

Creative and Innovative Good Practices in Compulsory Education in Europe

Collection and Descriptive Analysis of 10 Good Practices
of Creativity and Innovation in Compulsory Education in the EU27

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Preface

This report has been prepared by Futurelab and the IOE, London, with the support of the Institute for Prospective Technological Studies (IPTS).

The report is part of a project on 'Creativity and Innovation in Education and Training in the EU27 (ICEAC)' carried out by the Institute for Prospective Technological Studies (IPTS) in collaboration with DG Education and Culture, Directorate A, Unit A1. This project aims to provide a better understanding of how innovation and creativity are framed in the national and/or regional objectives and applied in educational practice at primary and secondary level. It collects and analyses the present state of affairs in the Member States as regards the role of creativity and innovation in primary and secondary schools. The project started in December 2008 and the following methodological steps were taken:

- A scoping workshop (held in Seville on 23-24 February 2009);
- A literature review on the role of creativity and innovation in education by IPTS;¹
- An analysis of curricula by Empirica;
- A report on a teachers' survey conducted by IPTS and European Schoolnet and analysed by IPTS with the support of the University of Seville;
- Interviews with educational stakeholders by Futurelab and IOE;
- This report on good practices by Futurelab and IOE;
- A validation workshop (held in Seville on 1-2 June 2010);
- A final report.

More information on the project can be found at:

<http://is.jrc.ec.europa.eu/pages/EAP/iceac.html>

More information on current and past projects on ICT for learning can be found at:

<http://is.jrc.ec.europa.eu/pages/EAP/eLearning.html>

The studies and results of the IPTS Information Society Unit can be found on the Unit website:

<http://is.jrc.ec.europa.eu>

¹ See http://ftp.jrc.es/EURdoc/JRC52374_TN.pdf

Executive Summary

The main aim of this study is to collect and analyse educational practices which exemplify good models of creative learning and innovative teaching in compulsory education in the EU27. Ten good practices have been identified according to the following criteria:

- Fair geographic distribution within the EU27;
- Fair distribution according to age groups, from primary to lower and upper secondary;
- Variety of domains of knowledge, from cross-curricular initiatives to projects related to specific subject areas;
- Variety in the scope and scale of the initiative;
- Variety of examples that consider the different facets of creativity.

For each of the good practices, the research team has identified resources and information and evaluated them in order to provide the reader with an exhaustive overview of the projects. The table below summarises the main features of the good practices presented in this report.

	Name	Country	Age of pupils	Subject areas	Brief summary
1	FUNecole®	Cyprus	Primary	Cross-curricular	Curriculum supported by a Virtual Learning platform built on active learning and creativity-for-life principles.
2	Summative Project	Denmark	15 years old	Cross-curricular	Group work on cross-curricular project on a given theme embedded in formal assessment national schemes.
3	Open Air Classrooms	Estonia	Primary and Lower secondary	Art, Science, Geography, Literature, Maths	Part of the timetable is set outside the school buildings, in the open air.
4	Digital storytelling – Historia do Dia	Portugal	Primary	Language, Literacy and Literature	Every day a new story is broadcasted through the web in Portuguese and English.
5	Can we "see" the Sound?	Greece	10-12 years old	Music, Physics, Mathematics	Pupils handcrafted instruments; used ICT and sounds to investigate and understand mathematical and physics concepts.

	Name	Country	Age of pupils	Subject areas	Brief summary
6	Value in the Valley	The Netherlands	Secondary vocational	Sustainable development, Green technology and agriculture	Students are involved in inter-disciplinary projects which are commissioned by real employers. The aim is to make students become innovative professionals.
7	Authors and Poets	Malta and Scotland	Primary	Literacy and Digital skills	Pupils write on a given topic and exchange texts with their twinned school through a blog.
8	Project Maths	Ireland	Secondary	Mathematics	Revised syllabi for lower and upper secondary Mathematics, based on activities which are meaningful for students.
9	Swedkin	Sweden	13-18 years old	Cross-curricular, cultural awareness	A website to address issues of minorities, diversity, and conflict in Sweden, with the aim of raising inter-cultural dialogue.
10	Queensferry High School Cross-curricular Projects	UK-Scotland	12-15 years old	Cross-curricular	Group works on a given topic supported by teachers and the school library during the spring and summer terms.

The analysis of the good practices presented in this reports highlighted several drivers and barriers for the success of the initiative.

All these practices need time and space out of scheduled time-tabling to engage in more creative and innovative activities, and a major factor for success is the motivation of the teachers, tutors and other staff involved in setting up the activity, which should also translate into motivation of pupils and students. The educational actors involved in these projects see creativity as arising from everyday life and value its spill-over effects on learning.

At the same time, it seems that creativity and innovation are stifled by an overloaded curriculum, by lack of time for flow in the teaching and learning schedule, by other systemic barriers such as summative assessment and league tables. This leads to a need to rethink the current compulsory educational provision, reshaping curricula, assessment schemes, schools' evaluation methods and possibly institutional priorities.

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1. Broad Theoretical and Pedagogic Context

The idea of creativity is as complex and varied as its current use in education policy in the EU is widespread. For educational stakeholders attempting to identify good practices in relation to creativity and education, it is helpful to frame these definitions as a series of structured oppositions as suggested in a booklet designed by a member of the team for the evaluation of creative learning projects in UK schools (Banaji and Burn 2007):

- Elite/individual/genius **or** democratic/sociable/collaborative,
- Original/from nothing **or** generic/transformativ,
- Arts-specific **or** residing in all human endeavour,
- Spontaneous **or** taught and learnt,
- Ubiquitous **or** special,
- Universal **or** culture-specific,
- Imaginative and intuitive **or** knowledge and skills-based,
- Process-based **or** product-led,
- Ineffable and instinctive **or** quantifiable and testable,
- Emotional **or** rational.

In looking for case studies to exemplify some of the current good practice and potential best practice or 'next practice' in this area, we aimed to find examples that consider and break down the barriers between aspects of the oppositions above.

Our methodology in this instance involved linking these structured oppositions – which themselves arise from a recent review of policy, practitioner and academic literature (Banaji and Burn 2007/2010) and from our examination and analysis of ongoing interviews with educational experts in the field – to a number of critical questions. These questions examine the conceptualizations and operationalisations of the notions of creativity and innovation in differing school contexts across the EU27 in order to situate the practices we discuss within existing or potential frameworks at local, national or European level. Hence:

Does creativity reside in everyday aspects of human life or is it something special?

- What are the implications of thinking about creativity as 'special' or as 'everyday' for the goals of educators in different economic contexts in the EU27?

What counts as evidence of creativity in educational contexts?

- Public examinations develop complex systems of assessment. In what ways are these systems accommodated to creative teaching and creative learning in EU27 schools?

What is the difference between 'good' pedagogy and 'creative' pedagogy?

- Writing on creativity in education distinguishes between creative teaching and creative learning and other types of pedagogy.
- What is the difference between creative teaching and learning and 'good' or 'effective' teaching and 'engaged' or 'enthusiastic' learning?
- Is there creative learning that does not deliver effective educational outcomes? Is there creative teaching that does not entail creative learning?

Is creativity necessarily collaborative and pro-social rather than disruptive, chaotic or even rebellious?

- Are all school creativity practices going to be judged successful depending on particular public perceptions of the ethical and appropriate nature of what has been produced or enacted by the students?
- Therefore, how will the planning and evaluation of creative teaching and learning in schools in the EU27 acknowledge and evaluate creativity that is consciously or unconsciously disruptive of accepted social conventions and artistic, economic, political or scientific norms?

Other questions we considered include:

- How significant is play as a component of creativity – do our best practices build in time for this kind of activity?
- How can cultural consumption be connected to 'creative' production? How are the out-of-school cultures of students and teachers valued and incorporated by the good practice?
- What is the relationship between creativity and innovation as cognitive processes and as socio-cultural processes? How are teachers' lives and livelihoods, their individual contexts and those of their students affected, altered by and/or constraining to the scope of the topics and ideas included in their daily work?

2 Selection of Case Study Sample

Methodologically, in choosing the good practices in relation to innovation and creativity in formal schooling we have been extremely sensitive to the following criteria:

- Most of the practices selected show a high degree of Creativity and Innovation from both the learner and the teacher side, but there are one or two which are weighted more on one or the other of these and it is important not to exclude such initiatives simply because they are not equally 'creative' both in terms of teacher and learner. Based on what we have discovered in relation to expert perspectives on Creativity and Innovation and in relation to practitioner and research evidence, sometimes 'good, effective or interesting (rather than innovative) teaching, planning and curriculum development' can elicit extremely creative work from students.
- All good practices outlined address compulsory education - primary and secondary.
- There is an excellent geographical distribution: good practices have been selected from different geographical areas, from North and South, East and West, old and new Member States (EU27).
- There is a fair selection of age groups: varying from primary (for instance, One Story per Day; FUNecole®) to early years of secondary (such as, open-air classrooms; Queensferry library cross-curricular work) and later years of secondary (Danish Final Assessment project).
- A variety of initiatives have been included at micro (local); meso (national) and macro (state and international) level, funded by a variety of sources from private initiatives to charities, universities and government departments.
- There is access to information about all cases - sometimes from National ministries, sometimes in research reports, newspaper articles and sometimes online.
- As can be seen several of the good practices in our selection highlight the use of ICT to develop Creativity and Innovation.

We have been sensitive to the need for variety and have attempted not to overlap these practices and case studies with ones that have already been highlighted by other EU initiatives in this area. We are aware that once a project has received acclaim and publicity it tends to get selected repeatedly and thus to curtail the potential for other good practices and new practices with excellent qualities to be explored and taken on board.

Additionally, we have opted, methodologically, for the best practices that seem most likely to or have the potential to be accepted by and have an

impact on a wide range of schools and teachers in a wide range of contexts, rather than ones that are very Arts-based and hard to 'spread'. Our rationale here is that change often happens easier if it can be linked to existing systems and that the larger the number of schools able to opt for the change the better.

Best Practice 1 – Cyprus

FUNecole® - Creative Learning Environment

Age of pupils

Primary – Age 6-10

Website

<http://www.funecole.com>

<http://digipro.com.cy>

Length of the initiative

ongoing

Country

Cyprus

Subject areas

Cross-curricular with particular focus on ICT, thinking skills, Science, Literacy and Language

Scope and Scale

Currently running in half a dozen schools in four countries (Romania, Greece, Cyprus, Estonia), with scope for many more, if schools can afford the per child licence fee or if governments can be persuaded to purchase a group licence

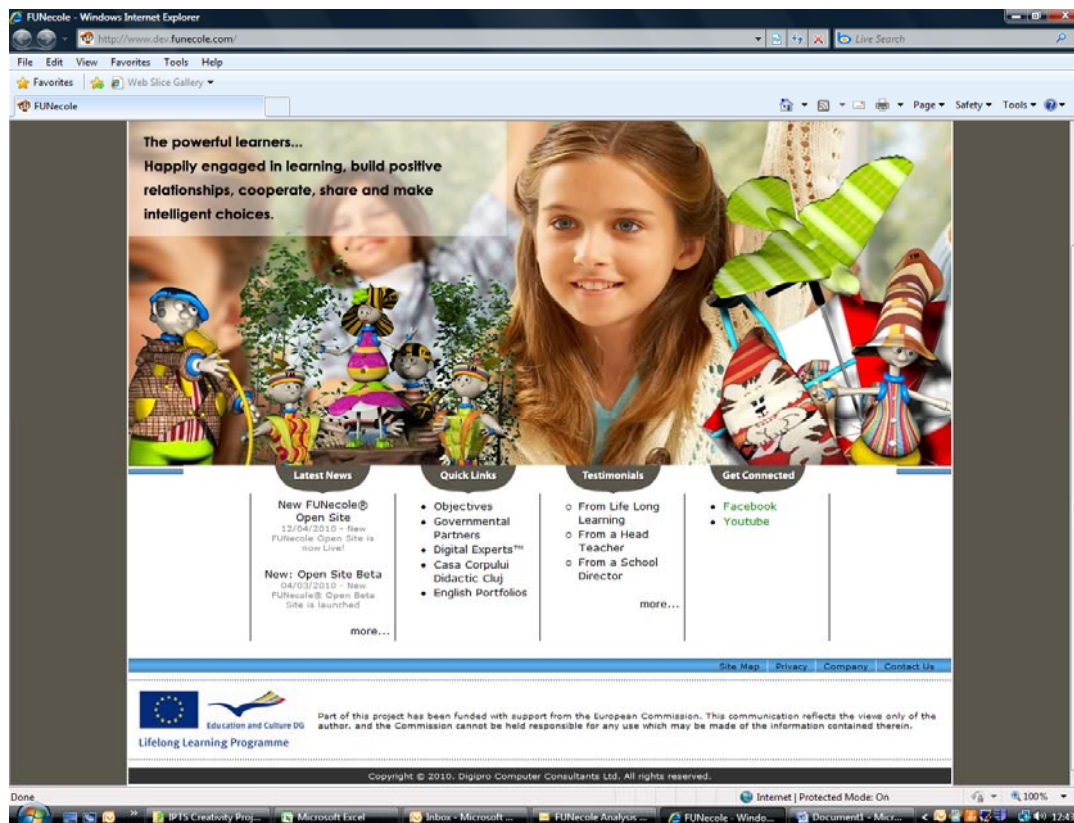


Figure 1. The FUNecole® website

Summary

FUNecole[®] is a privately financed Virtual Learning Platform and Curriculum built on active-learning and creativity-for-life principles by Digipro in Cyprus. The learning environment encompasses a series of password protected areas for students, teachers, administrators and parents. The licence fee can be charged by the makers at variable rates so that poorer schools in poorer countries are not excluded by a prohibitive price. The student area is stratified by age: there are different coloured environments for different year groups in primary school and materials are prepared in cycles and units to challenge the imagination and the civic skills of children at different levels in primary school. While a range of other learning environments both open-source and commercial do exist, most significantly, the FUNecole[®] materials are available in English, Greek, Romanian and Estonian and do not rely on rote learning in any form but on problem solving, self reflexivity and creative imagination.

Objectives

The objectives of some of the learning materials on the FUNecole[®] website foreground the importance of several aspects of creative learning: challenge, self-reflexivity, critical thinking, process, exploration and an open-minded attitude:

- Use the Internet intelligently and effectively.
- Learn how to master a wide range of attitudes, insights and skills.
- Be aware of own learning style.
- Be able to reflect on own experiences and take different courses of action that are analogous of different situations.
- Demonstrate ability to effectively focus on a task at hand.
- Take initiative, organize, plan, display or execute a project alone or as a part of a group.
- Compare their own work method with that of others.
- Have a critical and confronting attitude as opposed to acting in a sarcastic and degrading way.
- Be able to challenge stereotypes and set new standards.²

How the best practice works

In the context of current Cypriot Education – or in Greece, Romania and Estonia where the materials are also being used - where the curriculum and the pedagogy is apparently content-driven and generally teacher-centred, the curriculum and materials made and disseminated by FUNecole[®] for Primary school children, their teachers and parents do appear to open up new and innovative ways of teaching and creative ways of interacting with knowledge. The philosophy of the curriculum is based on feedback spirals "coming back but, at higher levels", which are the

² <http://www.dev.funecole.com/page.php?lm=oobjectives>

cyclical guides that enhance the methods by which teachers craft instruction.

Tools and resources

Although this is a private sector initiative, an evaluation of this project was funded by the European Commission, though the outcome is attributable solely to the authors of the site. The learning environment and associated sites have not been cheap to produce, and have consumed a large portion of the private savings as well as the time and commitment of the director and her team over the past twelve years. However, the fact that they have control over the product means that they can charge a variable licence fee or choose to waive it for pedagogic reasons where schools and students do not have enough finance to afford the standard fee.

Schools and students subscribing to the FUNecole[®] environment need to be aware of and in tune with its creative and innovative philosophy which does not rely on standardized testing or national assessment targets. The schools also need to have resources in terms of computers and internet access for students and teachers; as well as the possibility of the children accessing the site from their homes – in order to enable cross-school communication.

In terms of training to use the learning environment, the FUNecole[®] teams offer three days of coaching to all new teachers inducting them in the philosophy, thinking styles and pedagogies of the website and materials. The capacity to train is planned as a rolling initiative to be devolved to different countries as the initiative spreads.

Benefits, creative potential and barriers

The FUNecole[®] strategy, aims and resource materials are all directly related to creative learning and an environment which will motivate primary aged children to discover, think, argue, build and experiment. The presentation of the learning platform and curriculum and the age-based materials have very high production values compared to most of the other teaching resources and sites surveyed previously, and although there are some resources that act as work sheets, these are designed to be visually appealing.

There is also a sense of systematic progression in relation to emotional development and intellectual cohesion with these materials that is hard to find if looking randomly for materials online.

The team developing the materials have also done something that many teachers as individuals do not have time to do: they have used the potentials of an online environment for developing technological literacy alongside other forms of creative and critical thought in children.

In terms of the rhetorics of creativity visible on the FUNecole[®] website and materials, there are some which suggest the importance of imagination to the development of creative thinking, 'Imagination is more important than knowledge... the creative way.'³

Potentially, such materials could initiate space for creative learning in schools where the time and motivation exists to incorporate this alongside the mainstream curriculum. This is widely applicable across primary school but requires three key resources: commitment on the part of schools and government; funding to purchase a licence for the materials; and training for teachers in how to use them.

Notably, it must be borne in mind that these materials are not free, unlike many that can be found on the internet. They require a conscious and systematic investment by those who not only understand and value the creative and innovative ethos but also have the resources to pay for this. Questions arise about whether and how materials such as these with the pedagogic imperative to be creative and use digital technologies in an embedded way for learning could be extended for students in older age groups, designed to work as part of official curricula without losing their creative appeal, and made available cheaply by national school systems.

Scope: potentially **country-level** and **international** as the FUNecole[®] environment could be adopted by national education systems in countries where there has been a great deal of teacher-centred work till date but which need to alter their learning practices in a systematic and sustained manner to meet the challenges of the digital economy and train students to be creative and flexible in hard economic times. However, the uptake by the Government in Cyprus has been cautious in the beginning, although right now a school pilot is running.

³ <http://www.dev.funecole.com/page.php?lm=xryso>

Best Practice 2 – Denmark

Compulsory Summative Project

<i>Age of pupils</i>	Secondary – 15 years old
<i>Website</i>	Nil
<i>Length of the initiative</i>	Ongoing
<i>Country</i>	Denmark
<i>Subject areas</i>	Cross-curricular end of lower secondary assessment projects with a particular focus on integrating Art, Information Technology, Social Science, Mathematics, Science, Literacy and Language
<i>Scope and Scale</i>	Currently running across secondary schools in Denmark

Summary

Innovative cross-curricular project work in formal assessment is now embedded in the assessment practice of schools across Denmark with a framework provided by the National Ministry for Education. As part of the final assessment, students have to work together on innovative cross-curricular projects with pairs or teams of students in imaginative and diverse ways. During these projects students can use materials or technology to produce new knowledge, innovative solutions to problems or an innovative product with real-world applications. In some best practice cases they then have to present this to an audience (or peers, parents, local community and teachers) in order to pass this part of the assessment.

Objectives

This best practice provides a way of bridging gaps between current insistence on summative assessment and a lack of ways of incorporating creativity into this. It allows for teachers to assess both process and product and for students with non-traditional backgrounds to build on their strengths in collaborating with others to critically evaluate knowledge, create new ideas and solve problems rather than recall facts or produce individual responses.

How the best practice works

The project work takes place over the course of a single week of intensive data collection, technology use and collaboration starting on Monday and ending on Friday with the days running from 8am to 1pm each of the five

days. The aim of the project is to enquire and look at issues, problems and the world in different ways and from different angles.

It receives input from teachers in different subject areas and across disciplines while being supported by the class tutor throughout. It is evaluated and assessed both by a member of the school team and by an external teacher evaluator. It involves both emotional and intellectual skill and calls upon students to incorporate traditional literacy as well as digital and other literacy in the design and execution. Students who are not so good at reading books or are exceptionally talented with their hands have an opportunity to show what they can do.

At the beginning of the week, students join together in pairs or groups of 4. Individual work is possible but is very rare. Teachers choose a list of overarching topics, from which students can pick a 'minor' or subsidiary topic for the group.

- For instance, if a major topic chosen by a tutor is health and wellness, the minor topic researched might be a type of disease, illness, its socio-cultural roots, its prognosis and its cure.
- Another major topic might be 'borders and boundaries' – this is left open to students to interpret and frame in whichever subject area or discipline they desire. An intensely creative art project might emerge; or a work about refugees and immigrants or a work about urban spaces, youth and adults.
- Another topic might be Crime and Violence: in this topic students have created dramas about violence against children in the home; they have enacted on a doll the damage done to children by violent parents.
- Rainforests have been the topic in other years.

Teachers then scaffold the activity by briefing students for one or two hours on how the project works, the pitfalls and aims. It is at this stage that different student dispositions towards this kind of independent enquiry-based learning surface, as some students listen to the advice and others don't. Following the briefing, students discuss ideas and brainstorm minor topics within these groups. They plan their time, allocate tasks and pursue different aspects of the project.

Projects are generally cross-curricular in the sense that they call upon skills from mathematics, social sciences – history, geography, religion, moral education – language, science, design and technology and/or a modern foreign language.

Every group has to produce something that can count as a product. However, the 'product' could be a presentation, a dramatic production, a speech, a collaborative sculpture or artefact and/or something involving music and technology. More theoretical projects – for instance ones

related to breast cancer – might be followed by a paper or talk presenting findings based on research and interviews. The product has to be appropriate and fit to purpose.

To document the process during the week, all students keep a project journal which is also submitted on the Friday along with the project presentation and product.

The criteria applied are more innovative in the assessment than the usual ones. They take account of:

- the processes by which students gather data and information,
- how they evaluate and process sources,
- information and outcomes,
- how they work together to solve problems and
- how their product matches the initial project question and how the process fitted together all aspects holistically.

The timescale of the single week, while limiting in some ways, is also enabling to pupils in that they are able to plan their time very carefully and to allocate roles which suit each student. All the teachers who have guided students in the project have input into the assessment and moderate the final evaluation which takes the form of a diploma to be presented to individual students. The Ministry of Education provides teachers and schools with a report which sets out the framework for conducting the projects, so this is a nationally documented practice.

Tools and resources

The project requires a time commitment from a range of teachers within the framework of the school timetable and from an external examiner to whom the process and project are presented. It might also require a hall and publicity for the event if it is to be showcased before parents or the local community.

The tools and technologies vary hugely depending on the project but do not require any extra investment as they are the ones which are available to students in the school at any point in the school year. The internet provides a vital resource in terms of data and knowledge. Students might choose to embody their product via woodwork or art or graphics packages; they might simply present it in power-point; they might capture evidence digitally on recorders, mobile phones, cameras or camcorders.

Benefits, creative potential and barriers

This is an interesting and internationally viable method of incorporating and assessing creative learning within the more common frameworks of end of school examinations. The careful structured week gives opportunities for innovation, creativity, skills assessment and new

knowledge. Different levels of creativity emerge but all have equal chance. Sometimes students are more ambitious than their skills allow and their product might not show the intention. But this is credited to them – intention is rewarded in the grading.

In relation to potential barriers, 'the lazy pupils are satisfied with simple answers and obvious products'. Collaboration always comes with its pitfalls, not all members of a group pull equal weight. But this is accounted for by individual assessments as teachers focus on how each pupil addresses the project works with the group and progresses during the week.

If Denmark moves towards a more exam and test based system, some of the potential and practice of creativity will be lost. These projects might disappear or be devalued.

Best Practice 3 – Estonia

Open Air Classrooms

<i>Age of pupils</i>	Primary and Lower Secondary – 7 years – 16 years
<i>Website</i>	NIL
<i>Length of the initiative</i>	Ongoing
<i>Country</i>	Estonia
<i>Subject areas</i>	Art, Science, Geography, Literature, Maths
<i>Scope and Scale</i>	Taken up by some schools in the country; dependent on weather and season in some countries but runs commonly in Asian countries.

Summary

A number of schools in Estonia have learning time outside the main school building but in the grounds with 'open air classrooms'. In these classrooms, there may or may not be a blackboard or whiteboard set up at all times and there may or may not be a 'planting area'; students and teachers bring other equipment, painting materials and notebooks from inside the class.

Open air classrooms – or even open air schools – are not unique to Estonia. They were pioneered in developing countries such as India – the famous open-air school Shantinikhetan⁴ – in order to deal with issues of overcrowding, lack of school buildings and a growing population in need of education. Nor are open air schools always a creative or innovative break in some children's school day where they move from a contained and constricting interior to an out of doors area where they can be closer to nature. In some city environments, pavement schools operate literacy and numeracy classes in the most traditional manner for children with no other access to schooling. However, open air schools and classrooms have also been used in a range of innovative ways, for instance in places like England, the Netherlands, Flemish region of Belgium, New Zealand⁵ and Cyprus, to help both children and teachers reconnect their learning with the world in which they live. In rural areas they have been particularly successful at allowing children to bring out of school knowledge and learning, especially about crops and farming, or building and architecture

⁴ See <http://www.wb.nic.in/westbg/shanti.html>

⁵ http://www.tki.org.nz/e/schools/display_school_info.php?school_id=3338

into their school environment. (Cruickshank, 1977; Kingsley, 1913; Ayres 1910).

Objectives

Activities undertaken range from collecting samples and data for biology and geography to drawing, writing and physical activity. In these open air classes it is a set practice to stimulate students' creativity, curiosity and 'learning by doing'.

How the best practice works

In Estonia, teachers take their classes outside to the open air classrooms in science, geography, literature and languages. Depending on the time of year and the age of the students, they might be asked to go off in pairs or to work from their positions sitting down to collect data and samples, for analysis and discussion by the class. These samples could be local flora and fauna to be catalogued and drawn; specimens of grass, sand, rock, leaves, etc. to be analysed; samples of water – or even the counting of events and the documentation of weather changes with instruments. There are also examples of drama and art classes in open air classroom settings integrating nature and/or local urban objects as a subject and setting; mathematics teaching which involves measurement and testing of theorems; and poetry based on the environment.

In such lessons students might have to make their own measuring devices for aspects of the weather or use digital technology to record and create implements to aid in research on agriculture, biology or geography projects.

In one open air class session about meteorological conditions, for instance, students were asked to use materials at hand to create their own instruments to measure and demonstrate the speed of wind. In pairs or teams they constructed a variety of instruments and demonstrated their thoughts and how the instruments would be intended to work in the open-air classroom. Both successful and less successful instruments were evaluated in terms of their imaginative scientific potential in a real environment.

In other cases, domestic animals may be kept, looked after and studied, or plants and herbs planted, monitored and grown. This is notably different from taking classes on geography or biology fieldtrips, which might occur at best once or twice per year, in that it becomes a regular feature of their school week – with at least one if not two lessons per week taking place out of doors.

Tools and resources

Almost any school with some space for outdoor activities can easily and cheaply erect two or three open air classrooms and schedule classes in

there on a regular basis in good weather seasons. While noise is more of an issue in urban schools, choosing the site of the open air classroom carefully can minimise this barrier by situating the classroom at a point as far from a local road as possible and preferably in a place where trees and grass has have been allowed to grow. This is, however, a luxury in most urban schools, as can be seen in the following section.

Benefits, creative potential and barriers

Open air classrooms can be cheap to maintain, and for some schools would require little from the school management and teaching staff other than commitment to timetabling classes outdoors and imagination. After the constrained conditions of many modern classrooms where sometimes students have to sit for long hours without fresh air or much movement, being in the outdoor space can be extremely liberating for their imaginations and healthy for their bodies. Schools which have no space for play in a field or yard can resort to roof gardens or safe terrace space.

Reading and writing nature or urban poetry, doing sketches and painting landscapes, enacting drama out of doors or discussing weather, biological processes, mathematical trajectories and geographical topography in the outdoor environment of an open air classroom can bring the issues at hand much closer to children's lives at all ages. This allows the children access to fresh concepts that might otherwise seem more distant if simply written up on a whiteboard or shown on a power-point indoors. It also engenders in them a more curious and hands-on attitude to the world in which they live, with the means to satisfy curiosity close at hand. This is highly motivating for students and teachers. Assessments of activities can be as diverse or as targeted as they are in built classrooms.

In relation to potential barriers, the weather in certain seasons can be a factor affecting how much and what types of activities take place in open-air classrooms. Severe winter or heavy rain can mean classes have to be rescheduled or cancelled altogether. However, equally, snowfall and rain can offer objects of study in different ways to different age-groups, and some open air classrooms are not without a sheltering roof. More problematically, many modern urban inner-city schools are not situated in particularly conducive surroundings, suffer from a lack of outdoor space or may be in surroundings which prove disturbing or uncomfortable for certain groups of children. Additionally, some teachers may feel that the distraction of the outdoor environment for some students outweighs the imaginative benefits. Nevertheless, in the cases where this practice is planned and used in a consistent manner, it has been seen that children quickly learn to respect the opportunity and are neither wayward nor as easily distracted from the tasks at hand as they would be were the opportunity to arise only once a year. Indeed, for many children it is reported that moving from the contained environment of the classroom to

one where they can move freely increases their concentration and creativity both indoors and outdoors.

Best Practice 4 – Portugal

Digital Storytelling: Historia Do Dia

Age of pupils

Primary School – 7-10

Website

<http://www.historiadodia.pt/pt/index.aspx>

Length of the initiative

Ongoing

Country

Portugal

Subject areas

Language, Literacy and Literature

Scope and Scale

Currently National but only taken up by schools who have opted in



Figure 2. Friendly, easy to navigate visual style of the site: clicking on a story leads directly into the story

Summary

In this example of a best practice from Portugal, a team of digital technicians and educators work with a renowned author, a graphic artist, translators and children to prepare and publish a new digitally broadcast story in Portuguese and in English every day.

These stories are used with pupils in schools across Portugal, particularly ones with strong links between ICT and literacy, to aid in children's imaginative and creative development as well as their literacy skills and

motivation in relation to reading and literature. The child-friendly format of the website and the stories makes it easy for teachers to motivate their classes to use this resource.

How the best practice works

As demonstrated in the screen shots below, the website is updated with a single new digital story each day. The Portuguese version of the story has the option of being read or audio broadcast and listened to directly from the website of the project. As mentioned in a Stakeholder interview, in some primary schools, teachers use the new story each day to conduct a range of imaginative literacy activities with their pupils, to get them to make and model their own digital stories or to podcast stories for other children.

An archive of older stories exists in case a class wishes to work on different stories or to use them at home between parents and children. There is also the option for the children to vote about how much they like particular stories – the most popular stories have had more than 10,000 visitors. All the stories are written and told in an accessible and friendly manner with thoughtful scenarios that enable discussion of civic, moral and emotional issues with children in addition to helping to enhance their literacy and motivation. There are some activities that accompany the stories, in the English version these are games, in the Portuguese version these are puzzles, related didactic links to enable a better understanding of the story and the possibility to vote for the best story.



Figure 3. Both versions of the site (Portuguese and English) have didactic materials and a few games. They also include a communication option, an archive of stories, top ten stories and information about the project and its authors.



Figure 4. The format of most stories allows children to click in order to turn the pages as they might in a physical book



Figure 5. By clicking on the icon of the microphone above in the Portuguese version of the site, children can hear the story being read.



Figure 6. Children can rate stories when they have finished reading them

Scope and materials

Evidently in order to use this digital story initiative in schools there need to be working computers with fairly fast and working broadband connections. Teachers need to be motivated to incorporate digital technologies into the lives of their students and a culture of shared story-telling must be valued. If schools already have working internet connections and connected computer suites, no additional expense is needed in order to enable the use of their resource.

If schools have Interactive white boards, projectors and a computer in each classroom, children could be allowed to browse stories on the site individually or in groups or to read the story aloud to each other as a class.

Innovation and creativity – potentials and barriers

While the project itself is highly imaginative and the involvement of an author, illustrators and educators together in a digital environment is simple but innovative in the sustained manner outlined, the potential for students to use this resource creatively is variable and depends upon the innovative ideas of the individual teachers. It could be used simply as a literacy or story-telling exercise, with students listening to the teachers read the story aloud from a screen as they would from a book; or it could be used as stories in books can to springboard into other activities combining imagination, ICT and literature/ literacy.

Best Practice 5 – Greece

Can We “See” the Sound?

<i>Age of pupils</i>	10-12
<i>Website</i>	NIL
<i>Length of the initiative</i>	2000 – 2001; 2005
<i>Country</i>	Greece
<i>Subject areas</i>	Music, Physics, Mathematics
<i>Scope and Scale</i>	Small and short term

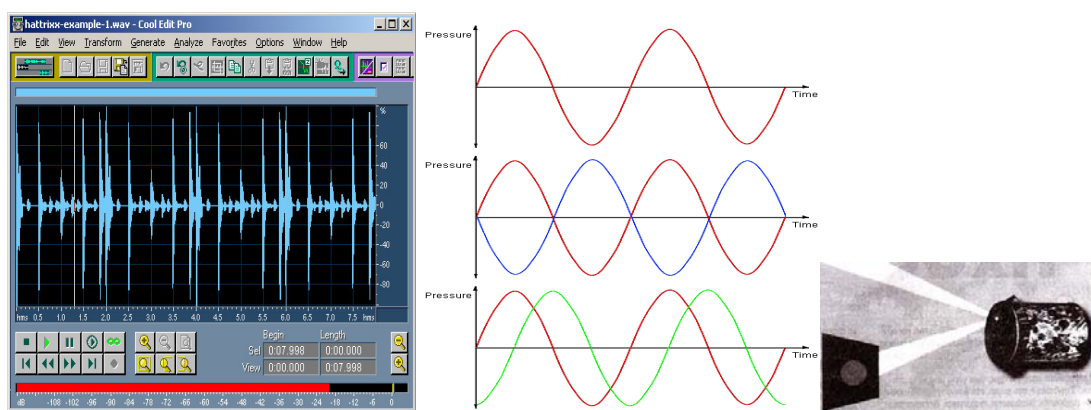


Figure 7. The software tools used, and one of the instruments hand-crafted (an oscillograph), by pupils to digitally manipulate and visualise the sounds

Summary

This was a project which used computer-based recording and editing of sounds to offer new learning opportunities in the teaching of music, physics and mathematics and to liberate pupils' creativity. The project took place in two separate instances, first in 2000/2001 and then in 2005. It involved Greek pupils in the fifth and sixth grades (10-12 years old) in cross-curricular learning. The pupils were provided with a range of musical instruments and tools, including computer equipment and software to capture, process and visualise sounds. Some of the tools, for example oscillographs, were developed collaboratively in the classroom.

This very small project was carried out as a research study. Although its scope was limited, this project raises interesting points and proposes a framework for cross-curricular learning in the primary context, successfully combining music and science education. It is one of several examples of innovative practices, which are introduced and managed by individual teachers, but cannot be considered as an expression of systemic innovation.

How the best practice works

The overall aim of the project was to provide pupils with the support and the tools to liberate their creative potential and imagination. According to the researchers who reported on the project, “pupils should not spend their whole energy and time to study the work of others but they should have energy and time to create, explore and question” (Kampylis and Berki, 2006: 195). The teachers/researchers that managed the project tried to put into practice basic psychological principles about how to enhance pupils’ motivation to think, understand, learn and conceptualise.

Objectives

The Greek educational system puts a great emphasis on creativity, especially in the primary context. The development of Greek primary school students’ creative potential lies at the heart of the educational goals as reflected in legislative acts and National Curricula (see Kampylis et al. 2009). However recent research (Kampylis et al 2009) noted a high degree of vagueness in Greek teachers’ understandings of creativity, and a general lack of training to support creativity meaningfully through classroom practices.

However, there are some initiatives and programmes in the Greek educational system to foster creativity; for example, the curriculum allocates time for creative classroom projects like the one documented here.

Tools and resources

Abstracts concepts such as periodicity, units, patterns, sound-waves, frequency and intensity were made more specific, as they were visualised through the construction of hand-made tools from trashy materials such as oscillographs and kazooes. Pupils also use the school IT Labs to explore sound waves and general sound properties. More specifically, they used:

- Multimedia PCs with soundcards and speakers, networked and with an internet connection,
- Classroom-based PA system, 8 channel mixer and a unidirectional dynamic microphone,
- Music software (audio editing: cool edit 200, sequencing: Sonar 2, notation: Finale 2000),
- MIDI keyboard,
- Stereo tape recorder,
- CD&DVD players and writers,
- Digital projectors.

Benefits, creative potential and barriers

This project explicitly tried to foster creativity using a clear pedagogical vision, drawing on a variety of inspirations like the Montessori Method.

This method assumes that children need to be involved through a range of communication styles and sensory stimuli which go beyond the textual or verbal dimensions, usually favoured in schooling.

This is also reflected in the emphasis the researchers put on hands-on activities, aimed at the creation of simple hand-crafted instruments, and in the use of sounds and music to introduce pupils to complex topics in physics and science. The project engaged pupils in activities around the conceptual structures shared by music, physics, mathematics and ICT, encouraging them to identify commonalities and patterns through unusual and out-of-the-box thought processes.

From this perspective, a multisensory and participatory approach is essential to unlock the natural disposition that every child has towards discovery, in what is essentially a democratic and emancipatory (creativity as a liberating force) view of creativity.

Best Practice 6 – The Netherlands

Value in the Valley

<i>Age of pupils</i>	Secondary vocational
<i>Website</i>	NIL (website is no longer online)
<i>Length of the initiative</i>	2005; no longer running
<i>Country</i>	Netherlands
<i>Subject areas</i>	Sustainable development, green technology and agriculture
<i>Scope and Scale</i>	Region wide

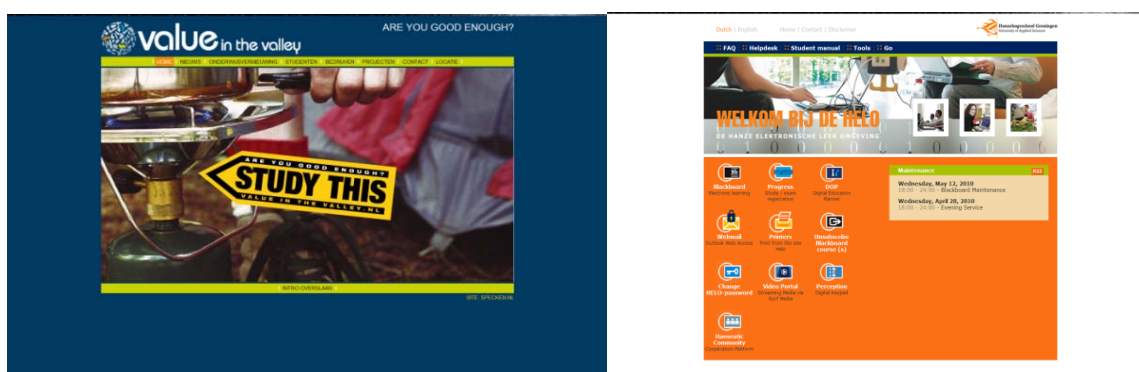


Figure 8. Screenshots of the project homepage and the blackboard section to support the students

Summary

The project “value in the valley” was launched in 2005 as a way to involve students from different fields of study and different levels of education, mainly secondary vocational education and vocational colleges in interdisciplinary projects, which were commissioned by real employers. The projects focused on renewable energy and sustainability, aiming to help students become innovative professionals in emerging and socially relevant areas of work. The students worked in small groups learning how to address global challenges in interdisciplinary ways, finding creative ways of solving problems.

The project originated with 6-7 teachers and a group of 20 students from secondary vocational education and then grew to become a region-wide initiative. The regional government provided 60% of the funding as part of an initiative to address dropping out and encourage technical education, whilst 40% of the funding was provided by schools and companies. Although it is not running anymore in its original form, the tools and methods developed within the project are now informing and supporting ongoing programmes and partnerships in the region, providing valuable pedagogical expertise.

How the best practice works

The goal of 'Value in the Valley' was to educate students from different fields of study and different levels of education to become innovative professionals in the areas of sustainable development, green technology and agriculture. In order to achieve its objective, the project created a "Community of Learners" (COL), where learning and working were more intertwined, and where the difference between schools and companies gradually declined. The students would carry out assignments for real clients in a semi-authentic, work-like environment, and were supported by clear pedagogic mechanisms which combined instructional design, active learning and a comprehensive evaluation process based on questionnaires, interviews with participants, clients and family/friends of participants.

Objectives

Value in the Valley came about in the context of a long-running initiative for regional development in the north-east part of the Netherlands. The project built on partnerships between different parties and organisations in the region, which however has been established without a clear pedagogic vision. The project addressed this issue by providing a framework for these relationships to be conducive to productive and efficient educational experiences.

Tools and resources

The project benefited from a clear methodological approach drawing on action research. The action research method is based on recurring cycles of design, implementation and evaluation, and engages with participants and stakeholders at all stages to ensure the project achieves outcomes which are relevant and owned by all. Action research can be a powerful framework to create the conditions for creativity to flourish: collaboration, mutual support and shared goals.

The project also made use of specific pedagogic tools to support learning: coaching guides for students to help each other, handbooks and planning documents which helped the teams understand how projects were running, what to prioritise and how to progress from simpler to more complex tasks.

Benefits, creative potential and barriers

The main assumption behind Value in the Valley was knowledge co-creation, which can be enabled by the cooperation amongst students, teachers and experts from specialist working fields. The project tried to implement a new educational paradigm bringing together the best of the worlds of education and work. The project succeeded in recreating a professional and trans-disciplinary learning/working environment, where all participants developed skills as innovative and creative professionals, learning to value creative and unusual relationships between disciplines.

The professional, business –like environment in which students were operating was also enriched with many pedagogical elements, which were meant to encourage students to work for “clients” and come up with creative solutions to specific challenges.

Best Practice 7 – Malta and Scotland

Authors and Poets

Age of pupils

Primary level

Website

<http://authorsandpoets2009.blogspot.com/>

Length of the initiative

Ongoing

Country

Malta and Scotland

Subject areas

Literacy, cross curricular including entrepreneurship and digital literacy

Scope and Scale

Small



Figure 9. The Authors and Poets Blog

Summary

Authors and poets (ongoing) was the January 2010 project of the month on <http://skola.edu.mt/> the official online gateway of Malta's education system, which identifies and rewards good practices in innovation and creativity. The project is the result of collaboration between Dun Gorg Preca Primary School in Hamrun, Malta, and Annanhill Primary School in Kilmarnock, Scotland, and it is part of the e-twinning EU programme. Children from both schools write poems, stories and songs in English, which are then posted on a blog: <http://authorsandpoets2009.blogspot.com/>. The best stories and poems have been published in a book.

This was a small project run by 2 enthusiastic and passionate teachers in 2 different countries. Although its scope was small in relative terms, the project came about thanks to a wider scheme (E-twinning) put in place to facilitate collaboration in innovative and creative projects. Authors and Poets should be seen as an example of how wider networks of support, aided by ICT, can create the systemic and sustainable conditions for creativity and innovation to flourish in specific contexts of practice, provided that individual teachers have the time and the motivation to engage.

Objectives

The project began in November 2009, the two teachers involved had known each other since 2005 and had been involved in a number of other projects before Authors and Poets. This time, they were specifically looking for something different and more creative. The project started as a way to encourage literacy but evolved into a cross-curricular endeavour touching aspects like entrepreneurship, by setting up plans to sell copies of the book containing the best stories, and digital literacy by learning how to use a blog and other technological tools.

How the best practice works

The collaboration between the two teachers was possible thanks to the E-twinning scheme. E-twinning works as a community for schools in Europe, allowing teachers from different countries to register and use web-based collaboration tools to find each other, meet virtually, exchange ideas and practice examples, while engaging in specific projects.

In Scotland, the project also took advantage of a specific initiative within the context of the CfE (Curriculum for Excellence) to foster literacy and creative skills (the "We are Writers!" Scheme⁶), which allowed the stories, songs and poems created during the project to be published in a book, copies of which were sold to raise funds. On the other hand, Malta has a long tradition of fostering creativity and innovation. Malta's involvement in the European Year of Creativity and Innovation in 2009 created a positive momentum for current curricular reforms which emphasise personalisation and innovative uses of ICT.

Tools and resources

As mentioned above, the project relies on a blog as a means of sharing the outcomes produced by the students. The teachers also make use of TwinSpace:⁷ a multilingual tool designed specifically for eTwinning projects, which they use for all communication and project activities. The TwinSpace is also used by the children to contact their partner friends through email.

⁶ We are Writers Scheme at <http://writers.scholastic.co.uk/get-involved?nb=t>

⁷ E-twinning at <http://www.etwinning.net/en/pub/index.htm>

Benefits, creative potential and barriers

The project is as much a creative experience for the pupils as for the teachers involved. However, the most powerful aspect in the project is the fact that the pupils in the two schools take up interchangeable roles as creators and audience, providing a "stage" for each other that extends beyond the boundaries of their classrooms, their school and indeed their countries. This was a great motivating factor and confirms the importance of the more performative and outcome-oriented aspects of creative learning. The project has obvious implications for English literacy, but it is also interesting in the fact that pupils make systematic use of e-whiteboards to access the blog and discuss what has been uploaded.

Best Practice 8 – Republic of Ireland

Project Maths

Age of pupils

Secondary

Website

<http://www.projectmaths.ie/default.asp>

Length of the initiative

2008 - ongoing

Country

Republic of Ireland

Subject areas

Mathematics

Scope and Scale

24 schools – rolled out nationally from September 2010 onwards

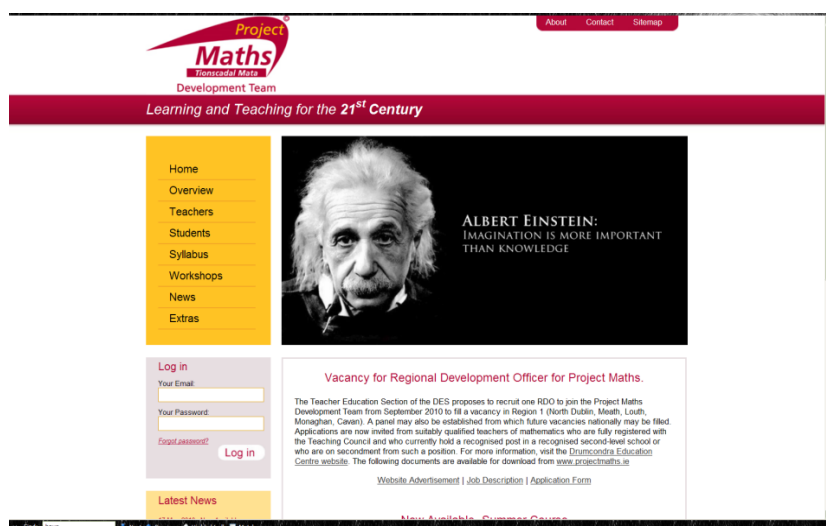


Figure 10. Project Maths Homepage

Summary

This is an initiative led by the Irish NCCA (National Council for Curriculum and Assessment) to provide schools with support and advice on innovation in maths learning. "Project Maths involves the introduction of revised syllabuses [...]. It involves changes to what students learn in mathematics, how they learn it and how they will be assessed".⁸ The initiative began in September 2008, with the start-up of Project Maths in an initial group of 24 schools.

The Irish Department of Education and Science have recently decided to implement Project Maths in all Irish schools from September 2010

⁸ <http://www.projectmaths.ie/default.asp>

onwards. Revised programmes in Mathematics at Junior and Senior cycle⁹ will be introduced on a phased basis in all schools beginning in 2010/11. The initial team was based on a National Coordinator and 6 Regional Development Officers, which has since been expanded to provide support as part of the national roll-out of the programme. The current objective is to provide support to approximately 6,000 Post-Primary teachers of mathematics.

Objectives

Project maths was first established in 2008 to provide support to 24 schools involved in the development and piloting of the new Mathematics curriculum in Ireland. The project builds on national policies and initiatives meant to introduce innovations in teaching and learning in post-primary education. Secondary education in Ireland is based on a junior and a senior cycle, which are reflected in the Project Maths strands to develop a consistent approach. In the junior strands, a more investigative approach is used which extends the experience of mathematics in the primary school. In the senior strands, students' experience of mathematics enables them to develop the knowledge and skills necessary for their future lives as well as for further study in areas that rely on mathematics.

How the best practice works

Project Maths provides lesson plans and guidelines which place great emphasis on student understanding of mathematical concepts, with increased use of contexts and applications that will enable them to relate mathematics to everyday experience. The syllabus is based on 5 strands, each with specific content for Junior and Senior Cycles, namely: 1. Statistics and Probability; 2. Geometry and Trigonometry; 3. Number; 4. Algebra; 5. Functions. The activities and the discussions are meant to help students experience mathematics in a new way, using examples and applications that are meaningful for them, and reformulating mathematical problems in more familiar and personally relevant terms. For example, tackling statistics by exploring questions like: How long will I live? Will I get married? How many children will I have?

Tools and resources

The project offers a range of tools, resources and support to teachers. These include the facilitation of workshops, the development of resources to support both teachers and students, the provision of modular courses in ICT and content and the creation and maintenance of web based support. There are also workshops on using ICT in the different strands. Often, teachers are encouraged to use readily available software to teach geometry, trigonometry and statistics.

⁹ Junior Cycle: the first three years of second-level education. Senior Cycle: last two years of second-level education.

Benefits, creative potential and barriers

Creativity in mathematics is not easy to define and operationalise. Project maths tackles this issue by encouraging teachers and learners to “rephrase” the language of mathematics, often abstract and de-contextualised, in original and creative way. Often this means situating the mathematical meanings in personal contexts to make them easier to comprehend and relate to. Ultimately, the aim of the programme is to help students develop skills in analysing, interpreting and presenting mathematical information; in logical reasoning and argument, and in applying their mathematical knowledge and skills to solve familiar and unfamiliar problems.

Best Practice 9 – Sweden

Swedkid

<i>Age of pupils</i>	13 - 18
<i>Website</i>	Young people's website no longer available. Project website at: http://swedkid.educ.umu.se/index_eng.html
<i>Length of the initiative</i>	2001-2004
<i>Country</i>	Sweden
<i>Subject areas</i>	Cross-curricular aimed at supporting young people in multicultural societies
<i>Scope and Scale</i>	Italy, Spain, England and Sweden involved.

Swedkid



Brief information and background to the Project

The project will develop a Swedish language website which addresses issues of difference, conflict and diversity in today's Sweden. It will include issues such as the treatment of minorities, the position of recent refugees and immigrants, xenophobia, anti-Semitism and linguistic differences.

It will use the advantages of the **Internet** to provide online teaching and learning resources which are freely available to schools and which are interactive and engaging to young people. The main target audience for the website is teenagers.

Department of Mathematics, Technology and Science Education
Umeå University
Postal address: SE-901 87 Umeå, Sweden
Visiting address: University campus
Responsible for the page: Anders.Westberg@educ.umu.se

Last date for control: July 2002

Figure 11. Swedkid homepage

Summary

This project ran from 2001-2004 funded as part of the Comenius EU funded project Eurokid, inspired by the Britkid website established in 1998 (www.britkid.org). As part of a wider research project, a Swedish language website was developed to address issues of difference, conflict and diversity in Sweden. Issues were included such as: the treatment of minorities, the position of recent refugees and immigrants, xenophobia, anti-Semitism and linguistic differences.¹⁰

The project aimed to use the potential of the internet to provide online teaching and learning resources for schools which were interactive and engaging for young people. The main target group were teenagers. The website was designed and developed at Umeå University in Sweden.

The wider research project involved academics who were specialists in multicultural issues within education from Spain, Italy, the UK and Sweden. The project investigated the development of the website as a means of challenging and preventing the emergence of racist and antidemocratic ideas of young people in and out of school. The information on the website suggested that the Eurokid project had received 'small-scale funds' mainly for the exchange of ideas and strategies with a view to encouraging the development of national websites in the countries listed above and later a European wide website.

Objectives

The project was a response to studies showing how minority ethnic pupils and students in Swedish schools often experience racism. In particular, in Sweden, there was concern about the rise of neo-Nazism amongst young people and its spread through the Internet and 'white power' music; and the reported increase of racist incidents in many countries.

How the best practice works

The website tried to support young people growing up in a multicultural Sweden. It aimed to provide a picture of what it was like to be young and different in Sweden - a picture of diverse young people, friends, family, religion, school, and music and the prejudice they experienced in their everyday lives.

Tools and resources

Nine characters from different minority groups talked about their life stories. It was possible to spend time with them, and meet their friends and families around town. The experience included encountering the different situations that they met; and also celebrities talking about their own experiences of racism. The website also provides links to other

¹⁰ See http://swedkid.educ.umu.se/index_eng.html for the research project website, the actual website for young people is no longer active.

websites that could help young people on particular issues. Schools could be involved through:

- young people sharing their experiences;
- trying out texts and their links from the website, for example, in drama and citizenship classes;
- commenting on texts, as different young people may have different views about the language used;
- by trying out and commenting on the website when it was in the process of construction.¹¹

Benefits, creative potential and barriers

The website aimed at young people is no longer available, therefore it is difficult to assess the creative and innovative elements of the project. And clearly this is a barrier to the project in general - that it is no longer running.

Camilla Hällgren (2005) wrote her doctoral thesis based on the Swedkid initiative and this describes the following outcomes:

- the website illuminated and challenged commonsense views of racism and ethnicity in Sweden; there is evidence of the website's success as an intervention at European, national, local and individual levels;
- the case study (an aspect of the wider research project) explored and provided information about racism in Sweden, the formation of identity and ethnicity and how ICT could support antiracist work in classroom settings.

In addition, from the information that has been obtained, it could be argued that one of the key creative aspects of the website was that it sought to share what it was like being part of an ethnic minority in Sweden and also the experience of being racially abused in some way for young people without this experience. Hopefully, this intervention could develop more empathy and better understandings between young people through this innovative ICT use.

¹¹ http://swedkid.educ.umu.se/index_eng.html

Best Practice 10 – United Kingdom – Scotland

Queensferry High School Cross-curricular Project

<i>Age of pupils</i>	12-15 Years (secondary)
<i>Website</i>	http://queensferryhigh.co.uk
<i>Length of the initiative</i>	ongoing
<i>Country</i>	Scotland
<i>Subject areas</i>	Cross-Curricular
<i>Scope and Scale</i>	The example is drawn from one school but this approach is used in a number of schools across the UK in more or less exciting ways.



Figure 12. Kidnapped, Project demonstration. Courtesy, school Website

Summary

This project was initiated by a strong library initiative and the school librarian and supported by the new Head Teacher and team at Queensferry High School. This Scottish comprehensive school with 850 pupils has developed an exciting strategy for engaging students in particular year groups and from different subject areas in a range of projects.

Objectives

The focus is on topics such as literature, history, the environment and civic and political initiatives in the local area. Students work together in groups to develop creative, critical and thoughtful approaches to international, national and local problems, using scientific and mathematical data and/or historical and social events, role play, debate

and performance to highlight their perspectives. These projects run over several months in the spring and summer terms, with the enthusiastic participation of teachers in different departments. They are co-ordinated effectively via the library, which also initiates and makes available a whole range of books and materials. This school serves a wide catchment area, with students from a range of socioeconomic backgrounds and the ways in which the creative curriculum at the school has been adopted have meant that innovation is now part of the aspiration of both teachers and pupils. While these projects fit naturally with Scotland's new curriculum for excellence, they have been ongoing before it was launched.

How the best practice works

In the past three years, members of staff from across the different departments, students in the lower secondary classes and as a coordinator, the school library, have been involved in several major cross-curricular projects.¹² For instance:

- ***Kidnapped*** was a library-based project centring on an adventure novel of that name by Robert Louis Stevenson and fitting in with a city-wide Edinburgh educational initiative 'City of Literature'. Pupils explored history, literature and drama and performed for other members of the school community. This was then showcased by the school.
- ***Rapid Response*** involved teams of six students drawn from across year groups acting together to imagine and respond to a local disaster scenario.
- The current project looks at discourses and ideas about Africa and explores history, colonialism, politics, development, aid, media representation and other key political and social issues.
- ***Our Planet***¹³ forms the exemplary focus of this Best Practice case study. It was a cross-curricular project focusing on media discourses about the environment, sustainable development and climate change and leading students to build both knowledge and debating skills as well as confidence and civic consciousness.

Saliently, although the project – like some of the other projects – did culminate in a showcase day, there was constant input and output from the project in the form of visits (to wind farms or other external venues) or by scientists, politicians or artists to the school; film showings and discussions; models were built by students – for instance in relation to water conservation; in art and literature photographs of working and displaced people by international photographer Salgado were used as stimuli for discussions of labour rights, displacement and sustainability; students wrote and performed rap poems, took their own photographs of the local area, debated the feasibility of nuclear power-supplied energy in

¹² <http://queensferryhigh.co.uk/index.php?viewcategory&id=8>

¹³ <http://queensferryhigh.co.uk/index.php?render&page=27>

their area, discussed and calculated the effects and inputs needed to build bridges in the area or to fly flowers and fruit in from other countries; engaged in physical activity such as cycling to school instead of being dropped off by car and much more.

Tools and resources

The range of tools and resources used for this particular project encompassed all available tools and resources in the school itself, but did not entail any external or extra investment. Outside visitors came to the school on a voluntary basis and students' visits to external locations were kept local and within easy reach.

Computers and internet connections were used to write blogs, mobile phones and digital cameras to take photos of buildings, bridges or rural areas, art materials to paint portraits of endangered species or people at work; calculators to measure and calculate, children used musical instruments, human bodies, paints, cameras, printers and ink, or Power point, paper, pens and blogs to make presentations. In terms of time, the projects since 2008 have been scheduled to coincide with the summer term when the senior students are either on study leave or have left after examinations, thus leaving some teachers with a few lessons release time which can be devoted to the project.

Key creative successes and barriers

During the project the librarian involved teachers from every subject area encouraged their students to collect, analyse and reflect on and then to debate a range of conflicting perspectives available in the media about the issues relating to, for instance, global warming, international politics, sustainable development, local neighbourhoods, migration, flora, fauna, power and energy, work and trade, ecology, architecture, trade and education.

Overall, the students showed both resilience and skills in taking on board, critiquing, evaluating and debating perspectives to which many of them had never been previously exposed. By the end of the project, these perspectives were explored in media such as speech, blogs, paintings, photographs, drawings and charts, graphs and calculations.

The teachers' willingness to give up their precious time ensuing from some classes having left and their enthusiasm were among main enablers of the project's success. Additionally, the organisation, knowledge and enthusiasm of the school's librarian and the support of the new head and management team meant that the work was valued in and of itself, rather than being seen as needing to have a testable outcome. The children's commitment, the extra work they put in at home as well as at school and their willingness to participate for the length of the project made it an overall success. This extra commitment could also be regarded as a

barrier in some schools where parents and students are not convinced of the worth of the cross-curricular work.

Sustainability and scope

One of the key aspects of the project that makes it so accessible to other schools is the way in which it fits into the everyday lives and work of the school, and does not disrupt the curriculum because each teacher continues to teach integrated units in their own lessons. As a result of the project, students' enjoyment and motivation in relation to their learning has been enhanced. Their knowledge of current affairs has improved. Some students have taken independent initiative even following the completion of the project to write letters about the topic to local politicians and to the newspapers. Their civic consciousness has been refreshed and their debating skills challenged. Now, every time a new project starts there is a palpable excitement across the year group involved.

Benefits, creative potential and barriers

The notion of a cross-curricular project is not new. However, the imaginative and sustained manner in which this school implements these cross-curricular projects and the sheer diversity of opinions and activities encompassed drew from the children, their parents and the community new ways of approaching longstanding issues and problems.

Where it would be normal for students to hear only one perspective, and that too in a single subject, this project approach engages them with multiple scientific, moral, social and political perspectives on a key topic in different subjects such as mathematics, science, art, geography, moral education, history, politics, civic education and literature. These all contribute in some way to the totality of the children's growing understanding of global warming and climate change without disrupting their normal lesson.

Teachers of different subjects incorporate the work of the project into their lessons in a holistic and embedded manner so that resources and time are used in an exemplary manner. But more importantly, they use the resources at hand both in terms of the school's environment and in terms of the children's skills to build towards a collaborative conclusion which does not involve formal examinations or assessment but does note the incremental increase in a variety of students' skills, knowledge, understanding and confidence.

3 Conclusions

The good practices in relation to innovative teaching and creative learning embodied in the ten examples provided here are not the only ones we found during our investigation of creativity and innovation. They do, however, exemplify creative and innovative teaching and learning on a small, medium and large-scale, and in time-limited and timeless conditions. Saliiently, they are not all of equal status in relation to national education systems: some remain 'alternatives' to the mainstream curriculum (e.g. the Portuguese digital story-telling and the Scottish cross-curricular initiatives), whereas others (i.e. the Danish Assessment projects and the Open Air Classes) are utilised more holistically by formal educational mechanisms. Nor are we recommending that all good practices should be taken up and implemented simultaneously as some are more appropriate in urban settings and others in rural settings, some are better for younger rather than older students, and all need to be embedded in specific national contexts.

The vision of creativity emerging from these good practice case studies is collaborative and individual, distinctly linked to cross-curricular practices but nevertheless embedded in the skills of specific subjects and disciplines. In the projects discussed, creativity is seen as needing a careful rethink of time-tabling and schedules to leave spaces for play, discussion, experimentation and flow. These processes, in turn, need to be valued as much, if not more as lifelong-learning tools than the end 'products' of creativity within the classrooms. This, in itself, suggests that the teachers, librarians, scientists and authors involved in the best practices see creativity both as something that arises from everyday life and as something which enhances and increases the outcomes of learning.

In all cases, motivation on the part of staff and students is the absolute key to success. And motivation, as suggested by educational experts and stakeholders can be easily destroyed by systemic barriers such as summative testing, unrealistic staff targets and a fact-based, overloaded curriculum. Teachers can also be hindered by a mechanistic dependence on new technology to mediate every learning experience. As these case studies suggest, technology of all kinds from old to new, carefully used and integrated at certain points, in sophisticated and individualised ways, can prove a brilliant friend to innovation and creativity.

The initiatives surveyed here lead us to conclude that most pupils across the vast majority of schools in the European Union are not being offered even the innovative or creative curriculum that is possible with the limited resources available to their schools and local education authorities. Teachers are not being given the physical and mental space, the time or the support to deliver the curriculum in innovative ways. Most assessment

regimes, in most of the EU27, do not even come close to valuing the processes and products of creative learning in formal ways. Given the manner in which time-tabling, imagination, space and everyday materials can be combined by school leaders and teachers to provide students of all age groups and ability levels with sustained, educative and creative learning experiences, the absence of these offers and experiences in secondary and even primary schools in the EU27 is a cause for deep concern.

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Technical Note

Abstract

This report is part of the ICEAC study on Creativity and Innovation in Education and Training in the EU27. It presents 10 Good Practices of creative and innovative teaching and learning from European compulsory education. Each good practice embodies a particular aspect of creative learning and innovative teaching, embracing initiatives which are used as alternatives to the mainstream curriculum to projects which are embedded in formal educational systems.

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