Pan-European Policy Experimentation on the Use of Tablets in Schools

Project Summary and Recommendations for Policy Makers
The Creative Classrooms Lab project (CCL) was a pan-European policy experimentation on the innovative use of tablets in school education involving nine Ministries of Education (MoEs), which ran from April 2013 to May 2015. The project was one of the first ‘policy experimentations’ funded under the European Commission’s Lifelong Learning Programme.

The idea for the CCL policy experimentation stemmed from the increased interest of MoEs in 2013 in further exploring the added value of tablets as part of 1:1 computing strategies for schools. The project also targeted concrete policy concerns that MoEs were facing on how tablets can be effectively integrated in schools. The main objectives of the project were the following:

1. To develop innovative teaching and learning scenarios involving the use of tablets in and out of school. The focus was on the possibilities of 1:1 computing paradigms with the potential to be mainstreamed.

2. To design and run two rounds of classroom pilots in a controlled environment as policy experimentations based on these scenarios with teachers and students from 45 classrooms in eight countries.

3. To observe, document and report on the innovative use of tablets by teachers and students involved in these policy experimentations, with a particular focus on how tablets support collaboration, personalisation and active learning in creative classrooms.

4. Draw lessons from the policy experimentation and provide a final set of recommendations for policy makers on what changes policy makers in Europe may need to make in their education systems and curricula in order to foster and sustain the innovative use and large scale implementation of tablets.
Project methodology

Project actors and roles in the policy experimentation

European Schoolnet coordinated the pilots in collaboration with the five main project actors: MoEs or Responsible Organisations (Policy Project Partners), teachers, the University of Wolverhampton, industry partners (Associate Partners), and a Pedagogical Board consisting of six external experts nominated by education ministries.

Each actor played a specific role in the policy experimentation. MoEs identified five teachers to participate in the project, one of whom was appointed as a lead teacher to support the school pilots at national level. Lead teachers also worked with CCL policy makers to design the ‘Learning Scenarios’, and provided ongoing support for the other CCL teachers in their country. As part of the project’s quality assurance, the Pedagogical Board ensured that the CCL Learning Scenarios were well aligned with requirements from participating ministries. Industry partners provided hardware and software and contributed to the scenario development process. The University of Wolverhampton was responsible for the Observation Visits in schools, which captured the real use of the tablets in classrooms.1

The project lifecycle

The Creative Classrooms Lab project consisted of two project cycles during which the pilots were designed, prepared, implemented and evaluated (May 2013 to April 2014, and May 2014 to March 2015). At the beginning of each cycle policy makers and lead teachers developed policy scenarios and learning stories. In the second phase of each cycle, the pilot implementation phase, the learning stories were developed further with lesson plans and activities, and were then tested by the 45 teachers.

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1 For more information see the Protocol for Policy Experimentations: http://creative.eun.org/c/document_library/get_file?uuid=6426b41e-31b8-417f-95a5-2a083a190b87&groupId=96459
Developing pedagogical scenarios

Developing and implementing pedagogical scenarios, known as learning stories, was a core objective of the CCL project. These scenarios guided teachers in the innovative use of tablets, and fostered new pedagogical practices by engaging students in collaborative, personalised and active learning activities. The scenario development process was based on a proven methodology developed in the ITEC project\(^2\) and involved the main project stakeholders. As a first step, policy makers developed scenarios based on educational priorities related to the use of tablets. Lead teachers then took these ideas further and developed learning stories in collaboration with policy makers and Associate Partners. The CCL Pedagogical Board ensured the quality of the scenarios and the process adopted.\(^3\)

in their respective classrooms. At the end of each cycle, there was an evaluation of the pilots, involving classroom observations and a national focus group meeting, the results of which were fed into the next cycle for capacity building and mainstreaming.

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2 [http://itec.eun.org](http://itec.eun.org)

3 For more information see [http://creative.eun.org/c/document_library/get_file?uuid=255a0a3a-ed78-4771-834f-b7db75a26ead&groupId=96459](http://creative.eun.org/c/document_library/get_file?uuid=255a0a3a-ed78-4771-834f-b7db75a26ead&groupId=96459)
The project developed two sets of Pedagogical Scenarios/Learning Stories that were implemented by CCL teachers with their target class during the project, with each set of scenarios implemented during a school term. The first set of scenarios was tested from November 2013 to April 2014, the second set of scenarios was implemented from October 2014 to January 2015.

**CCL SCENARIOS 2013**

- Flipped Classroom
  - Italy • Portugal
- Collaboration
  - Austria • Belgium Wallonia
  - Slovenia
- Personalisation
  - Czech Republic
  - Lithuania • UK
- Content creation
  - Belgium Flanders • Italy

**CCL SCENARIOS 2014**

- Collaboration and Assessment
  - (iGroup)
  - Austria • Italy • Slovenia
- School to School Collaboration
  - Belgium • Czech Republic
- Liberating Learning
  - Lithuania
  - Portugal • UK

There was some variation in the number of devices available in each classroom pilot, the level of wireless connectivity and also in the students’ access to the equipment, with some students having ownership of the technology 24/7, while others only had access to it at school during designated lesson times. Most of the teachers had only been using tablets with students for a short time before the beginning of the project. In just two cases, the schools had been using tablets for almost four years. The majority of teachers in the project used iPads and Android devices, while a few used Windows devices.

**Characteristics of the CCL pilot classrooms**

All schools participating in the project had to provide their own technology, connectivity and infrastructure and there was a certain degree of flexibility in terms of the age range of students and curriculum focus. Around two thirds of the teachers involved in the project used tablets in mathematics, science and technology classes, while the remaining teachers used tablets in language, geography or history classes. Forty-two of the teachers worked in secondary schools, and three teachers implemented the pilot with students in primary schools. In some cases project partners helped equip pilot classes with tablets at the beginning of the project in collaboration with commercial suppliers.
Observation Visits: Summary of key findings

The University of Wolverhampton carried out 22 classroom Observation Visits in 22 CCL schools in the eight participating countries (at least two per country). A further 11 lesson observations involved other teachers using the tablets with students in the schools. The objective was to observe the real use of tablets during lessons and to discuss how the Learning Scenarios involving tablets had been implemented. The Observation Visits included interviews and discussions with head teachers and senior management teams, as well as with other teachers and support staff involved with the implementation of technology in the school. In addition, the University of Wolverhampton carried out interviews with each project partner at the beginning and end of the project. The detailed Observation Visits report can be found on the project website.

Implementation of devices and connectivity

- Most schools used a single type of device. In some cases parents bought tablets, either in agreement with the school or of their own accord.
- Students had varied levels of access and ‘ownership’ of their tablets; allowing students to take the tablets home was effective (although some did not have internet access at home).
- In most schools teachers were provided with the same kind of tablet used by the students. It is important for teachers to have access to a device.
- Implementation was often ad hoc and depended on a few teachers without always considering the changes that might be necessary across the school.
- Teachers often faced unreliable wireless connectivity.
- In some schools, one or two students were no-minated to provide support to others (and the class teacher); in others, technical support often lay with the class teacher who was expected to be responsible for downloading apps, as well as for the updating and general maintenance of the tablets.

Pedagogy

- Teachers found it challenging to explore new ways of working whilst trying to fulfill the requirements of the curriculum and prepare for external examinations.
- The scenario development process enabled teachers to plan with colleagues collaboratively and allowed them to discuss their ideas.
- Teachers felt that they needed more flexibility within the timetable. Where lessons were 90 minutes, students had more time to develop ideas.
- Some schools found it beneficial to arrange ‘team-teaching’ as part of the tablet implementation.
- At first, teachers tended to direct the content and workflow of the lessons very closely, but as they became more familiar with the scenario development process, students were given the freedom to make decisions about producing different outputs.
- Where teachers had not implemented the CCL project scenario, students could appear to be busy on the tablet on unchallenging tasks searching for information and simply copying and pasting rather than learning how to analyse, validate and evaluate.

4 http://creative.eun.org
Teachers involved in the scenarios on personalisation and liberating learners said that it helped them to learn more about their students by giving them opportunities to explore how the students learn.

Students found it challenging to work collaboratively on projects without guidance and structure; teachers therefore gave the students roles within the group, sometimes on the basis of questionnaires about preferences.

Schools were concerned about how to provide parents with evidence on individual students’ work on tablets and in groups; teachers had to make changes to ensure that they provided evidence of students’ progress and reflections on their learning, although this was not always gathered.

Resources, applications and content

Tablets allowed access to rich content, and students became resource creators and enriched their digital skills.

Access to a consistent learning platform – sometimes cloud-based – was helpful to schools, as it provided a single location for lesson content.

Teachers could spend a long time searching for resources and stressed the importance of giving students a restricted list of apps at first, and then, as both teachers and students grow in confidence, allowing them to make their own decisions about which apps to use and the types of end products to create.

Teachers said they were not accustomed to sharing their resources with other teachers, planning collaboratively or using social networks, but recognised that it was useful to be a member of a community in order to share ideas and recommendations.

Content is not always available in languages other than English.

Some teachers and students used the tablet only as a research tool, and recorded findings on paper or in an exercise book, partly because parents wanted to see evidence of written work, considering videos as ‘fun’, rather than serious study.

There were both technical and pedagogical e-safety challenges. Several partners found the European Schoolnet eSafety label useful.

Whole school issues

Pedagogical change takes time, needs leadership and requires strategic planning but, for many of the teachers, whole school issues were not at the forefront of their agenda at the beginning of the project.

In some schools there was a clear vision for the development of learning and teaching, but others introduced the tablet as the ‘latest device’, with no plan for going beyond a pilot.

The implementation of tablets led to a rethinking of learning environments, but in some classrooms students were still seated in rows when using tablets, with the teacher instructing from the front.

Teachers needed ongoing technical and pedagogical support as well as the opportunity to simply talk and exchange ideas with others. Commercial suppliers provided some training, but this was largely technical and did not address the pedagogical implementation of tablets.

Webinars provided as part of the CCL project enabled the teachers to reflect on their practice, while collating evidence from the blogs informed further practice within the project.

Schools realised the importance of involving parents and informing them about decisions regarding the use of tablets, even if only one class in the school was involved.
Recommendations for policy makers

The CCL policy experimentation has shown that tablets allow teachers to explore new ways of working by involving students in scenarios on personalisation, content creation, collaboration, the flipped classroom and liberating learners. However, practices vary between schools and between countries, pedagogical change takes time, and challenges remain. The following guidelines are intended to provide guidance to MoEs and regional educational authorities on how to foster the large-scale uptake of innovative teaching and learning practices using tablets. The recommendations directly result from the findings of the CCL Observation Visits and are therefore grouped under the same topics. Moreover, during the CCL final mainstreaming workshop in March 2015, the recommendations were reviewed by the project partners and a wider group of stakeholders (70 in total), including policy makers, researchers, teachers and industry partners. Stakeholders rated the recommendations in terms of their relevance for policy making, identified the most important recommendations and reviewed their potential for implementation, forming the basis for drafting the final recommendations.

Implementation of devices and connectivity

1. Strengthen the digital capacity of schools by providing resources and support

1.1. Further investment in providing a sustainable ICT infrastructure in schools: Governments at regional or local level have a key role in investing further in schools’ ICT infrastructure to allow for the deployment of mobile devices such as tablets, not just in a few classrooms but across the whole school. Schools should receive the means to provide wireless connectivity, a precondition for the integration of tablets in school activities. Wireless should be stable and reliable throughout the whole school.

1.2. School leaders and teachers need technical support and guidance: At national or regional level, policy makers are advised to offer ongoing support for the implementation of tablets and other mobile devices in the classroom. This includes providing advice on how to upgrade the school’s connectivity/Wi-Fi and ensuring that schools have access to technical support staff who can help install new apps and software; implement emerging cloud based solutions/platforms; upgrade and provide general maintenance of tablets; and monitor and help address security or health issues.

1.3. Communicate what works: MoEs and National/Regional Agencies for ICT play an important role in providing schools with guidance on the preconditions and enablers of successful tablet integration based on existing evidence and the experience of 1:1 learning initiatives with tablets. This includes allowing students to take devices home and ensuring that they have a sense of ownership of the device by using their own devices, or allowing them to personalise the devices for access to learning materials. Schools should make it a priority to equip and train teachers prior to the introduction of tablets in the classroom, e.g. during the summer before the start of the school term. Teachers first need to develop their own digital skills before they can begin to plan activities for students.
**Pedagogy**

**Strengthen the pedagogical capacity of schools and teachers**

2.1. **Invest in formal and informal training for teachers:** There needs to be a national/regional strategy to train teachers on the implementation of tablets and mobile devices in education. This should involve Continuing Professional Development (CPD) for new and existing teachers. Schools should provide opportunities for formal and informal professional development opportunities and give teachers time to experiment, explore and share practices. CPD should include encouraging teachers to innovate, recognising their efforts and providing support for peer learning and networking.

2.2. **Promote teacher collaboration:** Teachers need to be given opportunities to observe colleagues’ teaching practices and to collaborate with other teachers to plan for the use of personal devices within teaching and learning. Co-developing pedagogical scenarios or team teaching can be a very useful part of teachers’ professional development, allowing them to see the learning activities and tasks that students are engaged in, consider the level the students are working at, and make valuable comparisons between subjects about the consistency of the level of challenge.

2.3. **Communicate the need for pedagogical change:** The evidence shows that tablets can support personalised, collaborative and active learning approaches, e.g. involving students and teachers actively in the creation of content. Tablets should be used to differentiate learning for students rather than delivering the same lesson for all students via the device. Moreover, tablets are especially suitable for engaging students in multimedia activities and extending learning outside the classroom. In order to exploit these possibilities there has to be a coherent approach towards implementation strategies. National or regional authorities should guide schools in their choices regarding the implementation of tablets (or other mobile devices) and support the necessary pedagogical changes. This will require a sustained effort in order to build the capacity of teachers in pedagogical approaches and their digital competence.

2.4. **Develop new formative and real time assessment approaches:** Teachers designed and developed personalised learning approaches and scenarios to engage learners actively in the learning process by reflecting on their own tablet-supported learning. Tablets make it possible to provide students with varied and multiple formative and summative assessments on an ongoing basis and in real time, and also help students to reflect on their own learning results. Assessment frameworks need to be aligned with such possibilities and allow for the assessment of competency-based approaches such as collaboration, creativity, problem solving and learning-to-learn skills via formative assessment approaches.

**Whole school issues**

3. **Support schools in their vision and implementation strategies by providing a clear and coherent national or regional strategy to which schools can link**

3.1. **Promote vision and effective long-term implementation strategies:** Schools need to develop a vision for the implementation of personal devices for students. This should include a clear roadmap on how the ideas will be piloted and the professional development available for teachers.

3.2. **Share vision and strategy:** Schools need to share their vision and strategy with a team comprised of identified school leaders, teachers, parents, students and school management boards. Prior to implementation schools should share the thinking behind their strategy with those stakeholders.
3.3. **Ensure flexible school curricula, timetables and school autonomy:** Schools need to be able to create opportunities to pilot the use of devices with students; this may involve adapting the curriculum, exploring different timetables and making changes to the learning spaces. The national, regional or local curriculum should be flexible enough to allow for interdisciplinary, competence-based and active learning approaches as supported by tablets. There is evidence to show that where students have longer lessons this not only helps students to create outputs, but also allows time for more focussed and facilitated discussions.

3.4. **Support piloting and research with schools:** Schools benefit from planning and implementing research and development programmes that allow for a review of how tablets will be used. This could be done with a link to a local university or via national or European pilots.

**Resources, applications and content**

4. **Establish or promote existing digital content repositories including Open Educational Resources in the local language**

4.1. **Support the development of quality-controlled content for tablets aligned with the curriculum:** At a national level, schools need access to repositories of content that is appropriate for the use with tablets and other mobile devices that is approved and quality controlled. This should prioritise native language resources and open educational resources, especially for small language communities.

4.2. **Promote access to educational apps and content across subjects:** Schools should provide access to apps/tools that can be used for different subjects (usually referred to as productivity tools) to enable both teachers and students to become familiar with how they work. However, in the early phase of tablet implementation, the number of recommended apps should be limited in order not to overwhelm teachers.

4.3. **Promote the best use of tablets to benefit students with special needs:** Tablets offer a variety of built-in accessibility features (e.g. VoiceOver, Zoom, Large Font, Black on White Display, Mono Audio, Voice Control) that can benefit students with special needs. Schools should encourage teachers to use the devices’ potential in this area. This task might require extra work for the teacher, e.g. sending lesson materials to visually impaired students in advance (to enable them to access the materials via the tablet during the lesson), or providing materials in different formats (audio, video, etc.).

4.4. **Promote guidance on eSafety issues at national/regional level:** Schools need support in providing appropriate advice to students, staff and parents about eSafety, and need to recognise that there are technical and pedagogical issues related to eSafety. Students and parents need to understand that they must also take responsibility for data and for the protection of personal information.
Conclusions

Running a pan-European policy experimentation on the use of tablets in schools needs to start with and focus on pedagogy rather than the technology. Tablets can support personalised, collaborative and active learning approaches and should therefore be used to differentiate learning for students rather than delivering traditional lessons with the device. Moreover, the added value of tablets lies in their multimedia functionalities, mobility and potential benefits for students with special needs. This policy experimentation has shown that it is advisable to adopt the CCL scenario development approach but to include three cycles (school terms) in order to help teachers fully engage with and benefit from this process, and to enable them to reflect on and change their practice. It is crucial in this process to have an experienced lead teacher who provides pedagogical support to teachers in other schools, including organising a community of practice. Also important is the provision of opportunities for face-to-face peer exchanges for all teachers at the beginning of a pilot. The project methodology included building in feedback loops of what works and what does not, in order to ensure continuous improvement during a pilot.

Evidence shows that schools with longer experience in running 1:1 initiatives (e.g. netbooks or laptops) are better prepared when it comes to integrating new mobile devices such as tablets. Teachers in Europe would benefit from a digital “what works network” in the area of 1:1 initiatives and mobile learning, which gives them access to a digital archive at national or European level of relevant research findings in the area. This would allow schools to learn from the research about enablers in past initiatives.

Moreover, in order to avoid fragmented single tablet initiatives that are not supported at a national or regional level, it is advisable to map and collect detailed information on different initiatives in countries in order to provide support and guidance, and to connect different actors. In short, policy makers should develop a coherent approach to the integration of mobile devices such as tablets in schools. This approach needs a vision and the design of good implementation strategies, including the following:

- Communicating the need for pedagogical change to head teachers and teachers.
- Providing ongoing support to schools on strategy, implementation and pedagogy.
- Providing continued investment and resourcing (sustainable financing models).
- Gathering evidence from pilots for feedback and mainstreaming.
- Further investing in the capacity building of schools and teachers.

The CCL policy experimentations were very valuable in terms of helping education ministries develop strategies for the deployment and mainstreaming of mobile technologies. A great deal, however, remains to be done, such as further exploring the challenges and opportunities of Bring Your Own Device (BYOD) and the potential offered by emerging cloud services for schools. There is also a need to continue short policy experimentations such as CCL with pilots that involve a more in-depth evaluation of the innovative use of mobile devices in and out of schools, and could perhaps also include longer-term impact studies.

In order to allow for a mainstreaming of innovative pedagogical approaches involving ICT, several countries that are members of European Schoolnet have appointed Future Classroom Lab ambassadors via their national Ministry of Education, who, in turn, will be able to provide advice and support to new lead teachers embarking on national or regional tablet pilots.

European Schoolnet’s Future Classroom Lab website\(^5\) will continue to provide information on how the work in the Creative Classrooms Lab project will be taken forward in new European projects and initiatives.

The CCL website\(^6\) also contains valuable professional development materials from the CCL online course, pedagogical scenarios, and support materials for the integration of tablets. It also includes access to the CCL teachers’ community and the reflective blogs developed by teachers during the course of the project.

\(^5\) \(\text{http://fcl.eun.org}\)
\(^6\) \(\text{http://creative.eun.org}\)
Discover all the CCL resources online!

- Videos of innovative classroom practice using tablets, created by CCL partners and teachers.
- Online materials of the successful CCL course are available for self-studying.
- Recordings and presentations from practitioner-led webinars.
- Observation blog with insights and ideas captured during school visits and the final report on the Observation Visits.
- Case studies focusing on how the scenarios were put into practice in different schools.
- Teachers' blog with teachers' reflections throughout the project, as well as their conclusions and recommendations.
- All the policy maker Scenarios and Learning Stories that were developed within the project.
- Summary brochure of the four themes, providing information and practical tips on each.

http://creative.eun.org

facebook.com/groups/CreativeClassroomsLab/ #CCLproject youtube.com/user/europeanschoolnet

Project Partners

Associate Partners

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