Education on the Cloud 2015

State of the Art

Case Studies

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Abstract: This report documents the state of the art concerning the Cloud in education through 59 case studies gathered in partner countries across Europe. It describes recent activities across Europe in using the Cloud in education. These are initiatives, projects and developments in different countries. The report indicates that there are many examples of Cloud-implementation in Europe, however overall coordination and strategy appears to be lacking.

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Contributors

Apostolopoulou Aikaterini, 3rd Primary School of Agia Paraskevi
Armstrong Niamh, Mary Immaculate College, University of Limerick
Barrix Ken, Scholengroep Brussel
Beránková Tereza, Komunikujeme o.s.
Bosse Ingo, Prof. Dr., TU Dortmund University, School of Rehabilitation Sciences
Buzo Sánchez Isaac & Fernández Lo Faso Daniel, IES San Roque
Christou Elpida, Thales Foundation
Ciaperoni Silvia, Centro Studi ed Iniziative Europeo
Colaiuda Cinzia, Italian Ministry of Education
Cotoara Angela, Professional Foundation
De Lázaro y Torres María Luisa PhD, Otero Javier Álvarez & María del Carmen Mínguez García PhD,
Universidad Complutense de Madrid
De Miguel González Rafael PhD & María José Lozano de San Cleto, Real Sociedad Geográfica
Donert Karl, Innovative Learning Network Ltd.
Doppler Gerhard, bit media e-solutions GmbH
Giuseppe Ursino, Fabio, P.M.F. S.r.l.
González Jesús González María PhD, Universidad de León
Jacob Lorina, Colegiul National Iasi, Romania
Jenal Flurina & Joerger Ladina, Kantonsschule Solothurn
Kanwischer David, Department of Human Geography, Goethe University Frankfurt am Main, Germany
Katsalis Christos, Ministry of Education and Culture (MOEC), Cyprus
Klonari Aikaterina, University of the Aegean
Koutsopoulos Kostis, European Association of Geographers
Kovatcheva Eugenia, State University of Library Studies and Information Technologies
Krevs Marko & Resnic-Planinc Tatjana, University of Ljubljana
Lambrinos Nikos, Aristotle University of Thessaloniki, School of Education, Department of Primary Education
Leonardi Simonetta, Istituto Comprensivo Assisi 3
Meletiou-Mavrotheris Maria, European University Cyprus
Nunes Célia, University of Beira Interior
Panayotou Panayotis, Cardet
Radovan Dalibor PhD, Geodetic Institute of Slovenia, Ljubljana
Ribeiro Cláudia, University of Porto
Šolar PhD Renata, National and University Library, Ljubljana
Sotiriou Chryssanthe, Primalis Dimitris, Kotsanis Yannis, Doukas School
Suls André, Van Dijck Bart & Van Der Veken Danny, KOGeka
Totev Todor, Vyara Foundation
Vercleyen Frank, De Cupere Sofie, Buytaert Jan & Veermersch Jens, GO! Education of the Flemish Community
Vieira Silva Durval & Carvoeiras Luís, Escola Básica de Santa Maria, Beja, Agrupamento nº 1 de Beja
Wołoszyńska-Wiśniewska Elżbieta, UNEP/GRID-Warsaw Centre
Zwartjes Luc, University Gent
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**SUMMARY**

*Education on the Cloud 2015: State of the Art* provides 59 examples of Cloud Computing developments being tested, piloted and implemented in education around Europe. These range from national assessments and reviews, to public and private sector developments. Many of the advantages and benefits of Cloud Computing are illustrated as potential barriers are overcome.

*Education on the Cloud 2015: State of the Art* suggests Cloud Computing can be a key driver for innovation and transformation in learning and teaching. It introduces European policy and its focus on economic development and sustained growth in Europe. This will however only be ensured if measures to develop and widely implement innovative education are encouraged so that relevant Cloud-based skills and the capability to exploit them are developed.

*Education on the Cloud 2015: State of the Art* illustrates how Cloud Computing is being used as a delivery method for IT services. Both teachers and learners are enjoying education benefits. There are a wide range of customised solutions and individual actions, which predominantly appear to be piecemeal rather than coordinated.

*Education on the Cloud 2015: State of the Art* highlights local scale, national and international initiatives. Funded projects support experimentation and development. Private sector developments are common in introducing innovative products and mobile access to information.

The *School on the Cloud: connecting education to the Cloud for digital citizenship* network seeks to address three key questions:

i) How should education respond to the potential of Cloud-based tools and technologies;
ii) What is the impact on education stakeholders, and
iii) What might the situation be like in the future?

To explore these questions, *School on the Cloud: connecting education to the Cloud for digital citizenship* network has 4 working groups:

1) **i-Manager**: Transition from ground to Cloud: infrastructure, mentality, innovation and change.
2) **i-Teacher**: the role of the teacher, teacher training.
3) **i-Learner**: Integrating the Cloud: personalised learning, formal and informal education, special needs.
4) **i-Futures**: Future prospects: visions on open education, interactivity, impact and communicating the Cloud.
European Cloud Computing Strategy

The European Commission promotes the rapid adoption of Cloud Computing in all sectors of the economy in order to boost productivity. In September 2012, the European Commission adopted a strategy for “Unleashing the Potential of Cloud Computing in Europe”. The strategy outlines actions to deliver a net gain of 2.5 million new European jobs, and an annual boost of €160 billion to the European Union GDP (around 1%), by 2020. The strategy is designed to speed up and increase the use of cloud computing across all economic sectors.

Unfortunately, despite the fact that the strategy was developed as a result of an analysis of the overall policy, regulatory and technology landscapes and with a wide consultation with stakeholders, educational perspectives are not included and thus the ways to maximise the potential offered by the Cloud are based on insecure foundations.

In the future, there are many important and urgent additional actions needed to support Education on the Cloud and the second summit meeting of partners will examine some of these.

European Cloud Partnership

The European Cloud Partnership (ECP) has been established as part of the European Cloud Strategy. It brings together industry and the public sector to establish a Digital Single Market for Cloud Computing in Europe. The European Commission gets advice on future policy and strategy from the ECP Steering Board. The goal is to turn Cloud Computing into an engine for sustainable economic growth, innovation and cost-efficient public and private services. Higher efficiency is sought by developing common definitions of requirements, joint procurement and the pooling of public requirements. This could bring higher efficiency and common requirements in different sectors like eHealth, social care, assisted living and eGovernment services. In turn, this would reduce costs and enable interoperability. It is thought that the private sector would also benefit from higher quality services, more competition, rapid standardisation and better interoperability and market opportunities for high-tech SMEs. However, education perspectives are so far not included in their remit, despite their research activities being supported by an initial budget of €10 million under the EU’s Research Programme, which set up the Cloud for Europe project. However, the EU’s Horizon 2020 programme provided €22 million of support for the development of Cloud Computing services in public sector innovation under the 2015 work package.
With a forecasted European ICT skills gap of 15% over the period 2012-2020, encouraging innovative uses of technology for learning and collaboration is vital for ensuring the longer-term economic success in Europe. As a result the European Commission promotes various initiatives aimed at increasing training in digital skills for the workforce and for consumers; modernising education across the EU; harnessing digital technologies for learning and for the recognition and validation of skills; and anticipating and analysing skills needs. Several EU funded projects are described in Education on the Cloud 2015: State of the Art.

A strong digital economy is vital for innovation, growth, jobs and European competitiveness. Educational perspectives are central to these developments. The spread of Cloud Computing is having a massive impact on the labour market and the type of skills needed in the economy and in the society. The types of jobs are changing along with the structure of employment. Increasingly, more skilled ICT professionals are required to support and develop all sectors of the economy. It is estimated that there will be 825 000 unfilled vacancies for ICT professionals by 2020.

The ways we learn need to change. The adoption and growth of online professional and educational communities is necessary. Personalised learning experiences are essential to meet current and future needs. Education must incorporate and support the development of soft skills such as problem solving, collaboration and creativity, and by making learning fun. Participation in modern society requires not only basic digital skills but also access to Cloud-based information and services.

The European Commission confirm that while digital technologies are increasingly part of everyday life, approximately 60% of students never use digital equipment in their classroom (European Schoolnet, http://www.eun.org/c/document_library/get_file?uuid=9be81a75-c868-4558-a777-862ecc8162a4&groupId=43887). It is clear the full potential of Cloud Computing for improving education remains a future vision, however as described by Education on the Cloud 2015: State of the Art, there are signs that exciting local developments are taking place. Educators have been innovative and entrepreneurial. However the European Commission needs to develop policy and supporting much more research and development to make education fit for the future.

In the ICT cluster report “Learning, Innovation and ICT”, Van den Brande, Carlberg & Good (2011) reported on lessons learned through the Lifelong Learning Programme up until 2010. They identified i) digital leadership, ii) placing the learner at the centre; iii) a change of mindset in teacher training and iv) reinforcing the evidence base and research on use and impact of ICT for learning as most important features. Six future actions for the future of learning in Europe were recommended:

1. Leadership and institutional change for a renewed strategy on learning
2. Digital competences and new transversal skills as core life and employability skills
3. Towards a new learning paradigm
4. Professional development – the teacher as learner at the centre
5. Research on learning in a digital society
6. Envisioning the future of learning in a digital society

The working groups organised under the School on the Cloud KA 3 network embrace all these areas and the Education on the Cloud 2015: State of the Art report indicates how many different Cloud-based developments are being piloted in education.

Education on the Cloud 2015: State of the Art presents almost 60 case studies representing the situation in different countries in mid 2015 as researched and presented by School on the Cloud: connecting education to the cloud for digital citizenship project partners.

One of the key shifts is from an IT-centric development to one that targets user needs, provides services as and when required and offers opportunities for personalisation. Systems and platforms have become more accessible, flexible and open. Cloud services have evolved to support email, mapping, storage, photo sharing, collaborative tools, and communication.

Organisations are expressing commitment to students, with BYOD (Bring Your Own Device) systems increasingly in operation on education campuses. The consumer-based technologies like smartphones and
social applications, change expectations from all those involved. The demand for 24/7 access to secure, reliable networks is growing and the Cloud provides the ability to create, deliver, and share content on any number or types of devices, which requires a whole new service model.

The management of education and decision-making approaches are becoming modelled on a participatory culture, where other stakeholders like companies and non-profit organisations transform decision-making about where to allocate resources.

Ever-changing IT environments for learning, teaching and managing are another factor affecting education. New solutions are being developed every day, the infrastructures needed to support them are constantly evolving, and organizations are expected to respond with increasing agility to every new opportunity. Flexibility is important in running many different Cloud services, supporting everything from infrastructure to software applications to collaborative tools.

Major new trends include the development of Massive Open Online Courses (MOOCs) and apps for learning. These are other options in the toolkit, which has the potential to transforms education. Cloud adoption enables education organisations to take advantage of economies of scale by connecting with others.

In a 2012 study, entitled “Cloud in Europe: Uptake, Benefits, Barriers, and Market Estimates” (http://cordis.europa.eu/fp7/ict/ssai/docs/study45-workshop-bradshaw-pres.pdf), IDC surveyed European business users and consumers. Four specific barriers, primarily related to data, were cited by most participants:

1. Legal jurisdiction: Where does the data reside? Where does the data reside?
2. Security and data protection: Who is responsible for security, data protection, and backups? What happens if something goes wrong?
3. Trust: How do I know which services are reliable? Who guarantees data integrity and availability?
4. Data access and portability: Once a contract is signed, how much interoperability will there be?

Customers’ single biggest reason for choosing Cloud services was to lower costs, and providers indicated that providing clear evidence of cost savings is one of their biggest challenges. Service level agreements that provide reassurance over cost-effectiveness and security are needed.

As education moves beyond experiments and trials into more advanced applications, more challenges will be faced. Transitions are likely to become increasingly difficult as the organisations try to move forward.
There are significant policy implications of Cloud Computing in education at institutional, regional, national and international levels. At a local level, the roles of teachers, learners and managers is likely to evolve. Increasingly, staff will have to monitor the rapidly evolving landscape of cloud computing and plan ahead.

The European Commission acknowledges that Europe must become more active in the Cloud. Technologies are forecasted to continue to change, at least in the near future. This is why Cloud Computing will probably continue to be the most dominant IT theme for education. However there are some key barriers which limit uptake. Adoption is slowed by concerns surrounding legal jurisdiction on elements like privacy and specific data regulations on security that must be met.

To make full use of the Cloud, institutions will need to put aside their fears about data security and manage risks by ensuring appropriate arrangements. They will also have to accept that users will be able to by-pass institutional policies over computing provision and develop an environment where applications are subject to rapid upgrades outside the control of the institution.

The ownership of data needs to be clearly established. Educational institutions may re-assign ownership to the user who uploaded the content. In cases where educational materials are being stored in the Cloud, intellectual property rights clearance may have to be carried out.
D. CLOUD CASE STUDIES IN EDUCATION

Austria

CASE 01: E-Books as part of digi4school, Austria

a. Introduction

The Austrian Ministry for Families and Youth announced free e-book versions for school books. Orders can be made for these publications from February 2016.

On June 18, 2015 the Austrian Minister for Family and Youth, Dr. Sophie Karmasin announced the start of “digi4school”. Under this initiative digital versions of school books can be ordered free of charge. The action will start in February 2016.

Each year 8.9 Million school books are ordered for pupils in Austria. The Ministry estimates that in the school year 2016/2017 50% of those books will be digital. The decision is taken at a school by school level. The main aim is that “no pupil leaves school without digital competence”.

Pure digitalization is just the start to support interactive and individual learning, the development of new learning scenarios and teaching methods (key word: flipped classroom) as well as media competence.

b. What is the case study about?

The basis for this ministerial decision lays in more than 10 years ago, already in 2003 the action “SBX” (school book extra) provided first contact to digital add-ons in school context.

As a small company and provider of learning material (ECDL and Entrepreneur’s Skills Certificate e-learning content, e-books, printed books) we do not have insights but see the very nice opportunities.

c. Conclusions

The strategy leads to opportunities for vendors in the sector of teaching and learning material. Smart solutions like integration of (digital) school books, interactive e-learning material and mobile apps (serious educational games) will help to improve learning and understanding.

References

http://www.bmfj.gv.at/ministerin/Aktuelles/Themen/PK-EBooks.html (German)
CASE 02: sCool

a. Introduction

sCool is a project from LearnScape that started in April 2014 and has been tested with 150 children age 7 to 11 in a Primary School in Antwerp. (https://thelearnscape.com/scool, http://www.smartschool.be/)

The initial goal was to educate children on digital social behavior and the use of social apps. Other digital challenges of primary schools where included in the research that has been done together with input experts from GO!, Microsoft and Child Focus.

The project was initiated by Katja Schipperheijn who is a social learning and social media expert with an extensive experience in building learning communities for both educational and corporate environments.

sCool started after Easter holidays in 2014 with two classes involved and kept running over the summer holidays to explore children’s needs for sharing knowledge, experiences and connecting during the Holidays.

In December 2014, four more groups where included. In the initial phase only an ICT coordinator and Care Teacher where involved and in the second phase other teachers where involved to investigate there findings and requirements.

During 2015 other schools where contacted and shown the initial goals and where involved in a sharing community. Workshops on social media use where given to teachers and group discussions with parents where held in informal settings to get feedback from them. The project officially was launched for other schools in April 2015 at TNW2015 in Amsterdam where sCool was nominated and won 7th place out of 150 European tech start-ups and was first placed in Education.

As from September 2015 more schools are involved and sCool is being adapted to teaching and innovation requirements of their need. During this first test year research has been done based on literature (eg. Taccle2, ICT in Primary schools, .. ) and on reports from Europe and projects such as Erasmus+ where GO! is involved.

b. What is the case study about?

Together with GO! and schools in the Netherlands sCool has today 3 main goals of which the first is still the main focus.

1) Social and Digital media literacy
2) Leading innovation in education with children’s needs and individual talent and progress first. More room for project work and collaboration flipped and blended learning.
3) sCool as an integration platform for other digital initiatives schools might have. As today we have integrate with Microsoft 365 for education and explore for schools the need to integrate with Neoscores (digital music class), WizeNoze (safe search engine for primary education), CRM and other tools used for administration.

In September 2015 a new partnership with Thomas Moore was started with the goal to have five students for three years doing research on how a social learning platform can add value to children, teachers and even parents. 5 projects are being analyzed.
- How does a social learning community help new students to integrate? If new students don’t master the language would a multilingual platform help them to learn the language faster and integrate easier?
- What could be an obstacle or barrier for teachers to get involved a using social apps for learning and technology in class?
- What is the attitude of teachers regarded social media such as Facebook?
- Assuming that children like school and come sick to school would the virtual classroom and connection with there friends help to get children involved even when ill and would this have a positive impact on less ill children in schools.
- How are social connections in the virtual school platform different from friends at the school playground? (initial research has shown that, like on Facebook friends are not the same friends as in school and children connect on hobbies, likes, interest)

**c. Some more details**

The first focus was, and still is, education for Digital Social Responsibility for the vulnerable age of children 3 to 11. In almost all press coverage sCool has been named “a learning Facebook” for schools and mandatory learning tool for children to educate them on e-safety and online social behavior.

Together with our partners GO! have made some learning plans and tutorials to introduce e-safety concepts to the children in a fun format that they can explore together or alone without extra work for teachers.

Some examples that have been very successful and are now being implemented in other schools;

**Teacher’s Little Helper**: Every week one kid will help the teacher with the administration of the online agenda. These kids will also have a very important task to read all articles and micro blogs to see if there is any inappropriate behavior or even cyber bulling. This had proven to be a very efficient way to learn children how social behavior is different online. They will ask many times to the caretaker if what they see is in a positive note or can be flagged as inappropriate.

**sCoolPaper**: Being a reporter is fun learning method (Tackle2) . On the platform we have introduced a News Paper where children and teachers can publish their articles, video and photo material in sections like sports, hobby, and many more if they like. If schools want to link this to their websites or teachers want to blog in their own sections parts of the sCoolPaper can made public

**BoekenWiki**: a combination between an online book review site and tool to stimulate reading and making presentations using wiki’s as collaboration tool.
sCool Open Community: Besides the platform a community of teachers and parents and partner organization is created where best practices are shared and questions on STEM, digital learning, social media and sCool related topics can be answered by experts. This has proven to be very successful and has generated ideas for innovation both on sCool but also on teaching methods. The community will officially launch on a new site end 2015 with tutorials for STEM workshops, tips and wiki’s to co-create.

d. Other information

Press:
sCool : un Facebook pour enfant - Interview Katja Schipperheijn @ LeWeb’14
http://www.flanderstoday.eu/innovation/qa-katja-schipperheijn-social-media-learning-site-scool
https://www.vlaamsparlement.be/commissies/commissievergaderingen/991344/verslag/993680

Social Media
https://twitter.com/its_sCool
https://www.facebook.com/scooliscool

e. Conclusions

sCool is an ongoing project initiated by Katja Schipperheijn co-developed with children, teachers, parents and organizations in the field of e-safety, digital education and STEM. Having children involved in every stage is one of the reasons for the success.

sCool is a tool that can be adapted to the specific needs of schools and implemented in stages of priority.

The open community and research by Thomas Moore students is to assure continuous innovation.

References
CASE 03: Smartschool

a. Introduction
Smartschool ([http://www.smartschool.be/](http://www.smartschool.be/)) was invented and developed by Jan Schuer. In 2003, while he was studying to become a teacher, he worked on an electronic learning environment. The Internet was in its early years, and no-one ever heard of the Cloud. His idea was to digitalize documents and connect teachers, students and parents in order to communicate faster and more efficiently. His digital platform is continually evolving, following the needs of schools and teaching. Beside a web app, Smartschool provides mobile Apps for iOS, Android and Windows 10. In the field of educational e-learning platforms Smartschool is the absolute Belgian market leader.

b. What is the case study about?
Smartschool is a digital platform for schools. The web application Smartschool forms the basis of the initiative. It contains over 20 modules that support the educational process. Smartschool is a unique concept because it integrates communication, administration, e-learning, reporting and a student tracking system. Files from students can be transferred from one school to another. The career path of the pupil can thereby be mapped. The newest developments in Smartschool are adapted to recent changes in education. The platform can be adjusted by each school, tailored to the needs they have.

c. Some more details
Over the years Smartschool expanded the number of modules and improved those already existing. Smartschool is active in all levels of education, from kindergarten to adult education. Furthermore, new forms of communication through the Smartschool app are being explored. Smartschool also works closely with the educational guidance service(s). The company and umbrella organisations within the field of education are actively networking in providing in-service training for the different modules of the system. Smartschool accompanies schools that start with the system and gives support where needed.

The purpose of Smartschool is to allow schools to work faster and more efficient through the modules, which allows teachers to concentrate on their pedagogical and didactical duties. By working with these cloud-tool data can be mapped, consulted from different locations and parents are actively involved and stay up-to-date, a smoother cooperation is possible ... In short, everything that provides the pupil with better education.

d. Other information
GO! has a Smartschool coordinator, who supports schools in their daily operation with Smartschool, both in technical and pedagogical areas. Smartschool is at this moment only available for Belgian schools.

e. Conclusions
Technology can change education. Software is the foundation for major projects. The right tools in schools can mean a world of difference. They provide people the possibility to communicate on every single moment of the day and give special talents more chances. Within GO! Smartschool is used in about 70% of all primary schools and in 99% of GO! secondary schools. Smartschool is also the market leader for the other educational networks.
CASE 04: Learning with or despite computers?

a. Introduction

The OECD study on computer use in education, edited September 15, 2015 (Students, Computers and Learning: Making the Connection) rightly did not stay unnoticed. In the popular media, conclusions such as ‘Pupils using computers most have the worst results’ and ‘Schools wasting money on computers for kids’ were drawn. This case study looks at how KOGEKA connects learning, technology and 21st century skills.

By reading the text however, one finds out that the writers of the report consider the elaborate digitisation of our society, as a topic education should respond to. To handle the abundance of information that is readily available on the Internet, a number of specific skills are presumed in the fields of reading, writing and finding ones way in digitally presented texts, without even considering the dangers connected to the use of the internet like cyberbullying, against which we have to reinforce our youngsters. Is this compensated for enough by the obvious benefits of ICT use in the classroom?

OECD summarizes its study like this: ‘Are there computers in the classroom? Does it matter? Students, Computers and Learning: Making the Connection examines how students’ access to and use of information and communication technology (ICT) devices has evolved in recent years, and explores how education systems and schools are integrating ICT into students’ learning experiences. Based on results from PISA 2012, the report discusses differences in access to and use of ICT – what are collectively known as the ‘digital divide’ – that are related to students’ socio-economic status, gender, geographic location, and the school a child attends. The report highlights the importance of bolstering students’ ability to navigate through digital texts. It also examines the relationship among computer access in schools, computer use in classrooms, and performance in the PISA assessment. As the report makes clear, all students first need to be equipped with basic literacy and numeracy skills so that they can participate fully in the hyper-connected, digitised societies of the 21st century.’

Of course, in essence, the mere presence of computers at school makes the pupils no better learners. If there’s one clear conclusion to be drawn out of this OECD study, it’s this: the key to success is the teacher. If he makes use of ICT in an appropriate way, a strong lesson will even get better. However, ICT is no wonder drug with which any learning situation can be turned into a powerful learning environment. That’s a question of didactics rather than technology.

We explain KOGEKA’s point of view on this. KOGEKA is a group of schools in Geel and Kasterlee, two neighbouring municipalities in the north of Belgium (4750 pupils, 6 secondary schools, 1 primary school). We belong to the believers when it comes to ICT use in the classroom, but we think it’s important to explain why and how.

b. What is the case study about?

It all started with a dream, the dream of a group of headmasters. In
September 2014, the dream awakened: KOGEKA launched the pedagogical concept ‘LED-leren’ (LED learning), in which LED stands for ‘Levensecht’ (lifelike), ‘Eigentijds’ (contemporary) and ‘Duurzaam’ (sustainable). In all our classes in secondary education (age 12-18), whatever the age of the pupils, in general as well as in technical and vocational education, we promote lifelike, contemporary and sustainable learning. We believe this concept is offering an answer to a number of societal evolutions, coupled with some challenges education is confronted with nowadays.

These societal evolutions are:

1. ‘Glokalisation’: while society is globalising already for many years, breaking down borders and connecting people from all over the world, in recent years people start a search for the identity of their country, their region, their city or village.
2. Individualisation: the times of an ‘industrial’ approach to education with large groups of pupils, all equally taught, have gone. Society nowadays expects a personalised approach to education.
3. Digitisation: we are living in a knowledge driven society, with an ever-expanding amount of readily and freely available information thanks to computers and the Internet.

These developments place question marks concerning the ultimate goals of education. We believe nowadays these are the main goals:

1. Self-development: every child has the right to become the best version of his own.
2. Learning to cope with the other: school remains the place where youngsters get in touch with a diversity of opinions, customs, religions, cultures, physical characteristics etc... Therefore, a lot of social skills must be developed.
3. Preparation for participation in society: this includes the duality between a holistic approach, taking care of a broad education preparing for an independent life in general, and a utility driven approach, preparing youngsters for a specific study in higher education or for a well-defined job at the labour market.
4. Balance between individual and societal expectations.

To us, ‘lifelike learning’ means that in all lessons, we make visible the relevance of the subjects for the pupils’ everyday life. Lessons, projects and school activities connect as much as possible with the social environment and the experiences of our pupils. When possible, we learn and practise ‘in reality’, rather than in the classroom.

We realise that information really has become available anywhere, anytime and that this fact is radically changing the teacher’s role. He/she no longer is the only source of knowledge, but the reliable guide who can pilot the pupils through the exploding knowledge supply. Computers, tablets and smartphones are the devices this knowledge comes available with and can be made clear.

Contemporary learning means that we pay attention to 21st century skills (collaborating, digital literacy, creativity, problem solving, communication, critical thinking, socio-cultural skills) in our lessons and projects. To realise this, we make use of a kind of blended learning, a mix of didactic procedures, whether they are supported by technology or not, to enhance the commitment of our pupils and to stimulate them to become the first responsible person for their own learning process.

Sustainable learning can be defined as ‘learning with profundity’. Pupils assess their own competences and get useful feedback from the teacher, who is acting as a coach. Pupils start to reflect on their own learning process, get to know what their talents are and the chance to develop them. In this way, education is becoming custom fit more and more, tailored to the individuality of each pupil.

In this process of careful monitoring and guiding the pupils, the personality of the teacher is of priceless importance. Technology can play, at most, a supportive, although not unimportant, role.

At KOGEKA, we are convinced that a strong didactic-pedagogical vision must form the basis of ICT use in the classroom. Therefore, from the start of the LED learning project, a lot of attention has been paid to the in-service training of our teachers, in the field of ICT as well as in the field of didactics.

We soon discovered a big diversity in the level of ICT skills, among teachers as well as pupils. Therefore, in this school year (2015), each KOGEKA school has introduced its own ‘IT coaches’. These are pupils who are given short training courses so they can support pupils and teachers in the use of ICT. We noticed a great
readiness among our pupils to collaborate in this project and, thus, to contribute to realising 21st century education.

By offering a powerful learning environment we want to deliver competent youngsters to higher education and to the labour market. Computers, tablets and smartphones offer a myriad of possibilities to create such powerful learning environments, but they are only a device and should not be seen as a goal. So we decided to aim to use all available devices!

Up to now this has been our dream. Now it is becoming reality.

A deputy headmaster was appointed as ‘LED coordinator’ for the group of schools. Each school has one or more ‘LED supporters’. An action plan was elaborated, teacher training sessions were organised, LED projects were initialised, LED lessons were developed, e.g. on STEM (Science, Technology, Engineering, Mathematics). The previous school year (the first one for this initiative 2014/5) was focused on ‘lifelike learning’, which often meant we had to find appropriate answers to the question ‘How can I use freely available information with pedagogical added value?’

This school year (2015/6) the initiative has deviated a bit from ICT, concentrating on contemporary learning by focussing on the 21st century skills. For the next school year (2016/7), sustainable learning will be the main topic.

The LED learning project has turned out to be a challenging, yet rewarding journey into educational innovation and it certainly keeps this status, but meanwhile we also discovered the limitations of our ICT network (in between dreams and actions stands laws and practical obstacles).

This ICT network was build over the years with limited resources. Originally, its structure was different from school to school and it was enlarged time and time again according to the needs of the day. But it has turned out not to meet the needs of the 21st century, which should offer the possibility to access the Internet anywhere, anytime for anyone. It was far too slow, at best.

c. Some more details

If we want to evolve to an IT policy of bring your own device (BYOD) – pupils and teachers can use their own laptop, tablet or smartphone at school for their lessons if they want to, and that is exactly what we want to evolve to, we will need a powerful wireless network in all the school premises. To realise this, our ICT coordinators gradually came to the conclusion that we no longer can enlarge the existing network, but we need a whole new one. Therefore, they elaborated an ICT masterplan, in which the structure of the ICT network is similar in each school.

For each component, the following questions were asked:
1. Can we upgrade the present one or do we need a new one?
2. What’s the price?
3. Can we install this on our own or do we have to engage externals?
4. Can we manage this on our won or do we have to engage externals?
5. Is it safe?

The components we were talking about are the following:
1. Servers;
2. Computers for specific applications;
3. Network wiring: copper or optical fibre;
4. Network infrastructure: new generation switches;
5. Internet access: copper or optical fibre;
7. Wireless network: choice of access points.

d. Other information

We will finalise this ICT masterplan in three years (2016-2018), simultaneously in all our schools, through the following steps:
1. Internet access: for a fast connection to the outside (digital) world, we count on an optical fibre ring between our schools, making use of an optical fibre owned by the municipality of Geel.

2. Installing new firewalls for security against attacks from outside, but also from within (BYOD – *man in the middle*).

3. Network wiring and infrastructure.

4. Wireless network: access points covering all school premises.

5. BYOD: active promotion to use your own device for school work (within the limits of a BYOD school policy).

6. Reduction of the number of computers provided by the school, since for general use, most pupils and teachers use their own device.

e. Conclusions

This is an ambitious plan, and an expensive one, but we are convinced to execute it, because in fact, there’s no alternative for a group of schools wanting to stay relevant in the 21st century.

References

Danny Van der Veken, coordinating headmaster of KOGeka, with the collaboration of Bart Van Dijck, LED coordinator (KOGeka), André Suls, ICT coordinator (KOGeka)
CASE 05: iPad school Sint-Pieters – Sint-Jozef Blankenberge.

a. Introduction
In 2012 Sint-Pieterscollege Blankenberge was the first school in Flanders to start working in the Cloud through the use of iPads. For this school, innovation was and remains a priority. The school was among the first in Flanders to implement teaching and administration using computers.

The introduction of tablets is a logical continuation of this vision. The school resolutely opted for tablets because it is motivating for learners. Students are challenged to participate actively and independently with the subject, differentiation is a fact as students can choose specific learning paths at their own pace. As an extra, the weight of the school bag has been reduced, and the costs for taking photocopies has diminished by 66 %.

b. What is the case study about?
The case study illustrates how one school is trying to change the educational approach by choosing a new and innovative teaching tools, together with the integrated use of Cloud Computing. This is not only in the lessons, but also concerns the tasks and tests that are being completed on the Cloud.

For teachers this meant a complete transformation of their teaching methods:
- all material must be transferred through the Cloud
- tests and tasks are saved and marked in the Cloud
- teachers are becoming more tutors in the learning process of the youngsters
- communications between students and teachers as well as teachers and parents is done through the Cloud.

c. Some more details
The introduction of iPads in the class started in the 2011-2012 school year as a small project, the next school year it was introduced as an obligatory action across the whole school. To facilitate this, pupils could lease an iPad, or buy an iPad. The fear that the price would be a barrier proved not to be correct.

For the teachers the impact was probably bigger. They were forced to use the iPad in as many ways as possible, excluding as much as possible other (mostly printed) resources.

The outcomes show that the transition from traditional to cloud-based learning using tablets – although very abrupt – has been rather successful:
- pupils like the new ways and possibilities the tablets offer
- pupils and teachers are encouraged the explore new ways of using the tablet
- the digital literacy rate of the youngsters and teachers has grown seriously.

d. Other information
To help the implementation of the tablets training sessions for the teachers were organized with the help of Apple (Apple Distinguished Educators). Also a special website was made on the school platform.

To inform the outside world of the vision and implementation of iPads, the school has already organized three yearly conferences: Radicaal Digitaal (Radical digital) where the give a showcase of the way teaching is possible using iPads.

e. Conclusions
The case study illustrates the introduction of tablets – in this case iPads – in the classroom as teaching tool. Although there are still some problems (e.g. publishers don’t have appropriate school ebooks) it shows that tablets can be useful in introducing cloud computing in education.

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Articles
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CASE 06: Cooperative learning

a. Introduction


The Arteveldhogeschool conducts project-based scientific research. Two years ago (01/09/2013 – 31/08/2014) a study was done within the Faculty of Education about ICT (Cloud Computing) and cooperative learning. The target group were pupils in the fifth and sixth year of primary education (students of 10-12 years of age). Several Flemish primary schools participated. The study was led by three college employees.

2b. What is the case study about?

In each school the college employees and the teachers involved elaborated one case. Each case consisted of an initial situation, a teaching concept and an evaluation. Based on the cases and relevant literature study the added value of cloud computing was examined in cooperative learning. It is called “cooperative learning 2.0” and plays an important role on three levels:

1. It contributes to work on affective goals and social skills such as compromises and deliberation.
2. It gives the opportunity for quick feedback and securing learning situations so on a meta cognitive level other learning objectives can be achieved.
3. The use of media gives meaning to the learning and therefor the learning effect increased.

c. Some more details

In the current education the learning product has more importance than the learning process. As a result teachers do not experience the need to deploy Cloud-based tools that facilitate cooperative learning. Therefore opportunities are missed to achieve goals and to develop competences through process evaluation. This position has to be permeated by looking at the learning process as a form of the learning product.

Although the learning process can’t be something artificial, it is of great importance that it can be supported in a digital context at all times. ICT integration is much more than “another didactical instrument”. It is also a process where teachers are given time and resources to match cooperative learning, digital media and learning content. Thereby innovations can be tried out along with the students and teachers can develop knowledge and skills at the same time. It is the best way to professionalize a team.

What can help is a presentation of tools that inspire teachers and motivate students and the presence of an ICT coordinator who has the necessary competences to support the teachers in a pedagogical-didactical way as well.

d. Other information

The results of the study were compared in secondary schools. It was noticed that to a large part many of the conclusions are the same. Considering the age, the students are further in their competences and they can use more complex applications.
e. Conclusions
Sustainable implementation of ICT integration requires sustainable forms of professionalization. This is not an individual matter, but a team effort. The methodology that applies is “Teacher Design Teams”. It means that a group of teachers have to (re)design materials bound to the curriculum and focusses on the integration of ICT tools.


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Projectvoorstel Coöperatief leren en Cloud computing
CASE 07: Managing integrated cloud technologies

a. Introduction

This case study considers the University of National and World Economy (UNWE) already managing integrated Cloud technologies http://www.unwe.bg/en/

It was started in Autumn 2014 for period of 4 years and includes 20 000 licenses of Office 365 ProPlus for all students of the university like a part of platform Office 365 Education. Currently UNWE has 50,000 active accounts in Microsoft Cloud.

Management of UNWE in cooperation with Microsoft made a present to the students and the teachers on the eve of the student holidays. This gift was provided in the form tools with which to develop his spiritual level to become too knowledgeable and capable, which make you unique in the region.

b. What is the case study about?

Office 365 University represents a four-year subscription, designed to assist eligible students to cope with their tasks from virtually anywhere and on any device. Through its new policy, Microsoft provides the ability to work from any device, ie we do not currently work only on Microsoft operating systems, but also on Android, iOS and others. This facilitates operation and increases the choice of each student and employee in UNWE.

c. Some more detail

In the project any license for Office 365 ProPlus can be installed on up to 5 devices. This 5 different devices that are loaded for one person and by 20 000 license, we can load 100 000 devices to students and teachers - and it practically happens this year. 100 000 devices with 9 products included in the package - Word, Excel, PowerPoint, Outlook, OneNote, Publisher, Lync, Access, infoPath, becoming 900,000 free product.

Licenses are available through the program of Microsoft Student Advantage, which is open to all universities.

d. Conclusions

Participation in this project gives greater freedom for students and teachers to work on various joint projects from anywhere and on any device. This will facilitate their joint work and accelerate the processes of implementation of tasks. One big advantage is that it provides access to cloud technology completely free for the students.

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CASE 08: VivaCognita

a. Introduction

The idea of VivaCognita (http://vivacognita.org/) was born in 2012 at the Institute of Mathematics and Informatics at the Bulgarian Academy of Science (IMI). At the beginning of 2014 IMI started a joint project with Vivacom – telecommunication company, and Union of the Bulgarian Mathematician. Any organization with clear plans how to add value to the project can also be included as a partner.

b. What is the case study about?

The result of this project will be a Web-based knowledge sharing and knowledge building platform with a free and open access for anyone interested in mathematics, computer science or IT.

VivaCognita is a virtual community for exchanging knowledge, opinions, sports, fun, race, helping those who are entering into the endlessly fascinating world of science and technology, and encourage those who have ideas how to change the world and make it better.

The portal VivaCognita is developed as a platform for providing materials and activity as the Theme of the Month and supporting the online competitions.

c. Some more detail

The Theme of the Month appeared initially as a tool to help students and their teachers in the preparation for the competition Mathematics with Computer. It gradually acquired however self-importance, even as a didactic concept. Each Theme of the Month consists of five tasks, united by a common mathematical idea and arranged in the direction of increasing difficulty. The Theme is published in the beginning of the month
on the project portal Vivacognita and contains an invitation to students to solve the problems and send responses (online) by the end of the month. Some of the problems are accompanied by auxiliary GEOGEBRA-files, which allow the students to explore the mathematical problem, to find suitable properties, to try out different strategies and find (usually approximate but sufficiently accurate) answer.

To solve more difficult problems from the Theme, the students have to adapt the auxiliary files from previous problems or to develop their own files for testing and solving the problem. The students can submit together with the answers of the problems also these modified or newly created files. Thus the participating students develop programming skills and algorithmic thinking. Their digital competence significantly exceeds that of the traditional passive users of information technology. The mathematical knowledge gained in the process of solving the Theme problems is deeply rooted in the mind because it is based on own research and observations of mathematical facts and phenomena. In addition, students deepen their understanding of the importance of mathematics and particularly of Mathematics with computer.

d. Other information

Due to the fast dynamics of emerging e-learning solutions the main priority of the Vivacognita development team was to quickly achieve a minimum value product (MVP) – a version of the product that has enough functionality to be used by all interested parties. The functionalities of MVP were supposed to be further expanded using a project approach.

Under these circumstances we considered that our development activities have to evolve around the following three main principles:

- Building on small iterations, constantly increasing the value of the system;
- Reusing ready or modified components wherever we can;
- Actively involving the community;

The project partners agreed upon a road map for 2014 which included organization of two online competitions, several contests and community games.

At this point there was enough data to build functional and performance requirements for MVP. Functional requirements were provided in the form of high level user stories.

All functionalities can be found in existing virtual community building frameworks or e-learning frameworks so we made a market research and identified 37 products that claimed they have at least one of the features that we needed. This list was revised over 6 criteria for stability and maturity – post sales support, active community, presales support, number of implementations, number of users, available documentation and as a result of expert judgment 14 products were shortlisted and received numerical assessment on each functional requirement.

e. Conclusions

The virtual community VivaCognita provokes the students to work outside the classroom in mathematics, computer science or IT. The high-level experts create the challenges (Theme of the Month, competitions).

The VivaCognita is a platform accessible by everyone and could be supportive instrument for the teachers. It is oriented to the Bulgarian audience (It is on Bulgarian language only).

References

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George Gachev: A system for online assessment of mathematical knowledge

CASE 09: Virtual Math Class

a. Introduction

The Virtual Math Class (http://www.math.bas.bg/omi/cabinet/) is based on an FP7 Project Fibonacci - Disseminating Inquiry-Based Science and Mathematics Education in Europe (2010 - 2013) from the Institute of Mathematics and Informatics – Bulgarian Academy of Science (IMI).

b. What is the case study about?

The major objective of the project is to promote and disseminate the inquiry-based approach in mathematics and science education. The existing institutions with significant experience in this type of education will support the establishment and strengthening of similar centres that in turn will assist the establishment of new such centres. By applying this procedure repeatedly, the number of such centres will grow similarly to the Fibonacci sequence and hence the name of the project.

c. Some more detail

Members of IMI create the dynamic resources (in ggb and html format) for supporting an inquiry-based approach in mathematics and science education.

The materials are structured in 16 sections starting from preschool education. There are sections and for art, games, puzzles, numbers, statistic, geometry and so on.

d. Conclusion

Very useful tools can be found in the Virtual Math Class. The students from any level can use them when discovered and learn from them. They can discover beauty in mathematics and mathematics in the beautiful.

It is only in the Bulgarian language but the use of dynamic elements does not depend on the language.
CASE 10: Living Schools Lab

a. Introduction

The “Living Schools Lab” (http://tinyurl.com/o6kvxvp) started in October 2012. It was a two-year project (ended in September 2014) and it was co-funded by the European Commission under the 7th Framework Programme of the European Commission.

The project promoted a whole-school approach to ICT use, scaling up best practices in the use of ICT between schools with various levels of technological proficiency. In this context, the participant schools published on line, monthly articles focusing on the ways to enhance their teaching and learning through integrating use of technology into their classroom practice.

In the project’s framework, several observation visits took place in order for the participant schools to present their practices in the use of ICT tools as across the schools.

On 16-18 May 2014, a three-day Living Schools Lab Summer School was organised in Dublin. Over 130 teachers, project partners and students took part in the event to consolidate and reflect on the results of the project and plan for future activities.

European Schoolnet – EUN (http://www.eun.org/), based in Brussels, coordinated the project. “Living Schools Lab” a Coordination Action involving 14 partners from 13 countries. What is interesting, is the fact that 12 Ministries of Education (MoE) are represented in the project, either directly or via nominating a national ICT agency or other organisation to act on their behalf. More specifically, the project’s partners are the following:

- University of Wolverhampton (UoW) – United Kingdom
- Dublin West Education Centre (DWEC) – Ireland
- Centre National de Documentation Pédagogique (CNDP) – France
- Istituto Nazionale di Documentazione, Innovazione e Ricerca Educativa (INDIRE) – Italy
- Centre of Information Technologies in Education (ITC) – Lithuania
- Direçao-Geral da Educação (DGE) – Portugal
- National Foundation for Educational Research (NFER) – United Kingdom
- Ministry of Education and Culture (MOEC) – Cyprus
- Centre for International Services / Dům zahraničních služeb (DZS) – Czech Republic
- Bundesministerium für Unterricht, Kunst und Kultur (BMUKK) – Austria
- GO! Onderwijs van de Vlaamse Gemeenschap (GO!) – Belgium
- Department of Education and Skills (DES) – Ireland
- Norwegian Centre for ICT in Education (NCIE) – Norway
- The Finnish National Board of Education (FNBE) – Finland

Now the project is under the wider umbrella of the European Schoolnet Future Classroom Lab initiative (FCL). (http://fcl.eun.org/fcl-network-labs).

b. What is the case study about?

“Living School Lab” has primarily focused on the identification of highly innovative pedagogical practices around a whole school approach to ICT, and then on demonstrating, sharing and validating those practices in order to enhance teaching methods and procedures. More specifically, the project aimed the creation of the following:
• A sustainable, growing network of primary and secondary schools, based around regional clusters that showcase and share best practice and ways to successfully embed the use of technology in teaching and learning (T&L) across the whole school.

• A strong community of practice, with supporting continuous professional development opportunities for teachers.

• Opportunities for schools to get involved in action-based research, creating links with outside partners including industry and other pan-European projects.

Through various dissemination practices, the participants managed to attribute high visibility on the project’s inputs. The project particularly helped the schools’ staff in order to rethink learning and teaching strategies involving ICT tools. This lead to the development of a teachers network, with access to continuous professional development.

c. Provide some more detail

One of the main outcomes of the project was the creation “Regional hubs: a network of living schools”. These are clusters for sharing good practices, and providing opportunities for closer mentoring and collaboration between the schools.

d. Other information

A range of resources including research, best practices, articles, meetings, workshops, presentations, as well as a project’s videos are all available. The articles have been gathered. All the project’s objectives and inputs were targeted disseminated to relevant stakeholders through the use of an online platform as well as social networks. In addition, LSL network schools have been encouraged to stay engaged by linking together various networks at pan-European level and national/regional level by promoting the value of collaboration with peers through linked networks.

e. Conclusions

The Living Schools Lab has enabled the establishment of a network of schools for scaling up best practices and supporting action-based research in education.
CASE 11: Grammar School Nicosia – Microsoft IT Academy Programme

a. Introduction

The Grammar School is the first school in the Nicosia District to become a Microsoft Office testing center under the Microsoft IT Academy Program (http://www.grammarschool.ac.cy/) e-Learning (training materials). Students have the opportunity to take the Microsoft Office Specialist (MOS) examination. MOS is a globally recognized qualification and the leading IT certificate in the world. More than 1 million MOS exams are taken every year in over 140 countries.

The school joined an exclusive community of 150 premier schools from around the world, recognized to celebrate their truly pioneering efforts and innovation in rethinking teaching, learning and assessment in order to drive deep 21st century competencies.

b. What is the case study about?

By joining the Microsoft IT Academy (ITA) program, schools will get a full curriculum for teaching technology courses and learning tools that help students achieve success.

ITA enables schools to offer training not only on fundamental technology skills, but also technical courses for students, faculty and staff who are interested in pursuing a career in IT after graduation.

IT Academy is transforming the school’s learning environment to deliver more personalized education to students, using mobile and cloud technology to better prepare students for success in the workplace.

c. Some more detail

Microsoft IT Academy delivers a complete learning and teaching framework developed specifically for use in an academic setting. It bridges the skills gap by providing the curriculum, the training ground and the validation of skills that college and career bound students need to be successful.

ITA helps students learn to be productive using Microsoft Office and other software tools for a wide range of jobs and other life pursuits. It prepares students for college and career roles in software and app development and provides the core technical skills required to build a sustainable technology career managing infrastructure for cloud, clients, devices databases, and Office 365.

It promotes online learning that helps educators integrate Information and Communications Technology (ICT) into their practice and provides unlimited access for more than 400 courses.

d. Conclusions

Microsoft IT Academy is a Cloud tool that will transform the learning environment in the school classrooms. It helps for better development of educators and students. ITA provides a method for teaching personalization and ease of access to various sources helpful for more than 400 courses. The tool is great for developing, mainly technical skills to students that are willing to follow a career path in jobs in ICT related field and better prepare them for their college/university student life.

References

https://www.youtube.com/watch?v=GzyE4jkqTf8
CASE 12: ALPHABETS OF EUROPE

a. Introduction

The innovative aspect of AlphaEU is that active and creative language learning is channelled through digital media that encourage children to approach European languages and alphabets in a comparative manner.

The AlphaEU digital books and activities were implemented with 10 kindergarten teachers and teacher assistants and 10 parents of children aged 2-6 in Cyprus, most of whom had participated in the Adult mediators’ training, in June through August 2014 (http://www.alphaeu.org/images/case_study/D20_Case_study_Cyprus_english.pdf).

The project encourages involvement of family members in supporting language learning. The digital alphabet books and activities will be implemented with pre-school children in all participating countries. The AlphaEU project is expected to have a positive impact on pre-primary language education across the EU.

b. What is the case study about?

The case study illustrates how The Alphabets of Europe (AlphaEU) project seeks to promote the acquisition of multilingual awareness, faster language learning and language skills of pre-schoolers in various European countries, including Cyprus, by developing, piloting and implementing digital alphabet books and alphabet-related games and interactive activities.

The implementation of AlphaEU project shows the importance of ICT in education as well as the supportive role of technology in the learning process. Technology is the new way of teaching in the classroom which is close to new generation students. Generally children are familiar with technology and they are computer literate. This plays a significant role during the implementation phase.

Moreover, the integration of digital alphabet books helps the teachers to prepare and present a creative and interesting lesson, which can draw the attention of their students more easily. As a consequence, the students are able to absorb new knowledge easily and effectively.

c. Provide some more detail

“Heidi Land” kindergarten participated in the implementation of the digital alphabet books. Heidi Land is a private pre-primary school which was established in 2000. It is located in Strovolos, in Nicosia. The implementation of the program took place in three pre-primary classes and both boys and girls attended the classes.

During the implementation digital alphabet books were integrated into the teachers’ lesson and curriculum. In addition, some parents also used the digital alphabet books with their children at home. The teachers were focused on teaching the letters of Greek alphabet to their students and to help them to recognize each letter and the words starting from the specific letter.

Students were extremely satisfied with the program in general and the use of digital alphabet books. The age of the students who participated in the implementation (3 – 5 years old) played a significant role during the implementation because the students were able to understand the activities and to use the computer. Both the integration of digital alphabet books into the classroom’s curriculum and the implementation at home were very successful and had a positive impact on children, teachers and parents who participated in the program alphabet books and the activities. Generally, children learned while having fun and they enjoyed both the lesson and the activities.

d. Other information
AlphaEU uses digital media (ICT-supported image, sound, video, animation, hypertext, etc.) to enhance interactivity, stimulate curiosity, and encourage children to explore differences and similarities between languages and begin to formulate general ideas about how languages work.

e. Conclusions

The case study illustrates the potential of digital activities and digital alphabet books to help the teachers create more interesting lessons to motivate the children absorb new knowledge in an easier and more effective way. The results of the implementation were very positive, showing that children can learn using digital media.

References

CARDET. (2014). *D19: Implementation Reports (Cyprus)*
CASE 13: Providing Tools to Enable Next-generation Learning in Higher Education

a. Introduction

Dr. Despo Ktoridou (an Associate Professor of Management Information Systems (MIS) at the University of Nicosia) and her research collaborators have for several years (since 2010) been investigating the integration of cloud computing in higher education. The case study is Providing Tools to Enable Next-generation Learning in Higher Education (University of Nicosia, Cyprus).

b. What is the case study about?

Using a case study approach, the researchers have conducted several studies exploiting the affordances of cloud computing tools (e.g., communication, collaboration, authoring) for pedagogical facilitation of learning activities in undergraduate MIS courses.

c. Some more detail

In “Community of Inquiry Developed through Cloud Computing for MIS Courses”, Eteokleous and Ktoridou (2012) investigated the implementation of inquiry-based learning and the development of community of inquiry (CoI) through Google Applications. Their study provides evidence on how a cloud learning community can be developed through the three presences of CoI: Teaching Presence (TP), Social Presence (SP) and Cognitive Presence (CP).

In “Google’s Applications for Undergraduate University Courses: Tools for Sharing, Communication, and Collaboration”, Ktoridou, Eteokleous, and Dionysiou (2013), describe a study conducted in three undergraduate courses in which they used cloud computing (Google applications), to enable students and faculty to communicate and collaborate. The primary conclusion is that Google applications facilitated the development of a student-centered learning environment that enhanced motivation and responsibility towards learning, built student-teacher relationships, and promoted the development of critical thinking and problem solving skills.

In “Cloud Computing: Providing Tools to Enable Next-generation Case-Based Learning in Undergraduate MIS Courses”, Ktoridou, Eteokleous, and Dionysiou (2012) examined the deployment of cloud computing for pedagogical facilitation of case-based learning (CBL) activities. Students’ and lecturers’ perceptions regarding the practices of CBL in a cloud environment were explored in terms of teaching process design, facilitation, and cloud technology tools and services. Results indicate that the use of cloud computing communication and authoring tools for pedagogical facilitation of CBL activities, leveraged learning through giving students the opportunity to interact and collaborate in diversified ways.

In “Interdisciplinary Problem-Based Learning Practices in Higher Education”, Ktoridou (2015) utilized cloud technology (Google Apps) to promote Interdisciplinary Problem-Based Learning (IPBL), through the provision of contextualized, complex, open-ended, authentic problem sets and innovative projects presented to students individually and/or in groups for investigation.

d. Conclusions

The above-mentioned case studies illustrate how effective integration of Cloud Computing in higher education can facilitate, enhance, and enrich the quality of instruction through the employment of communication, collaboration and sharing tools and resources that make learning more accessible, personalized and flexible for students everywhere.
References


CASE 14: Cloud Computing in education in the Czech Republic

a. Introduction

Not much has been written about Cloud Computing in the Czech Republic. Articles speak about its use in education, but not focused on its use in vocational education, thus ignoring the use of cloud storage and online office suites, such as processing and storage of measurement reports online in Czech Republic.

With the process of informatic technology is very important to monitor new trends. A lot of schools are fighting with the lack of money and it is difficult for them to buy new technologies. To buy new hardware and software is an expensive investment that the schools are not able to afford.

One solution how to reduce the investment costs is to maximise the effectiveness of ICT by using Cloud Computing. Then you can ensure superior education without the huge investment to the expensive software applications.

b. What is the case study about?

This case study is about Cloud computing implementation in Czech Republic in general and about iTřída – e-learning tool for Czech Elementary schools.

c. Some more detail

Cloud computing allows practical use of ICT and access to information practically anywhere, where you have Wi-Fi, regardless school, class, state or continent. This is the way how to share, update and back up data, application and services. The schools can use their applications, operation systems and are able to meet requirements of students...

Cloud services separation

**IAAS** – Infrastrukture as a service. Is it a supply of hardware or connectivity..

**PAAS** – Platform as a service. The provider offers support for the whole cycle of creation process and provides web applications. All programs are realized in the web setting.

**SAAS** – Software as a service. It is a service, which is realized by remote server. It is an access to application, not application as itself. The most common uses are: Google Apps (Gmail, Calender, Docs,) Zoho Office, Dropbox and so on...

Why yes and why no?: The biggest reason why the schools are afraid of Cloud tools is safety and the distrust in external server. On the contrary, the schools that are already using Cloud tools mention exactly the safety of the deposited data as the best advantage of this solution. The next advantage is flexibility and the availability of application and files everywhere.

Czech Republic and Europe: The statisticians found out that in 2014, 1.3 million people in the Czech Republic were using an Internet clearance site for files, this means 15% of the population, men (19%) used the Cloud more then women (11%). This use is definitely the domain of young people. The most part of users are in the age group 20–24 years and 25-29 years, and especially sharing files between students.
From the point of view of the international comparison the Czech Republic is above the EU average, where there are about 21% of individual users in ages 16-74. Denmark is the first followed by Great Britain, where the Cloud is used by 40% of people.

Use of Cloud Computing in Europe – persons in age 16–74 years (v %)

If schools and teachers want to “be in” the Cloud, they should find more information about this topic. Today many educational institutions offer courses in using Cloud Computing. Some elementary and high schools are using Cloud Computing. All universities are using it.

**iTřída – e-learning tool for Czech Elementary schools**

The Czech educational system offers Cloud-based classroom e-learning tools designed for teachers, pupils and their parents to direct and indirect teaching. The teacher can use modules from iTřída, students can enter teaching materials, assignments or tests. Students can also write messages, news and information, provoke discussion and brainstorming. The iTřída environment is linked to the portal DUMy.cz where users have access to more than 130,000 educational materials.

I learning, i teaching: Cloud services have proved to be very simple and effective assistant in school management and teaching. It can be argued both from a global perspective on the functioning of schools and in terms of individual teachers who have these services can lead and organize the teaching of their own subjects, or collaborate with colleagues. Currently, however, the Cloud is facing major obstacles due to the unwillingness on the part of users who would need to learn how to use new applications. This is despite the fact that they know that it would help their work and make other activities easier, which has been confirmed by two surveys, in which users have stated that despite the initial negative opinions they are now happy using the Cloud for teaching and learning.

**References:**

https://theses.cz/id/odrhow
http://www.itveskole.cz/itrida-2/
CASE 15: Dortmund Tablet Project

a. Introduction

The “Dortmund Tablet Project was conducted from summer 2013 until summer 2015 (four Project phases), in cooperation with the Albrecht-Dürer-Realschule (Middle School), the TU Dortmund University and the research center youth-media-education. During this period comprehensive measures for the inclusion of tablets in lessons were realised accompanied by a multi-methodical research design (Bosse, I.K., Marci-Boehncke, G., Strehlow, S.K.).

b. What is the case study about?

For four school terms a variety of classroom-tablet-projects were planed and realised. These projects were integrated in the regular lessons. These classroom-tablet-projects were led by the subject teacher as well as up to two students of the TU Dortmund. The tablet-project was supposed to embrace the subject of the lesson and provide active media-work with the tablets. The priority was the usage of the creative and productive features of a tablet.

These interventions were accompanied by a multi-methodical research design, consisting of:

1. Regular Meetings between the students and the project led by the university. During these meetings the students reported their experiences and observations, which were discussed and analysed.
2. Everyone involved (Pupils, Teachers, Students), took a written survey at the end of the classroom-project.

c. Some more detail

All grades of the school participated in the classroom projects (Grade 5 to 10). Primarily the projects were integrated in German lessons, less often in Politics or Music Lessons.

During these project the pupils created are variety of media projects. For example:

- Digital Comics and photo-stories, e.g. on the basis of previously read text;
- eBooks, in which the pupils present e.g. their favorite books;
- Soundfiles, e.g. with self-made songs about road safety;
- Keynote-Presentations, to present e.g. their favorite athletes;
- Digital internship reports

d. Other information

This project facilitated also the inclusion of tablets in the regular lessons. On the one hand the positive experiences became a regular topic in the teachers’ room, so more and more teachers became interested in the usage of tablets and learned how to integrate thus in their lessons. On the other hand the active participating teachers facilitated their media-competence during the project, and began to use tablets regularly beyond the Project.

e. Conclusions

The results of the accompanying research and the interviews with the participating students, teachers and the headmaster have shown that the project made a positive expression on everyone participating.

Accompanied by media literate students the teachers received new impulses for their lessons and gathered experiences in the usage of digital media in lessons.

The students were able to gather first experiences in practice and put their theoretical knowledge into practice. The constant cooperation with the teachers as well as with the Project lead was very valued by the students.
The pupils got to know the tablet on a new level. Prior to the project the tablet was primarily used for entertainment (Game-Apps or Youtube). Due to the project they got to know the creative potential of a tablet and gained practical experiences. The students value the tablets as highly motivating for the participation during the lessons.

References


https://eldorado.tu-dortmund.de/handle/2003/33599
CASE 16: Unit.schule.21

a. Introduction

In 2001 the district town Unna was challenged to equip its approximately 10,000 students and 620 teachers at 21 schools with a modern IT infrastructure as part of the funding of the federal state of North Rhine-Westphalia’s "facilities for learning with new media" (Vaupel & Hoffmann 2001). The target was to harmonize the cacophony of different hardware and software systems with the motto "everything in the cloud" (Kornatz & Ruthmann 2014). The case study is Unit.schule.21: The education cloud | Schools of district town Unna http://www.unit21.de/medientag-unit21/.

In February 2015 the project celebrated its 10th anniversary. Instead of investing in rapidly outdated hardware and isolated applications, Unna applies a combination of IT infrastructure consisting of software and hardware, i.e. a school campus via Cloud technology (http://portal.unit21.de/).

The completion of the entire project is supported by a municipal holding company. The municipal service is responsible for the school network, the provision of notebook trolleys, printers and projectors. The financial resources of 3 million euros for five years were provided by the city of Unna. The project involves many areas of society, but the initiation and leadership takes place on the municipal level. The project connects the private sector to parents, pupils and teachers as local multipliers, but the schools decide how to manage the new technology on their own.

b. What is the case study about?

The project "Unit21" provides a sustainable infrastructure for school boards, which allows teachers' and pupils' modern teaching without technical barriers and problems. "Unit21" is an education cloud which integrates the service models SaaS (Software as a Service), PaaS (Platform as a Service) and IaaS (Infrastructure as a Service) (Franzen-Paustenbach et al. 2012).

In "Unit21", all types of schools in the city have been linked by a private service through a wireless infrastructure and provided with a centralized management in an education cloud. The mobile use of laptops and tablets makes fixed PC labs obsolete and a flexible internet access from class 1 through grammar school is guaranteed. The server is located at the respective training providers, local authorities, the schools or the business enterprise. It is possible to integrate your own device with an APP solution that identifies the user, saves the data on the device and transfers the data through a SSL encrypted tunnel (Schwarz 2014 & Fig. 1).

The "Unit21" education cloud makes mobile learning, blended learning, web-based training, content sharing, learning communities, virtual classroom, webinars, chat and forums possible. Teaching and learning are changing, and learning in the education cloud has changed as well. Specific teaching materials and tasks are processed digitally. Furthermore, spontaneous or defined workgroups can be connected through the portal after school and doing homework together regardless of the opening times of schools becomes possible. The Data can simply be implemented into the school server.

Fears that the literacy of minors could decrease were clearly refuted. On the contrary: These competencies are systematically higher in the notebook classes compared to ordinary classes. Group work and interdisciplinary instruction have become self-evident. The requirements for teachers are changing: The ability to continually conduct web research requires the selection and testing of reputable and relevant sources (Kornatz & Ruthmann 2014).

Have books become obsolete? Exactly the opposite is the case: In terms of Goethe, Golding or Grass the pupils now have access to secondary sources, images and movies. Additionally, the teacher’s role needs to be changed into that of a facilitator for learning. Besides the change that comes along with the new
technology, this change of role is challenging for teachers. But together with the new infrastructure a space has opened which can be replenished every day – it is the schools themselves that decide on how to fill this space (Kornatz & Ruthmann 2014).

Successful after school: The transition rates to the labor market are above average. The pupils handle modern technology capably and prove this with the nationally recognized “Computer Driving License North Rhine-Westphalia” (Fischer & Peters 2014).

They certify that they have mastered the profession of media literacy that is demanded by the labor market nowadays. The computer is an obvious means of communication and work. The pupils have also proven to use the web safely and confidently and to handle social networks for research and presentation. Although technology cannot replace all systematic vocational guidance with internships and potential analysis, it clearly supports independent and autonomous learning.

The students’ notebook usage changed leisure behavior as well. An evaluation at the Werner-von-Siemens comprehensive school showed that pupils discover playing football, reading or the joy of their own creative design at home again. In the classrooms hand writing, sports and music without computer technology also play an important role. In notebook classes there is no social division between an “information elite” and marginalized groups that can be observed (Kornatz & Ruthmann 2014).

c. Some more detail

Technical data about the project: All 21 schools are equipped with notebook trolleys, whiteboards and a high-performance Wi-Fi network with 100Mbit uplink. 425 notebooks are provided by the city of Unna and 17 to 51 notebooks are available per school. 1200 private notebook and an increasing number of tablets were purchased.

The investment of Unna results in multiplier effects through parents. Parents financed notebooks, which are leased from the holding company for a monthly charge of 29.50 Euro, which also includes the maintenance of those notebooks with technical problems. A compensation for financially weak families is carried out by a social fund. The IT infrastructure improvements include 350 wireless access points and 25 physical servers. The monthly usage includes 24,000 and 30,000 logins in the “Unit21” network. There are approximately 1,500 logins per month and up to 400 a day with up to 15,000 hours of usage per school (Kornatz & Ruthmann 2014).

d. Other information

The work with educational portals and the complete infrastructure solution is used in the meantime not only in the schools of Unna, but also schools in Cologne, Bremen, Munich and at a Benedictine boarding school in Switzerland (Kornatz & Ruthmann 2014). The Project “Unit21” won the 2015 eLearning award in the category “education” (Siepmann Media 2015).

e. Conclusions

In particular, the shift away from international vendors such as Microsoft or Apple creates the possibility of keeping the data of all schools’ stakeholders it in their own hands. This case study provides a solution in accordance with the German constitution to protect pupils and teachers.

References


CASE 17: Flipped Classroom Literature

a. Introduction

This is an information gap activity implemented with the aid of technology. Doukas Primary School pupils (Grades 5 and 6), were divided into two teams and sent multimedia files with information in different forms (sound and image respectively). (The school has adopted the 1:1 approach both in primary school and high school since 2009). The Flipped Classroom Literature: information gap activities with the aid of technology project was introduced during 2011-2012 school year by their English teacher, Dimitris Primalis.

The activity was part of a project titled “Literature strikes back” and aimed at acquainting learners with literature through activities facilitated by technology. Among others students created word clouds and gave their opinion on virtual pinboards (linoit canvases). The project lasted for a school year and included visits to the library and creative writing activities.

b. What is the case study about?

The activity is based on the information gap activity notion which is based on the practice of dividing the class into two groups. Each group has half of the information required to achieve the task. Students need to share information in order to communicate (in Language 2- in this case English), negotiate and reach a final outcome/product. The activity requires collaboration in pairs or in groups and the medium of communication is English. Therefore, learners are urged to use language in a simulated real life situation.

The activity involves listening, speaking and note-taking skills as well as turn-taking and negotiation skills. It also caters for relatively weaker students as they can make use of the paralinguistic features shown on the film i.e. landscapes, gestures, facial expressions. This activity is intended to act as a lead-in to literature and aims at stimulating interest to extensive/literature reading. Students are given the opportunity to share their ideas with others, write collaboratively a brief narrative based on the assumptions they have made which are based on the outcome of the information sharing. This involved managing groups, appointing students who record the story for each group and making decisions on what the story is about.

The objectives of the activity are:

1. Encourage learners to use their imagination and creativity.
2. Develop speaking (narrate a story, turn-taking, negotiating) and writing skills (note taking, creative writing).
3. Facilitate learning and communication strategies where students exchange information and synthesize.
4. Introduce literature in an innovative and motivating way.

c. Some more detail

Pupils (Grades 5 and 6), were divided into two teams. Team A was sent an MP3 file with sound from a film based on a novel (Rebecca by Daphne Du Maurier) and Team B were sent an MP4 file with the same extract from the film but without sound. Information was emailed and pupils used at home their personal tablet PCs to watch/listen respectively the film extract. In class, they share the notes they took at home working in pairs or groups with pupils from the other group. Their aim is to decide what happened and to
reconstruct the story through communication and collaboration. When they reach a consensus, they write the part of the story that they watched/listened to and they share it with the rest of the class. The next step involves writing the next part of the story. They have to anticipate what happens next and then they share their version of the story with the other teams.

**Conclusions**

The information gap activity combined with the use of technology stimulates learners’ interest and acts as a stimulus for pair and groupwork in class. The ambiguity of clues given (image without sound and sound without image) triggers heated discussions. The latter often help shy students to overcome their inhibitions and contribute to the reconstruction of the story with their own view.

The activity allows for creativity and imagination, which is clearly indicated by the variety of versions produced by the learners which bear little resemblance to each other.

The “Cloud” and Flipped classroom approach facilitate learning as students can listen/watch the files as many times as they need to feel confident to talk about them.

Finally, it acts as a motivating lead-in to literature, which otherwise it is routinely rejected as boring by the learners.

The project was awarded the IATEFL Learning Technologies S.I.G. scholarship

**References**


Primalis, D. (2015), Literature: technology to the rescue, ELT News


(Members only area: http://ltsig.org.uk/events-archive/294-10413-liverpool-2013-ltsig-day-chryssanthe-sotiriou-a-dimitrios-primalis)
CASE 18: Is Skype the limit? EDMODO says, ‘No’!

a. Introduction

**Doukas** Junior High School students (Grade 9), following the learning process based on project-based learning, were asked to create the best possible city in Space. Information was googled in class using students’ personal tablet PCs. (Our school has introduced the 1:1 process both in the primary school and high school since 2009). Each group posted both their initial work and final proposal in **Edmodo**. Comments, feedback and useful links were sent to the students by the teacher. Questions raised by the students were answered by Space expert, Dr. Alexander Martynov via Skype ([http://library.iated.org/view/SOTIRIOU2012SKY](http://library.iated.org/view/SOTIRIOU2012SKY)).

The entire project was posted and assessed by the students themselves on Edmodo, the educational platform, where the teacher had previously initiated a discussion and then posted a poll. Edmodo is a safe, social learning platform for students, teachers and schools. It provides an easy way for students to connect and cooperate, both among themselves and with students of other regions or countries. The project was introduced during 2012-2013 school year.

b. What is the case study about?

Students become enthusiastic when given an opportunity to share their ideas with others via an interactive platform. The use of Skype in the educational process aimed to tear down the walls of the ordinary classroom, translating students into virtual worlds with an intercultural character. The class utilizes high technology tools for facilitating the learning of the English language in a pleasant way.

The objectives of the course were:

1) Speaking, understanding and producing written documents.
2) Developing learning and communication strategies where students learn to utilize new technologies.
3) Developing skills in multicultural awareness.

The educational value of the project is distinct from the recording of the objectives and planned courses of action. The level of student motivation in this project was also indicated by the fact that the students took the initiative to contact Dr. Martynov. All information was found on the Internet.

c. Some more detail

Doukas Junior High School students working on the basis of the six core characteristics of student-centered learning displayed a range of interesting projects on the subject of Space. The core characteristics are where learning occurs in small groups, where teachers act as facilitators/guides, where a problem forms the basis for organized focus and stimulus for learning, where problems stimulate the development and use of problem solving skills and where new knowledge is obtained through means of self-directed learning. Students had the chance to get answers to questions that arose during their investigation of Space by Dr. Alexander Martynov using Skype.

All steps including Web Quest, teacher comments, help from the teacher, as well as the assessment of the use of innovative tools, such as the Skype conferencing environment by the students themselves, were posted in the room that has been created specifically for the particular class in the educational platform, Edmodo. This class utilized high technology tools by creating a sustainable development framework, thus facilitating the learning of the English language in a pleasant way.

d. Other information

A video as well as several presentations both in **Greek** and **English** are available that give teachers and other school staff access to guidance on the approach, devices, and programmes and how it will best work for them and their pupils.
e. Conclusions

The teaching practice, based on the innovative approach of the use of the educational platform Edmodo and the Skype conferencing tool in the classroom, in conjunction with carefully designed lesson plans (scenarios), creates added value to the educational process. The learning outcome was very satisfactory. The virtual meeting discussion with an expert on the topic studied (Space), not only broadened students’ knowledge but they also became active participants in their learning. Of course, Edmodo provided a safe environment and was a major incentive in their innovative collaborative effort. We also mention the positive feedback from parents, whose consent we received before proceeding.

The project promotes an integrated approach to the educational process since it was based on collaborative learning (Edmodo and group/pair work), a topic which interests students (cities in Space). The Skype connection led our students to conduct a more scientifically documented study of the subject they were asked to investigate. It is of interest to note how the students discovered the renowned scientist. The investigation teams, while searching the Internet, came across the name of Dr Martynov as well as his contact information. They sent him an email and he responded to their request for a virtual conference.

The project contributed to the improvement of the learning process as noted by the high participation rates of students as well as by the production of a number of projects by the students upon the completion of the presentation.

The educational value of the project is distinct from the recording of the objectives as well as the lesson plan because it reveals the presence of educational elements that contribute to achieving higher expectations within each lesson while focusing on the needs and interests of the students of the corresponding age and knowledge group. The fact that each lesson is based on an educational scenario with specific structure helps in a better understanding of the subject/area discussed, and facilitates the process of 'learning how to learn'.

References

Sotiriou C. (2012), The project was awarded a bronze level by Microsoft Educator Network and a special mention by the Greek Ministry of Education as a good practice.
CASE 19: CADMOS a personal learning tool with graphical personalisation

a. Introduction

Cadmos tool was developed from the beginning of 2015 by the CoSyLab research team of the University of Piraeus in Greece and is a handy learning design tool with graphical personalization. CADMOS tool proposes the “separation of concerns” for the design of learning process. This concept stems from the principles of web engineering (Papasalouros, Retalis, & Papaspyrou (2004)) and argues that the designer builds the design in layers, and creates two design sub-models: the conceptual and the flow model.

b. What is the case study about?

One of CADMOS’ main innovative features is that it can bridge the gap between the design of a unit of learning and its enactment into Moodle. This case study presents how one can create a LD using CADMOS and deploy it into Moodle. Also, shows the findings from a case study, which was organized in order to evaluate the usability of the tool, its pedagogical flexibility and the usefulness of its innovative feature of deploying a LD into Moodle. CADMOS seems to be an easy-to-use tool, which offers guidance and flexibility during the design process.

The whole design process supported by the CADMOS tool is considered to be incremental. The practitioner first defines the learning activities and then moves to the definition of their orchestration. If s/he wants to add or remove an activity s/he can return to the conceptual model, do the changes and then revise the flow model accordingly. S/he can also edit only the flow model, i.e. add rules and conditions in the navigation between the activities without making any changes to the learning activities or the learning resources that are linked to those learning activities.

c. Some more detail

The Conceptual Model defines the learning activities that students will be engaged in and support activities that teachers will be engaged in, during the instructional process of a specific subject. Each learning/support activity may be simple or composite. The composite activity consists of two or more simple activities, but is addressed only to one role e.g. student or teacher etc. Additionally in this model are defined the type of the digital resources (e.g. text files, images, videos etc.) that correspond to these activities. When the designer makes the conceptual model, s/he specifies a concept map that has as a root the title of the course and as children the learning/support activities.
d. Other information

The Flow Model defines the navigational patterns (orchestration) of the learning activities. The flow model can be created automatically by putting the activities of the conceptual model, one after the other as specified in the conceptual model from left to the right. The model that is created assumes that there are no rules in the navigational between the different activities. This means that the student can complete them in a linear way (linear navigational pattern). There are three different swim lanes, one for the student’s activities one for the teacher’s activities and one for a specified pair group’s activities.

If the designer wants, s/he can add the following navigational rules to the model: The “User Choice” rule shows that a specific activity will be completed when its actor wants to. The “Time Limit” rule shows that an activity should be completed by a specific time. The score condition rule helps the designer define which activity will be done if the score of an activity is above a threshold or not. In case the teacher has specified a composite activity in the conceptual model, in the flow model the activities that are part of this composite activity are represented grouped (i.e. inside a rectangular).

e. Conclusions

Nowadays, the use of Internet has been widely broadened and is being adopted not only for accessing information for news and entertainment but also for facilitating the creation of on-line communities in order to assist the interaction among individuals

that share common interests and goals. These communities are described by the term “virtual communities” for highlighting their “on-line” substance. A key factor for the success and the subsistence of the virtual communities is a strong interest among the people concerned. Such a case could form a group of people that want to share knowledge and learn together and consequently constitute a learning community.

It is the basis of good teaching with technology and requires not only content knowledge or pedagogical knowledge but an understanding of the representation of concepts using technologies, how to teach concepts using technology, knowledge on the challenges their students will face when presented with this new pedagogy, and how technology can be used to build on existing knowledge and develop new knowledge. With the availability of dynamic software, like Cadmos, teachers are able to make graphical representations of teaching concepts. As the concepts are introduced with pictorial representations, teachers and their students are able to make the connections between the pictures, the concepts, and the symbolic representation. When presented with a new concept, students need to think, visualize and explore relationships and patterns. This is consistent with the CRA (Concrete, Representational, and Abstract) Model for teaching currently in better reaching students as they learn and understand concepts. Technology makes all of this possible for them in a short amount of time.

In the project, effective teaching practices are modeled and a collaborative learning environment is created in which teachers are encouraged to develop strategies and ideas about teaching and learning while using the technology. The content has explicitly utilized and intentionally emphasized foundational middle school themes, but this in a way that is new, often discovered through technology-based experiments in Cadmos and regularly connected to modern research and applications. The pervasive inclusion of cutting edge software like Cadmos into our program activities raised teacher perception of the significance of their work, and this sense of importance worked to elevate their enthusiasm for investing time, work, and energy into their own growth.

References


CASE 20: Uses of the Cloud in the Greek educational system

a. Introduction

Within the framework of distance learning a variety of technological environments have been developed, offering alternative methods of learning, based on a diverse philosophy moving away from traditional teaching and schooling. Learning Management Systems (or e-learning platforms) are essential technological software providing e-learning opportunities.

b. What is the case study about?

Open eclass is a complete Eclass Management System, supported in Greece by the Greek Universities Network (GUnet). It is a learning environment based on open-source software, distributed for free, mainly to tertiary education institutions. Open eClass platform aims at integrating technological tools and making valuable use of the Internet in educational practices.

Open eclass platform has been an essential part throughout the development and implementation of the teaching Undergraduate courses and Postgraduate courses. This platform offers a wide variety of opportunities to the user, depending on his/her role in the system (trainer, trainee, and administrator).

Additionally a great number of distance learning courses supporting by this platform giving access to the trainers and trainees to reach educational material from several open courses, but also to upload their works, to communicate with their group members and the community of the course, to receive messages or announcements, to discuss important issues concerning their studies, to keep notes, calendar, etc. For example in the first page of Open eClass-Univ. of the Aegean (see: https://eclass.aegean.gr/) refers that: The Open eClass - Univ. of the Aegean platform is a complete Course Management System that supports Asynchronous eLearning Services via a simple web browser. Its goal is the incorporation and constructive use of the Internet and web technologies in the teaching and learning process. It supports the electronic management, storage and presentation of teaching materials, independently of the spatial and time limiting factors of conventional teaching and creating the necessary conditions for a dynamic teaching environment.

c. Some more details

In the last two years the Cloud is increasingly used in primary and secondary education in several subjects. Teachers argue that the Cloud, and mainly the Open eclass platform, can be used because of its basic characteristics, such as the transcendence of the narrow boundaries set in a school classroom and the limited duration of about 40 minutes a typical lesson has. Furthermore, a wide variety of possibilities are offered to the user, depending on his/her role in the system (trainer, trainee, and administrator).

So, the Open eclass platform has been an essential part throughout the development and implementation of a project or in several other subjects as Geography, etc. (see Figure 1). The smooth process and effective outcome of the project were further abetted by web 2.0 tools integrated in the platform, along with other tools (such as tag cloud, newsfeed and board) as well as by a manageable environment and clearly organized platform tools.
d. Other information

Additionally other platforms (cloud based) as http://dschool.edu.gr/ (Greek National Aggregator for Educational Content), that is the central e-service of the Ministry of Education for unified search and distribution of digital educational contents in schools (primary and secondary), widely used. This platform is open to everyone, students, teachers, parents and anyone interested. The dschool platform composed from photodentro (http://photodentro.edu.gr/) (Learning Objects Repository), the ebooks platform (http://ebooks.edu.gr/) and the Digital Educational Platform «e-me», that is still in pilot phase. It is a digital environment that provides "space" and "tools" to serve and upgrade what already happens in school. It is the personal space of each student and each teacher. A digital meeting and cooperation space. The individual content repository and applications. But a projection area of their work. (http://e-me.edu.gr/).

ey. Conclusion

All the above characterized by a participatory approach to content creation and distribution, along with user interaction and cooperation. All activities carried out in this context do not abide by traditional teaching and the educator’s role acquires different dimensions. The educator assumes an auxiliary consultative role, functions as a students’ supporter, aiding them towards the appropriate application of modern learning networks.
CASE 21: Exploring the kingdom of animals. ETwinning project

a. Introduction

ETwinning is a community for schools in Europe. The European action ETwinning brings together different European schools offering the opportunity to share ideas, pedagogical approaches and ICT tools and create authentic and exciting projects. It provides a safe digital platform for staff (educators, head teachers, librarians etc.) that includes support, tools and services for communication, collaboration and development of common projects.

A total of 42 countries participate in ETwinning. Apart from all member states of the European Union, in 2015 the European Commission inaugurated ETwinning Plus, that involves new schools from Armenia, Azerbaijan, Georgia, Moldavia, Tunisia and Ukraine. ETwinning supports 27 languages.

ETwinning is organized in three layers: the Public Portal, the personalized Desktop and the Twinspace. The Public Portal offers online tools for teachers to seek potential partner teachers and schools, start projects, exchange ideas, find and share best practices, search seminars and professional development events and start working together, immediately without bureaucratic procedures using various customized tools available on the ETwinning platform. The Public Portal is the meeting point of over than 300.000 teachers, over than 142.000 schools and over than 42.000 projects between two or more schools across Europe. In Greece ETwinning is considered a very successful program. More than 12.800 teachers, 7.300 schools and 6.500 projects involving 10% of Greek teachers participate actively and every school year they earn European awards (http://www.etwinning.net/en/pub/news/news/european_prizes_winners_2015.htm).

The second layer of ETwinning is the teachers’ personalized Desktop, for registered members, where they have access to tools of communication and creation of contacts with potential partners. Lastly, the TwinSpace, the digital space of the development of the collaborative projects.

ETwinning started in 2005 as the main action of the European Commission’s eLearning Program and since 2014 it has been integrated in Erasmus+, the European program for Education, Training, Youth and Sport. Its Central Support Service is (CSS) operated by European Schoolnet, an international partnership of European Ministries of Education developing learning for schools, teachers and pupils across Europe and is regionally supported at national level by National Support Services (NSS).

As part of the ETwinning Project the 3rd Primary School of Agia Paraskevi, Athens, Greece along with Scuola Primaria ”Luigi Masi”, that is part of the Instituto Comprensivo Assisi 3, Perugia, Italy, Hjortsbergskolan Ljunby, Sweden, and Doukas School, Athens, Greece developed the project “Exploring the kingdom of animals” The project (http://twinspace.etwinning.net/5336/home) included activities in which pupils participated in a virtual classroom of 60 pupils, they presented themselves and were engaged in collaborative activities. The duration of the project was the school year 2014-2015. The project was evaluated and awarded the Quality Label (http://desktop.etwinning.net/files/desktop/pdf/label/qualitylabel/etw_qualitylabel_69858_en.pdf)

b. What is the case study about?

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The case study illustrates the collaboration of three primary schools in Greece, Italy and Sweden with the use of Cloud Computing. The main platform that hosted the project was eTwinning. Simultaneously teachers and pupils participated in a virtual classroom of 60 pupils using PowToon that was provided by the school in Italy, where they created, shared and discussed presentations.

The case study demonstrates the outcomes of digital learning with the use of a variety of online tools, such as PowToon, ArcGIS online, Padlet, Linoit, Tagxedo, Trello, YouTube and Slide share. Digital content was created by pupils working in groups, exchanging ideas and communicating their work to their peers from different European countries. Pupils developed digital skills, cultivated spatial citizenship and empowered their European identity.

TwinSpace offered tools for communication between teachers. They utilized the tool “Teachers’ bulletin” to plan, organize and develop a collaborative project. Through Teachers’ bulletin peer guidance or advice was provided to the members of the partnership that leaded to the creation of an informal community of learners between teachers.

The case study encourages teachers to get involved in collaborative projects with schools from different European countries regardless of their level of digital skills, exchange didactical approaches and tools, share experiences, provide and/or receive guidance and gain recognition of the pedagogical value of their project with eTwinning Quality Labels.

**c. Some more detail**

The title of the project was “Exploring the kingdom of animals”. The first phase of the project included the planning process. Teachers communicated and set the aims and the activities of the project. They agreed on a time range and discussed about digital tools that would support their collaboration.

In the second phase teachers and pupils developed the content of the project. The first axis was the introduction of the members of the school classes and the preparation of presentations about “Our countries and towns”, “Our schools” and “Ourselves”. Pupils participated in a digital classroom using PowToon, created presentation about themselves and shared them with their classmates from Italy and Sweden. Pupils first observed the presentations that the teachers created about themselves and after they created their own presentations with teacher guidance at school and at home. The activity was very successful. Pupils mastered the tool very quickly and they were very enthusiastic about the outcomes. The presentations on PowToon were also embedded to a blog that was created by the Italian teacher Simonetta Leonardi. To ensure that presentations would be viewed from each partner, teachers created a “Who is Who” Quiz on a padlet that was completed by pupils of the partner schools.

After the introduction of the members of the partnership pupils were asked to choose a favorite animal and four groups were created: invertebrates, mammals, fish and birds. Pupils created presentations about animals, which were uploaded to SlideShare and embedded to TwinSpace. An evaluation activity was designed to test pupils’ knowledge about the categorization of animals using a Trello board. Pupils also shared their favourite animals on Linoit boards that created collaboratively. Last they composed poems about animals based on book “The Greedy Whale” by Evgenios Trivizas. Pupils saluted their classmates with a wordcloud with summer wishes that was created with Tagxedo in the shape of a sea turtle Caretta and was uploaded on a padlet with a wallpaper of the image of an Ionian Sea beach.
The last phase comprised the presentation and evaluation of the project. Teachers invited parents and presented them the project. The project passed an evaluation process by the NSS and was awarded the eTwinning Quality Label that was recognition of its elevated pedagogical value.

d. Other information
On the TwinSpace teachers, pupils, parents and visitors can view the presentations, collaborative boards and other activities that were created as an outcome of the partnership of the European schools that participated in the eTwinning project “Exploring the kingdom of animals”. These resources can be used to give teachers ideas on which approach and digital tools will best apply for them and their pupils. A blog and other media clips are available on the Web.

e. Conclusions
The case study presents a project that was planned and developed by three schools from Greece, Italy and Sweden. The basic aim of the project was the collaboration of teachers and pupils with the use of digital tools and cloud computing. The case study can be used as a guide for teachers to design collaborative activities within their school community or with different schools in regional or European level.

References


TwinSpace of the project “Exploring the kingdom of animals”: http://twinspace.etwinning.net/5336/home

Map of partner schools in AOL http://www.arcgis.com/home/webmap/viewer.html?webmap=8090ecad3d0b4302bc9b1aa25dd7aea5&extent=31.1409,33.6559,60.7927,64.7765

Who is Who Quiz http://el.padlet.com/cathyapostolopo/urgqtymetkls

Blog http://schoolonthecloudkids.blogspot.it

Presentation of SoC and eTwinning project https://www.youtube.com/watch?v=Rt8G1TK8gos
CASE 22: Cloud mapping for the support of school geography and history

a. Introduction

The case study started two years ago and has no deadline. In fact it is in progress every academic year. The Hellenic digital earth Centre of Excellence in collaboration with the Department of Primary Education at the Aristotle University of Thessaloniki, Greece, are leading the case study. Along with the faculty of the Centre, the students of the Department are making the maps and the primary school teachers of Greece are implementing them in their lessons (http://www.digital-earth.edu.gr/).

b. What is the case study about?

The case study tries to show that Cloud mapping can support the teachers and students in an innovative and interactive way like never before. There are many disciplines that need maps and the teachers never had the maps they needed for their lessons. Also, they could never ask their students to apply different scenarios which were based on student’s thoughts about how something could have been shaped through space and time, simply because the maps they were using were static and couldn’t change anything, couldn’t test anything. After all, a map is a model and should be used as a model. Cloud mapping allows students and teachers to test different scenarios which help the students learn about the different conditions applied on a geographical or/historical site. This case study tries through geographical and historical maps to connect the landscape with the historical events. The students can learn how the landscape controls any human action. Additionally, the teachers learn how to make their own maps, the way they want them to be in order to support their lesson.

c. Some more detail

The academic year 2013-14 was the first year of the project during which one map was constructed in order to get the experience and find out the difficulties. The map was constructed by a university student and was about the Greek wetlands.

In 2014-15 19 interactive maps were added on the Centre’s website. Eight maps for geography, seven maps for history and four maps with various themes like religion tourism etc. The last 4 maps were made by primary school students under the guidance of the faculty of the Hellenic digital earth Centre of Excellence and the support of students from the Department of Primary Education.

The web addresses of the maps have been uploaded on the Centre’s website (www.digital-earth.edu.gr) while the maps are on the Cloud. This is very convenient because the teachers can use them any time from any place.
d. Other information

For the following academic year 2015-16 more maps have been scheduled. All of them are historical maps except one which is religious.

e. Conclusions

The case study, although in the first year started very hesitantly with just one map, the second year continued dynamically with 19 maps (two of them started at the end of the first year and continued in the second year). The university students and the primary school teachers realised that cloud mapping can support interdisciplinary and constructive teaching. The primary school students didn't hesitate at all to implement the new technology of cloud mapping and they did it very easily.

Since the first web address of the first map was uploaded on the Centre’s website, the visits were raised from 145 (February 2014) to 18225 (July 2015) showing how useful is this technology for the teachers and students.

References

Beretziki, A. 2015. "An interactive web map of the epicenters of earthquakes in Greece (from 550 BC to 2014 AD) and the volcanic activity. Its contribution to the educational process." Dept. Of Primary Education, Aristotle University of Thessaloniki, Greece (in Greek, English summary). http://arcg.is/1NNJQTm


CASE 23: Scoilnet – the Department of Education’s portal for Ireland

a. Introduction
This is an Education portal which includes a subject specific website French.ie, German.ie, scienceunleashed.ie. This started in May 2014 and is ongoing. It includes a Professional Development Service for Teachers PDST and Irish Teachers.

b. What is the case study doing?
The role of the site is the provision of curriculum relevant digital resources to assist teaching and learning for Primary and Post-Primary School teachers in Ireland.

All the resources on the site have been either reviewed by teachers for their relevance to the Irish curriculum or used by them in the classroom.

Scoilnet is managed on a day-to-day basis by the PDST Technology in Education Unit. Specialist sites for French, German, Geography and History provide pedagogical online resource for teachers.

c. Some more detail
The new interface has implemented features of a dashboard, my shared resources, favourites and news. The biggest innovation on the new site is the facility for teachers to upload their own resources and share them with the wider education community.

Resources finding is now easier with the implementation of a search box, which facilitates filtering resources to specific sections of the curriculum. Theme pages that support a thematic approach to teaching are also available. The Learning Path feature enables teachers to select and organise resources into their own collection and share it with their peers or pupils. The search also finds federated results from Britannica School, the Ask About Ireland website and images from the ImageBank project.

As part of a wider Scoilnet initiative, the website has many portal sites specialising in specialist areas. These specialist site provide a rich curation of learning objects for teachers.

http://www.german.ie/
http://www.french.ie/
http://maps.scoilnet.ie/
http://lookathistory.scoilnet.ie/
http://www.jamanartist.ie/
d. Conclusions

The redevelopment of the site to include efficient search, dashboard and the teacher upload functionality has enhanced the teacher experience and facilitated easy collaboration of resources.

The new addition of specialist sites for example French.ie http://www.french.ie/ extend the use of ICT in language teaching. The site http://maps.scoilnet.ie/ provides tools to support learning across a wide variety of subjects, including Geography, History and Mathematics. The collaborations with the National Broadcaster RTE and Ordnance Survey Ireland (OSi), the French Embassy, The Department of Education (Inspectorate), Teachers' Association and the Austrian Embassy enhance knowledge base of expertise that contribute to the learning objects.
CASE 24: MATHletes Challenge: to transform teaching and learning of maths in Ireland.

a. Introduction
This was started in 2014. Mathletes was developed by Irish entrepreneur Sean O’Sullivan in partnership with Khan Academy (KA) to improve maths standards in Ireland (http://mathletes.ie/).

b. What is the case study about?
The aim is to develop student competence and confidence in maths by introducing Irish students and teachers to the Khan Academy.

Mapping Khan Academy resources to the Irish Curriculum is to create a resource that illustrates to teachers, students and parents how Khan Academy can support the teaching and learning of specific areas of mathematics stipulated by Ireland’s the National Council for Curriculum and Assessment (NCCA).

c. Some more detail
Students earn points, compete against peers across Ireland, and win personal points and for their school. 6 primary and secondary teachers from across Ireland, led by researchers at Dublin City University’s School of Mathematical Sciences undertook the task to map Khan Academy resources to the Irish Curriculum. The mapping curates KA exercises that relate to specific areas of the mathematics syllabus, and shows how Khan Academy may be used as a ‘virtual workbook’ for students in Irish primary and post-primary schools.

d. Conclusions
The project has generated excitement for mathematics and STEM in both students and teachers. Teachers have indicated that it has increased engagement, improved test scores, and given them newfound confidence. The project provides a wealth of resources for teachers and students to facilitate students to direct their learning in mathematics and to challenge them to excel by placing the competitive side in encouraging schools to participate again one another. It allows student to work at their own pace and set their own personal goals.

References
http://mathletes.ie/2015/02/19/khan-academy-mapped-to-irish-curriculum/
https://www.khanacademy.org/
CASE 25: EUfolio

a. Introduction
EUfolio is a collaboration of 14 partners from Ireland, Lithuania, Slovenia, Cyprus, Bulgaria, Spain and Austria.

b. What is the case study about?
The EUFolio project was piloted two ePortfolio platforms – Mahara and Microsoft Office 365. ePortfolios can be use as repository to display the products of learning, used as a journal to document the process of learning and use as a showcase to collate the representation of learning. The tool facilitates the learner voice, develops multimedia technology skills, and active participation in learning motivates and allows students to take responsibility for their learning.

c. Provide some more detail
What is being done in the project, what has been outcome, is there any ideas, advice or guidance provided?
The project analysed EU policies on ePortfolio use in schools, are seen as tool for assessment, validation and recognition of skills and competences and a tools for student collaboration. Different Definitions and Functions of ePortfolios and best practice case studies on their use in different counties were analysed. 4 key competencies from the project results were stressed:
Lifelong learning skills; Problem solving skills; Self-direction skills; and Collaborative work skills. These “soft” skills are difficult to measure and eportfolio use is a tool to measure these skills.

d. Conclusions
Documenting students learning and providing students with an environment to take control of their learning will only enhance the students learning. The tool benefits skills development, provides evidence of learning, facilitates the ecosystem for self-reflection, self-discovery and allows students to engage evaluate assessment using self and peer assessment.

For the teacher it can improve the pedagogical sequence of learning, give directed feedback and actively involve students in their learning. It provides the teacher a rich picture of the learning and competencies students have achieved.

References
CASE 26: FÍS Film Project

a. Introduction
FÍS (http://www.fisfilmproject.ie/) is an ongoing film project for primary school. Primary Schools, the National Film School at the Institute of Art, Design & Technology and PDST Technology in Education

b. What is the case study about?
FÍS Film Project (literally translated as 'Vision') encourages children to explore the medium of film in the primary classroom developing essential skills in moving-image literacy, communication, teamwork, visual arts and numeracy. The FÍS Film Festival is an annual event that brings together schools whose films have been shortlisted for an “Outstanding Achievement” award. The project develops student’s multimedia, technology and digital literacy skills at an early age. It encourages creative and allow students to be active participant in their learning.

c. Provide some more detail
FÍS helps children to develop essential skills in moving-image literacy, communication and teamwork. The children develop additional skills in problem-solving, critical thinking, investigation and analysis as observed by their teachers. FÍS puts the children being at the centre of the film-making process and their teacher as a guide on the side.

d. Conclusions
Projects that encourage creativity, digital literacies and activity participation are extremely valuable in education.
CASE 27: Primary Online Database (POD)

a. Introduction
The database was initiated in 2015 by the Department of Education and Primary Schools.

b. What is the case study doing?
The Department has developed an electronic individualised database of primary school pupils, called the Primary Online Database (POD). POD will collect individual information on each pupil (https://www.education.ie/en/Publications/Statistics/Primary-Online-Database-POD-/).

c. Some more detail
“POD will facilitate inter-school transfers, facilitate the transfer of data from primary to post-primary schools, identify pupils who do not make the transition from primary to post-primary, allow schools to update DES centrally-held, school-level data such as School Name, Address and Telephone Number. This will provide schools with one point to correct or amend contact details which will then be available to be accessed by all areas across the Department.”

https://www.education.ie/en/Publications/Statistics/Primary-Online-Database-POD-/

d. Conclusions
This database is just implemented in schools since September 2015.

References
https://www.education.ie/en/Publications/Statistics/Primary-Online-Database-POD-/>
CASE 28: Glocal Education for 2020

a. Introduction

Glocal Education for 2020 is an Erasmus+ KA1 project for school staff modility. It was approved in June 2015 and started its first staff mobility in August-September 2015. The project lasts 2 years and is funded with 65,000 € by Erasmus +.

PARTICIPANTS: Istituto Comprensivo Assisi 3, Italian pre-primary, primary and lower secondary school.

15 participants for 30 mobilities. During two years are involved: pre-primary teachers, primary teachers, lower secondary, administrative staff and headteacher

ACTIVITIES: Structured course abroad to enhance communicative skills in English, Job shadowing in school abroad

PARTNERS; Askim ungdomsskole secondary school- Askim – Norway , Woodhill Primary school- Glasgow- Scotland

2. What is the case study about?

The case study illustrates how a project funded by Erasmus+ can help schools in the innovation process, internationalization of the curricula, working in the field of the Cloud and in promoting more effective teaching methods. IC Assisi 3 institute strongly wants to integrate ICT and CLIL into its pedagogical vision of the learning /teaching experience. The 21st Century teacher profile requires fresh approaches to learning and soft skills to face the social changes in the fields of communication and ICT. Nowadays communication and learning are strongly connected with ICT and English language. Teacher have to manage both to promote his/her students competences and to make them able to take part actively to the 21st century “glocal” experience.

The project also encourage teachers to face innovation collaboratively and to share their achievements and their experiences with their colleagues using social networks, blog and Cloud based tool as well as Google Drive.

OBJECTIVES

Promoting language skills and methodologies in the teaching of a foreign language through ICT for the teaching staff of the institute.

These skills are essential to support:

1. the process of ongoing innovation
2. Improving the quality of teaching / learning
3. the implementation of CLIL experimentation scheduled for the school year 2017-2018
4. the widest participation of the teachers and administrative staff at numerous international projects implemented in the school

The different kinds of training (language improvement course and job shadowing allow to teachers to make sure that they are equipping themselves and their students with all of the skills that they need to enter the 21st Century society.

c. Some more detail

What is being done in the project, what has been outcome, is there any ideas, advice or guidance provided?
METHODS OF IMPLEMENTATION

- training abroad for Italian staff
- use of Google apps for education and Cloud tools to facilitate teachers’ training
- communication mediated by eTwinning to get in touch the staff involved from the 3 countries
- collaboration between teachers within the school and with colleagues in Norway and Scotland to facilitate the experimentation of new teaching approaches
- sharing useful learning resources with the partner schools
- multimedia documentation
- empowerment of the capacity of building training/self-training of human resources of the institution
- paperless in organization, communication and study approach
- learner diary to document the progress of each participant to the project

IMPORTANCE OF THE CLOUD

During the linguistic training at NILE teachers have created their “Learner Diaries”.

The “Learner Diary” is created by using Slides from Google Drive. It is easily shareable through embed code or link in every blog or website. It’s a collection of elements from the training course relevant for the participants. The learner diary shows that the teacher has reflected on the main issues introduced in the training and that he/she has engaged with learning and also with comparison of ideas with colleagues and trainers. Each teacher in her learner diary comments ideas, takes notes of resources from the course materials that she has found interesting or useful in the lessons. Here you can find the whole collection of the learner diaries produced (https://www.symbaloo.com/home/mix/13eOhE4XpC)

d. Other information

The project, being at its first year of activity, is still in progress. During the second year two job shadowing mobilities will take place to the school partners in Scotland and Norway. The job shadowing experience will allow to Italian teacher, head teacher and administrative staff to observe in action in the host schools what they aim to achieve in their school.

e. Conclusions

The case study illustrates one of the several initiatives that IC Assisi 3 for years has been pursuing, participating in many of the actions of the European Programme, according its policy of internationalization, with the aim of building the European citizenship.

The goal of the project is that by attending courses/job shadowing and by engaging with peers, teachers will feel empowered and inspired to try out something new in their school practices. The project also aims to enable teachers to manage effective lessons using ICT and teaching school subjects in English (CLIL)

References

Further information about the project is available on the European Platform http://ec.europa.eu/programmes/erasmus-plus/projects/eplus-project-details-page/?nodeRef=workspace://SpacesStore/1bc3e02e-d92a-4ff1-877d-c72922ac1d6b

Project blog: http://glocaleducationfor2010.blogspot.it/

Facebook: https://www.facebook.com/glocaleducation2020?ref=ts&fref=ts

Twitter: https://twitter.com/glocaleducation
Glocal Education for 2020 team during the training in Norwich (UK)
CASE 29: ArdesiaTech

a. Introduction

The ArdesiaTech pilot project (ArdesiaTech – Sperimentazione di un setting tecnologico orientato alla didattica collaborativa - ANSAS – INDIRE, 2011) started in the school year 2010-2011. The aim of the project was to observe, in a limited and controlled context, the learning processes in an environment with an advanced technological setting.

The project took place in the primary school “Baccio da Montelupo”, in Tuscany, and it has been promoted by INDIRE-ANSAS, a research body of the Italian Ministry of Education, in collaboration with Intel Italia, Microsoft Italia, SMART Technologies, Fondazione ASPHI onlus, the Department of Human Sciences for Education “Riccardo Massa” of the University “Bicocca” in Milan.

The project was focused on researches in education with a particular focus on ICT innovation and requalification of the learning setting.

b. What is the case study about?

The project aims to analyse if the introduction of new technologies in the classroom could answer to the needs of the new generation, the so-called “digital natives”.

The setting introduced in the class is composed of an Interactive Whiteboard, a SMART Table (an interactive horizontal surface), a Classmate PC (a notebook for each pupil) and a computer for each teacher.

Initially, the teachers involved did a training course to familiarize with the devices and the new setting.

In a first moment, the management and exchange of data has been done offline in order to give to the actors involved the opportunity to familiarize with the new setting. After a period of training, the online platform has been activated. The SMART software used allows the interconnection, full sharing of documents and interchange among all students’ and teachers’ devices.

In the first two months the classes acquired the necessary competences to use the software. As soon as the teachers felt comfortable in using these tools, the online interchange has been activated.

The tool SMART Response is also part of the setting and is used as basis to collect information to build the teaching plans according to pupils’ needs.

c. Some more detail

Before the introduction of the technologic devices, a need analysis of the involved actors has been done along with a study of the characteristics of the interested environment.

The goal is to test some technologies’ potentialities in modifying the social climate of the class and the relationships among the actors part of the teaching/learning processes.

Each pupil has been provided with a notebook, Classmate, developed to be used by children. Each Classmate has been connected to the teacher’s computer and to the interactive whiteboard in order to promote the pupils’ active participation and an interactive learning. The multimedia station has been specifically designed to be easily used by children.

All the ICT devices have been connected to an online network in order to facilitate the exchange of didactic material, to share projects, to use the interactive whiteboard to show and modify the school work done by the kids.
The possibility of using an interactive surface positioned horizontally on a school bench allows pupils to stay there and look each other in the eyes and has been considered particularly important to explore the potential of the optical interaction.

The activities have been conducted in three mixed and heterogeneous groups coordinated by 2/3 teachers. Each group has been further divided into 3/4 units.

The result has been a coherent and advanced model of technological classroom.

d. Other information

The emerged problems can be grouped in macro areas:

- limited memory in the personal devices compared to the heavy digital contents elaborated by pupils;
- hardware to be optimized for educational activities that require a ease and quick response;
- updating applications;
- conflicts raising with the software update and the integration of new applications;
- frequent misshapes to cope with and centralized management interventions.

e. Conclusions

This experience shows how it is important that the ICT tools for a classroom should be designed according to its needs.

The integration of all the devices used in this project designed a strongly social learning environment in which the creation of networks and groups eliminate the isolation factors and favour a cooperative learning. In fact, the use of a personal device, such as Classmate, should be included in the context of the social network of the class.

References


See more at: http://www.scuola-digitale.it/ardesia-tech/il-progetto/introduzione/#sthash.HeTOtTF8.dpu
a. Introduction

The project leader is the Ingegneria Informatica, an Italian company working in the new communication technologies sector, flanked by Fastweb, Interactive Media, iCampus Consortium. On the research field, the partners are the Natural and Cognition Lab of the University of Naples “Federico II”, the Department of Communication and Social Research of the University of Rome “La Sapienza, the Department of Electrical Engineering and Applied Mathematics of the University of Salerno and the Department of Engineering and Informatics of the University of Trento.

The project started on June 2014 and will last 26 months, by finishing on July 2016 (http://infanziadigitales.altervista.org/).

The aim of the project is to enhance the use of ICT (cloud computing, social media, open data, etc.) and of the newest paradigms of man-machine interaction (augmented reality, handwriting and speech recognition, motion detection, etc.) in order to define psycho-pedagogic practices that can improve the didactic activities and facilitate the processes to acquire new competences and knowledge.

Among the other objectives, there is the use of ICT:

- to create more effective learning paths;
- to facilitate teachers in controlling in a not invasive way pupils’ progresses;
- to build new learning scenarios.

b. What is the case study about?

The primary aim of the project is to experiment the ICT potentialities applied to learning and teaching activities. At the heart of INF@NZIA DIGI.tales 3.6 there is the creation of innovative teaching and learning environments.

The aim of the intervention of the project is the primary school, to which the Ministry of Education gives the task to enhance the identity development, autonomy, skills and sense of citizenship of the children.

More specifically, the project is directed to children aged from 3 to 6 years.

The steps taken have been:

- a preliminary needs analysis;
- the definition of methodological guidelines;
- the screening of possible technological solutions;
- the preparation of the technological setting;
- the results dissemination.

c. Some more detail

This project applies the Embodied and Situated Cognition theory, according to which our interactions with the environment determine our neurocognitive structures. The aim is to search psycho-pedagogical practices to value the new technologies potential and to emphasize the social dimension of the learning process as a result of the individual participation in the community.

In this dimension, the knowledge building raises together with and is simplified by the construction of a social identity shared with the community through the performance of common activities.

The goals are:

- to create, design and implement Smart Learning and Teaching Environments that can be integrated in the primary school curriculum;
• to create learning and teaching paths respectful of the community principles for an harmonious and complete growth of the children;
• to enhance a deeper participation of and relation among the different actors of the learning process.

Given that learning is not just an individual process, the project focuses not just on the pupil as an individual person and in his/her relation with the teacher, but also on:
- his/her socialization and collaboration with the classmates during school hours;
- the interaction with coevals, friends and parents outside school;
- the relational dynamics.

To reach the above-mentioned goals, the following activities have been considered:
• preliminary needs analysis and definition of the project’s methodological guidelines by involving the representatives of the different target groups (parents, teachers, school heads) in order to ensure the greater cohesion between the project solutions and the real needs recorded;
• preparation of the technological system;
• test, evaluation and validation of the project outcomes. During the evaluation, the learner satisfaction and the learning objectives will be evaluated through a test;
• dissemination, reuse of the results, exploitation plan and management of the intellectual property rights.

d. Other information

INF@NZIA DIGI.tales 3.6 focuses also on the provision of integrated personalized solutions for the training for students with specific learning problems, with disabilities or with special education needs, and on inclusive practices towards not Italian citizens to promote their complete integration.

The project will broaden the interventions in the field of school to two secondary fields of the project:
• Cultural Heritage: to value the use of the tangible and intangible cultural heritage of the territory. The project foresees the activation of learning paths on a continuum school-family-city and the enhancement, within the school curriculum, of the territorial resources.
• Cloud computing technologies for smart government: to improve the quality and the accessibility of school services; to facilitate the teachers’ activities; to ease the relation between school and family by using application and infrastructural resources based on cloud paradigms.

e. Conclusions

Nowadays, children are experiencing a relevant technological gap between the school, usually underdeveloped from this point of view, and the domestic environment, where instead new technologies are increasingly pervasive and advanced.

Inf@nzia DIGI.tales 3.6 aims to connect and integrate these two scenarios aiming at finding effective solutions to promote the children development by exploiting the diverse opportunities offered by the new technologies. And it aims to develop innovative contexts both in terms of methodology (new pedagogical tools), both from the technologic viewpoint (smart objects).

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CASE 31: Cloud computing at the Technical and Commercial Institute “L. Pacioli” Crema

a. Introduction

The Technical and Commercial Institute “L. Pacioli” is an important example of technological innovation in the school at national level. In 2007/2008 the first collaboration between the Institute and some prestigious American and national institutions (such as the MIT in Boston and the University of Udine) started in order to realize the project “1x1” aiming to replace traditional books with a notebook (http://www.pacioli.net/).

In 2009, the implementation of the project started with the realization of a wireless coverage in both the Institute’s buildings. Each classroom basically became a multimedia lab.

In 2010, the first training courses for the teachers and the didactic trial started. Each student has been provided with a netbook with e-books and in each classroom there are a computer and a projector, while in 10 classrooms there is an interactive whiteboard.

The institute uses the Google cloud computing to connect all the actors and to favour the communication among them: immediate communication, possibility of creating and modifying texts, etc.

The last step has been the introduction of the “Aula 3.0”, a classroom where new technologies and furniture are in strict synergy and the spaces are reprogrammed according to the different learning needs in order to favour the collaboration among students and improve the learning process quality. It has been furnished with an interactive whiteboard flanked by three screens connected to a projector to easily show the same images or use the screens separately to share information in smaller groups. Each screen is connected to a computer.

All the students can access with their own notebook and the teachers can use a tablet to govern the technological equipment and organize the teaching.

b. What is the case study about?

The main aim of the project is to try to find innovative strategies to involve more the student through a methodology that can be called “lab teaching”.

Through the use of ICT in the learning and teaching process it is possible:

- to optimize space and time, for instance by bringing the tools usually used in laboratories (computer, projector, etc.) into the classroom. Each class becomes a laboratory;
- to improve the learning processes;
- to easily manage the classroom: transmission of didactic materials, homework, discussions, interchange, information;
- to favour a flexible learning process in order to better adapt to the learners’ needs.

In particular, the introduction of “Aula 3.0” has favoured the use of teamwork, the participation of each student, the interaction student-student and student-teacher. The main actor of the learning process is the student.

c. Some more detail

The school uses the cloud services provided by Google Education by using an email. Each member of the institute has an email of 25 GB that allows teachers, students and the administrative department to communicate, collaborate and share information on this platform.

Class groups formed by students, teachers and parents have been created to ease the spread of information.
The documents are shared on Google Drive, so that it is possible to create, modify and share them in an easier way.

One of the main outcome of this project seems to be a decrease in the school drop-out.

The introduction of cloud computing lead to:

- new tools to communicate, share and collaborate;
- students can communicate also outside the school among each other, with teachers or students from other parts of the world (e.g., the U.S.A.);
- the didactic material is collected on the cloud so to set up a multimedia library;
- each device is a workstation.

**d. Other information**

The institute has developed a great European and international dimension highlighted by diverse activities:

- training for teachers of scientific subjects in some prestigious university (as the MIT, Stanford);
- support on the job by researchers of the MIT;
- participation to various European projects;
- collaborations with European schools to find innovative models.

The institute has been selected to represent Italy during a meeting in Bruxelles in 2013 focused on the innovation in education.

It is also part of the project “Avanguardie Educatives” (education avant-garde) of Indire (the Italian national institute for documentation, innovation and educational research) as one of the leading schools in technological and learning methodologies innovation.

**e. Conclusions**

The debate about how future schools should look like is still open, but experience as this one represents an important step towards that. The experience at the institute Pacioli shows how the introduction of ICT tools can be useful to all the actors involved by easing the communication, the possibility to share information and documents, etc.

Technology is an important support to the teaching and learning processes, but this project highlights how it should be properly integrated in the concerned environment, as it is not an end in itself.
CASE 32: Cloudschooling

a. Introduction
The project Cloudschooling (http://www.cloudschooling.it/) started in 2014 and is based on previous experiences developed by “Maieutical Lab”, an Italian start-up located in Turin, in the field of online tutoring for students of secondary schools with the support of cloud applications.

The project has been developed in collaboration with the Ministry of Education and two Italian publishing houses, Zanichelli and Loescher.

The impact of the project (600 virtual classrooms / 27.000 tasks developed by students) shows the importance of “personalized learning” and of the cloud in education for a digital future and their strong impact on the new e-generations.

b. What is the case study about?
This project can be seen as a way to promote the idea of “digital school/e-school” in Italy through the implementation of an online tutoring desk based on the principles of “personalized learning”.

It is closely related to new learning scenarios and the ways students learn: not only through the traditional interaction teachers/students but also online through e-collaboration and knowledge sharing with peers/with online groups.

Furthermore, digital learning scenarios can foster the integration of weak or at risk students (migrants, Rom, etc) and SEN pupils.

It shows also the new role of teachers as “facilitators” of the learning process and of schools as potential lifelong learning communities through the integration of digital/cloud resources into their pedagogy.

c. Some more detail
Even if there aren’t at the moment reports or articles about this initiative, its impact, as reported above, shows the importance of the cloud as a catalyst for school and social innovation.

d. Other information
Online tutors of 11 school subjects are selected through a specific procedure.

e. Conclusions
The case study illustrates the potential of the cloud in the field of personalized learning.
CASE 33: Aula 3.0

a. Introduction
The project Aula 3.0 started at the beginning of September 2015 and has been realized with the contribution of Auriga (http://www.aurigaspa.com/eng/), a software house that was born in Bari.

The project aims to create a research lab, in the Arcangelo Scacchi High School in Bari, in which students and teachers can develop an active and non-formal learning approach, based on problem solving, with an interaction achieved using the latest technologies and hands-on activities to improve the effectiveness of teaching and learning processes.

Promoted by Indire (National Institute for Documentation, Innovation and Educational Research, http://www.indire.it/), the idea of building technologically innovative classrooms aims to create a flexible space for a 3.0-learning methodology that will introduce a culture of innovation among students.

At present, there are only 28 students involved, but the next year the school will continue the investment, initiated by Auriga, offering the same opportunity also to another class. Aula 3.0 (translation in English: Class 3.0) - Arcangelo Scacchi High School in Bari (Apulia - South Italy) http://liceoscacchibari.gov.it/home/lo-scacchi-sui-giornali/trassegna-stampa-sulla-classe-3-0.html.

b. What is the case study about?
According to the High School headmaster, Giovanni Magistrale, thanks to the project, students will be able to learn a new collaborative approach, focusing not only on the traditional class but also on debate. Teachers can send the lesson of the next day to their students in the afternoon, asking them to reflect on it and exchange ideas and suggestions all together in class the following day. The aim is letting them plan the lessons like in a flipped classroom and take the role of their teachers by re-elaborating the lesson of the day through teamwork.

"We have enriched our virtual classrooms, the cloud and the flipped classroom. There will be an integration of all technologies, even though we don’t want uncontrolled experiments: we will be very careful to integrate the traditional way of teaching with the innovative", said Giovanni Magistrale.

c. Some more detail
According to the project idea, in the classroom there isn’t a traditional blackboard, but tablets for everyone, there are colorful and trapezoidal desks, and in this way, professors are ready to “build” the lessons with their students through technology.

Teachers had to do a specific training to learn new teaching techniques and are now ready to kick off this phase of experimentation.

All the students in the class 3.0 will have a tablet: the school will provide those who require it with a computer or they can bring a device to be integrated with the others.

The spaces for teaching are therefore flexible and the teacher has no longer a traditional role but rather that of facilitator who organizes the activities. The furniture also ensure a flexible arrangement of the classroom that facilitates group work. There are interactive whiteboards with touch screens, all networked and connected with devices used by both students and professors (tablet, PC / laptops), in order to share innovative lessons.
All this is possible thanks to the contribution of Auriga, a company of Bari, which also painted the classroom and provided the necessary furniture.

d. Other information
N/A

e. Conclusions

This is one of the few projects in Italy that aims to digitise teaching in schools. It is an innovative and entertaining way to engage students in class with updated tools, which are also those they use daily and with pleasure.

In this way, students have the possibility, at a young age, to measure themselves with the use of those technologies that will be very useful in the future. In the meanwhile, they will learn practical ways to participate in class, through debates, group discussions, teamwork and by taking their teachers’ role.

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CASE 34: Edoc@work3.0

a. Introduction

Edoc@work3.0 (EDucation and WOrk On Cloud) is a research project that has been implemented in Apulia (South Italy), which aims to reformulate the teaching and learning approach through the use of 3.0 technologies (http://www.edocwork.it/percheedoc).

The project started in 2014 as an experimental phase aimed at schools in the region of Apulia. The idea is to create an Innovation Lab Network between Apulia and institutions and make a comparison with the past experiences in the context of the National Plan of the MIUR (Ministry of Education, http://www.istruzione.it) for the digital school and Cloud for national education.

The project is funded by the Ministry of Education within the National Initiative "Smart Cities and Communities and Social Innovation", aiming at innovating the whole chain of education, from primary schools to vocational training, leading technologies at the heart of teaching.

The project aims to innovate the learning environments, languages, tools, and content thanks to the latest technologies. It is a new way of teaching with innovative tools for distance learning and collaborative virtual environments, e-books and social spaces to overcome the physical barriers of the classroom by encouraging the sharing of experiences and methodologies.

In this testing phase, it is essential to involve all the school subjects: students, teachers and families for sharing and active participation.

b. What is the case study about?

What is the case study trying to achieve? How does it relate to learning, teaching, managing and leading?

Exchange of knowledge and collaboration among institutions, researchers and companies are the levers of the project.

This project is a partnership between public and private organizations where everyone is giving its contribution: those who study and do research on models, those who design systems and technology services, those who enable models and formats, those who create prototypes and test solutions.

c. Some more detail

What is being done in the project, what has been outcome, is there any ideas, advice or guidance provided?

The pilot schools will be equipped with the necessary technological infrastructure that will then remain available to regional education. During the testing phase, it will be possible to monitor the benefits produced by the use of the solutions proposed by Edoc@work. Teachers, experts and researchers will be able to access the portal and know the results.

Interactive whiteboards, readers and books, multimedia labs, software tutorials, word processing and hypertexts are the new technologies that are coming into the classes and moving the focus on the creative abilities of the students.

Students not only read and hear but see and do, thus applying higher cognitive abilities, as doing and seeing the results of their actions make them learn faster. Technologies, in fact, give strong motivation to
learn and foster collaborative group dynamics. They can become a tool to promote excellence: ensuring that each student addresses the educational path with their own style of learning.

On the other hand, teachers have access to new tools to create an environment where the kids listen and read, using audio-visual, participating in discussion groups, producing new educational products and, therefore, they learn in a more autonomous and thus more effective.

The technologies available today can support the adoption of different teaching methods and support a new model of school-oriented flip teaching, learning by doing and collaborative learning.

d. Conclusions

The project Edoc@work is an innovative experiment that will probably change the teaching methodology throughout Italy by exploiting researches and models carried out by a specialized partnership coming from both the public and the private field.

Students will find stronger motivation by experimenting, together with their teachers and families, new innovative and non-formal ways of learning and attending classes. Nowadays, the way young people interact with the outside world has completely changed compared to previous generations. The school willing to involve them in educational projects is, in some sense, obliged to consider carefully how the impact of new technologies would affect the teaching and learning activities.

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CASE 35: School on the Cloud – a model school

a. Introduction

For the last five years Primary School no. 3 in Ząbki (small town near Warsaw, the capital of Poland) has been developing and implementing modern model of education, introducing new technologies into all aspects of learning, teaching, managing and leading.

The whole process is led by the manager of the school, in close cooperation with the local community, teachers as well as parents. Moreover, in 2014 the school has started cooperation with business – IT and educational sector (Microsoft, VULCAN, Oxford University Press). This helped to introduce the cloud-based educational solutions into every day work of the school. This pilot project was called School on the Cloud – model school.

b. What is the case study about?

The main aim of the school transformation is to implement “cloudy” technologies in all aspects of learning, teaching, managing and leading. To fully integrate technology into pedagogy school community works on:

a. development of IT infrastructure – there are 3 “mobile classrooms” with tablets (16 tablets in each) and 2 traditional IT rooms with PCs. School library is equipped with ebook readers. An ECDL laboratory (European Computer Driving Licence) operates in the school. In each classroom students have access to the high speed internet and an interactive board;

b. supporting teachers and students to use the Cloud by providing:
   - professional trainings for educators,
   - access to an online educational platform with dedicated materials. Ebook used by students are linked with online resources;
   - access to applications available in the Cloud.

c. supporting school administration (manager, secretary) by providing access to professional cloud-based software.

c. Some more detail

What is being done in the project, what has been outcome, is there any ideas, advice or guidance provided?

In 2014 thanks to cooperation with business the school managed to improve its IT infrastructure. About 30 students and teachers were equipped with PC tablets. The company (Microsoft) also provided access to the cloud-based package of the office apps (text editor, app to create and manage spreadsheets, etc.). All teachers were trained to be able to lead pilot project.

d. Other information

Feedback for the project was provided by parents – the group not directly involved in the activities. They were happy to see that their children learn how to use new technologies to find information/knowledge needed not only at school but also in everyday life.

On the other hand, representatives of business sector emphasized that use of the cloud-based technologies at schools helps to improve the quality of education and training and prepare young people for integration into the labour market.

e. Conclusions

The case study showed the potential of implementing Cloud technologies in education. Moreover, it proved that the success in this process can be achieved only by complex approach. It’s not enough to give teachers and students new tools (tablets for example). They must get professional support (training, access
to educational materials, etc.) as well as be supported by other teachers and management of the school. Only in that situation man can really talk about “school on the cloud”.

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CASE 36: The Internet Atlas of Kujawsko-Pomorskie Province

a. Introduction

The concept of Geographic and Statistic Atlas of Kujawsko-Pomorskie Province (http://www.atlas.kujawsko-pomorskie.pl) appeared at the beginning of XXI age and it was created by scientists of the former Institute of Geography (the present Faculty of Earth Sciences), Nicolaus Copernicus University in Toruń. But only in 2013 The Marshal Office of Kujawsko-Pomorskie Province initiated studies over this unique project aiming at the creation of widely available internet tool where you can find broad knowledge about factors and conditions of the province development taking into consideration spatial aspects.

The project was finished in May 2015 and made accessible for public after 12 months. It was mainly done by scientists (65 authors) from Faculty Earth Sciences of Nicolaus Copernicus University, and the computer part was done by 3D Design Team company from Toruń.

The final project, which has a part with informational portal and the proper part with atlas application, is innovational and it is the only such a study in Poland. It is available on personal computers, notebooks, netbooks, but also on mobile devices such as tablets and smartphones.

b. What is the case study about?

The Internet Atlas of Kujawsko-Pomorskie Province is a modern, complete, and regularly updated cartographic-thematic and geographic-statistic monograph of the region. The application shows the current knowledge about the province as well as prospective diagnosis of its development. It is a comprehensive and easy to use source of knowledge about the region.

Universal character of this application makes it possible to be used by people of different age, level of education who are working in various places. It is the source of knowledge for pupils, students and teachers, and also for clerks, farmers and businessmen. It will also be useful for future generations. This Atlas will be developed by Internet users by saving some compositions and it will show their creativity. On the other hand, it has unlimited possibilities of interpretation of geographical environment.
c. Some more detail

The application The Internet Atlas of Kujawsko-Pomorskie Province consists of six thematic sections: General Issues, Natural Environment, Natural Resources and Environment Preservation, Society, Economy and Strategy of the Province Development. Among all of them, 140 map compositions are created, 362 thematic maps applying over 7000 topics. Thematic issues are presented in eight scales – from 1:50 000 to 1:32 000 000, with most 1:1 000 000 scale using various cartographic methods (quality and quantity) of spatial data presentation.

The description is prepared for each map composition. It shows methodology of the study, data sources used, authors and more, e.g. the dynamic of changes, previous state of the phenomenon.

Each user of the application has an opportunity to see up to 10 map compositions, to change their order and transparency of the content, to use the functionality of interactive legend, and also to save and print. The system makes it possible to search for maps by writing to browser a word/phrase, which is connected with the map or important key words. It is possible to relate maps to some statistic data prepared for the given area. An Internet user can see on the screen applications of whole maps as well as single elements or layers.

d. Other information

At the time when the application was created, especially its application part (interface, navigation, intuition), opinions of pupils and students from some primary and secondary schools, university from the regions were taken into consideration. They could test prototypes of the application and express their opinions. Collected experience was used at the final project of the application.

In the nearest future the application will be promoted among teachers of all levels of education in Kujawsko-Pomorskie region. It should be used as a didactic tool in the realization of chosen natural and social-geographic issues. Handout for school lessons with the Atlas application will be prepared.

The promotion of the Atlas in other provinces in Poland is planned to make them prepare the same applications for their areas.
e. Conclusions

The application is a unique didactic study, which is suitable for the current trend of modern education with the use of interactivity and interoperability. Issues included in the application not only show the current area of the region and its condition but also processes which make it possible to diagnose their reasons and educate in the field of natural and social-geographic environment presenting the most up-to-date state of the knowledge.

Professional team of authors of the application is the guarantee of the most essential quality of the study, which today supplements very often out-of-date school atlases, portals or other Internet tools can fully replace them in the future.

References


CASE 37: UBI Competence Centre

a. Introduction

UBI Competence Centre in Cloud Computing, University of Beira Interior (UBI) http://www.ubi.pt/Noticia/4900 is cooperation between UBI and Portugal Telecom (PT) in the Competence Centre in Cloud Computing, which started on April 2, 2014. UBI was the first university in Portugal to house Cloud services. The signing of the agreement between UBI and Portugal Telecom was on November 28, 2014, at the rectory. http://www.ubi.pt/Noticia/5309

This cooperation will enhance the development of the economic and social fabric of the region, allowing the identification of scientific and technological opportunities that can attract businesses, create jobs and create mechanisms to bring to universities and R & D institutions.

The Cooperation marks the beginning of a partnership in research projects, development and innovation in the area of systems and information technologies applied to the cloud computing and the health sector, fostered by several of UBI research units in areas pioneering and installing the Data Center of PT.

b. What is the case study about?

The case study illustrates how the proximity of UBI with the Data Center PT installed in Covilhã is based on the importance of training in the areas of computer science and medicine. Moreover, it has been constant cooperation with companies located in the region linked to the new technologies of communication and information, as exemplified by Altran and the OutSystems. The project comes within the strategy to create a new line of action for the more remote universities of the Litoral.

c. Some more detail

In addition to the hosting and housing, the agreement includes an innovation that consists of the provision, by PT, of VDI terminals (virtual desktop interface) for high graphics performance capable of supporting applications engineering and technical drawing with high speed.

d. Other information

One result of this cooperation was the creation of the postgraduate: “Information and Communication Technologies for Cloud and Datacenter” by Informatics Department of UBI. http://www.ubi.pt/Entidade/Departamento_de_Informatica#Cursos

e. Conclusions

The case study illustrates the beginning of a partnership in research projects, development and innovation in the area of systems and information technologies applied to the cloud computing.

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CASE 38: Learn Portuguese Sign Language with an App

a. Introduction
This App was created during the last school year and disclosed in June 2015 on Youtube, from the Agrupamento de Escolas n.º 1, Beja (Portugal) https://www.dropbox.com/s/lm1rnf0sy151md1/LGP%20-%20ABC.apk?dl=0, https://www.youtube.com/watch?v=C4ruOzNrzIA and https://www.youtube.com/watch?v=C9oFxX_5XSQ

It was created by the Special Education Department in cooperation with the school library and the school’s Deaf Unit.

b. What is the case study about?
The main target of this App is to promote the learning of Portuguese sign language by students and teachers, not only from our school but also from the school community. In this specific case, the work team chooses “the color” as main theme.

c. Some more detail
The same team has also developed two support videos: one explaining on how to download and install the App on a Smartphone and another one about the colours in Portuguese sign language (please check links above).

This App is the first of a set that have as the main purpose is help the communication between deaf students and their teachers (and friends and families). Other themes like animals, objects, means of transport, professions are being prepared.

d. Other information
In Agrupamento n.º1 de Beja we have four deaf students and two teachers directly involved with them.

e. Conclusions
Teaching a deaf student is a challenge. It is not easy and it requires a lot of work, patience and expertise. So, the importance of this tool gains even greater importance for a teacher (or for a deaf’s friend).

References
CASE 39: Olá! Hello! Hola! Salut! Ciao!

a. Introduction

This case study (Olá! Hello! Hola! Salut! Ciao!: and the distance becomes closer - technologies for Interculturalism in Education) began in September 2014 and was completed in May 2015, during one school year. The study was conducted by an history and geography teacher in its classrooms, in the third cycle and secondary classes in Portugal. In his classes, the teacher used Skype as a technological tool to put in contact its students with citizens of other countries who taught History and Geography aspects of their countries and that took the students from over the Portuguese border. Students heard the explanations of the foreign guest and could raise concerns about their country, way of life, custom, ideas they had on Portugal, and what was taught in history and geography in these countries, etc.

b. What is the case study about?

The study shows how the use of communications technology platforms can be effectively used in teaching and to what extent the multicultural contact can be promoted in a manner next even if from afar. It also allowed to understand how teachers can use this technology in educational processes, realising its advantages and disadvantages, and the opinions of students about the use of technologies in their learning process.

c. Some more detail

This study selected a series of classes in basic and secondary education and applied the Skype tool to put students in contact with citizens from other countries. Although it was a case study with a small sample, it served to identify a set of potentialities and limitations that this kind of activity allows. The study is published in open system and has been presented in several congresses and conferences and it may be replicated in other school spaces.

d. Other information

This case study had as final product a Master’s thesis defended at the Faculty of Arts, University of Porto and had 18 marks as final grade.

e. Conclusions

The application of this study highlighted that with the evolution of the distance ICT, its use in classroom is possible and fundamental.

This experience proved to be innovative the students, allowing them to contact with people from other countries, which showed them other perspectives on certain thematic contents, enriching students’ knowledge and opened their horizons, allowing another culture came into classroom.

When used in classroom, the Skype was seem as something new by the students and was considered by them as an experience they would never forget. In another dimension, this experience also revealed itself as unforgettable for the teacher who applies it. On one hand, the teacher can captivate the attention of students in a dynamic way, complementing the thematic content that is being worked. On the other, the teacher can be aware of certain expressions of the students, showing the enrichment that this activity gives them not only at the thematic level but also at the of attitudes level.

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CASE 40: Ujr: Junior University – Summer School for Kids

a. Introduction

_Ujr – Oporto on the Cloud_ was an activity implemented in July 2015, inside the programme Junior University and was created by CITCEM-FLUP researchers [http://universidadejunior.up.pt/programas/atividade/6](http://universidadejunior.up.pt/programas/atividade/6). Ujr (Junior University – Summer School for Kids) - Oporto on the Cloud.

Junior University is an initiative of the Oporto’s University in Portugal, and had its first edition in 2005. Every year, in July, the university welcomes students between 11 and 17 years old, from all over the country, to develop scientific activities in the several colleges of the university.

_Oporto on the Cloud_ was created for the 2015 edition, inspired in the European SoC project and pretended to study the use that children of the second series of Portuguese basic education do related to a specific technology – Mobile Applications. It was also an experience that allowed to understand how this technology can be used in the learning process.

The case study is based on a mobile application about Oporto’s heritage and history that was specifically built for it by the researchers and was implemented by two recent graduated teachers with 280 students.

b. What is the case study about?

The case study illustrates how a mobile education can be used in the learning of local heritage and history. It also allowed us to understand how teachers can use this technology in educational processes, realising its advantages and disadvantages, and the opinions of students about the use of technologies in their learning process.

c. Some more detail

The case study held in July 2015 with 280 students between 11 and 12 years old of the second series of Portuguese basic education from different regions of the country.

The activity used a mobile application that works as a paddy paper guide and at the same time a source of information about pre-selected monuments of Oporto city.

After a field trip through the city using the mobile application as a support, the students used web applications to create a presentation about what they had learned and published it on the cloud.

At the end of each day, children were asked to answer an online survey about the activity and their opinion about the use they had done of the technology in the learning process during the day.

The study case showed that students enjoyed learning with cloud-based technologies and that they become more motivated for learning with this kind of learning strategies.

d. Other information

This activity will continue next year because it was very welcomed by the Ujr organization, not only by its innovation but also by its success with the students.

During the current school year (2015/2016), this case study will be presented and disseminated in the classes of “Web and History Learning” on the Oporto’s University in the Faculty of Arts. It will also be a case study to continue developing next year, comparing the great results of 2015th edition with the ones of the next edition in 2016.

e. Conclusions

The case study illustrates the potential of mobile applications in the learning of local heritage and history and in general education. It shows that Cloud-based technologies can be successfully implemented by i-teachers that are prepared for it, and it is a key element to the motivation and autonomy of young i-learners.
CASE 41: Electronic Text Books – an experience with tablets in school

a. Introduction

This experience starts in September 2013 on two Portuguese primary and secondary schools and will finish on July 2016. Fialho de Almeida’s Primary and Secondary School, Cuba (Portugal),

Cuba’s school have been involved from the beginning about 15 teachers and 44 students.

The schools have the support of the Portuguese Ministry of Education, Catholic University of Portugal, Microsoft, Promethean, Fujitsu and a Portuguese publisher of text books (Porto Editora).

In the school the project is leading by a mathematics teacher which works in straight collaboration with the school board.

b. What is the case study about?

This project has two main proposes: put teachers and students working exclusively with ICT in the classroom on several subjects: mathematics, sciences, physics, chemistry, history, geography and languages. There is no place to paper books on classroom and teachers must teach with their tablet, supported by an interactive board. By other side, students should do their work almost using the tablet. They are allowed to use in some subjects an exercise book.

This project also aims to: set an alternative concept of electronic textbook; adapt the teaching-learning process to the individual characteristics of each student; using advanced technologies and teaching methods in order to provide students with more better learning; make the process of teaching-learning more interactive and dynamic; train more competent students, technically and scientifically; enter a dynamic and interactive dimension in the manual; contribute to a rethinking of the publishing market in Portugal a more competitive and fertile dimension in content; improve teacher-student relation; reduce the weigh to be carried by the student to school; secure digital content that do rely on an internet connection; make the textbook easily upgradeable and correctable.

c. Some more detail

In the beginning of the project, teachers, parents and students worked together in order to understand the implications that this technology will bring to the classroom and their practice. It was a great challenge for all: teachers (some of them) should change their vision about what is a classroom; students had on their hands an object witch didn´t served exclusively to play games and parents didn´t spent (much) money on text books! So they decided to accept this challenge and the project started.

Today, two years later, many things have been achieved: students gained more autonomy dealing with technology, they are now able to use diversified software in order to do their work on classroom; teachers are now more comfortable preparing their lessons, teach his subjects and help students on classroom. An online platform for communication (One Drive) between teachers and students (and even families) was created to share information, materials and data resources for classroom during the three years. Some teachers provide their homework through this cloud.

A project blog and a Facebook´s group were created in witch, teachers, students and parents make their own contributes (news ideas, suggestions, share activities, etc) to improve it.

Teacher´s also created a space on the cloud to share their lessons in many forms: videos, Powerpoint presentations, word, excel, etc. All using their tablets.
d. Other information

Supervision and testing of pedagogical model is monitored by the Catholic University of Portugal and the Portuguese Ministry of Education. This project has a regular (quarterly) assessment distributed during the three years.

This project has been publicized quite a lot in the Portuguese media in his first year (radio, TV, newspapers, internet).

e. Conclusions

I am tracking this project because I have some relatives studying on that school and I have the opportunity to see their progress on the use of ICT on their work (and life) and in the improve of their knowledge, became better citizens. However the success of this project depends a lot on the work of all the teachers involved on it, in their capacity of improve their practice, and their teaching. There are not (yet) official assessment results, because only in June 2016 students do the final national exams. However expectations are very high.
CASE 42: Adservio - Software educational technology

a. Introduction

Adservio is software educational technology, web apps; Web site http://www.adservio.ro, Headquarters: Eternitate, nr. 21, Iasi, Romania

Adservio is a digital platform dedicated to integrate all parties into a one-stop shop cloud solution, capable of organizing and centralizing all school information, turning them into easy-to-use assets for parents, teachers, departments of education and governmental bodies. Addressing everything from online grading, attendance management, engagement analysis across the curriculum, direct communication between all parties and big data collection, Adservio unifies information locally, district wide and nationally.

It was founded in 2008 and has grown constantly ever since, reaching a total of 26 schools in 2015, in Iasi and Bucharest, the capital of the country. Its founder, Alexandru Holcov, has presented the evolution of the platform – created by young computer specialists - from an electronic register of grades and academic evolution to a complex tool which has contributed to a better communication among parents, teachers and students, to improved results and a significant drop of truancy, as well as to new approaches in teaching and learning.

b. What is the case study about?

The case study illustrates how such a platform and cloud computing can eliminate bureaucracy and make communication among different parties easier (parents, students, teachers). It contributes largely to better management, transparency and increases the confidence of parents and pupils in the educational process. It also provides all parties involved with the possibility to access the platform from any electronic device (computer, laptop, mobile phone, tablet) and thus to be kept up to date or make any inquiry that seems necessary. For teachers, this aspect is particularly helpful as they have the possibility to register all grades and write a feedback anytime they want from any place/device that has an Internet connection.

Another advantage is related to the possibility of sending projects, homework, presentations to teachers and receive the materials graded, as well as a feedback concerning the quality of the work along with useful recommendations. It saves time, materials (such as paper) and makes the whole collaboration easier and closer to a familiar environment for students.

The system provides all users with access to a free library (containing classical literature) that can be read online or downloaded and to a list of the most recent publications that can be ordered directly from the platform.

Learning has become easier and more fun as the system offers the opportunity to relate to one’s peers and exchange ideas and information. All the activity, files and projects one has (teacher, student etc) are stocked in the cloud related to the platform.

Teaching has become a more dynamic process as any materials available online can be quickly forwarded to students and used in the learning process.

c. Some more detail

So far, each year has brought improvements of the platform as to the organization of the information stocked and to the dynamic of communication. The system is now available for everyone from anywhere, from any electronic device, provided there is access to Internet.

All the statistics, reports required by the school management or structures of the Ministry of Education are now generated automatically based on the data stocked in the system – which makes a certain number of tasks easier for teachers, on the one hand, and transparent for the community and official bodies on the other hand.
Thanks to this platform, parents and students are better informed. Results during the academic year as well as at the national exams have improved. Parents, students, teachers are much more involved in the educational process. The directors of the school have also access to all the data (concerning all the activities) from anywhere anytime through Internet.

Security is an important aspect of the platform. No breaches have been recorded so far.

d. Other information

Due to the transparency and rapidity in communication, the students’ average has improved, in some cases, with one point per class.

The Adservio platform has allowed schools to maximise their resources. For now, a parallel printed register for grades is still necessary, but by the end of 2016 it will be replaced by a printed version of the data stocked on the platform.

Integrating technology in learning and communication has brought schools and their community closer, especially now when every parent or student has a mobile device connected to Internet.

A range of resources including research, case studies, library etc. are all available.

The platform has a special section destined to news from fields like education, psychology, careers, which are useful for students, parents and teachers alike.

All the data from previous years (students’ names, grades, message archive, personal achievements recorded in personal files, presentations etc) is kept on hand and is easy to access by any teacher, by the directors as well as by former students.

e. Conclusions

The case study illustrates the necessity of having technology in schools, as part of the communication and of the learning and teaching process. It proves that such platforms are highly successful and lead to improved results and higher confidence among partners in the educational system. For students, having such a platform is making school be a real part of their lives and their familiar environment.

So far, Adservio which recommends itself as a social innovation, is the most complex and reliable application used in education in Romania that has proved over the last years its advantages and usefulness.

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CASE 43: Eratosthenes Experiment: first prize for Romanian school

a. Introduction

A small school in Romania recreated the Eratosthenes Experiment in the Open Discovery Space and won the contest between 370 schools from 37 countries.

It is 2,200 years since the experiment was conducted by the famous Greek mathematician and astronomer Eratosthenes, a school team lead by the maths teacher Ovidiu Geambazu from the Secondary School of Jimbolia has recreated the experiment to calculate the circumference of Earth.

At their respective noon times on the 21st of March the students measured the length of shadows casted by sticks and then consulted the observations made by others at the same latitude. By sharing this data, invoking the properties of right triangles and applying proportional reasoning to angular distances, the students obtained a good measurement of our planet’s size.

The experiment, which took place in the school yard, was documented with photos that brought the teenagers and their teacher the First place at the 2014 Eratosthenes Experiment International Photo Contest, organized by the Department for Research and Development at the Greek school Ellinogermaniki Agogi. The experiment is an activity of the European project Inspiring Science Education (ISE), while the contest was an event of the European project Open Discovery Space (ODS). The second winner of the contest was a school from Samsun Turkey.

"The 2014 Erathosthenes Experiment, developed by our students, recreates the steps made by the famous Greek mathematician and astronomer in his attempt to measure the circumference of the Earth, by using the shadow of the Obelisk of Alexandria at the Summer Solstice date. The “little” difference from the original experiment is that the Greek approximated the distances with the number of steps made by people paid for doing it, while we used computers and eLearning software available on the Internet”, said Ovidiu Geambazu, maths professor at Jimbolia.

b. What is the case study about?

The Eratosthenes experiment, organized on 21st of March 2014, the day after the Summer Solstice, attracted the interest of both teachers and students all over the world. 370 schools from 37 countries took part in the contest. The schools had to choose a pair on the same latitude, from an area suggested by the organizers and recreate the experiment, providing the organizers with the results of the measurements and photo proof.

"When teaching math, one of the teacher’s goals is to attract students to mathematics and science. By presenting them with this interesting project, the idea of Eratosthenes for measuring the circumference of our planet and the easy and friendly way for developing the activities, I think I have managed to show them the fact that maths is a discipline which deserves to be studied with growing interest, particularly the activities that use the method of project-based learning”, stated professor Ovidiu Geambazu.

Both teams from Jimbolia, Romania, and Samsun, Turkey, have determined the circumference of the Earth by using eLearning tools but also simple instruments like a wood stick. All teams have worked using dedicated tools, material, and online communities in for educational communities in the ODS and ISE portal.

c. Some more detail

“For the activities of the ODS and ISE projects, SIVECO Romania has a national coordinator role. On the project portal, http://portal.opendiscoveryspace.eu, we have created the Teachers Community of Romania, where we already have over 30 schools registered. Why is this portal important? Basically, the teachers of this community have the chance to interact with other teaching communities around Europe and have
access to over 600,000 educational resources, communities, tools, etc. Participating schools also gain an international profile, an area that Romanian schools need to improve. In addition, schools have access to information regarding contests, special events, workshops, webinars, academies, etc. Finally, schools can find support in introducing innovation in the classroom, as well as on issues relating to European exchange EU training programs such as the Erasmus +”, Marius Preda at SIVECO Romania, Project Manager and ODS National Coordinator, has stated.

d. Other information

SIVECO is a full partner within the European project Open Discovery Space (April 2012 - March 2015) aiming at attracting over 2,000 European schools. SIVECO’s coordination team has started to advertise and register Romanian schools, achieving a number of 56 schools so far. The aim of the project is to introduce innovation and leadership in the classroom that combine the use of ICT with modern pedagogies.

e. Conclusions

The case study illustrates the potential of grassroots activities in transforming learning and education. It is based on the mission to help teachers and educators provide exciting 1:1 learning opportunities in Romania and Europe.

References


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CASE 4: Field Work in ČRNUŠNJICA 2015

a. Introduction

The project started in January 2015 as part of a compulsory course named Organization and realization of excursions and fieldwork at the Department of Geography, Faculty of Arts, University of Ljubljana. The course is attended by 1st year students of the master’s degree program. Students in this program study to become teachers of geography in primary and secondary schools. Part of their education and training is also the organization and realization of a field work on both primary and secondary levels. Faculty students are obliged to prepare field work based practical session for grammar school students as part of their preparation for Baccalaureate exam (“Matura”) from geography.

During the preparation of the lectures in January it was decided that we should change the final evaluation of the whole process by using computer assisted survey data collection. A software tool for online surveys named 1KA was used. The innovation – developing and testing the online survey – was led by two members of the Department of Geography, Faculty of Arts, University of Ljubljana. The pilot testing of the online survey was carried out by the faculty students (15) of the above-mentioned course. The conclusion of the field work was followed by the final evaluation done by the students of the grammar school Gimnazija Bežigrad. 51 students participated in the online survey from 27 March until 31 March 2015.

b. What is the case study about?

The case study was carried out primarily as a demonstration of a selected aspect of the “School on the Cloud concept”, using a software tool for online surveys within a course with faculty students of geography (future teachers) – in order to motivate them to learn about the software and later on bring more cloud-computing-based activities into education. However, other goals, such as testing the tool with the grammar school students, testing the quality of the collected data, presenting a new approach to gathering the information etc., were also fulfilled.

Both groups of students embraced the idea of using this kind of tools for the evaluation of their work and the whole educational process. No technical problems arose. Accordingly, we will continue to teach faculty students how to develop and prepare the online surveys and how to use them fruitfully during the educational process in the whole vertical.

c. Some more detail

Within this course, the future geography teachers experienced for the first time the use of such a Cloud-based, specifically designed software tool which they could relate to activities in schools. From that point of view, the main outcome of the project is the participants’ awareness of the potentials of such tools and the motivation for their development and use in the future.

The results of the analysis of the collected data was used as an evaluation of students’ work and achievements.

d. Other information

The online survey can be found at: https://www.1ka.si/a/60847

1KA service allows us to create, execute and analyse online surveys. Basic use on the 1KA.si domain of Centre for Social Informatics, Faculty of Social Sciences, is free and virtually without any restrictions. The installation of the application on user’s own server is also free and open source.

e. Conclusions

Apart from the above-mentioned positive experience, the use of 1KA application is simple. Once you know how to create a survey, you can do it within a few hours. Consequently, it was decided that the same approach will also be used in the 2016 course.

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CASE 45: Crowdsourcing web map of barriers for physically handicapped in Koper

a. Introduction

The project started in July 2015, building on an idea to prepare an up-to-date information about barriers for physically handicapped in the “old town” of a coastal town Koper, Slovenia (idea from 2012, master student’s research project at the Department of Geography, Faculty of Arts, University of Ljubljana). The innovation – developing and testing a mobile application for crowdsourcing / collaborative mapping – has been led by a team from the Department of Geography, Faculty of Arts, University of Ljubljana.

Pilot testing of the application has been carried out by the participants of a conference of Slovenian geographers (Melikovi in Ilešičevi dnevi, Koper, 25-26 September 2015), including teachers of geography, and students – future teachers of geography. The collected data will be checked in October 2015, especially regarding the classification of the barriers and spatial accuracy of the collected data. The mobile application will be used for further crowdsourcing, with special attention to the quality of the collected data, before publishing on the public version of the online map, planned for 2016.

b. What is the case study about?

The case study has been carried out primarily as a demonstration of a selected aspect of “school on the cloud concept”, using mobile application for crowdsourcing / collaborative mapping within a workshop with teachers and students (future teachers) of geography – in order to motivate teachers to cooperate in bringing more cloud-computing-based activities into education. However, other goals, like testing the quality of the collected data (in relation to the devices used in the field, and to specific situations like narrow streets potentially influencing the positional accuracy), contributing to a real-life project, involving also other participants (working as professionals, researchers, decision makers, managers) have also been given attention.

During the workshop (after returning from the fieldwork) a discussion revealed a realistic (e.g. considering the technical problems with only a few of the mobile devices, and the potential social segregation issues in a class due to the fact that many children in schools do not own a smartphone) and an enthusiastic reaction to their experience with cloud computing behind the collaborative mapping in the field.

Many of these enthusiastic teachers have been reluctant to use geomedia in their work so far, which shows that the workshop is achieving more than only its goals. In the on-going web discussion (after the workshop) teachers so far proposed 20+ mobile apps they would be happy to use in primary and secondary schools – included in teaching and learning geography or in other subjects. Besides, university students expressed several ideas about developing and using similar cloud based (mobile or online) applications within their diploma or master research. Also some researchers have seen great potential for innovative use of such applications in their work (especially fieldwork).

As a spin-off, another half-day workshop has been proposed (in late 2015), based on supervised self-learning through independent designing, implementing and testing geographic mobile applications. Invitations to that workshop will target teachers and students of geography, professional geographers (including researchers), as well as university staff from other disciplines.

The second spin-off might be a collaboration in the upgrading of an existent powerful cloud based online / mobile survey and survey mobile

From the workshop presentation
applications designing tool (http://english.1ka.si/) with the ability to add spatial information (e.g. using GPS in mobile devices) to the collected data – to support crowd sourcing / collaborative mapping, with a freeware tool. Discussions with 1ka team already started.

As the third spin-off, a participant from Slovenian Statistical Office suggested the use – when relevant - of their online STAGE spatial data server (http://www.stat.si/statweb/en/show-news?id=5238&idp=20&headerbar=16) either as a collection of basemaps (for simple applications like the one used in the workshop), or external spatial data source (in more complex online / mobile applications).

The management aspect: during the preparations of the workshop the organizers have been considering testing the mobile application installed on an ArcGIS server on one of the faculties in Ljubljana. Due to limitations of such installation regarding the number of users that can use the application at the same time, the cloud solution has been selected instead. The decision has proven to be correct, no considerable fluctuations in the accessibility and performance of the application have been noticed. The only important task for the management (of the department, faculty and university) consequently refers to the contract between the University of Ljubljana and the provider of ESRI tools and services (GDI), and the yearly payments for the licences.

The workshop and the development of the mobile application have been led by the team at the Department of Geography, Faculty of Arts, University of Ljubljana. However, further use of the application to prepare a publishable map of barriers for physically handicapped in the “old town” of Koper will be led by the student that started the idea in 2012 (Štefanić, 2012) and might later invite the residents of Koper to crowdsource the changes in comparison to the situation on the published map.

c. Some more detail

Within this workshop the majority of the participants, including geography teachers and
students, have experienced for the first time the use of such a cloud-based, specifically designed mobile application, which they could relate to activities in schools or in their other work. From that point of view, the main outcome of the project are the participants’ awareness of the potentials of such applications, and the motivation for their development and use in the future.

The results of the analysis of the collected data will be used to demonstrate the positional accuracy of different models of mobile devices, and other eventual noticeable factors influencing the accuracy. These results will be included into guidance provided online for the future designers and users of similar mobile applications. The guidelines will also be given during the planned half-day workshop on independent design, implementation and testing of mobile applications.

d. Other information
ArcGIS Online has been used as a Cloud service to carry out the crowdsourcing.

e. Conclusions
The team which prepared the workshop has been searching for a simple proof of the potentials of cloud-based support to teaching and learning— and has found several. The workshop has been different from usual workshops on using geomedia in schools in many ways, which may be its main advantage beside the advantages brought by the use of cloud computing alone:

- participants have got a strong introductory motivation by linking their participation to solving real life problem;
- the mobile application has been extremely simple (3 steps to add an obstacle to the database / map in the cloud), besides they have found it nice;
- the application functioned reliably nearly on all mobile devices; a short in-advance-announcement of a tiny possibility a problem could happen (like with other mobile apps) helped to minimize stress;
- no installation, preparation of devices or participants was needed; even no registration — the application has been set to be accessible to “everyone” with the link to it, as a true anonymous crowdsourcing support;
- the only device they used was the one they use every day;
- the participants can use the app also at home or in another area (no spatial restrictions in basemaps / data layers);
- participants can see the current result of collaborative mapping anytime, either directly from the mobile application, or on an embedded web map on the web page of the organizers;
- they can inform or invite others by sending a link to the mobile application or the mentioned web map by email, SMS or via social networks.

The organizers have hoped that the workshop will contribute to improvement of the awareness of the cloud-based support to teaching and learning. The feedback has considerably exceeded their expectations, resulting in three mentioned spin-offs, and a plan to prepare a few more mobile apps for the schools in the near future.

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CASE 46: eContent for teachers: Renewable sources and energy efficiency

a. Introduction

The project Renewable sources and energy efficiency: Educational e-content for teachers and children was based in the Littoral municipalities, Slovenia. http://egradiva.golea.si/. It lasted from 2012 till 2014. Since then the e-content has been in permanent educational use.

The author of methodology, technical concept and implementation is the Geodetic Institute of Slovenia (Geodetski inštitut Slovenije). The contracting authority is Goriška Local Energy Agency (GOLEA, Goriška lokalna energetska agencija).

The project “Renewable energy in the Littoral municipalities” is funded by the Swiss contribution, and the funds of municipalities involved in the project.

b. What is the case study about?

The e-content has been included in the project "Renewable Energy Sources in Littoral Municipalities" in order to strengthen education and awareness activities for children and youth. It serves to amend and upgrade the regular education program, which has been prepared for teachers and educators, who cover the topic of renewable energy sources and energy efficiency in schools and kindergartens.

c. Some more detail

The material produced is web e-content, which is divided into two thematic sections, energy efficiency and renewable energy sources. They are further subdivided into 12 subjects. Each subject is presented with several portlets - web sites. The overall number of portlets is 51.

d. Other information

The advantages of using modern information visualizations lie in the communication value of interactive materials that allow most people much faster perception of content compared with written materials, as well as in the possibility of a different way of learning. Pupils learn dynamically about the natural and technical processes, commonsense facts and energy themes. In this modern way they are able to mentally interconnect the meaning of separate themes.

e. Conclusions

With the help of e-learning materials the pupils are able to independently reach certain conclusions. They develop the ability of independent learning and the integration of learning content. Through visualization they deepen their knowledge which becomes more persisting and durable. At the same time they are further developing the skills of using ICT technology and raise the competencies in this area.
Učinkovita raba energije

- Energija ter sjema učinkovita in varšna raba
- Učinkovita raba energije v gospodinjstvih
- Učinkovita raba energije pri gradnji in obnovi streb
- Učinkovita raba energije v prometu in javni razsežnosti

Obnovljivi viri energije

- Obnovljivi in neobnovljivi viri energije
- Sončna energija
- Hidroenergija
- Energija bionase
- Vetrna in geotermalna energija
- Energija iz odpadkov in poročo celice

E-gradiva za najmlajše
Preveri svoje znanje.
CASE 47: KC CLASS - CLOud Assisted ServiceS

a. Introduction

KC CLASS Package 5: E-Learning Services in the Cloud, [http://www.kc-class.eu/packages/p5-e-learning-services-in-the-cloud](http://www.kc-class.eu/packages/p5-e-learning-services-in-the-cloud) lasted from 15.12.2010 to 31.3.2014. The grant beneficiary was EuroCloud Slovenia

The leader of “Work Package 5: E-Learning Services in the Cloud” was University of Ljubljana, Faculty of Electrical Engineering. The project was held under public call for proposals “Delevopment of competence centres in the period 2010-2013”.

The operation is partially financed by the European union, European regional development fund. The total costs of the project are 9.331.120 EUR.

b. What is the case study about?

The project offers services and tools, constructed on PaaS solution that enable availability of exiting and simple construction of quality new learning content and tools for monitoring human resource development, and at the same time with integrated option of cloud installation solve infrastructural problems.

c. Some more detail

The e-learning package of the project has built the following services:

- educational applications and content,
- e-learning platform,
- knowledge verification tools,
- access to remote labs,
- resource reservation system.

d. Conclusions

A simple ubiquitous access to knowledge enables companies a quicker reaction to market changes and monitoring of recent technological trends in their area and so increases innovativeness and competitiveness of companies. Access to educational content is the basis for achieving a higher employment of the population as learning is the basis of human resource development. Simple availability of this content enables a more balanced regional development. Lifelong learning has already become one of the foundations of modern society that on the one side raises added value in professions with little added value and on the other side enables reintegration of increasing share of non-active population in the economic cycle.

References


CASE 48: Learning by using laptops or Netbook class

a. Introduction
The project Learning by Using Laptops or "netbook class" ([http://www.gjp.si/netbook-razred/](http://www.gjp.si/netbook-razred/)) is a three-year pilot project in the framework of computerization project of the Slovenian education. It was set up in cooperation between the Ministry of Education, Science, Culture and Sport, the National Education Institute and the school project team of the Jože Plečnik Grammar School, Ljubljana. It is the continuation of the school project Digital Literacy, during which the teachers have already gained a lot of knowledge and experience in the use of ICT for educational purposes.

In 2014, the project was completed with baccalaureate of the notebook class; however it continues its development work during the school year 2015-2016 in the framework of the project Innovative Pedagogy 1: 1 in the light of the competences of the 21st century.

b. What is the case study about?
The project realized the following objectives referring to:

- Curriculum: recording learning objectives by using ICT
- Evaluation: assessment of students’ achievements in learning, using ICT
- Education in a broader sense: developing of digital literacy among students and teachers
- Organization: creation of starting points or recommendations for the use of computers in the classroom.

c. Some more detail
During the learning process they tried to ensure that planned learning activities using ICT would include processes of identification and understanding, application of information or new knowledge, the synthesis of individual parts as well as the evaluation of the information.

Positive responses of students can be grouped into:

- “Computer does not judge”; computer only gives feedback information regarding accuracy in problem solving and no value judgment;
- Visualization of complex processes for better understanding of school subjects of natural sciences;
- Independent and active problem solving.
d. Other information
As part of the project Innovative 1:1 pedagogy has been used, the evaluation, guidelines and implementation curricula are available at http://www.inovativna-sola.si/

e. Conclusions
Learning with laptops has brought positive changes in the learning and teaching process; it also had an impact on students’ learning achievements - in the school year 2013/2014, the “netbook class” students passed baccalaureate as the best class of the Jože Plečnik Grammar School, Ljubljana

References
Granfol, S., Kreuh, N. (2015), Kako nam je uspel netbook razred in zakaj oz. učenje in uporaba računalnika, Zavod Republike Slovenije zs šolstvo
CASE 49: University Library of Maribor and e-education

a. Introduction

In its development strategy for the period 2013-2020, the University of Maribor has set itself the objective of increasing the use of the Moodle e-learning environment (University Library of Maribor and e-education https://estudij.um.si/, http://libguides.ukm.si/). To this purpose, the University has established a commission for e-education in which the Maribor University Library has its representative. Services of academic libraries representing effective support of changed method of education at higher education institutions are: making available a range of electronic information resources, providing assistance to teaching staff in their integration in study programmes, providing information on the academic literature available in the open access, giving advice on copyright issues, the implementation of e-learning for information literacy etc.

b. What is the case study about?

Library systems enable integration of links to material in online learning environments in which teachers systematically prepare to students the necessary study literature in an aggregated form. Support of libraries in the selection and evaluation of sources makes the library as an important link in the development of critical thinking of students, based on the relevant resources. The development of Open Learning Resources (OER) and massive open online learning modules (MOOC) raise a number of questions concerning the protection of intellectual property. Education and counselling for teachers as regards the management of resources and the access to documents while respecting copyright are becoming increasingly important roles of libraries.
c. Some more detail

The objective of the pilot example of inclusion of library services in e-learning environment of the University of Maribor was to establish a closer contact between students, teachers and librarians in the Moodle environment, and to encourage students to explore on one’s own initiative, and to acquire knowledge provided by the access to electronic information resources. The study subject Introduction to Medicine I experimentally included functionalities of the EBSCO tool for detecting information (UM: NIK), thematic portals of LibGuides and assistance thematic expert librarians during the study.

d. Other information

The survey showed that students welcomed new possibilities of e-learning, enabling the integration of different information resources and new forms of organizing the learning process. As a result of the project, students said that they would more frequently use UM: NIK to search for information, that content portals have more useful information overview of the existing literature, that content portals have useful information for them and that in the future they would more often ask librarians for assistance. In 2014, a plug in EDS (EBSCO discovery) was integrated in the Moodle environment at the level of all individual subjects.

e. Conclusions

The development of education is more than ever based on accessibility of resources. In addition to the availability, quality and relevance of resources are particularly important. The main task of the library is to provide and incorporate up-to-date relevant resources support to students, teachers and researchers in online learning environment and to educate and advise teachers as regards copyright.

References


http://www.dlib.si/details/URN:NBN:SI-DOC-A3GPCNWT/?query=%27keywords%3de-izobra%c5%bevanje%3a+izziv*%27&pageSize=25
CASE 50: Spanish humanitarian action and peacekeeping missions

a. Introduction

This case study is about an interactive storytelling map on ArcGIS Online created by the Complutense University of Madrid (Spain), http://ucmadrid.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=c7596c0b21614903b36d49fa096bb553

As we consider peace to be an important value, we have created an interactive storytelling map on ArcGIS Online, as a piece of collaborative work between students on the cloud, showing efforts contributed by the Spanish Ministry for Defence towards peacekeeping and humanitarian missions.

This map is a useful tool for schools and an innovative resource for teachers. For these reasons we are using it in our University Teaching Master’s Degree geography lectures and for informal learning initiatives in 2014. Some questions have been added onto the map to be reflected upon during lectures and practical lessons about conflicts and world peace. In addition, one of the first purposes was to be used later in secondary schools on School Day of Non-violence and Peace, and by other students in future courses.

Many conflicts exist in our world which are frequently not understood by our young Spanish students. As young people, they are usually familiar with technologies and we wanted that they would be active participants in this experience. For this, this map was transformed, adding more layers made by themselves through an active and collaborative methodology.

This innovative project has been led by professor Dra. María Luisa de Lázaro y Torres, which is part of a reflection on the state-of-the-art project "School on the Cloud: connecting education to the cloud for digital citizenship" (543221-LLP-1-2013-1-GR-KA3-KA3NW) from the European Commission and the Spanish Ministry for Defence project: "Cartografía de conflictos en un mundo globalizado: De la seguridad militar a la seguridad humana" nº de ref. 023/02 / 2014. Orden DEF/ 887/ 2014, de 28 de mayo (BOE nº 131, de 30 de mayo de 2014).
b. What is the case study about?

The case study has as principal objective to create a collaborative map in order to understand better the causes of conflicts in the world and the need for peacekeeping missions made from the Spanish Ministry for Defence. Thus, we are going to use collaborative work for learning and teaching the subject. The collaborative technique used has been problem-based learning. At the end of the activities we will give some guidelines to evaluate the project.

Then, we will quote the learning objectives to be achieved:

a) Conceptual contents objectives:
- Learn concepts related to conflicts
- Promote the search for information on conflicts and relate it to their themes applying the contents of the syllabus.
- Prepare key questions for a deeper understanding of conflicts
- Fulfil the aims of the project from an efficient methodology

b) Attitudes:
- Make students aware / increase awareness of the fact that peace is a very important value
- Learn skills for collaborative work: listening to others, respect other opinions and evaluations or appreciation of other students’ work in the rest of the classroom.
- Improve attitudes towards collaborative work as a useful way to acquire competences.

c) Competences:
- Literacy on technological tools (ArcGIS Online, Google Drive, useful Internet places for the topic, etc.)
- Efficiency in team work competence

Managing the activity is carried out by professor Dra. María Luisa de Lázaro y Torres and her research team in Geography Teaching.

c. Some more detail

This process enriched all those who actively participated on it. Intrinsic motivation and responsibility are important ingredients for this methodology. Students fulfilled their objectives. As the students improved their academic performance they were also more motivated and active in the teaching-learning process. With this collaborative methodology, students are the protagonists of their own learning.

There were at least two important learning results, one to do with conflicts and attitudes towards them, and the other to do with emerging digital technologies and beyond as it has been used as a tool for researching and learning conflicts.

Additionally, this experience allows us to purpose other methodologies in order to learn the same contents (as important in the Spanish curricula). All these methodological techniques have to be based on active learning, in which the students are the protagonist in their learning-teaching process.

d. Other information

The ArcGIS Online platform allows unprecedented collaborative work to be done on the cloud. This has made it possible to create an interactive map showing conflict areas in the world where Spain has intervened through its peacekeeping missions which include some questions for further research. No doubt that geospatial localization of conflicts helps provide a better understanding of the causes of conflict and the need for peacekeeping missions in some parts of the world.

Further work on the interactive map provoked reflexion and controversy. It depends on the type of class where you can apply the methodology. Because of that, we have to take into account some pedagogics elements: we need active students and we must motivate the students. Thereby, we can apply the collaborative work and both students and professor are responsible for the teaching-learning process. So, the professor must moderate the debate and the controversies which can take place in this experience.
e. Conclusions

A collaborative cartographic map of conflicts was created on the ArcGIS Online platform focusing on Spanish humanitarian and peacekeeping action, with the purpose of being used later in secondary schools on School Day of Non-violence and Peace. Additionally, it has been used in some informal learning initiatives, such as Science Week or GIS Day at Complutense University and in the Real Sociedad Geográfica. Finally, this project will be continued in the following project of Spanish Ministry for Defence: “África y la cultura de defensa: riesgos y amenazas para la seguridad”, in this case it will be focused on the African continent.

References


CASE 51: Learning Geography with Web 2.0

a. Introduction

ArcGIS Online (AGOL) is being used by teachers who have studied the Secondary School teaching Master’s Degree. The platform belongs to the intercampus UCM ESRI licence. This initiative is being led by the GEODIDAC UCM-931335 research group: “Innovation in the learning and teaching of geography under the EHEA” It is an interdepartmental group headed by the Human Geography Department of the Complutense University. Its members belong to the Social Sciences Didactics (Geography, History and History of Art) UCM Department and collaborate with other university departments such as the Didactics department (Zaragoza University), the León University Geology and Geography departments and with other Spanish Geographical Associations (the Royal Geographical Society and the Association of Spanish Geographers).

b. What is the case study about? What the case study is trying to prove?

Creating a web map in class and then discussing it or using a previous web-mapping develops geospatial thinking and digital competencies. Students learn while they work as they do from the results of the work completed: the web map. http://eprints.ucm.es/28547/

The work is based on rural landscape photographs already worked on, the landscape previously chosen is different. Relevant materials are collected and comments are made on the photographs. All information uploaded onto the map should be original. Mapping in this way will provide students with a lifelong learning skills based on geospatial thinking competencies and innovative story telling tools.

c. Some more detail What is the project about? What are the outcomes, are ideas or advice or guidance provided?

Many Master’s students are using these tools in their practicum secondary schools together with active methodologies using collaborative techniques. It is now also utilized in other subjects such as Arts.
Two resulting maps, one created by a teachers’ research team: http://ucmadrid.maps.arcgis.com/apps/Viewer/index.html?appid=ea9c8b352b60491b8741d5f65457028d and the other web mapping was created by students using flipped classroom techniques: http://ucmadrid.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=db455dc4e4214f58a491b8858b9e0af5

It demonstrates that active methodology, using collaborative work and flipped classroom, is very useful during lessons and lectures because it motivates students and it faces them with spatial problems. Web mapping is a very useful tool for learning.

d. Other information

The same activity was carried out at Ghent University during an Erasmus+ STA teachers’ mobility programme in December 2014. Next year new maps will involve AGOL at Geography lectures as part of the Secondary School teachers Master’s (degree).

e. Conclusions

The case study has made a change to lectures and lessons and has improved active learning. This different use of maps has surprised students, and future secondary school teachers, who have never used interactive maps for learning purposes.

References


CASE 52: Integration of Geographic Information Systems on the Cloud

a. Introduction

The case study looks at the integration of Geographic Information Systems on the Cloud in investigation programmes by students from the San Roque Highschool in Badajoz (Spain). Case study 1: I+D+i School Programmes.

Since the school year 2013/2014, the San Roque Highschool in Badajoz (Spain) has tried to integrate the use of Geographic Information Technologies (GIT) when teaching Geography in the different levels of both compulsory and non-compulsory Secondary Education. Bearing this in mind, our highschool has applied to different calls to participate in projects that promote researching among students from both compulsory and non-compulsory education from the Regional Government of Extremadura. Among these projects we find the I+D+i School Programmes, whose aim is to arouse the interest in investigation, technological development and innovation, as well as stimulate the learning of those students who show a good level of motivation and achievement. These projects had been carried out after school time and the results were shown in a final meeting in which all the participants from our region were present. Up to this date, we have implemented the following investigation projects:

School year 2013/14: “Analysis of the environmental situation in Badajoz and suggestions for improvement”.

School year 2014/15: “Physical exercise in public areas in Badajoz”.

In both cases, students have used Cloud computing throughout the project using mobile devices in fieldwork, Geographic Information Systems to represent and interpret data; as well as the development of products in the form of maps and apps for mobile phones.

b. What is the case study about?

These are multidisciplinary projects that are coordinated by the Geography department from the highschool in which students and teachers from other scientific areas can participate. The starting point in each project is geographic data processing using Cloud computing GITs, more precisely ArcGIS online, together with mobile devices and image and data storing tools on the Cloud.

On each case we have tried to apply Cloud computing technology to develop research and investigation in the highschool aiming to achieve active learning, where students are in the centre of the learning process and teachers help as guidance.

In the school year 2013/14 we carried out the investigation project “Analysis of the Environmental situation in Badajoz”, in collaboration with another highschool from Badajoz (IES Ciudad Jardín). This was a multidisciplinary project which tried to analyse several environmental variables in the city, among which noise/entropy was the main one. The San Roque Highschool team was formed by several Sixth-form students (16 and 17 year-old pupils) and Technology, Physics and Geography teachers. The students were responsible for monitoring noise/entropy in a hundred spots in the city located with a GPS and using several sound level meters. The results were rendered in a noise map elaborated with ARCGIS Online platform with images that had already been uploaded onto the Cloud.
During the last school year 2014/15 our highschool took part in the investigation project called “Physical exercise in public areas in Badajoz”. This was also a multidisciplinary project which dealt with promoting physical exercise among year-eleven students (14 and 15 year-old pupils) and where teachers from different specialities participated (Physical education, Technology, Physics and Geography). Using the GPS from mobile phones and Google’s app My Track in the field work, we came up with two routes through a public park consisting of multiple stops where the students had to perform different exercises. Several photos and video clips were taped and edited using Picasa and Youtube, as well as the data obtained that was rendered in the ArcGIS Online platform. As a final result to the project, we created several interactive maps for each of the planned routes. On the maps, the information about what exercise to perform in each stop is presented through pop-up windows that appear as you move around the map, and all the data (text, images and video) is stored on the cloud. In the end, these maps were used to build an app for mobile phones that uses Mobincube web services and that can be downloaded at http://mobincube.mobi/33HDSY

C. Some more detail

Together with the scientific results on themselves, on each project we have obtained an enormous pedagogical outcome in the sense that we have worked with our students extracurricular contents and extensions, thus reinforcing the integral development of the core competencies.

Each of the projects has generated as a final product a collection of maps elaborated using ArcGIS Online.
Noise map elaborated in the “Analysis of the environmental situation in Badajoz” project.

In the case of the I+D+i Schools Programme done in the course 2013/14 about the analysis of the environmental situation in Badajoz, the final products were:

- Web map: "Noise map": http://arcg.is/1ICYFGX
- Web mapping application: http://www.arcgis.com/apps/OnePane/storytelling_basic/index.html?appid=a6a9b779e91b42d1b741b00c9940cee

In the case of the I+D+i Schools Programme done in the course 2014/15 about physical exercise in public areas in Badajoz, the final products were:

- Web map with the two routes provided: http://arcg.is/1KqVu4w
- Blue route web map: http://arcg.is/1ithHFy
- Red route web map: http://arcg.is/1KqX71Z
- Blue route simple story map: http://arcg.is/1elZJaf
- Red route simple story map: http://arcg.is/1G98SEX
- App for Mobile phones, download at: http://mobincube.mobi/33HDSY

The project “Physical exercise in public areas in Badajoz” was given the highest mark among the 26 highschools which participated in the I+D+i Schools Programme competition in 2015. Some of the key aspects that were pointed out by the panel that chose our project as the most interesting in the competition were: the multidisciplinary perspective that we presented, the use of ICTs, the applicability of the elementary investigation that we carried out and its innovative nature.
d. Other information

All the resources created in the different innovation and investigation projects are neatly stored and sorted by levels in the Moodle platform, so that they are available to other schools as a guide and inspiration. Visitors can also access them at:


e. Conclusions

Undertaking the projects, we have demonstrated how important is for our students to provide them access to geographical data, both from verified sources available thanks to open-data policies or from field work providing that the students themselves were the ones who collected the information through GPS and their own mobile phones.

These kinds of project which mix field work with the use of common, everyday mobile phones or tablets, allow students to improve their digital competence through the use of apps in real contexts. The use of the GPS to locate problems, together with many other collaborative applications based on geolocation, increases their spatial and citizenship awareness.

All in all, we consider fundamental to keep up working in this direction, a way that allows students to learn through experience, in this case about stamping ground, since it is demonstrated that it results in more long-lasting learning.

References


San Roque Highschool website: http://iessanroque.juntaextremadura.net/index.php/148-uncategorised/476-ies-san-roque-premiado-en-la-jornada-de-clausura-del-programa-de-escuelas-de-i-d-i

Clip from the project “Physical exercise in public areas in Badajoz”:
https://www.youtube.com/watch?v=13rJl8F3ROQ
CASE 53: RACMA (Augmented Reality Cultures in American Museum)

a. Introduction

RACMA is an app designed and developed for the American Museum of Spain by two students of Faculty of Computing, Universidad Complutense (http://www.mecd.gob.es/museodeamerica/espacio-interactivo/Tanto-que-disfrutar-jugando---/RACMA.html).

The Museum of America was created in 1941 in order to gather collections of American archeology and ethnology, pre-Columbian, colonial and ethnographic pieces.

b. What is the case study about?

A Map of the American continent is located in the floor of a room, inside the museum and visitors, have to go through a gateway that is one meter above the map. On the map, they have located four easily identifiable cultural areas.

With the app will appear on the screen four characters, who move within their cultural area. This gives more life and dynamism to the application. It is clearly seen, as each character has a distinctive look.

Furthermore, other elements are placed which provide information about the contents. The user clicking on the characters on the screen of the device mobile, you get detailed information from the cultural area, including a description of it and a gallery of images Parts of this area are exhibited in the museum. It can to access specific information on the culture represented.

c. Some more detail

The App provides information on the different cultural areas and cultures set out in museum and for this we have chosen to populate the map with characters representing each of the cultures. By interacting with these characters the visitor access related information representing the cultural areas. The Cultural Area is a territory with common environmental and cultural characteristics.

d. Other information

This app has the novelty of being able to be used by those who come to the American Museum, also it includes an enhanced experience at home, so that the contents of the museum can also be visited outside. This app is free and it’s in Spanish and English language.

e. Conclusions

Augmented Reality applied to the contents of the museum is a means innovative dynamism and great potential, since it allows attracting new more familiar with these technologies audiences, increase information the museum provides visitors and improve the user experience, both inside and outside the museum.
References

App designed and developed by David Hernando y Marta Caro. Guillermo Jimenez (Coord), Juan Francisco Román (Logo) y Samuel Clemen (3D). 2015.


Different Cultures

Amazonic Culture Area
The amazonic region is a jungle area with an altitude higher than seven million km². The Amazon river, the longest and largest in the world, together with its tributaries, forms the Amazon biotic diversity territory in the planet. The traditional tribes were organized in egalitarian societies based on the family, where the leader is elected for having the best qualities.

Andean Culture Area
It spreads on a narrow strip in the South-American west, from Colombia to Chile (in yellow on the map). This area has three remarkable ecological interconnections: desert, coast plateau and tropical rainforest where different cultures have developed through time and interacted each other.

Location in the museum

Area Cultural Costa Noroeste

Characteristics

INCA Culture
They dominated the andes region at the arrival of the europeans in the first third of the XVI century. Their signal was the curro and they spread a net of paths of more than 30,000 km. “Choquek” were messengers who ran through those paths carrying information or products. This territory was expanded and controlled by the army, the population transferred (natives) and a hierarchical organisation...

Anthropomorphic vessel

Ceramic figure of a shaman
CASE 54: Using ArcGIS Online and Google Earth Pro

a. Introduction

Digital competence occupies a place of choice within educational curricula worldwide. This is due to the greater importance of information and communications technology (ICT), which offers numerous possibilities to facilitate teaching-learning processes in the classroom, allowing students to access, evaluate, store, produce, present and exchange digital information.

ICT has become a powerful tool because it enables cognitive skills such as categorization, reasoning, decision-making, problem-solving, critical thinking, invention and creation to be developed. These new technologies have taken a turn in education and students are seeing the world in a different light.

In schools and universities, teachers are beginning to incorporate Geographic Information Technology (GIT) in the teaching of Social Sciences, using platforms such as Google Earth, Street View Open, ArcGIS Online and other free use software. The impact of technology in the classroom has truly transformed learning.

b. What is the case study about?

The goal is to implement an active methodology that can be applied in classrooms for teaching Geography and Social Sciences. In particular, we will carry out a cultural tourism activity. We created didactic routes through the cities of Rome, Seville and Leon using Google Earth, as all primary and secondary school pupils are well-acquainted with it. Another possibility is ArcGIS Online and the technique of storytelling, which students can develop with the help of the teacher.
Our aim is to achieve goals and skills in line with the official curriculum, in Decree 52/2007, 17th May, of Castille and Leon, and national legislation. This activity has already been implemented in San Andrés primary and secondary schools and contextualized in the School Educational Project and the Social Science Teaching Programming in 3rd year primary school. Students have to develop educational itineraries through places of historical and cultural interest in Leon, Rome and Seville using Google Earth and ArcGIS Online.

We consider that using an educational itinerary as a resource plays a great educational role as it enables the pupils to take an active part and provides direct contact with the environment and therefore with reality. It gives an insight into acquiring knowledge and working methods and help pupils experimentally compare events and cultural, artistic and historical facts. Thus they become protagonists in their learning, being active rather than passive pupils. We focused especially on the historical district, because in these areas different societies have been established throughout history.

The subject of Social Sciences, Geography and History in primary and secondary education tries to analyze our knowledge of society, both in terms of its organization and operation over time as well as in regard to the territory in which it is established.

Plaza Mayor (Main Square, León_Spain). Photo inserted in the Argis on-line window, and explanation.

The Plaza Mayor is the real heart of the city, with a lively business environment: fruit and vegetable stalls and agricultural products from the province of Leon. Currently maintains its distinctive arcade and middle floor houses and continues to host the market, whereas under the columns entertainment proliferates.

Story Map. Monument Inventory Thematic. Historic Centre. Seville (Spain) Available at: http://sig.urbanismosevilla.org/sevilla.art/monumentos/
c. Some more detail

Students on Teacher Training Masters courses learned to design these itineraries in ArcGIS Online and implemented them in primary and secondary schools.

The activity is carried out through interactive maps and virtual travel, using the technique of storytelling in the subject of Social Sciences and Geography in 3rd year primary school. Students will actively participate in this activity and it will help them learn the content relating the geographic diversity of Spain.

The goal is to implement an activity using the technique of storytelling supported by cooperative work and resources. Virtual tours are an itinerary with technological means available, such as Google Street View, Google Earth Pro and ArcGIS Online.

This interactive map is prepared by the teacher and is accessible on-line. It includes the contents of the subject supported by audiovisual resources: photos, 360 ° photos and videos.

d. Other information

The first resource is the "Story Map" application through the ArcGIS Online virtual platform. The teacher and the students can travel around the world with this application and clicking on each of the tabs leads them directly to the actual point on the map. The tabs are in connection with the map and images or videos belonging to the YouTube website.

This application was used in a classroom session at the Universal and International Exhibition in London 1851, Paris 1889 and Barcelona 1929. It was also used to explain cultural tourism and the importance of historic centres.

A range of resources including research, good practices, a toolkit, workshops, case studies, fact sheets and inspirational videos from pupils are all available. These resources are used to give teachers and other school staff guidance on which approach, devices, programmes and apps will best work for them and their pupils. A blog and other media clips are available on the Primary and Secondary Schools Web.

e. Conclusions

The case study illustrates the potential of grassroots activities in transforming learning and education. The educational value is in the consideration of these areas as historical documents and the districts contain the most representative buildings in the previously mentioned cities.

The use of interactive maps, virtual tours and the storytelling technique is helpful for teaching Geography and Social Sciences. However, we must also remember that technology is the means to learn and not the end (Uhlenwinkel, 2013), and, therefore, should be used correctly, taking into account its strengths and weaknesses.

References


Didactic Track. Rome (Italy)
CASE 55: A workshop: Displaying georeferenced information on the web

a. Introduction
The workshop comes as an extracurricular activity for secondary school students for gifted students. The activity has begun to make in early 2015 and it takes place in some Saturday mornings for half an hour. Secondary school students join to MERCATOR research group members are involved (http://feriaingenieria.geomatica.es).

b. What is the case study about?
The case study illustrates how the selection of a set of visualization tools with georeferenced information on the web can encourage students to approach the technologies of geographic information.

We have selected a set of web applications that display geographic information in a friendly way (in several cases using the cloud as data carrier). With them we have created an activity that encourages students to become aware of the impact of geographic information such as monitoring sporting events in social networks or the evolution of meteorological phenomena with the time component. Then real-time information with the location of aircraft and ships are explored.

Students see that the impact of applications is high and diverse and not so difficult to do.

c. Some more detail
The activity only requires a web page acting as a starting point and ordering the exhibition and maintaining the web links. Activities are done explaining some concepts and basic functioning, visited applications.

d. Other information
The activity initially made to students attending our classrooms, have been tested in a recent exhibition titled Apprentice engineer.

e. Conclusions
The activity has shown that secondary school students do not know the capabilities of the web and cloud on issues related to the display and use of georeferenced information (tweets, lightning, aircraft, ships, mountain bike tracks ...)
CASE 56: Smart City Learning (SCL) with bike-sharing system

a. Introduction
SCL was started in 2015 as a learning experience for the development of teaching tools in the cloud, and lasted throughout the school year 2015-2016 (http://atlas-escolar.maps.arcgis.com/apps/MapJournal/index.html?appid=95154be348cf4cd6be9bcca2fb789d1e).

b. What is the case study about?
15 year old students from two middle schools at Spain were involved in the project, with teachers of geography, as geography department led initiative. The case study illustrates how students can learn about public transportation accessibility by using geospatial technologies in the cloud. This case study helps to achieve spatial citizenship to the students as they make maps, but also communicate about them and modify their commuting patterns after managing geospatial information.
c. Some more detail

Students create a group in ArcGIS Online (platform on the cloud) to develop a collaborative environment of learning. Students obtained and analysed geospatial information to create maps about bike sharing system as a way to boost a more sustainable transportation in the city. Students analysed places with higher and lower accessibility.

Students raise awareness of the importance of collaborative mapping to help other citizens to improve their daily commuting patterns. All this work –learning by doing, Inquiry-based learning, and uploading and modifying layers- could be possible thanks to cloud technologies.

d. Other information

This case study will be improved next year with outdoor learning activities. Mobiles devices will help to the integration of cloud and geospatial technologies.

e. Conclusions

The didactical experience demonstrated the effectiveness of geospatial technologies -ArcGIS online-, not just for school learning of a scientific discipline such as the geography, but also especially for the development of spatial thinking and spatial citizenship. Through the application of active learning methodologies, as Inquiry-based learning, students have acquired skills of obtaining, organizing, analyzing and communicating geographic information based on smart city data and smart city topics. This case study details the urban space learning experience of a group of students of Geography and shows outcomes by measuring the degree of acquisition of spatial thinking after the learning process, but also the capacity of communicating geographic information.

References

CASE 57: Rural School Cloud - Cloud Computing for School Networking

a. Introduction


The aim of this project is to achieve an efficient and effective education in Rural Schools, by creating an educational environment to inspire such schools to develop the means to transform their own identity into a powerful tool in designing their teaching and learning practices.

The educational stakeholders that the project is focusing on are the following:

- Elementary, primary and secondary school teachers,
- Teacher trainers,
- Educational researchers,
- Educational policy makers and
- Students of education and pedagogy interested in exploring issues around ICT and rural or isolated schools.

The Coordinator is: CESGA (Galicia Supercomputing Center) – Spain, the Partners are: Universidade de Santiago de Compostela – Spain/ AKETH (Developmental Center of Thessaly) – Greece/ Provincia di Parma – Italy/ VIA University College – Denmark./ Macedonian Institute for Integration – FYROM/ Devon Learning and Development Partnership – UK.

b. What is the case study about?

The project aims to improve the quality of learning and teaching in small rural and remote areas schools in Europe. More specifically, by exploring, adapting and improving several innovative European ICT based methodologies is providing the means to help teachers in designing their classes, as well as in improving their professional competences.

In order to achieve that goal the project is focused on:

- Analysing the situation of the participant regions in order to adapt and enhance the original technological and pedagogical approaches, as well as improve the quality of teaching and learning for both pupils, teachers and the educational community.
- Developing a flexible, rich and cost-effective solution based on the shared knowledge from ICT based solutions and initiatives in rural areas (Spain, Italy, Denmark, UK, Greece, Macedonia).
- Experimenting with various free online cloud based tools and social resource sites and their possibilities in the educational contexts where different levels and ages of students are found.
- Providing specific training to teachers oriented to use ICT to improve creativity and networked collaboration as well as providing guidance to support their students’ acquisition of such skills.
- Promoting a connected community of practice at European level regarding learning in rural school context.
- Evaluating the experience thoroughly and extract practical lessons that can be useful for participant regions as well as other European regions that have similar needs.

c. Some more detail

The project has been applying the following series of activities:
- Boost students creativity by using a common cloud environment with online tools and resources where they can develop advanced ICT skills present in their leisure time (such as video editing, multimedia creation, communication in social networks...) and bring them to school.

- Strengthen the link between families and school through the cloud computing solution, by providing communication among teachers, parents and students, as well as support to parents to open the school activities to them, and supporting parents to share their children learning and collaborate with schools.

- Test and implement the ICT based pedagogical innovation in at least 2 schools in each country.

- Test meaningful educational possibilities in these new contexts, such as applying the solution to several educational levels (elementary, primary, secondary school), supporting live distance learning with remote teacher support, parallel teaching, co-operative creation of educational resources among students and teachers, etc.

- Find a common core and disseminate the lessons learned, open source software developed, and provide training materials for other regions to implement the solution

d. Other information

In order to analyze the e learning experience results of this project, as it relates to the impact of the Rural School Cloud on:

- Improving the attitudes of students and teachers
- Improving the teaching methodologies.
- Improving the learning methodologies.
- Improving the collaboration, communication between teachers, students and parents.

Two electronic questionnaires for the participating teachers and students were utilized concentrating on the following dimensions:

- Descriptive data.
- Attitudes towards ICT.
- Knowledge of ICT.
- Uses of ICT.
- Use of ICT in the design of the practice.

e. Conclusions

The project is focused on the need for the education environment to inspire education institutions to develop the means to transform their own identity into a powerful tool in designing their teaching and learning practices or curriculum structures. These objectives, however, can be determined by a host of factors arising from their different needs and expectations, such as the language, the culture, the particular conceptual structures of education etc. found among the diverse ethnic, cultural and regional groups that inhabit the European continent.

References


http://rsc-project.eu/index.php/products/
CASE 58: Sharing Learning in Solothurn: project work

a. Introduction

This case study is about Sharing Learning in Solothurn: Project work in geography; first grade FMS (Fachmittelschule), Kantonsschule. It started August 13, 2015 and will end December 17, 2015. The timeframe: 20 weeks; 90 minutes per week

Involved: four classes of the first grade FMS (17 year old students); two geography teachers; head of school. Lead: two geography teachers (Ladina Jörger & Raymond Treier)

b. What is the case study about?

The case study is about doing project work in geography. There are six topics: earthquakes, volcanism, climate change, floods, storms and droughts.

Aim: Students develop one of the above-mentioned topics (by personal preference) in teams and connect this topic to current information. Each team presents its topic to the rest of the classes.

Grouping: Every student chooses three topics. Students are assigned to one of the three chosen topic with the software TeamUp (http://teamup.aalto.fi). The advantage of the TeamUp-method is that every student can work on a topic according to personal preferences.

Results and grading: Written paper, PowerPoint presentation in front of a big audience (50 students and two teachers) and an online test on socrative (http://www.socrative.com/).

Teachers work as coaches and support the teams. Students record an audio-feedback every week, which documents the work in progress. In addition, all students get a clear and accurate semester plan from the teachers containing all of the necessary information.

c. Some more detail

Students work on the chosen topic and develop an in-depth knowledge over the course of some weeks. The following focuses are relevant for every topic: definitions, causes, consequences, measures, examples (regional, national, global) and a glossary. On top of that, every team shall include current events in their topic and the geosphere model.

During the first school lesson, the teacher gives an input and presents the topics. In the following four weeks, the students work on their topic in groups of three or four students each. Computer work is necessity at this stage (e.g. internet research). The teacher serves as an assistant who supports the students. After four weeks, every team submits a written paper. These papers can be uploaded and shared between teams and teachers on the servers of the Kantonsschule Solothurn (http://gisy.ksso.ch), or via the dropbox file sharing system (https://www.dropbox.com).

During the project work, students generate an audio-feedback on TeamUp (weekly basis) in order to reflect their teamwork critically. The teacher listens to these audio-feedbacks and discusses them with every team every week.

After the written paper the students prepare a PowerPoint presentation (timeframe: three weeks) and present it to their peers.

Completion of the project work: all students complete an identical online test on socrative.
d. Conclusions

Provide a brief summary, from your perspective, of the case study

Students prepare a topic of choice by computer, in teams, and present it to their peers, followed by an online test.

Students learn self-directed studying and independent work whilst being supported by a teacher, who serves as a coach.

This project work covers all state-of-the-art forms of learning and competences. Students get to know fascinating websites and clouds (Socrative, TeamUp, Dropbox, Gisy etc), can develop their own ideas and present these ideas to their peers.
CASE 59: Tablets for Schools

a. Introduction
Tablets for Schools [http://tabletsforschools.org.uk/] is a UK based project, which in 2015 became Techknowledge for Schools: [http://techknowledge.org.uk].

Tablets for Schools has been a charity that commissions a programme of independent research on how tablets impact learning and attainment. They believe strongly that education should inspire kids with a lifelong love of learning.

Their research shows that technology, and specifically mobile learning, can be used as a tool to encourage children to take a more active approach to their education, allowing them to personalise their experience and equipping them for a digital future. They suggest it is vital that this potential is unlocked in a consistent, leading edge way that encourages engagement and achievement. And in a way that can be delivered and sustained by schools and teachers.

They help schools who are at the beginning of their 1:1 journey develop a mobile learning strategy, and they help schools already on their 1:1 journey, maximise the impact of technology in the classroom to truly transform learning.

b. What is the case study about?
The case study illustrates how a charity working in the field of Cloud (and Tablets) is seeking to transform the way. It relates closely to school management. It is an example of leadership in the field and affects both teachers and indirectly learners.

They have undertaken research on the 1:1 process, where every pupil has a mobile device (‘1:1 learning’). Their research focuses on both the outcomes of digital learning and the processes surrounding it. We are learning not only what a difference technology can make, but what schools need to do to maximise their resources, and what pitfalls can be avoided through sensible consideration and planning.

They work with schools applying the research, using it as a basis for best practice advice – we help schools understand if and why they would like to integrate technology into their pedagogy and the technical architecture and solutions that will best suit their school and pupils. They also encourage teachers to share their successes and their experiences with their peers.

c. Some more detail
They started as Tablets for Schools, working with three UK secondary schools using 1:1 tablets to research the impact of technology in schools, and to establish the dos and don’ts of utilising it in a student’s learning.

They have grown their research to represent a large community of schools in the UK using 1:1 devices for mobile learning.

They are helping schools across the country develop robust mobile learning strategies. They work on how technology can be used as a tool to engage, motivate, inspire and broaden access for young people.

d. Other information
A range of resources including research, best practices, a toolkit, workshops, case studies, fact sheets, inspirational videos from pupils are all available. These resources are used to give teachers and other school staff access to guidance on which approach, devices, programmes and apps will best work for them and their pupils. A blog and other media clips are available on the Web.

e. Conclusions
The case study illustrates the potential of grassroots activities in transforming learning and education. It is based on the mission to help teachers and educators provide exciting 1:1 learning opportunities in the UK.
E. FUTURE PERSPECTIVES

Educational institutions and those working in them tend to suffer from inertia, avoiding risk. This means that they are slow to migrate key services to the Cloud, unless policy measures force implementation. Education has unique requirements relating to teaching methods, examination regulations, funding regimes, government policies and legal issues, which limit the development of bespoke applications. Schools see IT as a necessary evil. So, there are real cultural challenges facing education environments. A school may have IT support and an understanding of core requirements, but there is a gap in strategic vision concerning available technologies to deliver that vision.

As bandwidth increases and larger numbers of students have adequate access to the Internet, many through mobile devices, they will become more comfortable with using rapidly evolving, web-based applications and storing their data online rather than on their own storage devices. Demand for Cloud applications may therefore be driven by users rather than by the institutions themselves.

More complex educational applications, like elearning systems will be slower to move to the Cloud, however much functionality is increasingly found in applications such as Google Drive, and Live@edu. Some users and institutions may decide that this functionality is better than that offered by their elearning system. Education-specific software for assessment, which can be integrated with these suites of tools in the Cloud, will emerge and may ultimately make the elearning system redundant.

Systems are already being used for e-portfolios by some organisations, though there are issues such as the preservation of student work for assessment purposes, which can be problematic. It is not yet clear whether education organisations will find these systems adequate for all the purposes to which elearning systems are currently used. There is already some integration between cloud applications and popular elearning platforms with single sign-on. Applications such as Moodle and Blackboard are now available in the Cloud and hosted by third party organisations, as Cloud provision demonstrates secure, accessible and cheaper systems for repositories of learning content.

Before technology has a chance to really benefit education, there has to be a fundamental shift in thinking. Cloud Computing and its services need to be integrated into the curriculum. The tangible benefits, budgetary and educational, must be clearly demonstrated to managers either in terms of existing wireless infrastructure or when investment is made in new arrangements and also the migration to Cloud-based services. In situations where managers see IT as an integral element of education then the journey towards using Cloud Computing in education can be led from the top.
The purpose of this publication is to present the evidence about the range and variety of developments concerning the adoption of Cloud Computing in the education system in Europe. This includes not only higher education institutions, but also schools, classes and NGOs.

The use of Cloud Computing in education is gathering significant momentum through the rich benefits offered. The 59 examples presented in Education on the Cloud 2015: State of the Art illustrate that many educational organisations are adopting Cloud technologies. These are not simply examples of early adopters of Cloud apps, but represent a tidal wave of innovation and change taking place. Many more schools, colleges and universities will follow.

Online services are being run on the Cloud to provide services to support students, teachers, educators, administration staff and others. In general, there are three service deployment models at play: i) Software as a Service (SaaS), ii) Platform as a Service (PaaS), and iii) Infrastructure as a Service (IaaS).

Providing access to Cloud-based technologies has mutual benefits for students, citizens and European governments. ICT enables learners to tackle the 21st century head on and ensures they are better prepared to compete for the higher-skilled jobs demanded by today’s knowledge economy. From a European policy perspective, Cloud-based developments will also modernise educational institutions and strengthen their reputations, helping to drive greater national and European competitiveness.

Cloud services are generally considered a cheaper option for education. Moving to the Cloud allows education organisations to spread out their IT costs through flexible subscriptions. Such software as a service (or on-demand software) is a cheaper alternative to the large costs associated with software licences. However investment in technology and training is needed to enable Cloud-based developments to improve learning standards.

Cloud services complement what research has discovered about the benefits of tablets in education, their mobility and flexibility results in greater engagement with learning and opportunities for collaboration and personalisation. With Cloud-based education, the programs used to create and share become more mobile and less connected to a particular device or location. This greatly increases pedagogical benefits, learner engagement and productivity. The gap between education and the home is reduced.

Surprisingly, despite the growing demand for continuing education, new training and learning methods for teacher education and training, to meet the learners’ needs in Cloud-based environments, have not yet been introduced. Developing training platforms for teachers, based on Cloud Computing would appear to a way to make further progress in applying Cloud Computing in schools.
School on the Cloud: Deliverable D6.4b