Siena, UniStraSi - to adapt the language level. This because the visit took place in Italian, since one of the goals of this project was to help improve the knowledge of this language in order to promote communication and interaction between foreigners and locals. A booklet with exhibition’s key concepts was handed over, which, again, helped to consolidate integration both through language and content.
For children and adults, cultural heritage can convey a sense of belonging that promotes awareness, integration and therefore cooperation

# RESEARCH

## Life and career

## Personal & social responsibility

Too often it was neglected that educational solutions, which were thought to be overtaken, permitted, in the previous two centuries, a radical transformation of the social, cultural and economic context of European societies (or, however, of European cultures) and that through these solutions a big part of the ability to interpret and practice education in compliance with context's alternation was created. We should not forget that the outlined educational framework, and least of all, teachers' and students' behaviors, were everything but immobile in their original characteristics. It is surely not just a coincidence that, already during the nineteenth century, important lines of research in education were established, and that other lines have been added during the twentieth century. In brief, education systems' development has shown its ability to connect the arise of new needs in different national societies with the ongoing review of interpretative models, that proved to have ended their ability to orientate choices and with the acquisition of new, specific knowledge about student's characteristics, conditions of mental and physical development, variation of their needs in relation to needs of everyday life. But there was something more important: education was not limited to interpret the social issue or to elaborate responses able to satisfy it, but it anticipated scenarios, which reasonably could have been raised. In other words, educational interpretations did not present themselves as synchronous regarding social structures, but have taken on a planning meaning. Education did not limit itself to respond to a contingent question, but has anticipated a transformation of individual profiles and social structures, on the basis of lines still far from common sensibility. Until a few decades ago, the required temporal interval for a substantial review of interpretative repertoires and procedural solutions for education was sufficiently extended, because continuity traits in profiles of the next generations were prevailing on the discordant ones. Today, the opposite happens: significant differences in profiles have not to be considered only between two generations, but also within the same generation, at different times of development and of subsequent life experience. Children who begin their formal education path will find themselves, once they are adults, immersed in a reality where the only thing that can be said with certainty is that it will be very different from the one we know. Not only: considering that in industrialised countries women's life expectancy has largely exceeded the threshold of eighty years and the men's one is only slightly lower, the change in education role is even clearer (Vertecchi in POCE, 2015).

From a social point of view, exercising a moderating role on the access to education was necessary to maintain a position of advantage for the well-off classes and, at the same time, permitting a certain vertical mobility that confers legitimacy to the filter system, which opposed a more wide spread access. For various reasons formal education's finalization, in the described terms, has lost a significant part of its ability to support positive attitudes as regards studies. On the one hand, new knowledge acquisition underwent an acceleration that was not easily predictable, disturbing professional arrangements, which

were usually associated with formal education levels. It happened that not only new knowledge was added or substituted the one already available, meant as learning object, but also the importance of socially relevant activities was diminished, or completely dissolved, and others were confirmed. For undertaking them, a substantial review of their cultural profiles would be necessary. The result has been a growing improbability that the cultural and professional profile, derived from formal education experiences and attended during childhood and adolescence until adulthood, remains valid for the entire life duration.

## Case studies

For each Case study, DICHE project partners have underlined challenges and opportunities to apply that approach/methodology as tool to enhance cultural heritage education in primary schools within the context of 21st Century learning skills.

The evaluation of the digital tool use, in terms of knowledge acquisition and 21st Century learning skills development, has been developed.

### THE NETHERLANDS
### The role of teachers in 21st Century learning
### by Marnix Academie

As regards Cultural Heritage Education, it's obvious that the teacher's role is most relevant for the Marnix Academie.
Marnix researched the teacher's role within heritage education and more specific the way a teacher can and should interact with students and how he/she can accommodate interaction between students and between a student and the material. The relevance of this research within the DICHE-project can be found in the modern views of history education.

Related to 21st century learning, learning just facts about historic events is becoming less relevant as people move into a world where information can be found with the click of a mouse-button. This is even more true when we realise that historic events in themselves are irrelevant and cannot be perceived without context and taking the position of the one looking back in consideration. Ankersmit (2007) convincingly argues that it is impossible to distinguish a clear line between the subject and the object when it comes to our relationship with the past. In addition to Ankersmit, Klein, Grever and Van Boxtel (2010) state that the modern way to interpret cultural heritage is not to perceive it as a fixed artefact (ma-

terial or immaterial) but as both a collective and a personal discourse where, in an ever changing network of individuals, objects and locations, meaning is created.

In the DICHE Project the Università degli Studi Roma Tre is researching object based learning. Tollebeek and Verschaffel (1992) write about this topic and state that for an object in order to have meaning for the observer (i.e. the student), he/she needs knowledge about this object and its significance. Once the students are intrigued by the object, the work of a teacher is not done. The interested, sparked by the object, motivates curiosity to find out more about the object and to discover more about the era it is from. As the interest is evolving it moves away from the specific (concrete) object, the interest becomes less sensational and more intellectual (1992, p. 15). As we can see there is a process and there is an interaction between the student and the historic event/object. This process can be initiated and guided by the teacher. It is through this process that the historic event becomes meaningful for the student and this is why it is of the upmost importance that the teacher is aware of his/her role within this process.

In the Netherlands there is a development in historic education that goes in two, seemingly different, directions. On the one hand we realise that history has meaning through the relationship we have with it and, on the other hand, we value academic skills more and more. What can the teacher do to teach valuable, meaningful history lessons?
Klein and others mention the importance of reflecting on the tension between distance and proximity between the student and the historic event or object. They differentiate five dimensions:

1. Time
2. Characters
3. Representation
4. Location
5. Involvement

Where these five dimensions are theoretically distinguishable, in practice they are intertwined. The combination of these dimensions helps us defining or distance or proximity to the historic event and facilitates a conversation about the topic. Different students bring different experiences to the classroom. So when teachers relate to history for an individual point of view they need to keep in mind that different students relate to the same historic event in different ways and therefore this historic event has a different meaning (and relevance) for each student. Van Boxtel (2009) says that this means we should pay attention to make these differences explicit and collectively create knowledge. She specifically mentions dialogical education as a type of education that would suite this goal.

# RESEARCH

Cultural heritage defines the living environment of school pupils differently and offers opportunities for immersion in the past. By looking from the present – the visible and tangible heritage – to the past they can understand and experience that their environment is meaningful, full of stories and makes up who they are. By knowing the smaller, local stories of their own environment they are able to learn about the nearby world and to connect it to the bigger history. They will understand who they are, where they live, what it looked like in the older days and how different it was from nowadays. They discover how they belong to a broader, historical process.

Through heritage education pupils learn to:

- develop historical awareness, relate to other people and periods by placing themselves in another perspective/identity (mental imagination) and reflecting on it from their own point of view (cultural awareness and citizenship);
- develop competences in ways of thinking like exploring, problem solving, questioning, perception and creativity;
- work through collaboration, also raising skills in communication and presenting;
- place local heritage in a broader, worldwide perspective, but also to become aware of their own perspectives, listening to the opinions of other people; this is about identity forming;
- see their own environment in context and cohesion; this is about cross curricular thinking;
- experience their environment both in a sensory, affective and cognitive way.

Creativity

LEU is now involved in a large project in the Utrecht region in The Netherlands, dealing with cultural education in primary schools. The project is part of a national programme, called 'Cultural education with Quality' / 'Quality Cultural Education'. The programme stimulates better cooperation between schools and the cultural field. The novelty is that it does not primarily focus on the cultural field, but on schools: how can they embed cultural education in their teaching? Together with Kunst Centraal, LEU was asked to co-ordinate the 'Quality Cultural Education'-programme in Utrecht province.

'Creativity' plays the leading role in our programme: how can teachers enhance creativity among pupils through cultural education? We are aware of the fact that creativity in the broadest sense is an important keyword for 21st Century skills. Creativity makes it possible for people to innovate and imagine oneself in someone else's situation, adapt themselves and be flexible.

In this programme we had to find a good and satisfying definition of creativity. With backgrounds in arts and heritage it was a creative process itself to convince each other. For Kunst Centraal heritage education seems a cognitive way of learning and not a creative process. But when we ended up with words like 'problem finding', 'divergent or lateral

thinking', 'out-of-the-box'-thinking, etc., it became much easier to link it to heritage education as well. Heritage stimulates creativity in different ways: it stimulates divergent thinking – pupils use (mental) imagination for shifting to different times, places and meanings and by exploring heritage from all kind of viewpoints, with all their senses. It also stimulates convergent thinking - pupils create their own opinions, analyse, evaluate and draw conclusions from their research.

The definition we developed for school-teams of creativity:
*The capacity to make up non-obvious ideas, solutions and results,*
*by exploring it in your own and personal way, using your own 'luggage'*

And we created a model for a good creative process that teachers can use in cultural education:

| | Phase 1: **Orientation**<br>*Come in and get introduced!* | Phase 2:<br>**Diverging**<br>*Dive in and investigate!* | Phase 3<br>**Converging**<br>*Choose and collect!* | Phase 4<br>**Ready?!**<br>*Present, look, evaluate and learn!* |
|---|---|---|---|---|
| What do you do?<br>You ... | Introduce an inspiring and meaningful task, connecting to the world and experience of the children | Explore, imagine, investigate, experiment, improvise, ... | Choose, select, structure, combine, ... | Present, reflect, evaluate and criticize |
| How? You... | Raise questions, change perspective, amaze, alienate, ... | Associate, use specific work forms, brainstorm, use design principles | Design, produce, realise, conceptualize, ... | Ask question about the process, product or solutions |
| Why? To create ... | An idea, a problem, rules, context and framing | Possible ideas, solutions, possibilities, chances | An answer, a solution, a product, a concept or change | Opinions, knowledge, insights, meaning |

## BELGIUM

SPECIFIC DOMAIN WE ARE LOOKING AT

The three communities in Belgium - the Flemish Community, the French Community and the German speaking Community - are responsible for the cultural policy in their respective linguistic regions. The Flemish and French Communities are also partly responsible for the cultural policy in the bilingual Brussels-Capital Region. This responsibility is converted into

three different kinds of cultural policies, in respective initiatives and policy tracks. The three Communities must look for consensus in general, and for very specific dossiers as well. This was applicable, for example, in 2006 for approving the UNESCO 2003 Convention on Safeguarding Intangible Cultural Heritage. The Communities must speak one language during the General Assembly of the Convention or the Intergovernmental Committee. Positions are tested and agreed to in advance.

*Cultural Heritage in Flanders*

A definition

Cultural heritage is a collective term for all that has been created by previous generations and which still exists today and has great value for the community. Cultural heritage is subdivided into tangible and intangible cultural heritage assets.

Tangible cultural heritage is preserved in museums, archives, libraries, documentation centres, churches and monasteries, with groups of experts, heritage associations, schools and theatres ...

Intangible heritage includes assets such as stories, traditions, festivals, songs, dialects, parades, processions. A nice overview of intangible heritage can be found on http://www.immaterieelerfgoed.be.

Built heritage (in fixed assets) is the collective name for monuments, archaeological sites and landscapes which have been tangible, but can not be moved. Part of the architectural heritage is protected. The inventory of immovable heritage in Flanders provides an overview of approximately 80,000 heritage objects in Flanders, broken down by municipality. The inventory includes architectural heritage, historic parks and gardens, historic organs and world heritage.

A policy

The vision paper 'A Policy for Intangible Cultural Heritage in Flanders' makes links to other than the cultural policy fields and domains. A policy for cultural heritage is, in particular, not independent; but instead, it is related to many social domains: from work and education to well-being; there are links to movable heritage, artefacts, as well as with immovable heritage, monuments and sites. A policy for intangible cultural heritage is related to the relationship between people and their behavior. Therefore it also relates to diversity and identity.

The policy areas and fields of 'Work', 'Education', '(Amateur) Arts' and the 'Socio-Cultural' field are the most important domains which place central focus on the transmission of knowledge and skills. Training, and transmission of knowledge, techniques and skills occupy central stage in this. It is the Flemish Community's duty to ask that attention is paid to intangible cultural heritage in the educational curriculum, in the training provision of the VDAB, in the course provision of the socio-cultural associations and of the amateur arts organisations. Within these policy areas or fields suitable instruments are not always available for each transmission of knowledge on techniques and crafts or for knowledge about

the arts. To this end policy consultation and information exchange are necessary.

## ITALY

### ROMA TRE UNIVERSITY: Object Based Learning and heritage education

The case study presented by Roma Tre University during the first Kick-off meeting in Loughborough is about the use of an innovative educational methodology, Object Based Learning (OBL) and 3D printing, in a historical museum to develop critical thinking skills for secondary school students. This case study has been developed from the idea that "the use of museum collections as a path to learning [… ] is fast becoming a new pedagogy for education. Despite a strong tradition of using lectures as a way of delivering the curriculum, the positive benefits of 'active' and 'experiential learning' are being recognised" (Hannan – Chatterejee, 2015). The OBL is related to the direct use of the object (documents, work of art, materials) in teaching and learning (see http://www.ucl.ac.uk/museums/learning-resources/object-based-learning). Starting from the objects, students are stimulated in a sort of contest and a continuous interaction with the object, which promotes a critical approach to knowledge. The OBL approach would be more stimulating and motivating if it is used with other educational methodologies, such as Inquiry based learning, Adaptive learning and team work.
In September 2015 in Apulia (South of Italy) the Laboratory of Experimental Research (LPS) of Roma Tre University organised a series of workshops on OBL for secondary school teachers and students, thanks to an agreement with MUST, the historical museum of Lecce, and FabLab Lecce. Several workshops, in which students were divided into groups of 4 to 5 and read up on OBL, understanding how it is developed, promoted and realised, have been organised. Then, they chose an object of Lecce MUST and printed it on 3D: in this way, students could be in touch with the museum object on a multi-sensorial level, touching and observing it in an unusual and innovative way. After 3D printing, students could think about the object origin, its use and the inter-disciplinary involvement. Then, they wrote a report about the activity and about the result of their analysis, presenting it to other students in order to evaluate the learning activity. In this way, all of them could develop their critical thinking in a museum context, thanks to a well-defined learning activity and a critical use of technology in heritage education. The Roma Tre case study will be evaluated through the analysis of students' report. The student's written productions will undergo content analysis to verify the evolution of critical thinking; the analysis categories have been already defined, based on critical thinking encoding model devised by Newman, Johnson, Webb and Cochrane (1997). On the basis of an adaptation of the mentioned model, the researchers will proceed to evaluate students' reports with the use of an appropriate assessment grid.
Video interviews with the museum staff (MUST staff) have been carried out for the DICHE project to investigate the relation between virtual/digital tools employment in the muse-

um environment and learning effectiveness/impact.

### COOPCULTURE: Technology and museums

The contribution that CoopCulture can bring to the Common Research Agenda comes from its point of view on museum education, developed in years of experience on the field observing and interacting with students visiting cultural sites.
CoopCulture operates by receiving school classes in museums and archeological sites, therefore we will analyse the KSAVE model applied to this specific context. Our educators have a background of University studies in Archeology and/or Art History and are trained to work in various cultural sites among our offer. Typically an educator waits for the class at the museum/site, a maximum of 35 students arrive with their teacher and the activity lasts 1h/1:30h. Both in frontal guided tours and in workshops on a specific subject, children show a behavior that differs from the one in class, because of the fact that the environment is new and so is the person interacting with them.
Our educators have developed a set of skills needed to:
a) Assess group behavior, single personalities, interaction with their teacher and their reaction to the environment;
b) Establish an effective relationship to allow a two-way communication and creative participation both respecting the educator's role and the – often delicate - cultural environment;
c) Adapt the communication method to the specificity of each cultural site.
The tight timing to do this is the main difference between the museum educator's experience and the classroom teacher's, and the outputs produced by the students are often unique as well.

The use of technologies in museums is being experimented worldwide, most of the time it regards tools that are installed in the museum and that a visitor is supposed to understand and experience alone. On the other hand, there are technological tools designed to be handled by an educator with the goal to facilitate comprehension of the chosen key concepts for a group of people. Due to our delicate position as purveyors contracted by a cultural institution we need to discuss and agree with the curators on any experiment we might want to attempt and sustain any economic risk, which limits the autonomy to try new technology in this context. Yet we have treasured the few experiences done so-far:
"Critic Globus": during the summer of 2015 we designed and planned a project for the Colosseum based on collecting videos recorded by visitors. An installation in shape of an egg, made of wood and raw earth, and containing a seat, a touch screen and a webcam, was connected to a data warehouse were the videos got translated and approved and then sent online to a YouTube channel, a Facebook account and a wide screen placed at the Colosseum as well. The screen inside "the egg" presented three questions on universal

topics such as the Earth and its perception as Mother and Nurturer. People participated joyfully and with amazing creativity, happy of having been given the chance to express themselves and become a part of the artistic project generated by global community. Later, once at home, these tourists were curious to see their videos and the exponential sharing and commenting took place on the web using social networks. This was a unique chance to collect a frame of global community. 4000 videos were made in 2 months from more than 80 countries.

## UNITED KINGDOM

Digital Storytelling in Education
The School of the Arts, English and Drama of Loughborough University is involved in a number of initiatives that look at the role of storytelling in today's digital world and how it might be applied in education and to bring new voices into the public debate.

In DICHE Project we propose to explore how Digital Storytelling can be applied in heritage education to enhance the 21st Century skills.

As suggested by Porter (2015), 'the digital storytelling process helps us transform isolated facts into illuminated, enduring understandings'. Hence we propose 'storying' the cultural heritage as a way of making information come emotionally alive in a learning process aimed at improving the 21st Century skills. Given that Digital Storytelling problematises our relationship with heritage artefacts, we intend also to recognise limitations and challenges of this methodology.

As a starting point of this process we suggest to watch the interview about digital storytelling in education that we did with Steve Bellis, Lecturer in Media at Coleg Cambria and digital storyteller facilitator.

Reflect on challenges and opportunities of this methodology starting from this interview

| **Challenges** | **Opportunities** |
|---|---|
| **Question 1**<br>Starting from the 4Cs (Critical thinking, Communication, Collaboration, Creativity), how can digital storytelling reveal and enhance these skills? | |
| Flexibility of the methodology for different target groups > how to use it effectively in primary education? | The 4 Cs are all embedded in the process of digital storytelling. |

# RESEARCH

| | |
|---|---|
| **Question 2**<br>Talking about digital storytelling as a process, which is the most crucial step of the methodology that you can't renounce as a teacher and which is the one that your students generally enjoy most? | |
| The emphasis on the writing phase can't be stressed in the same way with different target groups. | The 5 steps process already provides a set of tools for teachers. |
| **Question 3**<br>Reflecting on digital storytelling as a tool for teachers, what have you learnt from your students thanks to this methodology? | |
| A teacher has to be sensitively aware about each student's needs.<br><br>Digital storytelling breaks down any kind of barriers between a professional member of the staff and a student.<br><br>Digital storytelling is an informative process with a personal element. | A teacher can learn from and about his/her students thanks to the digital storytelling methodology.<br><br>Digital storytelling is an informative process with a personal element. |
| **Question 4**<br>Remembering a digital story… Is there a story (from one of your students) that you can't forget? And why? For the topics, the making process (from a social or individual perspective), the digital component or… | |
| How to train teachers in becoming digital storytelling facilitators? How to understand where the limit to persuade a student to make his/her own story is? [Might be tricky when the focus is on a personal life event, easier if we focus on teaching subjects]<br><br>Is teamwork always feasible in a school? | The story behind a story is often more reveling than the story itself. |

General reflections / recommendations about the use of digital storytelling in education

- In terms of teachers concerns with regard of the use of digital storytelling, time may represent a big issue that should be considered in technology integration plans.

- Long-term storytelling projects may be more effective to increase students' understanding of curricular content and improve their skills. It is worthwhile reflecting on the duration of the digital storytelling activity in classrooms and re-articulate the 'conventional' model of the StoryCenter http://www.storycenter.org/
- Teachers may need more technical assistance and equipment.
- One of the challenges highlighted by Vinogradova (2011) in a paper where she de-

scribes her experience of using digital storytelling in English language classes with University students, is that ‘in a time of constrained state budgets, students and instructors have had to learn to make creative use of available resources - human and technological’.

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## DIGITAL TOOLS

Ideas for Digital Storytelling by Tech4Learning
http://www.tech4learning.com/userfiles/media/Samples/frames/Frames_Dig_Story_Samples/index.html.
This online tool provides some examples of different ways of using the digital storytelling methodology in a classroom: biographies, autobiographies, docudramas, mock interviews, news broadcasts.

Pics4Learning – Free, copyright-friendly images for education
http://www.pics4learning.com/?utm_source=hs_automation&utm_medium=email&utm_content=9576822&_hsenc=p2ANqtz-8TTM7tUaeQJhQ8eLrL2LNzExgrEvRK-aOy263xT90qEdliOKcWa4qdktoASjzVJJfC5uKFRwe4DDzKd1d51764F8F09w&_hsmi=9576822
Pics4Learning is a safe, free image library for education. Teachers and students can use the copyright-friendly photos & images for classrooms, multimedia projects, websites, videos, portfolios, or any projects in an educational setting.

BoomWriter http://www.boomwriter.com/ This is an online writing tool to build a story collaboratively. Learners work together to build a story set up by the teacher. Decisions are taken through blind peer evaluation and voting.

ZooBurst http://www.zooburst.com/ is a tool that lets anyone easily create his or her own 3D pop-up books. Authors can arrange characters and props within a 3D world that can be customised using uploaded artwork or items found in a built-in database of over 10,000 free images and materials.

GoAnimate for Schools https://goanimate4schools.com/public_index This tool is to create short cartoon–style animations.

StoryBird http://storybird.com/educators/ StoryBird enables students to create stories in e-book format (free for any educational setting).

ClassDojo https://www.classdojo.com/en-gb/ Teachers use the ClassDojo mobile app to record learner behaviour and achievements in context. The app automatically creates summaries and provides on–going tracking of behaviour, which can be shared with learners, other teachers, administrators and parents.

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PurpleMash - www.purplemash.com offers a suite of learning tools hosted on the Internet to support primary–aged pupils to transfer learning between school and home. This award-winning site, run by 2 simple softwares, contains hundreds of educational projects, games, apps and tools. Learners can develop their schoolwork at home with parents. Schools must pay a subscription fee to use the suite of tools.

The Tes connect website https://www.tes.com/uk/ is an excellent innovation that enables teachers to share digital resources.

**ThingLink** - https://www.thinglink.com/ is an interactive media platform that empowers publishers, educators, brands, and bloggers to create more engaging content by adding rich media links to photos and videos.
See tutorial about how to use ThingLink in classroom: https://www.youtube.com/watch?v=1yrcCE4RK1s

### Resources data base

- Map of CH resources: http://www.erfgoedkaart.be/
- Resources portal: http://www.faronet.be/web-links/erfgoed-portaalsites
- CH app: http://www.erfgoedapp.be/
- Agency for CH education: https://www.onroerenderfgoed.be/nl/diensten/educatie/

Main Education CH education:

- Liesbet Slegers, De archeoloog, 2015 Clavis Uitgeverij
- Expert in de klas: http://kogge.be/blog/de_kogge_in_de_klas
- NGO of CH volunteers: http://herita.be/
- De Nil, B., Samen inzetten op educatie, Gids digital storytelling voor archief én bibliotheek, 2014, Faro Brussel
- http://www.vlaamse-erfgoedbibliotheek.be/
- http://europeana.eu
- http://www.mooss.org/

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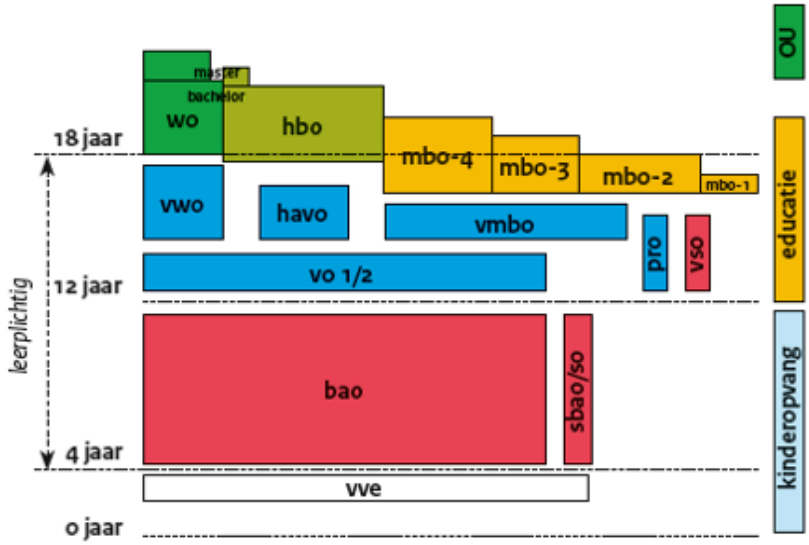
## Partners Countries Educational Systems

### THE NETHERLANDS

Dutch primary school lasts for 8 years (students aged 4 to 12). In 2014 there were approximately 1.565.500 students. In middle school (years 12 to 16/ 18) students are divided by academic achievement. This division is based on the students result in primary school with an emphasis on the results in the final year.




Schematic representation of the dutch educational system. Bao revers to primary school

In the Netherlands there is room for 78.300 full-time jobs for teachers in primary education. In 2014 there were 6549 regular primary schools and 288 primary schools for children with special needs. These schools are divided in four different categories by the national statistics-gathering agency CBS: public, Roman-Catholic, Protestant-Christian and Other Specific. Both Roman-Catholic schools and Protestant Christian schools account for 30% of the total number of schools. Public schools are most common with 32% of schools being public and 8% of schools is classified as Other Specific. In average there are 222 students per school. It should be noted that a large percentage of schools is not strict with its religious denomination. It is not uncommon for Muslim children to attend a Roman-Catholic primary school.

The inspection recognised that 97,8% of the schools was performing at the level that is required by the government. The inspection found that 2% was not performing adequately and 0.2% was performing poorly.

Teachers in primary schools vary widely in age and the amount of teachers in an age group

is evenly spread from roughly 25 years of age up to 63 years of age.

## BELGIUM

Heritage Education in Flanders

Heritage education is any form of education which is based on 'traces from the past in the present' and which embeds this in a context that is based on knowledge and/or that can bring an experience that refers to the past, in other words, a heritage experience.

The foundation of todays cultural heritage education in Flanders is based on the publication "Erfgoededucatie in het Vlaamse onderwijs, Erfgoed en onderwijs in dialoog" 2007, the Bamford report and the report on the thought process around Cultural Heritage "Van denken naar doen" from 2008 or "Learning and cultural diversity: from cultural assimilation to cultural learning". In these reports the main ideas and concepts were defined as:
"the intelligent combination of multiple subjects and contents, competences and attitudes in a situational and contextual education format that when adopted from pre-primary to higher education reinforces in a concentric manner".

The focus is definitely not on cultural heritage and education as two distinct elements, or on education about cultural heritage: "Education and heritage together must allow children to discover. The questions, meanings and curiosity of children is leading the process and not the school as an institute or the interests of the heritage institution. It is a nomadic journey together to discover and explore the world we live in, from the perspective of children."

The motto is: "Space for creativity, constructive criticism and citizenship are the three key concepts that help shaping the power of good heritage, art or cultural education." Heritage education - and by extension arts and cultural education - in its most ideal form begins with the self-creating ability of child and mentor, where each of them start on the same level from their own knowledge, culture, feelings and creativity and also finish as equals at the same level. Therefore, schools ideally subscribe in their school culture to the idea that the environments, the culture and creativity of students and teachers should be the starting point to acquire knowledge, attitudes and skills and to integrate these in their daily lives.
This concept lies at the basis of the learning objectives that are set in the long term for learners regarding the context of the political, legal, socio-economical and sociocultural society . The socio-cultural society is described in topics that expressly refer to what is considered socially and educationally important to ensure that specific context. The fifth theme that falls within this context relates exploration of culture related to art as part of the development of a social identity, social interaction and social participation. Conscious interaction with art, media and heritage results in an increased mastery of both individual and social learning processes.
A society stands or falls with the 'identity' of its citizens. Cross-curricular themes in the contexts shape the themes that are considered essential for a sound contemporary and future-oriented basic education. "Cultural learning, or to learn in and by culture, constitutes the core of lifelong and life wide learning." (De Braekeleer, J., Atelier Competentieverwerving en -waardering stimuleren, 2010, Cultuurforum Brussels).

In primary education, the learning objectives are still defined vertically per subject matter group. The following distinction is made: French, Physical Education, Art Education, Dutch, World Exploration Studies and Mathematics, beside those there are three themes that crosscut through all domains: ICT, learning to learn

# ANNEXES

and social competences. Cultural heritage education is part of the vertical "Dutch language learning" and supports the creation of an (inter) cultural perspective or direction by a.o. starting from one's own frame of reference to acquire some knowledge about the diversity of cultural heritage with a linguistic component and to appreciate it. Examples of activities include:

- Convert their first name or internationally used words in different scripts and discuss what they notice, what is attractive, what is difficult.
- Inquire in their family where their name comes from, what their first names signify, and compare with other children.
- Compare lyrics of songs that exist both in the Netherlands and Flanders.
- Read children's poetry and stories from different cultures and discuss the similarities and their individuality and learn to appreciate what is different.

Both in primary and secondary education, the focus within this context is entirely on the self deployment of the learner by confronting the learners with and embedding them in culture, media and cultural heritage, and much less on the learning about culture, about media or about cultural heritage. It is not about learning facts and figures but about what the learners do with these, how they become a better person, how they shape their lives by interacting with these.

This approach was supported by the research project "Cultuur in de Spiegel" ("Culture in the Mirror") that was embraced by CANON Cultuurcel of the Flemish Ministry of Education. Culture theories and scientific research on culture put an increasing emphasis on no longer seeing culture as a collection of objects and productions. The characteristic of culture is in the sense that people make of it or the meaning they formulate by means of it. In other words: culture is not the painting on the wall or the dressed up actor on stage, but the sense, the feeling, the impression that the museum visitor, the audience, the critic, the learner, the society take away from it.

The focus within the Ministry is less on the uptake of digital tools and resources and more on the introduction of methodologies to enhance cultural and heritage education in schools as well as to enhance learning by cultural and heritage education. Key competences are in this context social and/or cultural skills and citizenship, creativity and critical thinking, 4 key competences which are considered essential (but not exclusive) amongst the 21st Century skills.

"While education transmits cultural heritage to next generations, it has a mission to innovate traditional cultures. The negative elements in traditional cultures point to the need for their renewal in the light of the changing socio-economic contexts and education has an important role to play in effecting positive cultural value changes." (Learning: The Treasure Within, Report to UNESCO of the International Commission on Education for the Twenty-first Century, Zhou Nanzhao, UNESCO Publishing, Paris 1996).

## ITALY

Italian Primary School lasts 5 years (students aged 6 to 11) and is preceded by 3 years of non-compulsory nursery school.
The last report (November 2015) by the national statistics-gathering agency ISTAT states that the number of students in Italian primary schools is about 3.000.000, in 146.403 classes (on average, 19.2 students per class).

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Italian schools are divided into public and private schools: 91% of Italian primary schools are public, and 45% of public schools are situated in the North of Italy.
The total number of foreign students in Italian Primary School is 276.129, 9.7% of total students; 66.2% of foreign students is in the North of Italy.
As the OECD 2012 report states, some 7.5% of students in Italy had an immigrant background: this proportion increased by 5 percentage points between 2003 and 2012.
44.5% of the total number of primary students comes from the North of Italy, 18.9% from the Centre of the Country and 36,6% from the South, Sicily and Sardinia Islands. 48.4% of all students are female.
The number of teachers in Public school is about 245.000. Most of them teach in the North and in the South of Italy: about 10% of Italian primary school teachers come from Campania region.
The average age of teachers in Italy is quite high, as opposed to the situation in the rest of the OECD countries. In Italy, every three teachers are aged over 50, there is one under, exactly the opposite of the average tendency in the other OECD countries. For example, if the secondary school (middle and high school) teachers over 50 in the OECD countries are 36%, in Italy the same category represents 73 % of all teachers.
In primary school, 57 % of teachers is over 50. At the University, the rate is of 51%.

The last European countries in this rating have percentages that are quite far from the Italian ones:
teachers over 50 years old:
Bulgaria: 47.7 %
Estonia: 43.1 %
Lithuania: 42.1 %
Sweden: 41.7 %
Latvia: 41.2 %
Greece: 40.1 %
Italy: 65 %

We can say that, while in the rest of Europe there is a generational change that is organised in a structured manner, in Italy this happens abruptly from time to time and in an uncontrolled way. The very recent Law of "The Good School" (La Buona Scuola), that helps teachers to be hired, will not change this situation because many teachers that have worked until now without a permanent contract have been doing so for years and are already over 50.

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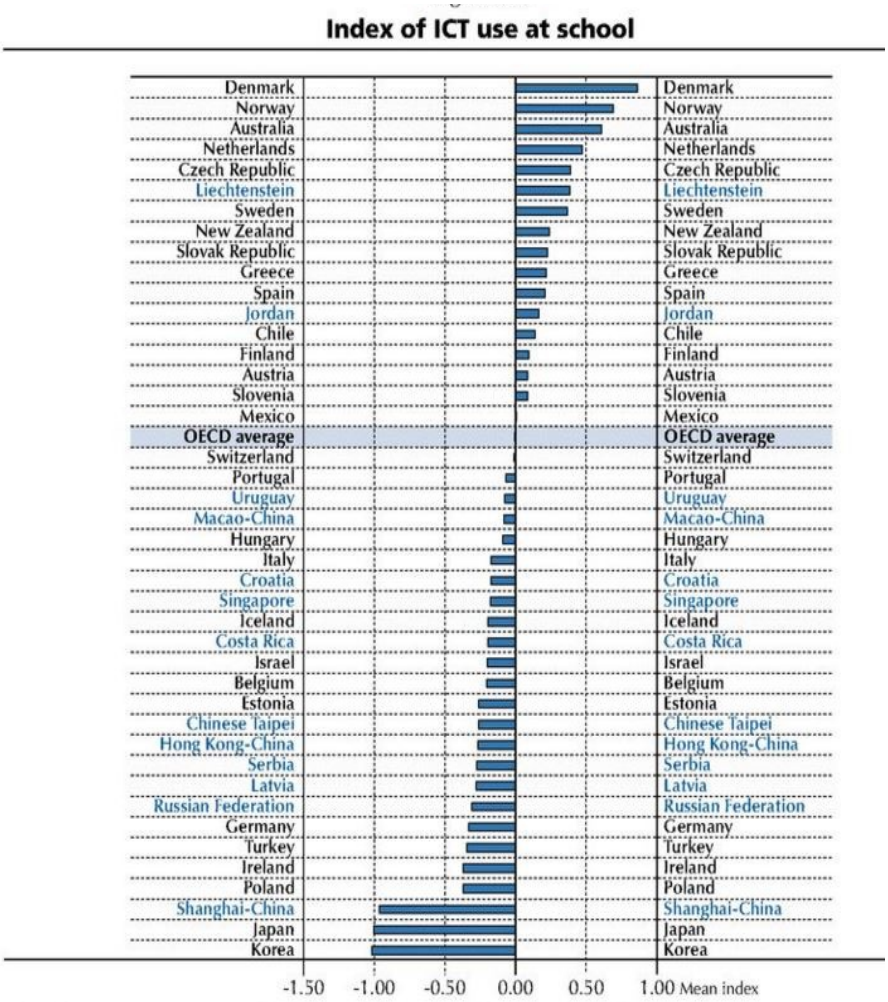
The Classi 2.0 programme has been promoted in 2009 to check if and how many technologies have been integrated in the learning environment and if their presence have improved teaching and learning practices. This project has been replicated at an international level in many European Countries, such as Escuela 2.0 in Spain and CAPITAL in England. Classi 2.0 objectives are to implement innovative teaching and learning methods, to reorganise school spaces and time management and to support teaching and learning individualisation processes.

Three national projects have been promoted by the Italian Ministry of Education to develop the use of digital tools in schools: Classi 2.0, LIM and Editoria Digitale

LIM project has been promoted to develop and improve didactic innovation using ICT in




*Countries and economies are ranked in descending order of the mean* index of ICT use at school.
**Source:** OECD, PISA 2012 Database, Table 2.2.
StatLink http://dx.doi.org/10.1787/888933252700

school; thanks to this project, the Italian Ministry of Education has provided public schools with technological tools, such as LIM (Multimedial and Interactive blackboard). Editoria digitale's aim is to spread digital book purchase from primary to secondary schools in Italy.

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These projects allow students to interact efficiently with digital tools and take part in new and innovative learning practices.

Recently (Nov. 2015) a new National Plan for Digital School has been started and it foresees a series of actions from the improvement of Internet access to the actual realisation of innovative teaching and learning programmes (Law 107/2015; MIUR (2015), Piano nazionale per la scuola digitale, see http://www.istruzione.it/scuola_digitale/landing/allegati/pnsd-layout-30.10-WEB.pdf ).

As the OECD 2012 report says, 66.8% of students use computers at school: this level increased by 3 percentage points between 2009 and 2012. In addition to this, 28.8% of students is used to browsing the internet at school for schoolwork or activities.
Unfortunately, the use of ICT and digital tools at schools in Italy is under the OECD average, as the graphic of the OECD 2012 report shows.

In general, Italian students are familiar with digital tools from primary school, thanks to specific activities and methodologies (like Flipped classroom) where the use of ICT is necessary. Prospective primary school academic curriculum includes the study of ICT in general and their use in the learning process in particular. But the average age of primary school teachers is over 50, so most of them are not able to use ICT.

Other figures that regard the Italian School System and the use of technologies :

- 375.000 classrooms
- 70.000 lab rooms
- 72.000 interactive whiteboards
- 750.000 teachers in force

## UNITED KINGDOM

The primary stage covers three age ranges: nursery (under 5), infant (5 to 7 or 8) (Key Stage 1) and junior (up to 11 or 12) (Key Stage 2), but in Scotland and Northern Ireland there is generally no distinction between infant and junior schools. In Wales, although the school types are the same, the Foundation Phase has brought together what was previously known as the Early Years (from 3 to 5-year-olds) and Key Stage 1 (from 5 to 7-year-olds) of the National Curriculum to create one phase of education for children aged between three and seven. In England, primary schools generally cater for 4-11 year olds. Some primary schools may have a nursery or a children's centre attached to cater for younger children. Most public sector primary schools take both boys and girls in mixed classes. It is usual to transfer straight to secondary school at the age of 11 (in England, Wales and Northern Ireland) or 12 (in Scotland), but in England some children make the transition via middle

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schools catering for various age ranges between 8 and 14. Depending on their individual age ranges, middle schools are classified as either primary or secondary. The major goals of primary education are achieving basic literacy and numeracy amongst all pupils, as well as establishing foundations in science, mathematics and other subjects. Children in England and Northern Ireland are assessed at the end of Key Stage 1 and Key Stage 2. In Wales, all learners in their final year of Foundation Phase and Key Stage 2 must be assessed through teacher assessments.

Schools, pupils and their characteristics: January 2015

8.4 million
Pupils are enrolled in state-funded and independent schools in England
1.3 Percentage growth in pupils numbers since January 2014. This increase is larger than in previous years and is driven largely by a 2.1% increase in the number of pupils in state-funded primary schools. The number of pupils in state-funded secondary schools rose by 0.1%, the first rise since 2010.
15.2 Percentage of pupils in state-funded schools (and local authority alternative provision) known to be eligible for and claiming free school meals. This has fallen from 16.3 per cent in January 2014. 15.0 Per cent of pupils in state-funded secondary schools are exposed at home to a language known or believed to be other than English. This is up from 14.3 per cent in January 2014.

15.0 Per cent of pupils in state-funded secondary schools are exposed at home to a language known or believed to be other than English. This is up from 14.3 per cent in January 2014.
School workforce in England: November 2014
Teacher numbers continue to rise. There were 454.9 thousand full-time equivalent (FTE) teachers in state-funded schools in England in November 2014. This is an increase of 5.2 thousand (1.2 per cent) since 2013 (449.7 thousand FTE teachers).

The increase in teacher numbers is being driven by the primary sector. The FTE number of teachers working in nursery/primary schools has increased by 6.0 thousand (2.9 per cent) between 2013 and 2014 whereas, over the same period, the FTE number of secondary school teachers has decreased by eight hundred (0.4 per cent).

The average salary for all teachers remains unchanged. The average salary for all teachers (full and part-time classroom and leadership group teachers) in service in November 2014 was £37,400, which is the same as in 2013.
**Four out of five school staff members are female.**
In 2014, 80 per cent of the full-time equivalent number of employees working in schools

were female. There has been a very small increase compared with 2013 when 79.7 percent were female.
79 per cent of school support staff and 91 per cent of teaching assistants are female.

Almost three out of four teachers are female. Female teachers account for 74 per cent of all teachers. Although there is a more pronounced difference by phase. For example, 85 per cent of primary school teachers are female compared with 62 per cent of secondary school teachers.

**Teachers in primary schools are slightly younger on average than those in secondary schools.** Teachers in primary schools aged under 30 make up 27.6 per cent of all primary school FTE teachers compared with 23.1 per cent for FTE teachers in secondary schools. Teachers in primary schools aged 50 and over make up 17.5 per cent of all primary school FTE teachers compared with 18.5 per cent for FTE teachers in secondary schools.
**87.5 per cent of teachers are White British**. Teachers from 'Other White Background' (3.6 per cent), White-Irish (1.7 per cent), Indian (1.7 per cent) and Black Caribbean (1.0 per cent) backgrounds are the next largest groups of teachers. In comparison, in 2014, the percentage of head teachers recorded as White-British is 93.7 per cent. A reduction from the position in 2013, 93.9 per cent.

**Special educational needs in England: January 2015**
15.4% of pupils in schools in England have identified special educational needs (equating to 1,301,445 pupils). This has been decreasing since 2010 (21.1%) and is a fall of 2.5 percentage points since last year. This decrease is due to a decrease in SEN without a statement or Education, Health and Care (EHC) plan.

# ANNEXES

## REFERENCES


Amabile, T. M. (1982). 'Social psychology of creativity: A consensual assessment technique'. Journal of Personality and Social Psychology, 43, 997-1013.

Amabile, T. M. (1996). Creativity in context: Update to "The social psychology of creativity." Boulder, CO: Westview Press.

Ankersmit, F. (2007). De sublieme historische ervaring. Groningen: Historische Uitgeverij.

Baker (2002). Metacognition in comprehension instruction. In Block & Pressley (Eds.), Comprehension instruction: Research based best practices (pp. 77-95). New York: Guilford Press.

Bamford, A. (2007). Kwaliteit en Consistentie - Arts and Cultural Education in Flanders. Brussel: Ministry of Education Flanders, CANON Cultural Unit.

Bandura, A. (1997). Self-efficacy: The exercise of control . New York: Freeman.

Beghetto, R. A., & Kaufman, J. C. (2014). Classroom contexts for creativity. High Ability Studies, 25(1). Special Issue: The Significance of Learning Contexts in
Talent Development . doi:10.1080/13598139.2014.905247

Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). Taxonomy of educational objectives: The classification of educational goals. Handbook 1: Cognitive domain. New York: David McKay Company.

Boden, M. A. (2004). The creative mind: Myths and mechanisms. New York: Routledge.

Bonk, C. J., & Smith, G. S. (1998). Alternative instructional strategies for creative and critical thinking in the accounting curriculum. Journal of Accounting Education , 16(2), 261-293.

Boxtel, C. van (2009). Geschiedenis, erfgoed en didactiek. Amsterdam: Erfgoed Nederland.

Bracken, C. C., & Skalski, P. (2006, August). Presence and video games: The impact of image quality and skill level. In Proceedings of the Ninth Annual International Workshop on Presence (pp. 28-29). Cleveland, OH: Cleveland State University.

# ANNEXES

Brown, J., Bryan, J., & Brown, T. (2005). Twenty- first century literacy and technology in K–8 classrooms. Innovate, 1(3).

Brown, Campione & Day (1981) "Learning to learn: On training students to learn from texts" Educational Researcher vol.10 no.2 pp.14-21.

Bush, L., & Hall, J. (2011, March). Transforming teaching with technology: Using Web 2.0 tools to enhance on-line communication, collaboration, and creativity. In M. Koehler & P. Mishra (Eds.), Proceedings of Society for Information Technology & Teacher Education International Conference 2011 (pp.
3887-3890). Chesapeake, VA: AACE.

Coiro, J., Knobel, M., Lankshear, C., & Leu, D. J. (Eds.). (2014). Handbook of research on new literacies . New York: Routledge.

Catharine Coleborne and Elaine Bliss, Emotions, Digital Tools and Public Histories: Digital Storytelling using Windows Movie Maker in the History Tertiary Classroom, History Compass 9/9 (2011): 674–685

Cradler, J., McNabb, M., Freeman, M., & Burchett, R. (2002). How does technology influence student learning? Learning and Leading, 29(8), 46–49, 56.

Condy, Chigona, Gachago & Ivala, Cape Peninsula University of Technology, South Africa Agnes Chigona (Corresponding Author), Pre-Service Students' Perceptions And Experiences of Digital Storytelling in Diverse Classrooms, TOJET: The Turkish Online Journal of Educational Technology – July 2012, volume 11 Issue 3, pp. 1-8.

Damhuis, R., De Blauw, A. & Brandenbarg, N. (2004). CombiList, een instrument voor taalontwikkeling via interactie. Praktische vaardigheden voor leidsters en leerkrachten. Nijmegen: Expertisecentrum Nederlands.

Damhuis, R. & Sytema, S. (2011). De leerkracht zet kinderen aan tot denken. De kern van taal- en zaakvakonderwijs. Basisschool-management, 2011, 05, 20-24.

Damhuis, R., Vonk, A., Tammes, A-C. & Postma, G. (2013). Taal, denken en geschiedenis. Historisch redeneren met kinderen op de basisschool. Kleio, jrg. 54, nov., 4-9.

De Braekeleer, J., et al., Cultuurbeleid in perspectief: Atelier Competentieverwerving en -waardering stimuleren, 2010, Cultuurforum Brussels.

Dorner, R., Grimm, P., & Abawi, D. (2002). Synergies between interactive training simula-

# ANNEXES

tions and digital storytelling: a component-based framework. Computers & Graphics, 26, 45–55

Feist, G. J. (2010). The function of personality in creativity: The nature and nurture of the creative personality. In J. C. Kaufman & R. J. Sternberg (Eds.), The Cambridge handbook of creativity (pp. 113-130). New York: Cambridge University Press.

Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. B. Resnick (Ed.), The nature of intelligence (pp.231-236). Hillsdale, NJ: Erlbaum

Goleman (1999). Working with emotional intelligence, London: Bloomsbury publishing.

Grasser, Mc Namara, Van Lehn (2005). Scaffolding deep comprehension strategies through point&query, autotutor, and Istart, Educational Psychologist, 40 (4), 225-234.

Greene, J. A., Seung, B. Y., & Copeland, D. Z. (2014). Measuring critical components of digital literacy and their relationships with learning. Computers & Education , 76, 55-69

Gregory, K., Steelman, J., & Caverly, D. C. (2009). Techtalk: Digital storytelling and developmental education. Journal of Developmental Education, 33(2), 42–43.

Grever, M., Boxtel, C., van. (2014). Erfgoed, onderwijs en historisch besef, Verlangen naar tastbaar verleden. Hilversum: Uitgeverij Verloren.

Haller, M., Leitner, J., Seifried, T., Wallace, J.R., Scott, S.D., Richter, C., Brandl, P., Gokceza-de, A. And Hunter, S. (2010) The nice discussion room: integrating paper and digital media to support co- located group meetings. in E. Mynatt, G. Fitzpatrick, S. Hudson, K. Edwards and T. Rodden (eds) 'chi '10: Proceedings of the 28th international conference on human factors in computing systems.' Atlanta, Ga, Usa, April 10–15, 2010. Pp.609–618. New York, Ny: Acm Press.

Halpern, D. F. (2013). Thought and knowledge: An introduction to critical thinking (5th ed.) . New York: Psychology Press.

Halpern, D. F. (1998). Teaching critical thinking for transfer across domains: Disposition, skills, structure training, and metacognitive monitoring. American Psychologist , 53(4), 449.

Hannan & Chatterjee (2015). Engaging the Senses: Object-based learning in higher education, Farnham: Ashgate Publishing.

Hasselt, G., van, Mein, M. (2013). Aan de slag met een leerlijn Erfgoededucatie. Rotterdam: KCR.

# ANNEXES

Heilesen, S. B. (2010). What is the academic efficacy of podcasting? Computers & Education, 55(3), 1063–1068.

Hicks, T. (2006). Expanding the conversation: A commentary toward revision of Swenson, Rozema, Young, McGrail, and Whitin. Contemporary Issues in Technology and Teacher Education, 6, 46–55.

Higgins, S. , Xia, Z. , Katsipataki , M. The Impact of Digital Technology on Learning: A Summary for the Education Endowment Foundation Full Report , Durham University, November 2012

Hong, E., Hartzell, S. A., & Greene, M. T. (2009). Fostering creativity in the classroom: Effects of teachers' epistemological beliefs, motivation, and goal orientation. Journal of Creative Behavior, 43, 192-208.

Horizon Report Europe, 2014 Schools Edition, European Commission DG Education and Culture; European Commission JRC – IPTS; and the New Media Consortium, 2014, Luxembourg.

Howe, C. & Abedin, M. (2013). Classroom dialogue: a systematic review across four decades of research. Cambridge Journal of Education, 43(3), 325-356.

Jonassen, D. H., & Carr, C. (2000). Mindtools: Affording multiple knowledge representations in learning. In S. P. Lajoie (Ed.), Computers as cognitive tools, Vol. 2: No more walls (pp. 165–196). Mahwah, NJ: Lawrence Erlbaum Associates.

Jonassen, D.H., & Hernandez-Serrano, J. (2002). Case-based reasoning and instructional design using stories to support problem solving. Educational Technology Research and Development, 50(2), 65–77.

Kafai, B., Ching, C., & Marshall, S. (1997). Children as designers of educational multimedia software. Computers & Education, 29(2–3), 117–126.

Klein, S., Grever, M. & Boxtel, C. van. Zie, denk, voel, vraag, spreek, hoor en verwonder. Afstand en nabijheid bij geschiedenisonderwijs en erfgoededucatie in Nederland. Tijdschrift voor geschiedenis, 2011, 24, 380-395.

Kozbelt, A., Beghetto, R. A., & Runco, M. A. (2010). Theories of creativity. In J. C. Kaufman & R. J. Sternberg (Eds.), The Cambridge handbook of creativity (pp. 20-47). New York: Cambridge University Press.

# ANNEXES

Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An overview. Theory into Practice , 41(4), 212-218.

Krathwohl, D. R., Bloom, B. S., & Masia, B. B. (1964). Taxonomy of educational objectives: The classification of educational goals. Handbook II: The affective domain. New York: David McKay Company.

Kritz, M., & Shonfeld, M. (2012). Avatars in 3D learning environments. In P. Resta (Ed.), Proceedings of Society for Information Technology & Teacher Education International Conference 2012 (pp. 2563-2568).

Kuhn, D. (2015). Thinking together and alone. Educational Researcher , 44, 46-53. Chesapeake, VA: Association for the Advancement of Computing in Education.

Laurillard, D. and Deepwell, M. 'ALT survey on the effective use of learning technology in education', July 2014 [For the Education Technology Action Group. UK]

Lee, Sy-ying, Storytelling supported by technology: an alternative for efl children with learning difficulties, TOJET: The Turkish Online Journal of Educational Technology – July 2012, volume 11 Issue 3, pp. 1-11

Leu, D. J., Gregory McVerry, J., Ian O'Byrne, W., Kiili, C., Zawilinski, L., Everett-Cacopardo, H. & Forzani, E. (2011). The new literacies of online reading comprehension: Expanding the literacy and learning curriculum. Journal of Adolescent & Adult Literacy , 55(1), 5-14.

LKCA (2015), Cultuur in de kanteling, strategische Verkenning cultuureducatie en actieve cultuurparticipatie (2017-2020). Downloadable from http://www.lkca.nl/publicaties/publicaties-lkca/cultuur-in-de-kanteling See p. 28 for the observed contradiction between 21 C skills and Bildung. [link checked on 7th January 2016]

Lim, S., & Reeves, B. (2007). Responses to interactive game characters controlled by a computer versus other players. International Journal of Human-Computer Studies , 68, pp. 57-68.

Littleton, K., & Mercer, N. (2013). Interthinking: putting talk to work. Abingdon: Routledge.

Lombard, M., & Ditton, T. (1997). At the heart of it all: The concept of presence. Journal of Computer-Mediated Communication , 3(2), 0.

Lowenthal, Patrick, 'Digital Storytelling in Education: An Emerging Institutional Technology?', in John Hartley and Kelly McWilliam (eds.), Story Circle: Digital Storytelling Around the World (Oxford, UK and Malden, MA: Wiley-Blackwell, 2009), 252–9.

# ANNEXES

Luckin, R. et all. (2012) Decoding learning: the proof, promise and potential of digital education, Nesta.

Marchisio, R. (2015) Il mondo della rete spiegato ai ragazzi. Cittadini di oggi e di domani ("The world of the web explained to kids. Citizens of today and tomorrow"), vol. 1.

Marra et al. (2004), "Content Analysis of Online discussions Forums: A Comparative analysis of protocols", Educational Technology Research and Development, 52 (2), pp. 23-40.

Meichenbaum, Burland, Gruson & Cameron (1985). Metacognitive assessment. In Yussen (Ed.), The growth of reflection in children (pp. 3-30). Orlando, FL: Academic Press.

Mercer, N. & Littleton, K. (2007). Dialogue and the development of children's thinking. A sociocultural approach. London: Routledge.

Merzenich, M. (2007). Computers go to school. Re- trieved May 14, 2007, from http://merzenich.posit science.com/2007/04/25/computers-go-to-school/

Morin (1999). La tête bien faite. Repenser la réforme. Réformer la pensée, Paris: Seuil.

Newman, Webb, Cochrane (1997), "Evaluating the quality of learning in computer supported co- operative learning", Journal of the American Society for Information science, 48 (6), pp. 484-495.

Niu, W. (2007). Individual and environmental influences on Chinese student creativity. The Journal of CreativeBehavior, 41, 151-175.

O'Bryan, A., & Hegelheimer, V. (2007). Integrating CALL into the classroom: The role of podcasting in an ESL listening strategies course. ReCALL, 19(2), 162– 180.

OECD (2015), Students, Computers and Learning: Making the Connection, PISA, OECD Publishing.

OECD (2010), Investing in Human and Social Capital: New Challenges, theme 1, "Tackling the effects of the crisis on education", Paris, available at http://www.oecd.org/site/0,3407,en_21571361_44559030_1_1_1_1_1,00.html, l.a. 20.01.2012.
Onderwijsraad (2006). Onderwijs in Cultuur. Den Haag: Onderwijsraad.
Paul & Elder (2002). Critical Thinking: Tools for Taking Charge of Your Professional and Personal Life, Upper Saddle River, N.J.: Financial Times Prentice Hall.

# ANNEXES

Paull, C. N. (2002). Self-perceptions and social con- nections: Empowerment through digital storytelling in Adult Education. Dissertation Abstracts Interna- tional. (UMI No. 3063630)

Poce & Angelini (2011). Per una nuova cultura didattica: riflessioni sul progetto am-Learning, Milano: FrancoAngeli.

Poce, ed. (2015). Individualizzazione del messaggio di apprendimento in ambiente adattivo, Milano: FrancoAngeli.

Poce, ed. (2012). Contributi per la definizione di una tecnologia critica: un'esperienza di valutazione, premessa di Vertecchi B., Milano: FrancoAngeli.

Poce, ed. (2014). Promuovere la scienza. Studi per la definizione di un canone, Milano: FrancoAngeli.

Porter, B. Digital Storytelling in the Classroom, Tech4Learning, http://www.digitales.us/wp-content/uploads/2015/07/Digital_Storytelling_in_the_Classroom.pdf [link checked on 26th October 2015]

Recalcati, M. (2014) L'ora di lezione ("Class time"), Einaudi, Torino.

Robin, B. R. (2008). Digital storytelling: A powerful technology tool for the 21st century classroom. Theory Into Practice, 47(3), 220–228.

Runco, M. A. (2014). Creativity: Theories and themes: Research, development, and practice (2nd ed.). San Diego: Academic Press

Sadik, A. (2008) Digital storytelling: a meaningful technology-integrated approach for engaged student learning, Education Tech Research Dev, 56:487–506

Salpeter, J. (2005). Telling tales with technology. Technology and Learning, 25(7), 18, 20, 22, 24. Retrieved May 22, 2007.

Scotto Di Luzio, A. (2015) Senza educazione, I rischi della scuola 2.0 ("With no education. The risks of School 2.0"), Il Mulino, Bologna.

Skogen & Siøvoll (2010). Creativity and innovation. Preconditions for entrepreneurial education, Trondheim: Tapir Academic Press.

# ANNEXES

Simonton, D. K. (2010). Creativity in highly eminent individuals. In J. C. Kaufman, & R. J. Sternberg (Eds.), The Cambridge handbook of creativity (pp. 174-188).
New York: Cambridge University Press.

Simonton, D. K. (2012). Taking the US Patent Office criteria seriously: A quantitative three-criterion creativity definition and its implications. Creativity
research journal , 24(2-3), 97-106.

Spitzer, M. (2013) Demenza digitale. Come la nuova tecnologia ci rende stupidi ("Digital dementia. How new technology makes us stupid"), Corbaccio ed.

Sprague, D., & Pixley, C. (2008). Let their voices be heard: Podcasting in education. Computers in the Schools, 25(3–4), 226–234.

Stein, M. I. (1953). Creativity and culture. The Journal of Psychology, 36(2), 311-322.

Sternberg, R. J. (2010). Teaching for creativity. In R. A. Beghetto & J. C. Kaufman (Eds.), Nurturing creativity in the classroom (pp. 394-414). New York: Cambridge University Press.

Sternberg, R. J., & Lubart, T. I. (1995). Defying the crowd: Cultivating creativity in a culture of conformity . New York, NY: Free Press.

Straker, L. M., Pollock, C. M., Zubrick, S. R. & Kurinczuk, J. J. (2005) The association between information and communication technology exposure and physical activity, musculoskeletal and visual symptoms and socio-economic status in 5-year-olds Child: Care, Health & Development, 32.3: 343–351.

Swan, K. (2002). Building learning communities in online courses: The importance of interaction. Education, Communication, & Information , 2(1), 23-49.

Tollebeek J. & Verschaffel, T. (1992). De vreugden van Houssaye. Apologie van de historische interesse. Amsterdam: Wereldbibliotheek.

Trilling & Fadel (2009). 21st Century Skills: LearningFor Life in Our Times, San Francisco: Jossey-Bass.

Tuijnman & Van Der Kamp (1992). Learning Across the Lifespan. Theories, Research, Policies. Oxford: Pergamon Press.

# ANNEXES

Tyner, K. (1998). Literacy in a digital world. Mahwah, NJ: Lawrence Erlbaum.

Van Heusden, B., (2010), Cultuur in de Spiegel: naar een doorlopende leerlijn cultuuronderwijs, Groningen Rijksuniversiteit/SLO.
Vertecchi (1993). Decisione didattica e valutazione, Firenze: La Nuova Italia.

Vertecchi, Poce, Angelini e Agrusti (2010). Orbis Dictus. Un ambiente adattivo multilingue per l'istruzione in rete, Milano: FrancoAngeli.

Vinogradova, Linville, Bickel, "Listen to My Story and You Will Know Me": Digital Stories as Student-Centered Collaborative Projects', TESOL Journal 2.2, June 2011, pp. 173-202.

Vonk, A. & Sytema, S. (2012). Interactie geeft geschiedenis-didactiek lucht. Taal Lezen Primair, nr. 1 (april), 7-9.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Cambridge, MA: Harvard University Press.

Ward, T. B., & Sonneborn, M. S. (2009). Creative expression in virtual worlds: Imitation, imagination, and individualized collaboration. Psychology of Aesthetics, Creativity, and the Arts , 3(4), 211-221.

Wedgerif, R. (2013). Dialogic education for the Internet age. London: Routledge.

Witmer, B. G., & Singer, M. J. (1998). Measuring presence in virtual environments: A presence questionnaire. Presence: Teleoperators and Virtual
Environments , 7(3), 225-240