

# understanding eMapps.com

## Learning through games and mobile technology

A comprehensive guide to  
eMapps.com project and its  
main results  
to all interested parties

## Dear Reader!

The eMapps.com project, funded under the European Commission's 6th Framework Programme, has produced some significant breakthroughs related to innovative ways of learning, using computer games and mobile learning in schools. The results are of particular relevance to countries in the expanded European Union.

Key aims of the project were initially to

- Build communities of creative, networking children in the new member states (NMS), generating their own cultural content and communicating with peer groups in other countries;
- Contribute to the growth of a community of teachers who are aware of the potential for change through 'schools without walls' and who exchange knowledge and experience through communication with counterparts in other NMS countries;
- Develop adaptable interactive tools (primarily games played on a mobile platform) with which to deliver learning objectives and which help to integrate the use of ICT in the delivery of the school curriculum;
- Establish processes and facilities for teachers and children to access relevant digital content available through a variety of sources while playing the eMapps.com games and to enable content created to be shared and repurposed

These aims have underpinned the strategic objectives of eMapps.com at policy level, namely:

- to have a significant impact on validating new learning paradigms for children in both school and informal settings and;
- to contribute to strategic thinking about school and curriculum reform processes in the expanded European Union.

In this guide we would like to introduce you to our achievements. After a short introduction you can read about the project's background, the concept of games-based learning and the technical background of the development platform. The next section covers the eMapps games. We briefly introduce our approach, development process and results, and provide information about where you can find the developed games on the Internet. The remainder of the guide then aims to provide relevant information to the main eMapps target groups.



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## eMapps overview

eMapps.com is a project co-financed by the EU's Sixth Research Framework Programme (028051) and focuses on communities of creative, networking children within the 9-12 age range in the new EU Member States.

During the last two years the project partners have developed and validated adaptable interactive tools which enable special games prepared for school-children to be played on an innovative mobile platform, running on multiple devices and networks. Teachers can customise the games to their own pedagogical requirements.

The multilingual, multicultural local content created through games is available for sharing and re-purposing in the wider eLearning context of schools in Europe. Teachers and children are enabled to draw on content held in other repositories while creating and playing games. eMapps.com participants have shown that the games can bring to life subjects such as history and geography through dynamic and creative experiences.

The project consortium consist of 13 partners coordinated by Cross Czech a.s (Czech Republic).

Other partners are:

- Ciberespacio (E)
- MDR Partners (UK)
- CERLIM - The Centre for Research in Library and Information Management, Manchester Metropolitan University (UK)
- EUN - The European Schoolnet Partnership
- CELN - Czech Efficient Learning Node (CZ)
- Tiger Leap Foundation - TLF (EE)
- Berzsényi Daniel College (HU)
- Stende's social care and development association "Mezazile" (LV)
- Institute of Mobile Technologies for Education and Culture - IMOTEC (LT)
- The International Center for Information Management System, Services - ICIMSS (PL)
- University of Ljubljana, Faculty of Electrical Engineering (SI)
- Elfa s.r.o (SK)

A combination of mobile games and content creation are the main technology drivers for eMapps.com.

In the eMapps.com approach, 'learning' is not only used in the sense of the formal curriculum, but encompasses everyone accessing information, cultural resources or entertainment in order to develop as individuals as part of a process of seamless blended traditional and eLearning. This approach supports the real needs of teachers and their students through its emphasis on how the school curriculum can use modern pedagogical approaches to address 20th century history, geography and other subjects, and thus contribute to progress towards European integration in the continental NMS countries.

The aim was to reflect key aspects of the curriculum in a creative and challenging environment. Children were enabled to learn more about their peers in other countries. e.g. through twinning arrangements, capitalising on the growing experience of young people in creating social networks by using mobile technologies and their existing enjoyment of games.

## Game based learning and eMapps

The approach of eMapps.com is closely related to constructivist concepts of learning, which hold that by reflecting on their own experiences all learners actively construct their own understanding of the world based on both their previous and current knowledge. Constructivism asserts that the teacher should not supply the knowledge required by students as a ready-made product. Children do best by creating for themselves the specific knowledge they need, rather than being instructed in what they must know. The teacher is a guide and mentor.



Research shows that most people learn best when they are entertained, when they can use creativity to work toward complex goals, when lesson plans incorporate both thinking and emotion, and when the consequences of actions can be observed. The past twenty-five years has produced a substantial body of psychological, educational and development literature highlighting the educational potential of digital games. However, this enthusiasm is tempered by the recognition that the majority of commercial 'edutainment' products have been largely unsuccessful in harnessing this potential to effective educational use.

Key design guidelines for achieving intrinsic integration in digital learning games include:

- Deliver learning material through the parts of the game that are the most fun to play, riding on the back of the 'flow' experience produced by the game, and not interrupting or diminishing its impact.
- Embody the learning material within the structure of the gaming world and the player's interactions with it, providing an external representation of the learning content that is explored through the core mechanics of the game play.
- Rather than pursue learning by listening and/or by reading fact-filled and not-too exciting textbooks, engage students in an immersive world has to perform a set of complex actions to achieve desired learning goals.

The advantage of this approach is that learning through performance requires active discovery, analysis, interpretation, problem solving, memory, and physical activity and results in the sort of extensive cognitive processing that deeply embeds learning. The educational value of the game-playing experiences comes not just from the game itself, but from the creative coupling of educational media with effective pedagogy to engage students in meaningful practices.



On a cognitive level, play encourages the development of our concepts about the world. By toying with objects and ideas through playful experimentation we develop an understanding of the physical world and our place within it. As yet, effective educational games are in their infancy. But as games increase in complexity and freedom, they will be able to accommodate many different playing styles and personal goals, mirroring the inner dynamics of the player's personality.

The problem of narrative, of integrating a linear storyline within an interactive game is widely acknowledged as one of the most intractable problems in the field of games design. Although many techniques exist and will attract developers and gamers for a long time to come, none of them solve the hardest problem; creating a truly dynamic narrative, of creating virtual worlds or 'Mixed Realities' (e.g. outdoor and indoor) where, although the themes and imagery in the world remain consistent, the actions of different players lead to utterly different and credible outcomes.

To solve this problem, we needed a way of designing a new learning game where teachers set the theme, the world-space where the game takes place, and the player can then explore and experience whatever permutations of that theme he or she desires.

The possibility of different types of interactive narrative that are not bound to specific platforms or stationary mediums, using connected devices, GPS systems or networks (GPRS, UMTS) or multiple users seem limitless. The use of location to trigger events, the presence of other users experiencing the narrative in the near vicinity, and the ability to align the narrative with the general culture are all possibilities with emerging technology.

The eMapps.com approach also requires the participants to draw upon a wide range of contextual content and to use new mobile devices in the creation and use of that content, whilst developing and playing game. Playful experiments with objects and ideas help develop our understanding of our place in the physical world while developing transferable skills which help us to secure our place within it.

## eMapps.com platform

The eMapps.com games platform enables the implementation of Alternate Reality games (ARG). It runs on digital devices such as mobile phones, PDAs and Tablet PCs over GPRS and UMTS networks and includes game control mechanisms, forum, chat facilities and pre-set map-based local scenarios.

The games are played on an open platform through multiple networks and devices. Weblogs, podcasts and videocasts are key components.

During the project partners developed and tested a web monitoring platform for multiple players enabling them to exchange information in real time (e.g. route definition over maps; painting maps for locating objects; linking embedded multimedia files in the cartography based on UTM coordinates; using the network to send and retrieve the data). The system is configured in a way that enables monitoring the implementation of games in real time, showing all the players simultaneously in the graphical interface. At the same time the Operation

Centre can modify any status (e.g. introduce a new clue, modify the map, locate a new object etc).

'Pins' located in a pre-set scenario (map-based) are linked to information placed in independently edited photo, audio, video and text 'blog' folders, using 'drag and drop'. Any mobile device that supports a browser can be used for uploading the content to any folder. The map also supports external links.

The map is a Graphical Interface that interacts with objects and can be used for mapping existing objects in a given territory, based on UTM Coordinates. The map also has a route editor and comes with a series of tools e.g. zoom in and out and move up/down/right/left.

Several Manuals have been created explaining how to implement a game and how to create the components in the Graphical Interface. These Manuals have been created in Flash, enabling them to be recorded live, explaining step by step what needs to be done. A complete Manual is also available in PDF and can be printed if required.



## eMapps games

eMapps.com shows how game technologies can be used to develop new types of imaginative learning games, exploiting the mobile and Internet environment. The nature of the games resulted from the particular needs of the curriculum, but eMapps.com encouraged activity outside the traditional classroom.

Teachers and cultural workers participated in defining the learning objectives, type of game (e.g. competitive, collaborative, role play, simulation), content, assessment, feedback and levels of difficulty. Parents have been involved in contributing 'stories' and content relevant to their localities. Teachers received extensive support in the early stages of implementing and testing the games platform, following initial training at summer schools.

A key result is the creation of an open games platform based on pre-set curriculum scenarios that can be used as a set of replicable tools, adapted and sustained by teachers, for use throughout Europe, whilst being versatile enough to handle a wide variety of content and played in any network on any mobile (or non mobile) device which operates under TCP/IP protocols. Several different content games of varying complexity have been developed and updated, based upon this platform, leading to the creation of generic and local Games Portfolios capable of adaptation by teachers.

The approach taken to games development was scenario-based and iterative, building on experience from each experimental 'release' in real world test environments. Content created by children and teachers was positioned, where possible on a multi-layered map, then enriched with new content which enabled subsequent development of the game itself.

eMapps.com supports the development of a number of game types drawn from popular genres such as: adventure/quest; simulation; race games; maze games; edutainment activities; creative model building; and shooting/arcade games. The concept involves adding or retrieving information reflecting the cultural diversity - the traditions, stories, music, monuments and languages - of the participating countries and regions through time-specific map-based screen displays.

### Would you like to see the games?

Visit [www.emapps.com](http://www.emapps.com), go to the Schools' Game menu or to the Living Map of Europe menu.

Under the Schools' game menu you will find links to each school's own area, where they introduce the school itself and the participating teachers, and share the experience gained during game development, as well as describing the game developed in the eMapps platform.

Under the Living map of Europe menu you can easily reach each game by clicking on the pins on the map.

The games descriptions follow a structure in order to make the games comparable and easy to understand:

#### 01 About us

About the school, teachers and children participating in the game.

#### 02 The story

Baseline story of the game.

#### 03 The characters

What kind of characters appear in the game and when.

#### 04 The puzzles

The parts of the puzzle and challenges

#### 05 The plot

Describing the different parts of the story, the level of each part, the challenges and the curricula targeted. This section also describes the objects, their file formats and the tools used.

#### 06 Playing the game

Includes the rules of the game, where the game was played, pictures and personal comments.

#### 07 The pedagogical matrix

#### 08 Results

Impact, likes and dislikes

## eMapps for children

By working directly with teachers and children in 17 schools in the 8 mainland New Member States of the EU, eMapps.com has gained significant evidence of the learning outcomes which can be supported by using a games platform in the school environment, including;

- » investigation of the 'real world' through access, analysis and interpretation of information sources
- » problem-solving, goal-related behaviour;
- » improved achievement and depth of learning in specific curriculum areas;
- » increased technology capability and skill;
- » communicative skills;
- » collaborative skills;
- » softer skills: e.g. resilience and persistence;
- » the emergence of mentoring and teaching skills among children

eMapps.com evaluated the impact of games designed and implemented by individual schools to make use of its technical platform for computers and mobile devices, from the perspectives of both teachers and children and from a technical point of view. The teachers involved have told us that the children who played learned new facts across a range of (cross-) curriculum subjects, new technology skills and improved generic skills such as teamwork and cooperation, analytical appraisal, collaborative decision-making, negotiating, independent decision-making, planning and navigating.

Children who participated demonstrated increased self-confidence and self-reliance and quite often showed leadership and high achievement in cases where this was not expected. When playing games, the relationship between teacher and children was more relaxed and less formal than that in the classroom. Where children were involved in developing games, they were enthusiastic, creative and hard-working. In several cases, game playing stimulated other learning activities such as artwork, acting, writing and video making

Successful games can teach large amounts of learning content. Players resolve challenges and problems. There is a high degree of learner autonomy, answering to a constructivist rather than didactic model. Players are required to use scientific meth-

ods, gathering data before developing, testing and revising an hypothesis. Well-designed games incorporate motivational factors such as challenge, fantasy and curiosity

Players are able to affect the outcome of the game positively or negatively, depending upon their actions, requiring them to use mental and/or physical skills and to develop strategies in order to succeed.

## eMapps for policy-makers

As a result of the project we offer 14 recommended actions for policy-makers to be discussed at dissemination events in spring 2008. They emerge from the findings of the project evaluation report (available on the project web site), observations in the field and extensive interviews with project participants, teachers, officials and young people. They should be read in conjunction with other public documents about the project (at [www.emapps.com](http://www.emapps.com)), and are grouped under six headings related to key drivers of change in schools.

### *System level: education 5-19*

1. Support and endorse pedagogies and a curriculum that support active learning and project-based learning, as exemplified in eMapps.com.
  - » Ensure that such exploratory and active pedagogies form part of teachers' initial and continuing professional development and that teachers are e-skilled. This may call for some e-skills updating for those who work in pedagogical universities and teacher training centres.
  - » Recognise that the better the fit of games to the curriculum and age, the higher the chances of their use.
  - » Consider how to open up the school and to link it to other places where informal learning can take place, thanks to technology, e.g. libraries, museums, nature centres, leisure centres.
2. Explore how assessment systems can better take into account individual and social skills and knowledge developed through games-based learning as in eMapps.com.
  - » Teachers prioritise that which is assessed. If "traditional results are easier with traditional methods," then how are social skills, team work, leadership, responsibility for others and politeness

developed in eMapps.com valued if they are not assessed?

### *Institutional level: the school*

3. Communicate the results of the project to school leaders and enable them to act on them.

- » In most countries head teachers are very influential in the success or failure of ICT projects.
- » Help school leaders explain to parents and employers that games and play in fact promote serious learning.

4. Remove the barriers to change and technology adoption.

- » Empower schools to act autonomously and invest time and money in educational reform.
- » Encourage rethinking of traditional school timetables and groupings to optimise the opportunities of ICT, for example using eMapps.com at the end of the school year, for revision and reinforcement.
- » Provide e-safety guidelines for young people using mobile telephones and the Internet in and out of school
- » Provide guidance to school leaders on optimum use of game-based mobile learning.

### *Pedagogical level: teaching and learning*

5. Communicate the results of the project to classroom teachers in a way that presents the benefits to them and learners and that enables them to make game-based learning happen in their own school

- » For example using eMapps.com teacher champions to talk about the project.
- » Encourage teachers to develop and share more game-based learning tasks using the eMapps.com platform.
  - Tasks should have a competitive element, mix appropriately on- and off-screen activities, be varied and differentiated according to ability, age and interests, and include token rewards.
  - Consider short, 15 minute games that can take place in classrooms.
- » However, not all teachers should be expected to participate. Recognise that participation in game-based learning calls for e-mature teachers with quite high ICT skills. Students too need e-skills development before embarking on games.

6. Exploit the fact that eMapps.com can be an in-

centive for teachers' promotion and professional development:

- » Participation in European projects and using educational technology innovatively should be encouraged.

### *Technology: ICT tools and services*

7. Monitor developments and best practice in mobile and game-based learning in other countries.

- » For example, through EUN's Insight knowledge base (<http://insight.eun.org>) which carries regular updates for decision-makers.

8. Aim to ensure that schools and the local area have the basic infrastructure for innovative learning to take place.

- » In particular a reliable broadband connection and possibly wireless internet inside the school.

9. The eMapps.com approach is successful and gives participating countries – even if in some ways behind in ICT in schools – an advantage over other countries in Europe.

- » However there is a need to be realistic about the actual eMapps.com platform as it is; it is not as sophisticated as those that young people are familiar with, and is rather difficult to use.
- » Consider translating the eMapps.com games platform; it aims to enable games to be created in two hours.
- » Base new activities on the eMapps.com approach and on satellite navigation technology (GPS), but without the mobile phone-cameras (for reasons of cost and possible school bans).

### *Economic: funding change*

10. Seek to fund further game-based projects, building on the experience of teachers in eMapps.com

- » Seek support from industry and suppliers through a public-private partnership.
- » Seek partnership with businesses and organisations involved in locations featured in eMapps.com games for further exploitation.
- » Recognise that eMapps.com took place only because funding was provided (for mobile phones, teacher preparation time, costs of internet access from teachers' homes) and design future activities that take this into account.
- » Build up a repository of games that schools can

adapt and use. The actual cost of organising a game in eMapps.com worked out at €1000 (travel, teacher time, meals).

- » Consider how to set up a scheme in which the centres featuring in games host school visits to play the game, and improve it over time and experience. They have much to gain financially from offering games-based activities for visitors.

11. Consider negotiating favourable mobile phone tariffs for young people to learn with their phone.

- » The cost of sending photos for example was a deterrent in the eMapps.com project. Students can upload photos to a laptop on the spot for later transfer, thus avoiding MMS charges.
- » Consider students' mobile phones as educational resources to be harnessed. They are powerful learning tools when used appropriately.

### *Cultural and linguistic aspects*

12. Identify other places that could be interested in the eMapps.com project approach and systematically develop game-based ICT activities for visitors of all ages.

- » For example folk museums, heritage centres, nature conservation areas, zoos, historic towns, etc.

13. Consider adapting and translating some of the successful eMapps.com games that are not country-specific.

- » For example water, weather or cookery, the 1980s.

14. Exploit an advantage that most countries in the project have over other EU countries: a tradition of out-of-school activities, summer hikes and camps, cultural days, school in nature days, research camps, and use game-based learning to enrich them. The tradition of helping children get out of school to get to know and love their country is precious and not found to such an extent elsewhere in Europe.



## **eMapps for teachers**

Why eMapps.com is important for teachers:

- » A new type of teaching by use of mobile technologies in schools “without walls”
- » A mix of tasks from the virtual and real worlds given through an interdisciplinary approach
- » Expanding children's competencies - not only their knowledge
- » Learn how to use the computer game concept for (“serious”) teaching
- » New ways of working with information
- » Getting to know where you live better

Benefits for students:

- » More facts can be learned in a wider context.
- » Work effectively and creatively with technologies, information and Internet.
- » Real-life simulation of teamwork (if there are problems among children at the beginning of the game, these are soon resolved by cooperation)
- » Use of students' own knowledge.
- » Game experience from real situations helps to consolidate knowledge and skills.
- » Working in groups, with technology, including out of the school classroom.

Benefits for teachers:

- » Can choose what knowledge and skills to develop – whether the amount of knowledge, interconnection of concepts or linking reality and causality.
- » Preparation of different scenarios according to pedagogical requirement.
- » Games can be developed in line with the actual skills of teachers and potential of the school.
- » Cooperation with colleagues within the school (acting as a single team), consultation on different issues with colleagues from different schools
- » Support by school management for an innovative approach.



Game development:

- » Platform in form of a BLOG editable by teachers and students, central point of communication
- » Process of game planning: scenario development, upload to platform, mastering the game
- » Division of students into teams (team=2parts – outdoor, indoor)
- » Functional teachers teams creating the game

Support:

- » Scenario templates and approaches in national languages available on [www.emapps.com](http://www.emapps.com)
- » Game examples on [www.emapps.com](http://www.emapps.com) in section Schools game
- » Teacher training conducted by teachers in the Czech republic realized within framework of Further Education of Pedagogical Workers by Ministry of Education in CZ

### eMapps for headmasters

Did you know that at the age 21 average student have spent 15,000 hours in school, 20,000 hours watching the TV and 50,000 at computer? Schools importance decreases constantly and you have to fight more and more to get at least some part of student attention. Believe us, they will listen to you when you are able to speak in their language and via devices they are using.

We know that you are used to think about mobile phones as peace-disturbers of lesson but let's look also at the bright side of mobile technology. These devices can be used for learning as well. And even games can be a serious learning. If you believe that things will turn back normal and it's possible to proceed with old good ways, you are wrong.

#### *How can your school benefit?*

eMapps project is something you can count on to have some success on this field. We have prepared for school a system which consist internet platform, manuals, sample games and methodology how to use smart phones for learning.

It's tested with primary students in eight countries and it really works.

eMapps activities and games have good quality and children learn something they will use also in real life not only theoretically.

School life turns often a routine and all we need sometimes interesting alternation. But this alternation can have the same usefulness as traditional classroom learning. Sometimes it can be even better. Happy people in your organization are a great value. And don't forget integration of different subjects – geography, history, art, music, math, biology and even health education – outside activities have very important part in eMapps games. Yes, of course you have to re-arrange something in your lesson plans and do also some extra organizational work but it gives you credit back, students will value it and parents as well.

#### *How to join us?*

You have in your country an eMapps consortium member who can help you get started. List of them you can find on web-page [www.emapps.com](http://www.emapps.com). Depending on what kind of technical possibilities you have in your school and your self-confidence, you have to choose between two ways.

Fist way is that you will organize activities itself and also create games itself. It demands a person who is able to create school account in eMapps game environment and learn how to create games – usually teacher of ICT or some other teacher who has good ICT skills is quite able to fill this task.

If you are not so good and confident, you can ask an eMapps consortium member in your country to create a game. Usually they have several games prepared already and can also organize game for your students. But depending on particular country it can cost you some money as well.

#### Twinning

eMapps games were played between different schools on national level and also within eMapps countries with great success. Use your chance to cooperate with other schools in Europe. Your students can learn a lot on other cultures through games and mobile technology!

## eMapps for parents

eMapps schools paid attention to explain to the parents why can be games effective tools in the education of their children. Besides the reasons listed above eMapps brought additional benefits to the family life as well.

The following experiences were gained in Poland:

Working on the eMapps game - based on history of contemporary life - children had to learn about the past not only from the school lessons, but they had to look at their homes for facts and figures from the recent history.

They realized that the history took place at the region they live, including their neighbours and family. To get information necessary for the game scenario, to bring pictures, documents, and equipment from the past so different from that they are familiar with, they had to ask parents or grandparents for help. It was an opportunity for parents to tell children about their life, their problems and achievement, sometimes-heroic decisions.

Usually children are not interested in listening to such stories as at this age they find them too boring. They spend most of their time looking for their identity. eMapps.com game forced them to look for a bit different identity. They discovered that their parents did something important not only for their own life, but also for the history. Their parents were not only witnesses but also the actors included into historical events, sometimes listed in the books or articles.

eMapps.com was important for parents as gave them chance to spend more time together with children and help them to understand one another better. Parents got a chance to fulfill children's different needs such as raised interest in their life, family documents. They got a chance for better judgment from their children who as all young people are extremely critical, especially when judging parents.

Because of real communication and respect for each other, parents could manage to improve their relationship with children. A child could discover that his/her father was also a child, a husband, a

boss, a brother, a friend, sometimes a hero similarly to their mother who was also a child, a wife, a boss, a sister, a friend, a not recognized hero. They were not just parents. They were also individuals with their own lives.

Usually parents want their kids to focus on what they need for schoolwork whilst children prefer something that is entertaining and cool.

eMapps.com gave them chance to compromise both sides expectations. Parents understood and approved such gadgets like computers, cell phones, GPS as technology supporting children's work. Children understood that even such poor technology as was available for their parents was a powerful tool for some actions.

eMapps.com as an Alternative Reality Game should be attractive for parents also because it doesn't allow their children to stay only at the computer screen, but requires their action in the territory, which children find as a very attractive after all.

Some parents found eMapps.com helpful in socializing their children who were too shy in school they didn't like, but working in less informal environment they made a big progress and became a part of a group.

## eMapps in Higher Education

During the project period the participants developed learning materials of different subjects of primary schools in form of games, and they also developed the control system so that the children can follow up the game after fulfilling the requirements.

The materials were created to be usable by electronic and mobile equipment. The 8-10 year old children could achieve learning and communication results, remaining knowledge, if they are active in using the suggested tools. They learned not only in classroom, but also in several locations that are connected with the learning material. Consequently the teachers who participated in the project had to learn a lot of new kind of material development, using e-resources and m-equipment when developing and playing.

### *Results of the project*

The result of the project can be summarized as a significant contribution towards the implementation of modern pedagogy in a technology-rich environment. In the past when children have played games on computers, it has sometimes been thought to be unhelpful or even dangerous for their further development. Mobile phones have been seen only as tools for communication and accessing information. The project proved that on the contrary

- » children accept the requirements of this new type of learning, and tests show that their levels of knowledge and skills have increased, and
- » the teachers were able to learn new methods of teaching

### *Proposals for decision makers in higher education*

We observed in the early stages of the eMapps.com project that teachers had not received training in the use of new technologies nor in the design of learning activities which exploit them.

Having examined the curricula of a number of pedagogical departments in higher education, we believe that there would be considerable benefit in including such topics in initial training and updating courses for teachers.

For this reason we propose that the curricula of pedagogical higher education should be enhanced as follows

- » Although the project focuses on primary school-children, we realised that also university students may like this form of learning.
- » Evidence as to how games and playing can be useful in knowledge transfer and skills development in all age ranges (not only in kindergarten) should be included.
- » Skills in developing learning materials using electronic and mobile services should be taught.
- » More opportunities should be provided during the college /university years to practice these new competencies while teaching. This methods could be practiced also be students, thus they can also make a kind of further development.

### **eMapps and industrial partners**

Beyond the eMapps.com approach, where teachers and children are involved in and responsible for the design of the games, using a common platform, there remain variant approaches to the implementation of games in school-based learning.

While it is possible that commercial 'off-the-shelf' games can be successfully packaged and integrated into the curriculum in a cost-effective way which capitalises on the investment made in the quality of game 'design' and 'flow', it appears more likely that the eMapps.com approach will produce games which are closely aligned with the curriculum and course content and syllabi.

It is clear from the results of the eMapps.com research that a number of challenges remain to be addressed before the potential of mobile technology based games in learning can be realised.

There remains a general lack of alignment between the world of education and the games industry based on previous false starts and misunderstandings. It is important that we learn from these experiences. Designers of "edutainment" games have not always understood how and why games are effective in learning. Those in school education have not always seen how to align the curriculum with games without taking away the fun and therefore the motivation.

A guiding principle of the eMapps.com approach is that games can succeed BECAUSE sound pedagogical approaches are innate in their design and that this makes it possible to create effective blended game-based learning.

eMapps.com has also identified issues of equipment cost, personal security and platform ease of use, which require fine tuning in individual contexts in order for games-based learning in schools to be successful.

In addition, it is not necessarily proven that the establishment or use of 'repository-style' content structures is of major benefit in the playing or design of games in schools. Teachers may well prefer to avail themselves of the powerful discovery features of standard search tools such as Google.

In summary, children had fun playing eMaps.com games, learned from the experience and wanted to play again. The teachers enjoyed the experience and there was positive feedback from parents. eMaps.com 'exploitation planning' is underway and it is expected that a version of its platform will be made available under an open source licence.

eMaps.com is now actively seeking exploitation partners at national and European level and assessing the prospects for service based exploitation (for example with a telecommunications provider or mobile service supplier).

It is very much hoped that these results will assist the mainstreaming of games in school education in order that the evident potential to enhance the competences and knowledge of Europe's citizens can be realised through the formative education provided through its schools.

## Press/Media Enquiries

We are looking forward to receiving your questions or comments on eMaps and / or your ideas concerning knowledge exchange or future co-operation. We would be pleased to forward your specific request to the respective addressee.

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