Innovative teaching and learning with tablets
The Creative Classrooms Lab project (CCL) brought together teachers and policy-makers in eight countries to design, implement and evaluate 1:1 tablet scenarios in 45 schools. The project produced learning scenarios and activities, guidelines and recommendations to help policy-makers and schools to take informed decisions on optimal strategies for implementing 1:1 initiatives in schools and for the effective integration of tablets into teaching and learning. The project, funded by the European Commission’s Lifelong Learning Programme, was coordinated by European Schoolnet, involved 10 partners and ran from 2013 to 2015.

In the project, policy-makers and teachers developed scenarios for the use of tablets in schools. The scenarios are visions for the future classroom that address trends and challenges facing schools. Learning stories are sets of concrete classroom activities. Both were developed using the Scenario Development Toolkit developed in the earlier iTEC project (fcl.eun.org/itec).

The brochure provides an introduction into the four main teaching and learning approaches underpinning the seven learning stories developed and piloted by 45 teachers from 8 countries. Each teacher piloted two learning stories – one learning story per school term.

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<tbody>
<tr>
<td>Collaboration (Austria, Belgium Wallonia, Slovenia)</td>
<td>School-to-School Collaboration (Belgium Flanders, Belgium Wallonia, Czech Republic)</td>
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<tr>
<td>Flipped Classroom (Italy, Portugal)</td>
<td>Collaboration and Assessment (Austria, Italy, Slovenia)</td>
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<tr>
<td>Content Creation (Belgium Flanders, Italy)</td>
<td>Liberating Learners (Lithuania, Portugal, UK)</td>
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<td>Personalisation (Czech Republic, Lithuania, UK)</td>
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Main outcomes

- **Scenarios and learning stories** developed during the project: creative.eun.org/scenarios
- **Video case studies** illustrate the implemented learning activities and were produced by CCL partners and teachers: creative.eun.org/results
- The insights gained from the CCL project have been integrated into an **online course (MOOC)** in the European Schoolnet Academy in April 2015. The course includes modules on how tablets can support new learning approaches such as content creation, collaborative learning, personalised learning and the flipped classroom: www.europeanschoolnetacademy.eu/web/tablets-in-schools
- The **final report from observation and documentation of practice** includes case studies, practical examples of scenarios and recommendations for education ministries and schools moving forward with tablet implementations and the use of 1:1 technologies: creative.eun.org/results
Collaborative learning is an umbrella term for a variety of educational approaches involving joint intellectual efforts by students, or students and teachers together. In collaborative learning situations, students work in groups of two or more, collaboratively searching for understanding, solutions, or meanings, or creating a product. Collaboration is a skill in itself that needs to be learnt, and which requires planning and guidance by the teacher. It puts students and their collective learning experience at the centre of learning, and includes students’ interaction by sharing ideas, knowledge and resources with peers, gaining experience in conflict resolution, self-criticism, self-evaluation and self-reflection. Collaborative learning scenarios can support the development of a variety of 21st century competences such as communication skills, interpersonal skills, collective problem solving skills, cooperation and teamwork and leadership. In collaborative work it is fundamental to share objectives and responsibilities between members of the group.

Roles and activities when implementing a collaborative learning activity

<table>
<thead>
<tr>
<th>TEACHERS</th>
<th>STUDENTS</th>
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<tbody>
<tr>
<td>Act as motivator, tutor, animator, observer, adviser, time-keeper</td>
<td>Act as observer, reporter, opponent, presenter, leader, mediator</td>
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<tr>
<td>Consider differences between learners e.g. gifted, less-gifted</td>
<td>Listen to others, establish common goals</td>
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<tr>
<td>Provide opportunities for assessment of the individual and group work</td>
<td>Assign and carry out different roles in teams related to skills and interest</td>
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<tr>
<td>Have regular meetings with each group</td>
<td>Search and share resources</td>
</tr>
<tr>
<td>Encourage students to self- or peer-assess, and to reflect on what they have achieved at various stages of the collaboration</td>
<td>Carry out peer- and self-assessment</td>
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<tr>
<td>Enable a physical learning environment that supports group working, and/or online learning environment that extends the collaborative work to after-school tasks</td>
<td>Alternate between individual and collaborative tasks</td>
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<tr>
<td>Apply new ways of assessment, including formative assessment</td>
<td>Collaborate with peers, within the classroom, within the school and other schools</td>
</tr>
<tr>
<td>Plan how the tablet can support different steps of the learning process and tasks</td>
<td>Collaborate with teachers and experts outside school</td>
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<td>Develop and present a product, the outcome of the group work</td>
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Tablets support collaborative ways of learning such as peer learning, mobile group-work, and project work, and can be used to:

- collect evidence and capture progress in one place: conduct own research online; take notes; collect, write and draw ideas; take pictures; record (audio or video) discussions anytime, anywhere

- exchange: with peers, teachers, experts and others, e.g. via Skype, Hangouts, Twinspace

- share ideas/collaborate online: use of online collaboration tools, communication tools, sharing tools (e.g. cloud-based solutions), blogs, social media, working on shared documents (a)synchronously also between schools

- gather feedback: from the teacher or others, for example via online learning environments like Edmodo, ClassDojo

Useful apps

- TeamUp is a tool that helps with organising group work online, following the criteria established by the teacher. The tool not only facilitates the rapid reorganisation of group members, but also allows them to give repeated feedback on the progress of the team work by recording short audio clips. [http://teamup.aalto.fi](http://teamup.aalto.fi)

- Edmodo is a virtual learning environment for teachers, students and parents. It makes it possible, for example, to submit assignments online, to plan using calendars, and to discuss and share relevant links/information. [www.edmodo.com](http://www.edmodo.com)

Learning activity example

**MATHEMATICS, 14-15 YEAR OLDS.** The class is divided into groups of four, with each of the students having a different role: photographer, speaker, secretary and controller. Each group uses a tablet according to their designated role, along with a bank of lesson resources, including suggested apps for the tablet, and a worksheet. The students have to form polygons with pieces of cardboard and paper fasteners, and then explore the properties and features of triangles and quadrilaterals. The teacher guides and corrects students if needed, but lets them create freely. Manipulating the different shapes is critical to understanding, after which the groups produce a report and present their work. All end products are different. One group decides to film the manipulation of the shapes, and add commentaries on the process; another one uses EduCreations to create the shapes; and other students photograph the key steps and assemble them with PicCollage.

*By Daniela Porro • CCL teacher • Italy*

Tips for your practice

- Use different approaches to form groups, taking account of the number of students, age, general skills, socialisation, gender and interest.

- Starting with pairs, who take on tasks and responsibilities, can be a good strategy. Then, it is easy to join two groups of two, forming groups of four, which allows for a rich variety of combinations.

- The bigger the group, the bigger the chance of inactive group members.

- Use collaborative tools and services that effectively support your educational goals.
The ‘flipped classroom’ inverts traditional teaching methods, delivering instructions online outside of class, and moving ‘homework’ into the classroom. The teacher creates and/or selects materials (e.g. videos, documents, presentations, or screen casts) for the students, who study the materials and resources as a self-learning activity at their own pace outside of a lesson. While doing so, the students identify difficulties and topics to be clarified with the teacher during the next lesson. Therefore, the flipped classroom approach aims to make the most of face-to-face time in classrooms for discussion, sharing, and deepening the gained knowledge, and also enables students to access online content and services outside the classroom and the school day. Teachers should assign meaningful, achievable and pedagogically-valid activities outside school, and provide a good mix of in- and out-of-school tasks. This approach benefits from the growing home access to the Internet, computers and tablets.

Roles and activities when implementing a flipped classroom activity

<table>
<thead>
<tr>
<th>TEACHERS</th>
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<tbody>
<tr>
<td>Act as content creator, tutor, initiator, manager of learning outside school, adviser, communicator, animators, coach, observer</td>
<td>Act as organisers of their own learning as explorers, reflectors, reporters, presenters</td>
</tr>
<tr>
<td>Prepare and select material for home learning phase</td>
<td>Interact with the distance learning material, repeat if needed to gain understanding; prepare questions to be addressed in class</td>
</tr>
<tr>
<td>Provide adapted content for students at different levels for higher engagement</td>
<td>Are engaged as working at their own pace and with material adapted to their level, learning type and/or interests</td>
</tr>
<tr>
<td>Revisit concepts students do not understand, individually or with the whole class</td>
<td>Work on challenging concepts and deepening understanding in the class with peers, supported by the teacher</td>
</tr>
<tr>
<td>Prepare collaborative activities and exercises for the classroom that extend student learning</td>
<td>Collect feedback and identify issues that may require additional time</td>
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</table>
Tablets support several aspects of the Flipped Classroom concept such as independent learning, collaboration in and outside class, and giving feedback on students’ learning. They can be used to:

- access material to learn from home: videos, documents, web pages, tutorials, both online and offline
- capture questions for the classroom: note down responses, observations and unsolved questions (text, audio, video)
- establish exchange: via online learning environments, e.g. Edmodo between students outside the classroom, preparation for the lesson with peers, discussion of difficult problems
- get feedback on students’ learning: online quizzes for students to see their progress and for teachers to receive feedback on which concepts need to be revisited
- work collaboratively during class: via online collaboration tools, shared documents

Useful apps

- ClassDojo is a fully-online class manager that can track students’ progress. Teachers can use it to record student learning and share it with them and with their families, while maintaining a level of assessment and information that is updated and accessible. Students can access a set of reviews and information about their performance which contributes to self-regulation of their attitudes and behaviours. [https://www.classdojo.com/](https://www.classdojo.com/)
- Teachers can create and share video lessons and other resources with students in a safe and private classroom environment and provide feedback on students’ work. Students can also create their own videos. [https://www.educreations.com](https://www.educreations.com)

Learning activity example

CHEMISTRY, 14-15 YEARS OLD. I introduce the topic and the lesson objectives to the class through examples or a problem-solving activity. The students get tasks to carry out at home using different online applications: EduCreation to describe the tasks, iTunes to view videos, and Infoschool to save the lesson file. During the next lesson, we discuss the tasks and repeat points, if necessary, for everyone to gain a full understanding. During the lesson, students work in groups or pairs to make exercises, to find resources, to record observations, etc. At the end of the lesson they sometimes take an interactive test made by presenter app.

Rosa Palmizio • CCL teacher • Italy

Tips for your practice

- Assist students having difficulty getting online outside school, finding somewhere/time to work.
- Parents must be aware of and support the flipped classroom model.
- Teachers must manage learning outside school sensitively especially with young learners, privacy issues can arise as well as concerns about intrusion into family life and free time.
Easy access to devices like tablets, social media and different creative technologies have made it possible for basically anyone to create, reuse and share content easily. In school, students can develop their understanding through content creation in different formats: videos, presentations, posters, comics, audio files, storyboards, or even an app. Instead of receivers of content, students become producers and learn about the processes and pitfalls of designing and creating content in an authentic, problem-solving context. The content creation process must include reflection on plagiarism, copyright, privacy issues, and online sharing. Creating one’s own content can improve motivation, participation and achievement with students. The outputs can be shared through a Virtual Learning Environment or a dedicated student blog.

Roles and activities when implementing a content creation activity

<table>
<thead>
<tr>
<th>TEACHERS</th>
<th>STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Act as advisor, specialist and manager role</td>
<td>Act as creator, explorer, assessor, presenter</td>
</tr>
<tr>
<td>Communicate to students from the beginning the purpose of the digital content being created</td>
<td>Learn by creating, by being actively involved in producing and creating their own content, exercising their imagination, and innovating</td>
</tr>
<tr>
<td>Set the goals and limits of the tasks</td>
<td>Practice independent, self-organised learning, individually and in teams, or even at home as part of homework</td>
</tr>
<tr>
<td>Agree together with students what the end product should be, and produce a plan to get there</td>
<td>Showcase and present what has been created: students can develop over time their learning portfolios helping them to link between different disciplines, and provide a real-life context to their classwork</td>
</tr>
<tr>
<td>Agree with students /teachers on quality criteria for content</td>
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<tr>
<td>Define available tools, and pre-select information sources and other materials for students to use</td>
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<tr>
<td>Assign roles for the ‘production team’ if needed</td>
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<tr>
<td>Support groups or individual students in doubt or with ‘creative blocks’</td>
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<tr>
<td>Help to publish and share the content</td>
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Tablets enable students to access, create and edit up-to-date educational resources, as opposed to traditional learning settings, where content is static and developed by teachers or textbook authors. Tablets can be used to:

- collect information, conduct own research online, take notes, collect, write and draw ideas, take pictures, record (audio or video) discussions anytime anywhere
- create content as an integral part of learning in new/creative ways presentations, e.g. eBooks, videos, digital stories, comics, games, apps
- share interim results via blogs, ePortfolios, Wikis, etc.
- publish & showcase results via online learning environments, social media

Useful apps

- Comic Life is an app with which students can create their own comics. They can insert their own pictures and fonts, templates, panels, balloons and captions. [http://plasq.com/apps/comiclife/macwin/](http://plasq.com/apps/comiclife/macwin/)
- PicCollage is an app to create collages using photos, stickers, frames and text. The setting “School settings” allows for disabling functions such as “photos from web”. [http://pic-collage.com/](http://pic-collage.com/)

Learning activity example

LANGUAGES/ARTS, 10 YEARS OLD. Students make a storyboard on paper and take pictures of their story with their tablets. They insert the pictures into a comic strip programme called Comic Life. Next, the students start creating their book with Book Creator and insert their pages from Comic Life. The speech bubbles come to life when students record them with sound. The teacher collects all the stories on one device to combine them into one book, which can be shared with other classes and parents.

Kurt Klynen • CCL teacher • Belgium Flanders

Tips for your practice

- Time always becomes a very restrictive factor in content creation, therefore, targets should not be too ambitious. Smaller and less time-consuming learning resources, combined with phases of reflection and discussion will make the performance more predictable and motivating than complex content production processes.
- The goal is an end product that fills a gap, is accessible, makes appropriate use of technology, and can be used and adapted by teachers and students.
- Give students free choice of which mode of presentation (e.g. keynote, movie, etc.) and app they use, and encourage them to experiment with new tools to create creative outputs.
The goal is to personalise learning; that is, to design activities that meet the needs, competences, capabilities and learning preferences of individual students. Personalised learning draws upon all the skills and experience of the teacher. It is essential that teachers know each student's abilities, strengths, and weaknesses, and can design learning activities that are appropriate, challenging, and motivating. For example, the teacher can use questionnaires, portfolios and face-to-face discussion to recognise students' learning styles and preferences. The ultimate goal is to support students so that they can take responsibility for their own learning process. Fostering autonomy in learning is not just about the process of accessing and acquiring knowledge, but also concerns its assessment and dissemination.

Roles and activities when implementing a collaborative learning activity

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<thead>
<tr>
<th>TEACHERS</th>
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<tbody>
<tr>
<td>Acts as researcher, designer of individual learning plan, facilitator, evaluator</td>
<td>Act as designer of own learning process, reflector, presenter, explorer, evaluator</td>
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<tr>
<td>Decide to what extent learning is to be personalised, e.g. propose individual learning plans and targets, or a part-way differentiated approach offering several modes of learning, each suited to broad groups of students</td>
<td>Engage with tailored learning activities or with own topics of investigation that boost motivation and self-expression</td>
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<tr>
<td>Support forming pairs, groups and teams required in tasks according to personal interests and levels, but also mixing different capacities</td>
<td>Develop personal learning portfolios</td>
</tr>
<tr>
<td>Provide feedback on students' work and performance, and encourage them to make self-evaluations, practice self-reflection and define personal goals</td>
<td>Gain independence and ownership over their learning: enhancing engagement with the task, and helping to foster the sense of personal responsibility</td>
</tr>
<tr>
<td>Coordinate with parents, as they have an important role, working both as supervisors and supporters, and in helping the teacher understand the interests, needs, prior experiences and circumstances of students</td>
<td>Are aware of developing their own learning skills, and understand differences in learning styles with other students</td>
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Tablets can support personalised learning, both for teachers and students:

- To identify students’ learning types, according to students’ preferred learning styles, strengths and weaknesses, via online assessment tools, e.g. ePace www.epaceonline.com
- To access class management tools - to have an overview of students and their progress e.g. ClassFlow classflow.com
- To prepare content according to different learning styles - presentations, video, audio, etc.
- To vote on preferred learning content, e.g. via EasyPolls
- To access an individual collection of resources in a personalised learning environment on the tablet, including personalised apps, content and/or learning activities, e.g. learning games
- To keep track of individual learning and progress, e.g. via eportfolios, blogs
- To share ideas about what they will learn, e.g. blogs or Padlet padlet.com/, reflections and conclusions about what they have learned and the learning process

Useful apps

- Showbie is an app which makes it easy to assign, collect and review student work using tablets. It allows the students to upload Keynotes, images, voicenotes, etc. and gives them access to a personal online portfolio. www.showbie.com
- EasyPolls is a very effective and comprehensive system to conduct online polls. Students can use this feature to decide on various options or to choose the subjects of their discussions. www.easypolls.net

Learning activity example

HISTORY, 11 YEARS OLD. I use the Showbie application to assign, collect and review the students’ work. For example, I can share an image file and ask the students to comment on it in their own way; some may use a mind map, whilst others can use a notation app or a drawing tool (e.g. SketchBook Express or iAnnotate PDF). The students can upload their work to Showbie for me to review it. Tablets also allow students to revisit instructional videos I have used during the practical art work if needed. The homework is shared via Showbie, but the students can also record the homework assignment (audio or video file), take pictures of any written notes on the board, or use an app of their choice to record this.

Lisa Cowell • CCL teacher • UK

Tips for your practice

- The teacher knows students as individuals and is in contact with parents.
- The student has targets and a customised learning plan.
- Tablets and an array of tools and services are harnessed to enable and support personalisation, and save the teacher time and effort!
- Evidence of progress and achievement are stored digitally.
Personalisation is a dream that many teachers have wanted to provide for years, but lacked the resources to deliver. The CCL project demonstrates that it has become a reality through the application of teaching and learning technology. This paves the way for a new way of working in the classroom and beyond that enables every student to achieve their potential at their own speed and in their own way.

Valerie Thompson  
e-learning foundation, UK

Teachers and students in Austria enjoyed working in collaboration projects, including the assessment of such collaborative work. With their mobility and features like camera and GPS, tablets support such new ways of teaching and learning.

Reinhold Hawle  
Ministry of Education and Women’s Affairs, Austria

Create different learning environments. If pupils want to create video content, they’re going to need space and to be away from other groups making noise. Have lots of break out space. Consider and change the layout of rooms and buildings where you can.

Lisa Cowell  
Teacher, UK

Believe in your students and challenge them to explore different apps, different resources and different ways of solving problems. Challenge them to think out of the box and don’t restrict children’s creativity and interest for research.

Rui de Lima e Silva  
Teacher, Portugal

A tablet is not a personal computer! Tablets are mobile, so change learning environments! Experiment on more apps and let your children do that!

Antanas Dzimidavicius  
Teacher, Lithuania

Play to the tablet’s strengths. They are fantastic for communicating and collaborating, for capturing/sharing/feedback, for research and for allowing extremely fast access to specific resources (e.g. using QR codes).

Phil Spoors  
Teacher, UK

Create different learning environments. If pupils want to create video content, they’re going to need space and to be away from other groups making noise. Have lots of break out space. Consider and change the layout of rooms and buildings where you can.

Lisa Cowell  
Teacher, UK

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Phil Spoors • Rosa Palmizio • Virginija Bireniene • Daniela Cuccurullo  
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