



KNOWLEDGE KIT

PLAY C2LEARN.EU

LEARN CO-CREATIVELY CO-CREATE LEARNING

Knowledge Kit

Deliverable D6.4.2 of the C²Learn project

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Based on the outcomes of the work of the C2Learn Consortium

www.c2learn.eu

Think creatively



Decide wisely



Act humanely



C²Learn

A space of infinite possibilities for you to explore

Play with your friends in YOUR creative adventures!



C²Learn at a glance: The formalities

C²Learn is a three-year research project supported by the European Commission through the Seventh Framework Programme (FP7), in the theme of Information and Communications Technologies (ICT) and particularly in the area of Technology-Enhanced Learning (TEL) (FP7 grant agreement no 318480).

The project started in November 2012 with the aim to shed new light on, and propose and test concrete ways in which our current understanding of creativity in education and creative thinking, on the one hand, and technology-enhanced learning tools and digital games, on the other hand, can be fruitfully combined to provide young learners and their teachers with innovative opportunities for creative learning.

The project designs an innovative digital gaming and social networking environment incorporating diverse computational tools, the use of which can foster co-creativity in learning processes in the context of both formal and informal educational settings.

This innovation is co-designed, implemented and tested in systematic interaction and exchange with stakeholders following participatory design and participative evaluation principles. This happens in and around school communities covering a learner age spectrum from 10 to 18+ years.

C²Learn at a glance – in plain language

In C²Learn we work on the crossroads of creativity, learning, and digital games. Our technologies and practices aim to foster co-creativity in formal and informal learning.

Our work is grounded on how we currently understand creativity in education and creative thinking. These meet in C²Learn with digital games and intelligent technologies to provide young learners and educators with new opportunities for creative learning and teaching.

We have developed games and activities for creative play with words, images, and emotions, as well as a social space for co-creative classrooms and groups. We invite young people to play (with their friends, teachers, family...), to be inspired and generate their own valuable, disruptive ideas, without sacrificing the sheer pleasure of play.

We are extroverts. C²Challenges is our scheme of public calls for action based on the C²Learn concept. We motivate people to play and be creative towards specific aims, such as winning a contest. There are general C²Challenges and specialized C²Challenges for teachers and schools.

In C²Academy, through a variety of training activities we explore synergies of creativity and digital games in formal and informal learning spaces. We co-design innovation together with the participants, with their own professional context in mind.

Overall, in C²Learn we apply co-creativity in practice. We do not work in isolation from people's needs and aspirations for enhanced creativity in teaching and learning practice. We work closely together with learners and educators, and we regularly discuss and co-design innovation with stakeholders in the landscape of learning and learning technologies.

IN C²LEARN, YOU PLAY AND LEARN, YOU LEARN AND PLAY – CO-CREATIVELY!

For more information:



Knowledge Kit: Your entry point to C²Learn

Welcome to C²Learn, the project we have been carrying out in the last three years. We have been working on the crossroads of creativity, learning, and games. We have developed innovative tools, games, and methodologies which we believe can foster creativity and creative thinking in both formal and informal learning settings. This has been an exciting, very creative enterprise.

Now that we are reaching the end of the C²Learn project, we would like to share with you the outcomes of our work and the knowledge we have gained in our creative voyage.

In this Knowledge Kit you can find an overview of almost all aspects of our work in the project. We have tried to keep it short and crisp, so that you can easily see which of these outcomes may be of interest to you. For more details please have a closer look at the documentation in our project deliverables, which you can easily find and download at <http://project.c2learn.eu>:
→ The Project → Final deliverables.

For any further information or assistance for the use of the products of our project, please write to us at info@c2learn.eu.

Where to find things in the Knowledge Kit:

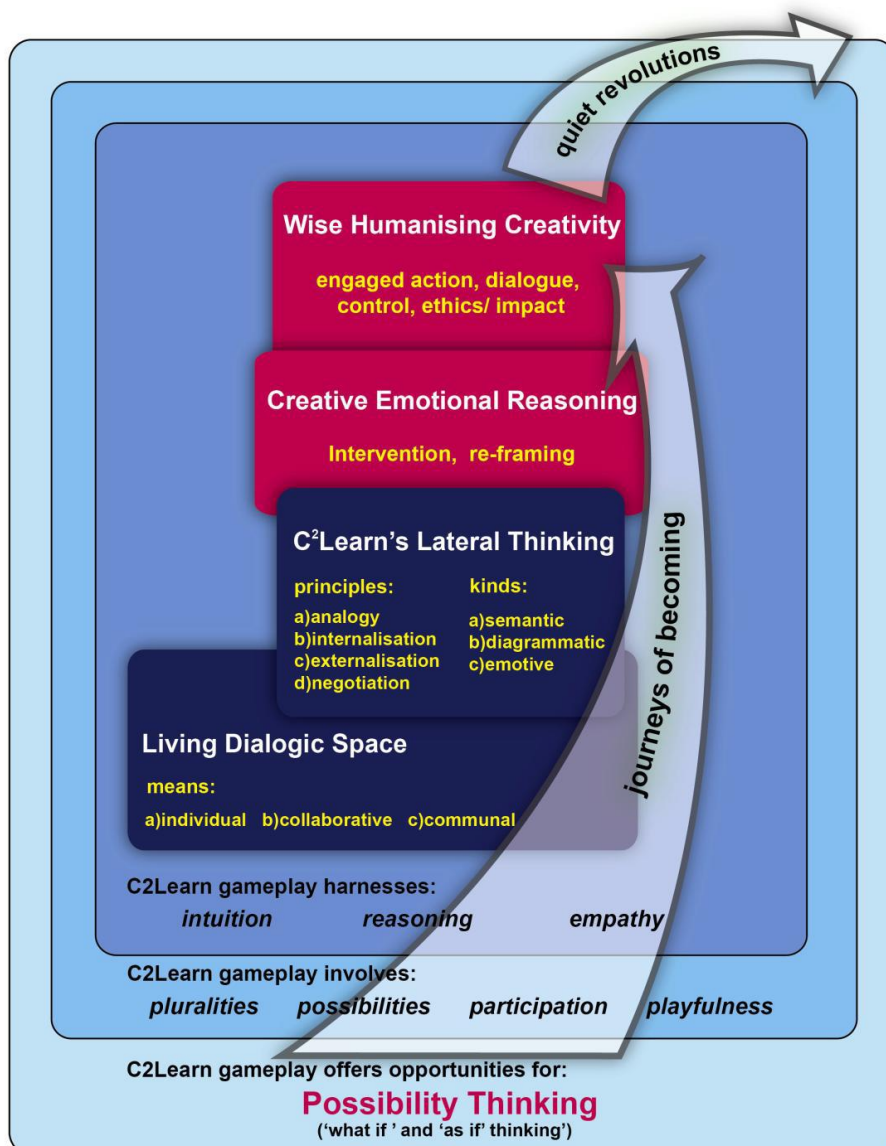
C²Theory: Standing on solid ground	6
C²Learning: Learning co-creatively	7
C²Experiences: Let's play!	9
Quests, Missions, and Challenges	10
The games and playful activities	11
C²Space	23
Co-creative learning scenarios	24
Where can I find and play with the technologies?	28
Appendix: A practical guide to C²Space	30

C²Theory: Standing on solid ground

In the C²Learn project we develop ways and tools in order to promote co-creativity in learning. We base our efforts on strong theoretical foundations comprising Wise Humanising Creativity (WHC) and Creative Emotional Reasoning (CER). Here is a visual overview of our rich conceptual framework:

C2Learn Co-creativity Conceptual Framework

Pedagogical context within and beyond C2Learn Game:
valuing learner agency, standing back, time and space, “meddling”.



Pedagogic strategies are built into the game
and alongside it (in classroom) to enable WHC through LTC².

You can read on this in the following project documents:

- Creative Emotional Reasoning (CER) techniques (deliverables D2.1.x)¹
- Learning Design for CER (deliverables D2.2.x)
- Co-Creativity Assessment Methodology (deliverables D2.3.x).

Here we will just give you a summary of our understanding of co-creativity in learning.

C²Learning: Learning co-creatively

In a nutshell:

C²Learn is about learning – but not any kind of learning. C²Learn is about fostering co-creativity in learning. Learners, individually as well as mainly collaboratively and also communally, come up with novelty, new ideas. These new ideas:

- Have emerged through asking 'what if' and 'as if' questions and through the use of disruptive techniques resulting in re-framing
- Have emerged from shared ideas and actions in an immersed dialogic rather than hierarchical pedagogical environment
- Are captured or selected because they matter to the community and have a valuable impact on it.

In this, learners take into account the impact of that novelty on the individual, collaborative and communal dimensions of their community.

In more detail:

In our vision of co-creative learning:

C²Learners attend to ethics and impact of ideas. They:

- Create new associations between ideas
- Actively explore the consequences of the newly created associations between ideas
- Exhibit awareness of and concern for the impact of new ideas on their group's values
- Actively promote ideas that are deemed valuable by the group.

C²Learners engage in dialogue. They:

- Engage in debate over ideas
- Promote dialogue within their group: pose questions, respect different viewpoints, encourage members of the group to voice their ideas
- Actively negotiate conflict and/or seek alternate paths.

¹ To find our deliverables: <http://project.c2learn.eu>: → *The Project* → *Final deliverables*

C²Learners are in control. They:

- Take a leading role during different phases of the creative process
- Exhibit a firm grasp of the rules in the system underlying the challenges facing their group
- Take decisions and instigate action.

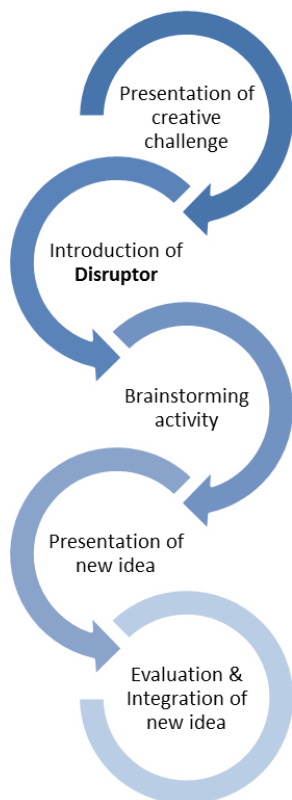
C²Learners are engaged in action. They:

- Immerse themselves in the experience of the creative process
- Facilitate immersion in the experience of the creative process for the rest of their group
- Are willing to take risks and/or leaving their 'comfort zone'.

C²Learners get involved in intervention and reframing. They:

- Create new analogies as building blocks of the creative process
- Actively experiment with re-combining elements of the creative challenge
- Actively facilitate a shift of perspective: they uncover hidden aspects of a challenge, and go beyond the given description of the challenge, recast it in a new light - as a whole or re-formulating elements of it.

A bit more on intervention and reframing:



C²Learners get involved in intervention and reframing by applying Creative Emotional Reasoning (CER) techniques: they utilize disruptors in order to open lateral paths, thus exploring a possibility space - under constraints - with the aim of achieving a reframing.

The creative act is an intervention that results in reframing. Frames are everywhere. They can be loosely understood as systems of established routine that divide the world into bounded, meaning-bearing sub-worlds. Reframing is a disruption to an established routine.

We call the disruption of an established routine: a lateral path. A lateral path is a cognitive process that promotes deep exploration of a possibility space, whilst satisfying stated (or implicit) conditions, i.e. under constraints.

A disruptor is the basic constituent element of all CER techniques. It is an abstract notion that can refer to any number or kind of tools that perform disrupt established routines: a disruptor opens up a lateral path.

CER techniques may utilize:

- conceptual disruptors – i.e. words (Semantic Lateral Thinking)
- diagrammatic disruptors – i.e. images (Diagrammatic Lateral Thinking)
- emotive disruptors – i.e. ascribing emotive value (Emotive Lateral Thinking)

C²Experiences

We have used this rich theoretical background to offer you C²Experiences: ways to enjoy and develop co-creativity in various learning situations – playfully, through games and fun!

Here is what we have done to achieve this:

- Together with teachers and young people, we have created practical methods and ways of learning co-creatively and have explained how we expect technology to help us in this. You can read details in our documents on Learning Design (deliverables D2.2.x) and Scenarios (deliverables D5.1.x).
- Listening to teachers and young people, we have designed and developed digital games and other playful applications as well as intelligent background technologies to facilitate and enrich experiences of co-creative learning. You can read details in our documents on the games (deliverables D4.1.x and D4.4.x) and on the various background technologies (deliverables D3. x, D4.2, and D4.3.x).
- Together with teachers and young people, we have played with these technologies to test them and evaluate the ways in which they foster co-creativity. You can read details in our documents on the pilot activities (documents D5.2.x and D5.3.x) as well as in the documents on our assessment methodology and evaluation analysis (deliverables D2.3.x and D5.4.x).

C²Play: let's be creative!

But above everything else, C²Learn is about playing. With us, you play digital games with your friends, family, classmates, teachers, colleagues... By playing, you will find out how playful creativity can be, how playing can make you creative!

We will tell you more about this on the following pages.



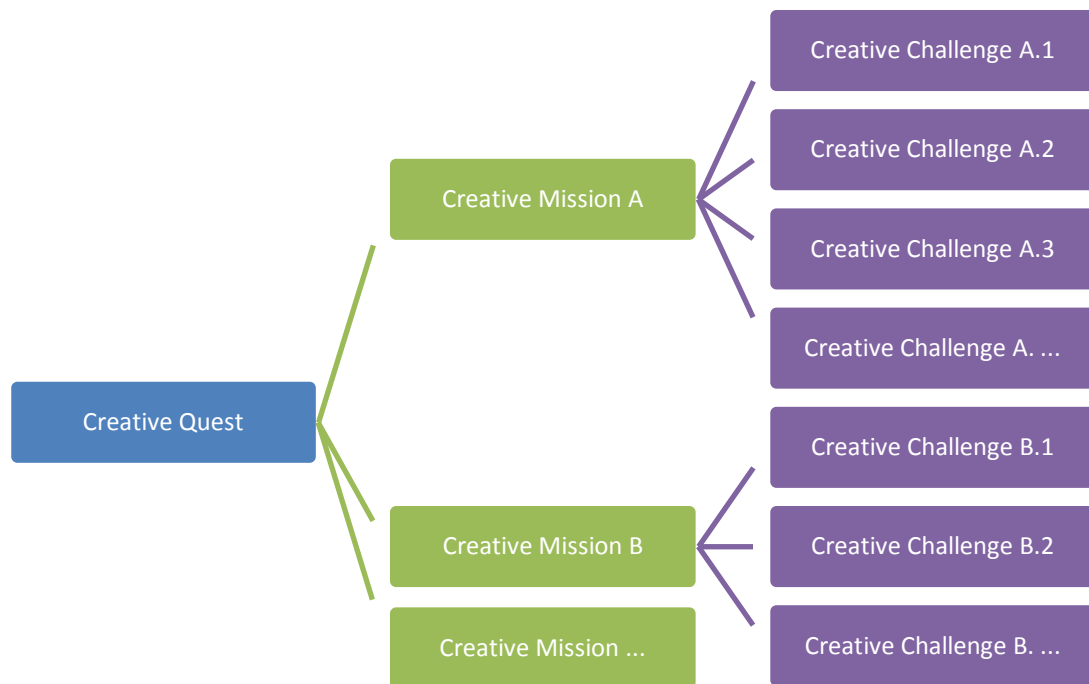
Quests, Missions, and Challenges

In our gameful learning design, we have structured C²Experiences into Creative **Quests**, which consist of Creative **Missions**, which include Creative **Challenges**.

Let's have a closer look:

<i>Concept</i>	<i>Explanation</i>	<i>An example</i>
CREATIVE QUEST	<p>In a Quest, you set out on a journey towards specified goals.</p> <p>Quests can be longer-term ventures (spanning over weeks or months).</p>	<i>Save the Earth from Invincible Invaders!</i>
CREATIVE MISSIONS	<p>In a Mission, you engage yourself in actions with specific objectives contributing towards achieving the goals of the Quest.</p> <p>A Quest can include a number of Missions.</p> <p>Missions are shorter-term ventures (spanning over a day, days, or weeks).</p>	<i>We will devise new defense methods against Invincible Invaders!</i>
<i>Problem</i>	In the heart of each Mission lies a <i>Problem</i> ; one with no obvious 'correct' answers, e.g. a dilemma.	<i>How can we outsmart Invincible invaders' warcraft, which is by far technologically superior to ours?</i>
CREATIVE CHALLENGES	<p>To address the <i>Problem</i>, you choose one or more Creative Challenges to pursue.</p> <p>A Mission can include a number of Challenges.</p> <p>Challenges take a relatively short time to complete (spanning over minutes).</p>	

Here is what a structure of Creative Quests, Missions and Challenges looks like in a diagram:



Creative Challenges: Games and playful activities

The Creative Challenges are six different games and playful activities.

They are there to help you generate your own valuable, inspiring, disruptive new ideas, so that you address the Problem at hand, execute the Mission and, eventually, succeed in your Quest – and all that, without missing on the sheer pleasure of playing!

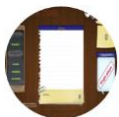
Creative Challenges get you to play with words, images, and emotions. Here is an overview:

Creative Challenges

Play with words:



4Scribes



Creative Stories



Explore and Expand

Play with words and images:



Iconoscope



Guess What

Play with words, images and emotions:



House of Emotions

On the following pages you can find out more about these games and playful activities.

4Scribes



4Scribes is a creative story-making game for groups of 4 players. To play it you need just one Android tablet which you will be sharing with your co-players.

The story starts with a given premise, that is, a short starting statement or phrase. Your objective is to develop the story together with your co-players. Playing in turns, you add a little more (e.g. one

or a few sentences) to the story text each time. While playing, each one of you tries to steer the narrative towards your individual secret ending, which you have defined at the outset. The winner is decided by the players at the end: each one of you anonymously vote which ending was the 'best'.

Next to the basic version of 4Scribes, you can also choose to play the Light and Dark variety, or maybe 4Scribes Co-Op.

In 4Scribes Light and Dark, at the start of the game each of the players is randomly given the 'dark' or 'light' quality: If you have 'dark' you must give an appropriate tone to your secret ending, so that it works against the ideals of the story premise. If you have 'light' you have to give such a tone to your secret ending that it will guide you to develop the story towards the ideals of the premise. This gives you and your co-players goals in different or conflicting directions and can result in more dynamic play.

If you want to play a less antagonistic game, you can choose 4Scribes Co-Op. In this case, there are no secret endings at all. Your group just enjoys co-creating the story without any predefined hidden goals!

Here is how you advance in the game: At the start, you get some cards, the 'Creative Elements'. Each card has a word or short phrase on it. Every time it is your turn to play, you select to play one of your cards. This means have to take the word or phrase appearing on it into account when you decide how you will continue the story.

It doesn't matter how 'irrelevant' these words or phrases may seem in relation to how you may have expected the story to develop. That's exactly the point: the cards are there to 'disrupt' your story, to make you think differently! And, in any case, you are not meant to interpret them literally: they are just creative thinking seeds to spark your imagination!

Here are three examples of 'Creative Elements':



Depending on how diverse you and your co-players want to make the game play, you may also decide to use the differences among the 'four suites' of the Creative Elements deck, adding your own rules to the game:

- **Fire** elements relate to emotions and relationships. They consist of emotions, such as love, hate, anger, joy, etc. Roles we assume and give others can lock us, or free us. Like fire, emotions can be sparked to provide warmth or if uncontrolled leave a trail of devastation.
- **Water** elements relate to our inner worlds of thoughts, ideas and imagination. They consist of Ideologies, philosophical concepts, and ways of thought. They govern what actions we take. Like water, human minds can flow in different directions, and when working together can break the hardest of rocks.
- **Wind** elements relate to society, systems and communication. They consist of noise, dialog, communication, strategy and systems, such as economics or politics. We are affected by them, events happen to us. Like wind, humans provide sound and communicate to prove their existence.
- **Earth** elements relate to the physical. They consist of physical items, objects, graspable materials. Most objects within everyday life come from the earth, allowing us to build tools which augment our power.

Creative Stories

Creative Stories is a game inviting you to write creatively. Your aim is to use as much of the creative advice the Wizard is giving as possible, so that you win more points while you are writing. You can play it alone or together with others, each one of you on your own tablet or computer. You select whether you want to play in single-player or multiplayer mode.

You play Creative Stories on a given Story Theme linked to your mission. There is also a time limit within which you have to finish. You type your text and you submit it to the Wizard. Throughout the game, he is suggesting using some words to which he has given a certain value measured in magic points. Usually, he decides to offer words that you



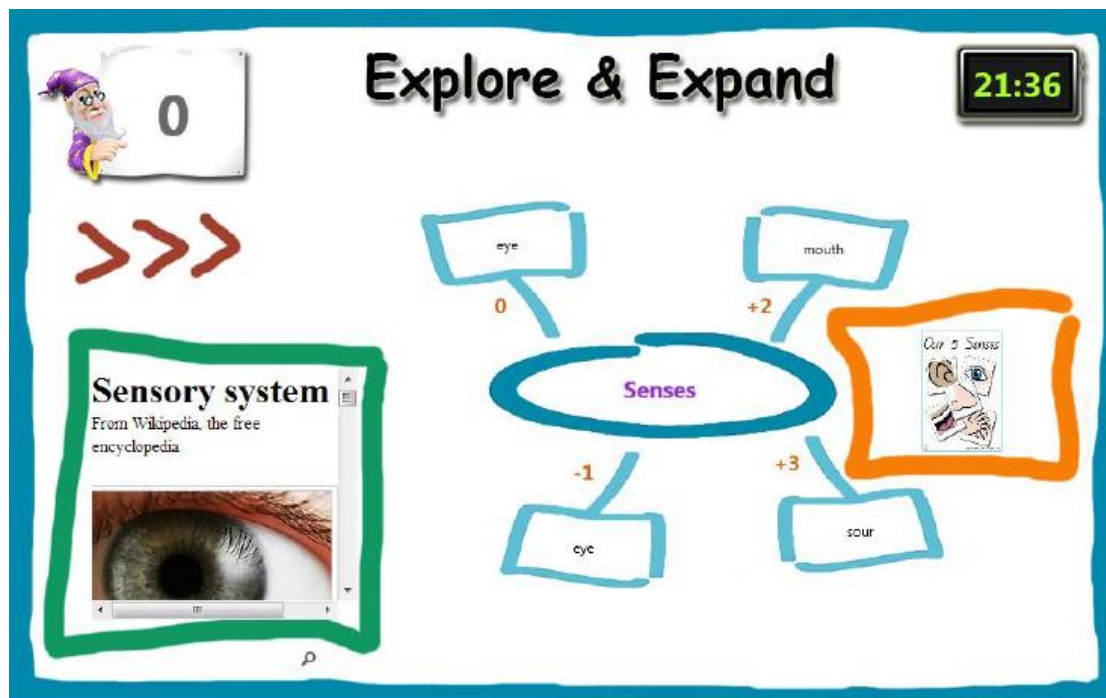
find rather difficult to incorporate in your text, unless you think really creatively. But that's his intention, after all: to help you think 'out of the box'! So, if you try to use his advice you can score more magic points and you will be challenged to become a more creative writer! It is good to submit your writing in small pieces, e.g. one or a few sentences at a time, and see how the Wizard will react. Each time you submit a piece of text, he performs some of his amazing calculations and gives you the 'magic points' your writing deserves!

In the central area of your main game screen you see the text you have written and submitted so far. Below, you type and submit the next piece you want to add to your writing. On the left side you can see Wizard's suggestions and your current score. If you play together with others using the multiplayer mode, on the right side of the screen you see a summary of the content created by the other players participating in the same session. You may want to use this information as inspiration or guidance while writing your text! On your screen there is always a reminder about the Story Theme and the time remaining until your session is over. The game is over either when you decide to finish (just tap on the clock) or when the time you have available is out. At the end, the Wizard presents you with your score and a calculation of your 'creative performance' as the game has assessed it!

If you are a teacher, you can use Creative Stories Builder to define and parameterize Creative Stories for your students. Among other things, you can even activate the social media sharing functionalities of Creative Stories and define a Facebook page or a Twitter account that will be used for posting the texts created by your players in a Creative Stories game session. The entries are posted anonymously, and you can use the functionalities offered by the social media to invite comments or judgements.

Explore and Expand

Explore and Expand is a simple playful activity inviting you to take a break and think creatively! You can play it on your tablet or computer. You are asked to think of words in the English language that are related to a given concept. The more words that are related you think of, the more points you score. You play Explore and Expand alone on your tablet. When you finish, you can compare the words you have found and the score you got for them with those of a friend!



In Explore and Expand the Wizard is asking you to create a simple conceptual diagram. Starting from a given concept in the centre, try to think of four other concepts that are linked to it from a specific perspective.

In reality, the Wizard has already 'searched' the world and is inviting you to guess concepts that he has found to be associated with the given theme, if you look at it from the specified perspective.

Your score increases each time you get it right – by more and more points at a time, as you are adding more of the related words. But be careful: if you write the same concept that you have written before you will lose one point!

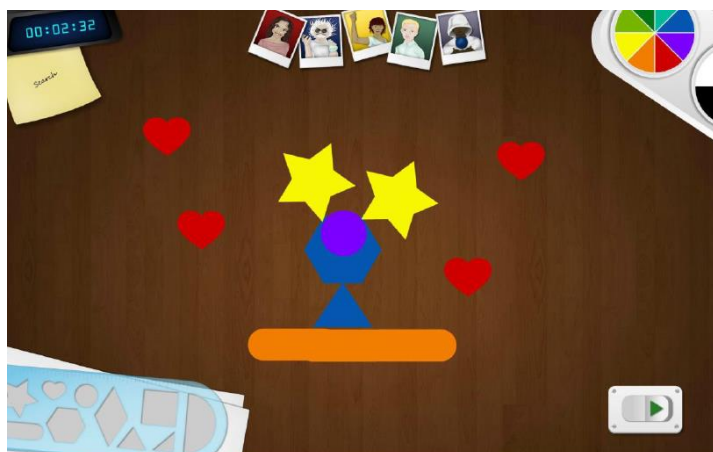
To help you, the game gives you an article from Simple Wikipedia that is relevant to the theme you are playing. If you want, you can look at it for some inspiration!

Iconoscope

Iconoscope is a game that gets you to play with visual creativity and ambiguity. It invites you to do something quite unusual: to represent a given concept through an image that you will create so that it will not be obvious to everyone what your creation represents! Let the others guess what that image might stand for and enjoy the fun! You can play Iconoscope as part of a group of 4-12 players on your Android tablets, but you can also play alone on your tablet or on the web (using any device) and let anyone with web access guess what you have drawn!



At the start of the game you are presented with three words or short phrases. They refer to three concepts which are somehow related within the context of a specified theme. You secretly select which of the three you want to play with. You use simple shapes and colour to create and submit a visual representation of your chosen concept. To do this, you choose from a palette of shapes, which you can drag and drop, rotate, resize, or colour.



Your ultimate goal is to trick some of the others who will try to guess what your drawing stands for, but NOT all of them! In other words, you have to make your visual creation representative enough of the depicted concept so that some may guess it right, but also ambiguous enough so that others get it wrong.

When you finish with your visual creation and submit it, time for guessing and fun (or serious discussion, for that matter) has arrived! You show your creations to each other and pass your tablets around for everyone to vote, i.e. state which of the three initial concepts they 'see' in each creation. Once everyone has voted for all creations, you get your scores. These are calculated on the basis of success or not in the main Iconoscope aim: to show it ambiguously enough to make your point! So, a visual creation loses if it communicates its hidden meaning to everyone or no-one, or if it communicates its hidden meaning to fewer people than another competing creation. Similarly, your creation can be voted for on the web by anyone who sees it in the Iconoscope gallery, if you select to play alone.

Guess What

Guess What is a game that invites you to guess what is shown in a picture and generally think through images, taking into account the perspectives of other players. It is a multiplayer game which you can play on your tablet or computer as part of a group of 2 to 5 players.

During a game session, you are presented with a concept expressed in words, and an example of a pictorial representation of that concept. The game asks you to provide your own depiction of the concept using the drawing tools provided. The other players have to guess the concept that you have depicted by selecting the right one in a list of four concepts.

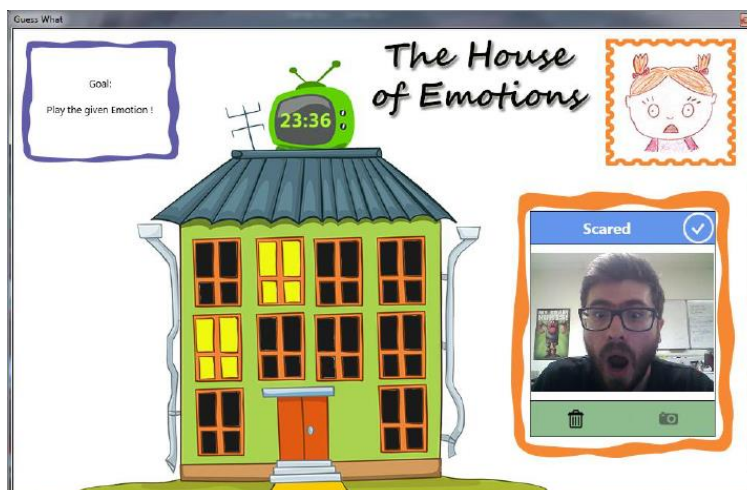


You get points if at least one other player correctly guesses the concept you have visualised. But note that the points you are awarded are equal to the number of players that have NOT guessed correctly! The aim of the game is to have you create visualisations of the concept that are not trivial but are nevertheless coherent and relevant.

The game can be played in English, German or Greek according to your and your co-players' choices for that game session. Each one of you will always be presented with the concepts in the language you have chosen. So, you can play Guess What even with people who do not speak the same language as you! Just explore with them your common language of images!

House of Emotions

House of Emotions is a game that gets you to play with how you and the others express and interpret emotions. By playing you will realise how you and others make emotive judgements: How do you express emotion in something you create? Do



you have any control over how the others understand your expressed emotions or react to your creations? House of Emotions is a multiplayer game which you can play on your tablet or computer as part of a group of 2 to 5 players.

When the game starts, the house is haunted and the time is 23:30. There are only 30 minutes left for you and your co-players to turn on all the lights in the house before the ghost appears. To achieve this, you need to carry out the different missions that the game assigns to you. There are four types of missions:

Dramatize an emotion! Make a facial expression representing the emotion that the game assigns to you. Capture your expression with your camera and the game will show your picture to the other players. They will have to guess which emotion you have dramatized!

Draw an emotion! Make a drawing to represent the emotion that the game assigns to you. The game will show your drawing to the other players. They will have to guess which emotion you have drawn!

Write to evoke an emotion! The game will ask you to write a short text with the aim to evoke either positive or negative emotions to your reader. As you are writing, the game Wizard will be evaluating your text and providing you with feedback on how you are doing towards achieving the set goal.

Colour an emotion! The game will ask you to choose a colour that you feel is associated with a given emotion. Depending on what the game Wizard thinks of your choice, you may get a 'Well done!' and one more light turned on in the haunted house, or else an 'Almost there...' message!

Keep on doing a good job with the different missions you are being assigned so that you turn on the lights in the haunted house in time. But beware! Beside the missions, there may also be random events that will influence your progress, either positively or negatively: so, the Wizard may decide to grant you an extra light turned on, or inflict a disaster on you, such as a fire, a lightning strike or a wind gust that will suddenly turn off a light!

C²Assistants and Computational Tools in the background

While you are playing with the games and playful activities in your Creative Challenges, you are not alone. Artificial Intelligence is working behind the scenes to enhance your gaming experience. You can find out fascinating details about all this in our documents on the Semantic, Diagrammatic, and Emotive Reasoning Computational Tools (deliverables D3.1.x, D3.2.x, D3.3.x) and on Mixed-initiative Procedural Content Generation (deliverables D4.3.x). Here we can give you just an overview:

On the one hand, **C²Assistants** are following you: the Mad Scientist, the Wise Oracle, Typical Tom, Progressive Petra, and Chaotic Kate. They are agents with computational intelligence capacities who are there to help you – or maybe *disrupt* you in your creative adventures. They are generally cautious not to disturb you too much, and by no means do they intend to replace your human co-players and co-creators or intervene in your collaboration with them. But they do have some useful suggestions to make at times. Let's meet them!



The Mad Scientist: The Mad Scientist is the assistant that always proposes artefacts that maximize the novelty value of your artefacts!



The Wise Oracle: The Wise Oracle shows you earlier highly-valued artefacts in a specific context!



Typical Tom and Progressive Petra: These two relate to typicality; the conservative Typical Tom proposes elements that maximize typicality, while Progressive Petra proposes elements that are atypical to the set of elements defined.



Chaotic Kate: Chaotic Kate relates mainly to randomness, but also other features, such as balance or symmetry in an image.

These five C²Assistants are active, in many different ways, in Iconoscope and 4Scribes.

In 4Scribes, for example, the C²Assistant you select to follow determines which cards you will get at the beginning. Will they be chosen randomly, or maybe so that they are as different as possible among players, or even based on their similarity or not to a 'typical' set of cards for the theme of your story?

In Iconoscope, you can ask a C²Assistant at any time of your design effort to suggest an alternative design, according to their character: from something conventional and modest to something really crazy!

On the other hand, powerful Semantic, Diagrammatic, and Emotive Reasoning **Computational Tools** are in function behind Creative Stories, Explore and Expand, Guess What, and House of Emotions, in order to support your Creative Emotional Reasoning.

Creative stories uses the Semantic Reasoning Computational Tools Suite to direct you in different lines of Semantic Lateral Thinking while you are writing. For example, this is how Wizard's suggestions are generated, or how you get to see the dominant terms in the stories of the other players participating in the same game session as you.

The Diagrammatic Reasoning Suite supports your Diagrammatic Lateral Thinking, by powering Explore and Expand to handle the concepts and their relations, as well as Guess What to associate concepts with depictions, or associate similar concepts with different lexical descriptions.

In House of Emotions, you are supported in your Emotive Lateral Thinking judgements through the use of the Emotive Reasoning Computational Tools Suite. These tools attempt to detect your emotive response when creating or accessing textual and pictorial artefacts.

The games we have produced in C²Learn demonstrate the possibilities offered by these various background technologies, which can be used in the design of many more different games!

Example of using Creative Challenges to address a problem

Now that you know about the games and playful activities let's go back to the example of a Quest and one of its Missions, which you saw earlier in this guide. Here is just an example (you can definitely think of many more!) of how playing these creative challenges can help you think and act creatively, so that you address the problem at hand, execute your Mission and, eventually, succeed in your Quest:

Concept	Explanation	An example
QUEST	<i>Save the Earth from Invincible Invaders!</i>	
MISSION	<i>We will devise new defence methods against Invincible Invaders! Problem: How can we outsmart Invincible invaders' warcraft, which is by far technologically superior to ours?</i>	
CHALLENGES	To address the Problem you may choose one or more of the following Creative Challenges to pursue:	
<i>4Scribes</i>	Playing structured story-telling to generate ideas for innovative scenarios of action. 20-30 minutes.	<i>"You are the last ones still conscious and capable of action on the Earth. You have just received Invincible Invaders' ultimatum before the Attack: the Earth is to be taken. Only one of you will be spared human consciousness to participate in the New Rule - provided you subscribe to the Cult..." Continue the story!</i>
<i>Creative Stories</i>	Playing free collaborative writing to generate ideas for innovative scenarios of action. 10-30 minutes.	<i>You are the last ones still conscious and capable of action on the Earth. You have just received Invincible Invaders' ultimatum before the Attack. Write Earth's Message to Invincible Invaders!</i>
<i>Iconoscope</i>	Playing with concepts and images to understand them better. 10-15 minutes.	<i>Dare you look deeper into the concepts 'War', 'Cunning' and 'Threat'? Prove it, outsmart the others! This may reveal to you how you will eventually manage to trick the Invincible Invaders too!</i>
<i>Explore and Expand</i>	Quickly exploring the conceptual space, in order to brainstorm new ideas. A few minutes.	<i>Take a break from action and find words linked to at least five concepts –not easy ones! We need fresh ideas urgently to deal with the invasion!</i>
<i>Guess What</i>	Playing with concepts and images to understand them better. 10-15 minutes.	<i>Communicate some concepts to the Invincible Invaders visually! Create the common visual language in which you will manage to negotiate with them!</i>
<i>House of emotions</i>	Playing with emotions to 'train' ourselves in emotive judgements. 30 minutes.	<i>Let's try to decode the emotions we are evoking to the Invincible Invaders! If we understand how they feel we will control how they think of us!</i>

C²Space

The games and playful activities we saw on the previous pages can be used, of course, independently, each one of them alone, or more of them together in various combinations, in several learning situations, or simply for fun.

But as we explained in the first sections of this guide, in C²Learn we create games and playful activities with the 'big picture' in mind: that is, we want to offer you ways and tools for co-creativity in the context of valuable learning experiences, inspired by the concept of Wise Humanising Creativity.



For this reason, next to the individual games and playful activities, we have developed C²Space: a gameful social digital space designed to foster co-creativity in learning. You can find out more on the ways we have envisioned C²Space as the wider digital environment extending the physical environments of co-creative learning, in our documentation on Learning Design (i.e. in the deliverables 'Overview of the C²Learn approach' and D2.2.2).

In C²Space the gameful co-creative learning experiences, C²Experiences, are structured in Creative Quests, Creative Missions, and Creative Challenges, as explained in the previous sections of this guide.

In this web-based environment, the use of three of the games, i.e. 4Scribes, Iconoscope, and Creative Stories, are fully integrated into the environment to offer you a unified experience. Using them in C²Space means, for example, that your creations and creative learning experiences are stored there for you to share them with your peers and reflect or get feedback on them in wider time frames. Next to these three games, you can of course use the other C²Learn games and any other games or materials in combination with C²Space.

C²Space is a rich digital environment, with many gameful learning management functionalities, and many things for both learners and teachers to choose to use in their co-creative learning voyages: from some very special, co-creativity-informed tags that we have devised for you to use instead of a simple 'like' on the creations, to awards that a teacher can create for their students. You can read more on all this and details on how to use C²Space in the Appendix at the end of this guide.

Co-creative learning scenarios

The games and playful activities of C²Learn can always be played just for fun, in many different contexts. However, as you can read in the previous sections of this guide, we have developed them with much more in mind. You can use their full potential for fostering co-creativity in learning, if you put them in the context of creative quests, missions, and challenges mapped with valuable educational experiences.

In our project we have experimented a lot with ways to do this in school and beyond, in connection to many different school subjects, but also in even more interesting approaches crossing the borders of different subject areas. Together with teachers and learners, we 'translated' the designs and developed technologies of C²Learn into scenarios, i.e. plans for the implementation of co-creative learning activities in a variety of teaching and learning settings. That was guidance for us during the pilot activities of project, but eventually also a source of guidance and inspiration for any educator or learner that would like to try out the solution we are offering for co-creativity in learning.

You can find a wealth of information on the educational scenarios of C²Learn in our relevant documents (deliverables D5.1.x).

The way we have designed and developed our technologies has you in mind not only as a 'consumer' of ready gaming content, but also as a creator of new content. C²Space as an environment, but also some of the C²Experiences directly (e.g. Creative Stories), allow you to insert your own content into the games and adapt them to your circumstances and needs, provided you have a user account that gives you access to these functionalities. Especially if you are an educator, you will immediately recognise the usefulness of this.

In the following pages of this short guide, we have selected to present you with just some of the scenarios we have devised in our various pilot activities during the C²Learn project. We are giving them to you as a starting point rather than an end. They are not meant to be 'perfect' in any way; they are just a thin slice of a huge possibility space hinting you about the variety of learning activities that the solution we have developed for you can support. Use them as creative thinking seeds to spark your imagination – that's what C²Learn is about, after all, right?

Concept	Example
QUEST	<i>Save animals from human cruelty!</i>
MISSION	<i>Abolish or change circus? Problem: How can we save circus animals from cruelty? This kind of entertainment is still offering people pleasure and jobs!</i>
CHALLENGES	
<i>4Scribes</i>	<i>Your parents work in the circus that has just arrived in this town. You hear that, under pressure from animal rights activists, the mayor has banned all circus performances! Your circus has recently gone through a major crisis, and this hitch now is bound to lead some of your parents to unemployment. On the other hand, you, too, love animals, maybe even more than those complaining activists... And, of course, you love your parents, and you love living the life of wandering artists... Continue your story!</i>
<i>Creative Stories</i>	<i>You are the animals taking part in tonight's performance in the circus, and you are writing a message to those who will come to see you. A child has promised to print your message in hundreds of copies, which she will throw in the air just at the right moment! Start like this: 'Dear spectators...'</i>
<i>Iconoscope</i>	<i>Iconoscope: Let's look a bit deeper. What do these concepts hide? Coercion; Punishment; Pain. Maybe you can see something the others can't see. Let's see who will outsmart whom!</i>
<i>Explore and Expand</i>	<i>Take a break from action and find words linked to at least five concepts. Bring them to our discussion, we need ways to recognise human cruelty to animals!</i>
<i>Guess What</i>	<i>Communicate concepts visually to your co-players and think of how you will convey strong messages in a campaign against human cruelty to animals through visual images!</i>
<i>House of emotions</i>	<i>Play with expressing and recognising emotions and then take some time to think and discuss what different people's emotive reactions would be to the solution you are thinking of giving to the problem.</i>

Concept	Example
QUEST	<i>Creating a new state</i>
MISSION	<i>The European Space Agency informed your government that an asteroid was going to hit your country. All citizens had to leave the place and find a new homeland for themselves. Many saw this as an opportunity to build an ideal new state with happy citizens from scratch. Problem: Citizens of the new state do not seem to agree on many things when it comes to foundational decisions...</i>
CHALLENGES	
<i>4 Scribes</i>	<i>There are strong views among citizens about the name of the new state. Some insist that maintaining the old name will allow citizens to remember their past and preserve their traditions. Others are fervent supporters of giving a new name to the new state, which will symbolise a new era of limitless globalised opportunities. Disagreement has turned to heated arguments and conflicts on the streets ...Continue the story!</i>
<i>Creative Stories</i>	<i>As a citizen of the new state, you feel the need to support the ideals of democracy and freedom against a strong group of fellow-citizens who promote the idea of establishing a 'meta-democratic' regime which would make use of some of the strong points of oligarchic and totalitarian systems. Write a short, powerful speech to support your views.</i>
<i>Iconoscope</i>	<i>Let's look a bit deeper. What do these concepts hide? Democracy, Dictatorship, Oligarchy. Maybe you can see something the others can't see. Let's see who will outsmart whom!</i>
<i>Explore and Expand</i>	<i>Take a short break from action and find words linked to at least five concepts. Bring them to our discussion, we need to think creatively of new options for the new state!</i>
<i>Guess What</i>	<i>Communicate concepts visually to your co-players and think of how you will convey strong messages in your campaign for a different social structure in the new state through visual images!</i>
<i>House of emotions</i>	<i>Play with expressing and recognising emotions and then take some time to think and discuss what your fellow-citizens emotive reactions would be to a new official state approach denouncing traditional morals and values.</i>

Concept	Example
QUEST	<i>Survival on a dangerous mountain</i>
MISSION	<i>The plane has made an emergency landing in an unknown mountainous area. There are wounded and it is quite cold. You decide to start looking for food, clothes, drugs. You think you will be saved despite the adverse conditions... Problem: How can you survive in this unfriendly environment with the others not being cooperative?</i>
CHALLENGES	
<i>4Scribes</i>	<i>While you are climbing, a blizzard forces you to change the way and get lost on the mountain. The group's choice to carry on climbing does not seem to work. There are disagreements about what path you will follow and how you will be saved so ... Continue the story!</i>
<i>Creative Stories</i>	<i>You have the feeling that someone from the team may not want to save the whole team. You must warn the others! Write a secret note to someone about this.</i>
<i>Iconoscope</i>	<i>What do these concepts hide? Anxiety; Anger; Achievement. Maybe you can see something the others can't see. Let's see who will outsmart whom!</i>
<i>Explore and Expand</i>	<i>Take a short break from action and find words linked to at least five concepts. Bring them to our discussion, we need to think creatively of ways to survive!</i>
<i>Guess What</i>	<i>Communicate concepts visually to your co-players and think of how you will collaborate with the others to leave visual messages on the snow between the trees that will be visible from the air, so that rescuers can find you!</i>
<i>House of emotions</i>	<i>Play with expressing and recognising emotions and then take some time to think and discuss what your partners' emotive reactions would be to a radical solution you are about to give to your survival problem!</i>

Where can I find and play with the technologies?

We have made efforts to make the technologies we have designed and developed easy for you to find, access or install them. You can really get most of them running on your tablet or computer within seconds or minutes!

We have also tried to cover as many of the popular platforms or devices as possible within the relatively limited scope of our research and development project. While offering other alternatives in many cases, we have made sure that you can experience C²Learn in full on an Android tablet. We hope in this way we have managed to make it easy for you to use our work for your own needs.

You can find all information and access or installation links in our website, www.c2learn.eu, in the section 'c2play, let's be creative'.

In the following tables you can get an overview of where and in which form you can find, access or install our technologies.

		In C²Space	Stand-alone
C²Experiences offered as: a) components of C²Space and/or b) stand-alone apps	<i>Creative play with words</i>	4Scribes	
		Creative Stories	Creative Stories
			Explore and Expand
	<i>Creative play with words and images</i>	Iconoscope	Iconoscope
			Guess What
	<i>Creative play with words, images and emotions</i>		House of Emotions

Digital prototype	Technology	End-user's device	Installation/ Source Code
C2Space Server Package (see following section)	PHP	Server	VM Installation Package downloadable through a public link
C2Space Web Interface	PHP/HTML	Any device with a web browser	Demo accessible through the project website on request Code available through GitHub
4Scribes for C2Space	Unity	Android devices (playable through C2Space)	Link to installer available through the project website
Iconoscope for C2Space (playable through C2Space only)	Flash	Android devices (playable through C2Space)	Link to installer available through the project website
Creative Stories for C2Space (playable through C2Space only)	Flash	Android devices (playable through C2Space)	Link to installer available through the project website
Iconoscope stand-alone application for Android	Flash	Android devices	Available at Google Play
Iconoscope stand-alone web-based application	Flash	Any device with a web browser	Dedicated website and link to it through the project website
Creative Stories stand-alone application for Android	Native Android App	Android devices	Available at Google Play
Creative Stories stand-alone application for Windows	Native Win32 App	Windows devices	Link to installer for Windows (win32) available through the project website On Windows 10 also accessible through Store
Explore and Expand stand-alone application for Android	Native Android App	Android devices	Available at Google Play
Explore and Expand stand-alone application for Windows	Native Win32 App	Windows devices	Link to installer for Windows (win32) available through the project website On Windows 10 also accessible through Store
Guess What stand-alone application for Android	Native Android App	Android devices	Available at Google Play
Guess What stand-alone application for Windows	Native Win32 App	Windows devices	Link to installer for Windows (win32) available through the project website On Windows 10 also accessible through Store
House of Emotions stand-alone application for Android	Native Android App	Android devices	Available at Google Play
House of Emotions stand-alone application for Windows	Native Win32 App	Windows devices	Link to installer for Windows (win32) available through the project website On Windows 10 also accessible through Store
Computational Tools services	Java Web Services	Accessed through corresponding games/applications	Code available through GitHub
C ² Assistants services	Java	Accessed through corresponding games/applications	Code available through GitHub

Appendix: A practical guide to C²Space

Using C²Space

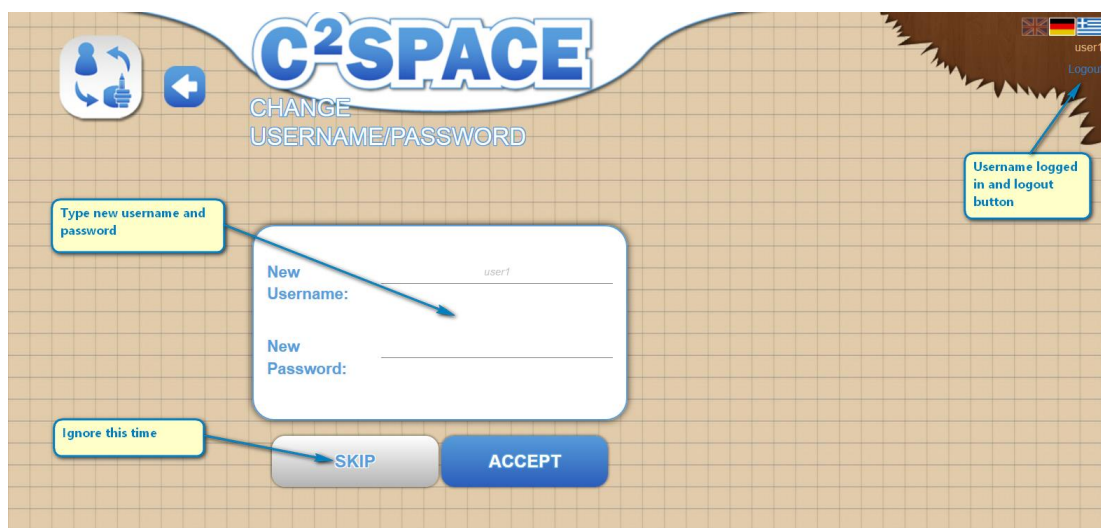
All C²Learn content is activated experienced and stored using the C²Space website. Games and other activities are not designed to run separately. The URL for C²Space is typed into the address bar of the browser – the URL will have been provided during the system setup. If you don't have it, contact your C²Learn contact for further instructions. It is recommended that educators log into C²Space using user1 account well before running the system in the classroom in order to assign user accounts, validate content and generally to become familiar with the system features.



Login page for C2Space

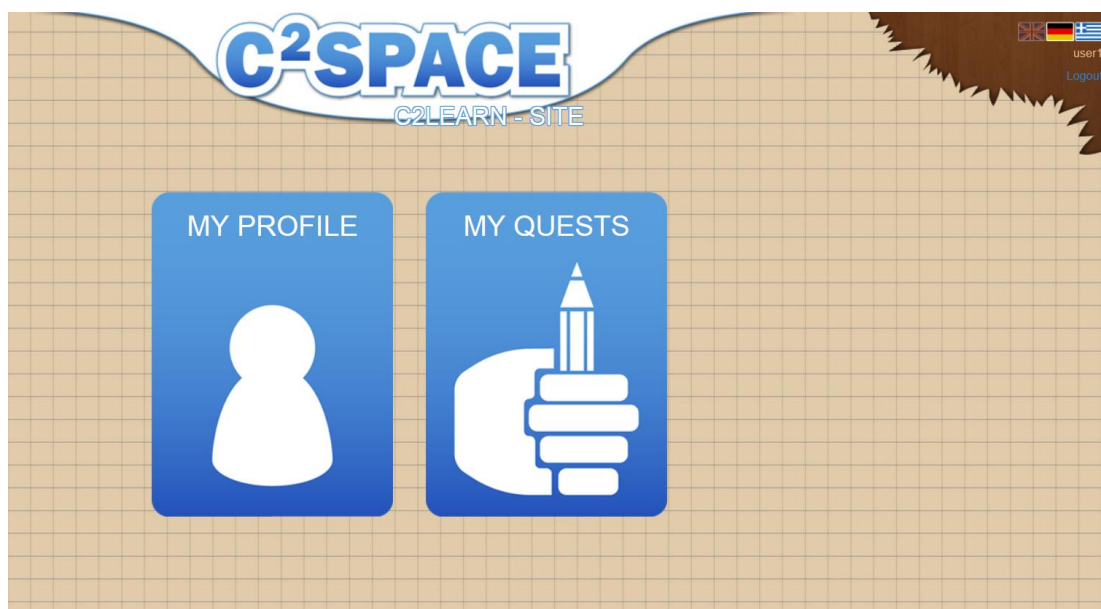
Login to C²Space using the form shown on the front page. The 'teacher account' is User1 and the remaining users are expected to be assigned to learners. User1 has some additional administrative functionality within C²Space and their content does not display to other users.

The first time any user logs into C²Space they will be asked if they want to change their username and password. It is suggested that all students change their username to their real name or similar, and the password to something they can easily remember and which is secure, i.e. do not share it with their friends.



Change username and password

Once the user has logged into C²Space their username and a logout link are displayed at the top right of the screen, just below the language settings.



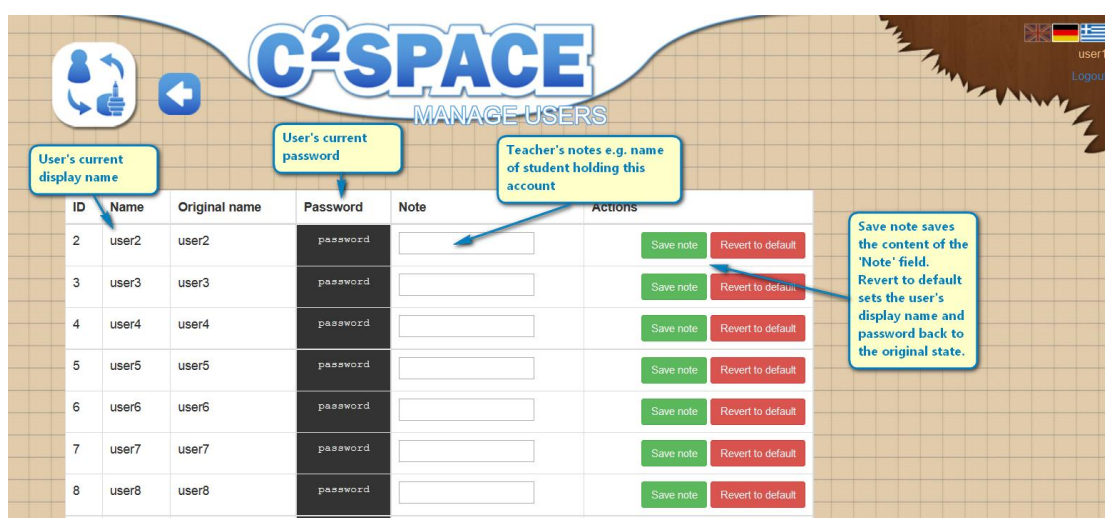
C2Space Homepage

C²Space has been designed to be simple and quick to navigate using an Android mobile device, although it can also be accessed via web browser installed on any device. The homepage indicates the fact that the content is divided between two categories. 'My Profile' allows the user to visit the historical creativity record of both themselves and the other users registered in the system. 'My Quests' is a repository of ALL content in an installation. This is likely to be more than the requirements of any given class and the teacher is expected to assign content to learners during classroom sessions.



'My Profile' as experienced using the User1 'teacher account'

The user profile is composed of three standard categories: content, community and award, and two additional areas which are only displayed when logged in using the User1 'teacher account': custom awards and manage users.



Manage Users

The 'Manage Users' area facilitates the teacher's control of usernames and passwords. The Name column shows the custom username for every user compared to their original UserX name. This allows the teacher to ensure that usernames are not insulting or otherwise unsuitable. The user's ORIGINAL password is also shown in the Password column. The Note column allows for note taking, for example, it is suggested that the teacher records here the real names of the students assigned to accounts. The Note field can store up to 250 characters. The Actions column allows the teacher to save any notes (they need to be manually saved) and to reset the username and password of students if they select an unsuitable name or forget their passwords, or otherwise need to change it.



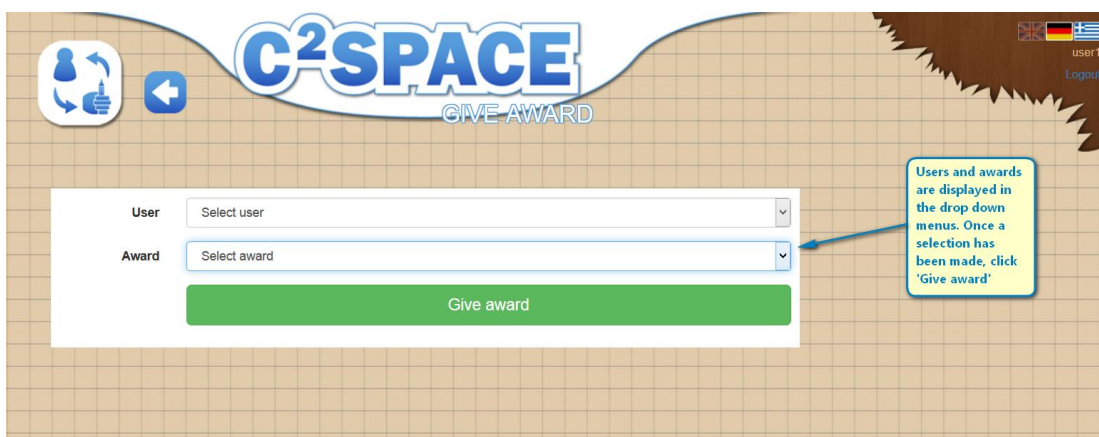
Custom Awards

Custom awards are created and assigned by the teacher as a mechanism to reward learners for the progress and interaction with the C²Space material. Awards are envisaged to be awarded as a result of group discussion and reflection outside of the C²Space environment – further details are available from your C²Learn contact.



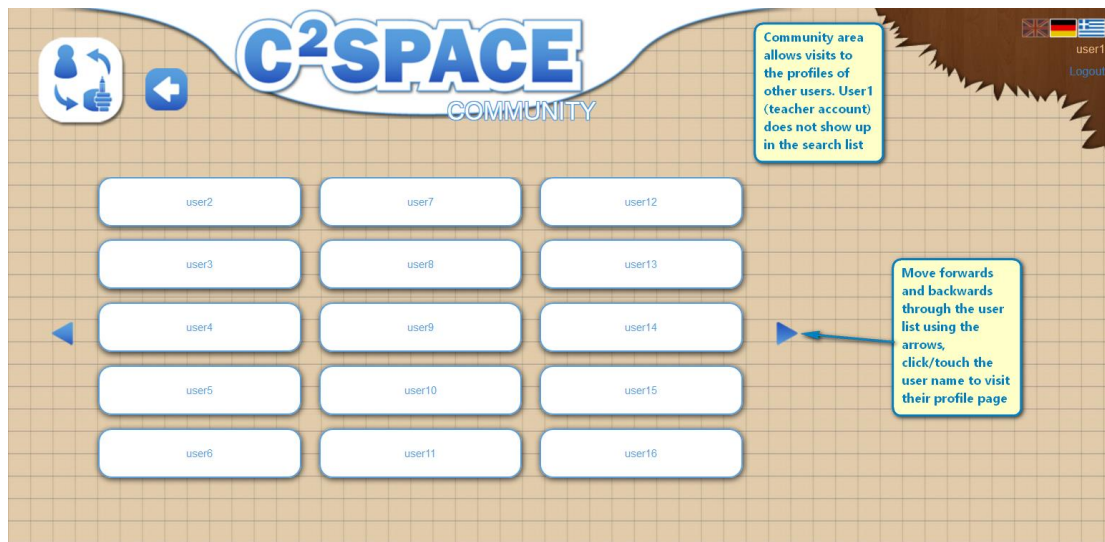
Creating a custom award

Creating a custom award is quick and easy. Simply select an image from the library provided, then give the award a name and description, e.g. why the award is given. Once these steps are finished press 'Create award'.



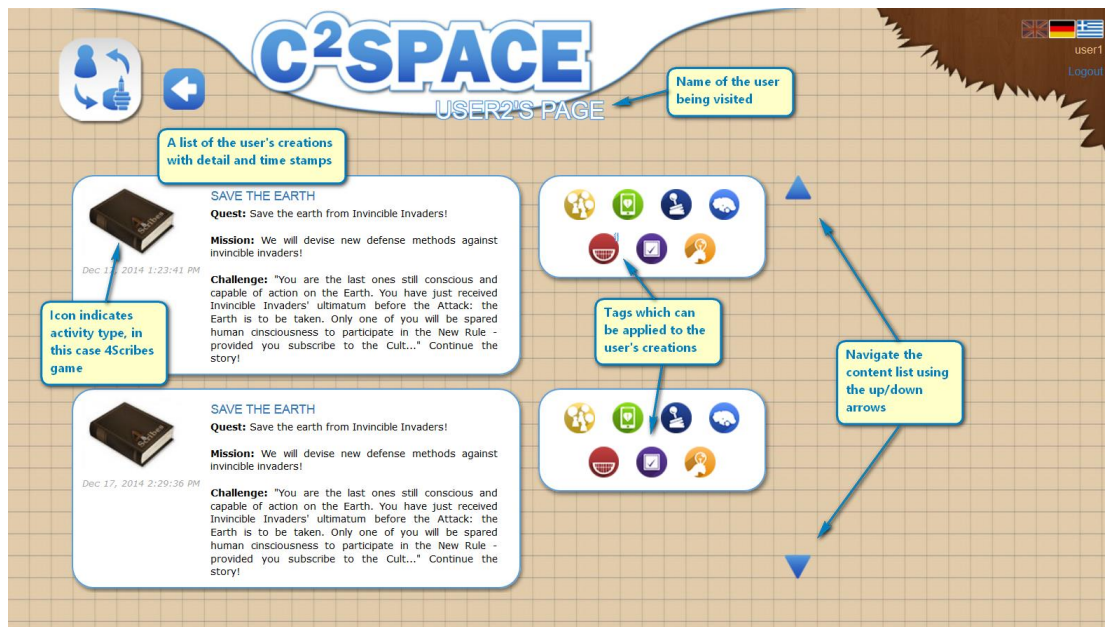
Give award to a user

Once you are ready to give an award, navigate to the 'Give Award' area, select a user and an award, and press the 'Give award' button. That's it! Note – the user list shows the custom display names of the learners.



The 'Community' section

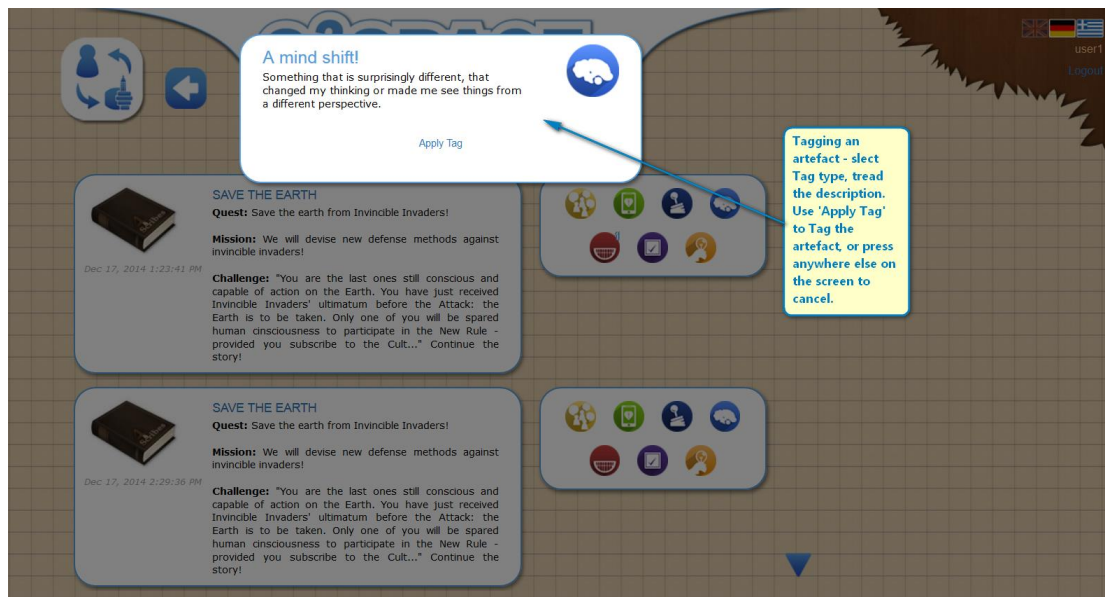
In the 'Community' area the user sees a list of all other users in the system EXCEPT user1 and themselves. If they press on a username they will be taken to the creativity artefact page for that user. There they can inspect the work of their co-learners and leave simple, safe feedback on it.



Visiting another learner's page

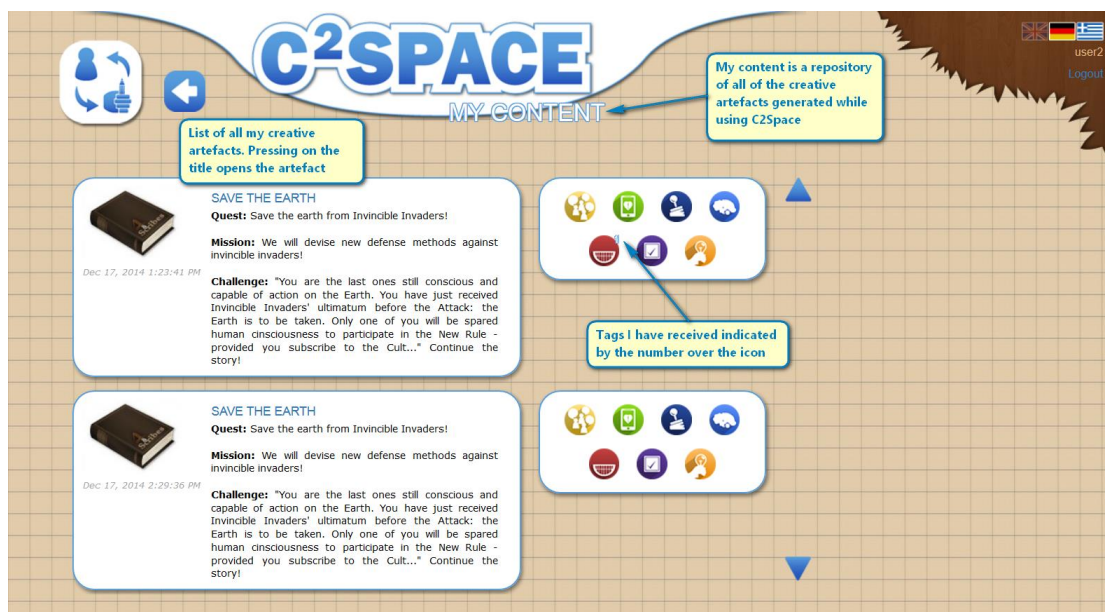
When visiting the page of another user their creativity artefacts are displayed in a vertically scrolling list. An icon displays the type of artefact based on the game or activity played, the context of the object in terms of which quest and mission it was created for, and a time and date record. Pressing the title of the object opens it up for closer examination. Finally,

artefacts can be tagged by selecting from a pre-defined list. During the prototyping of C²Learn all users in a virtual machine are considered to be the 'friends' of all other users, i.e. there are no functions to personalise who can and cannot see your content.



Tagging another learner's creation

Tagging is an important concept in C²Space because it promotes reflection and social creativity. Tags are pre-defined to ensure that feedback is appropriate without requiring teacher moderation of all communication.



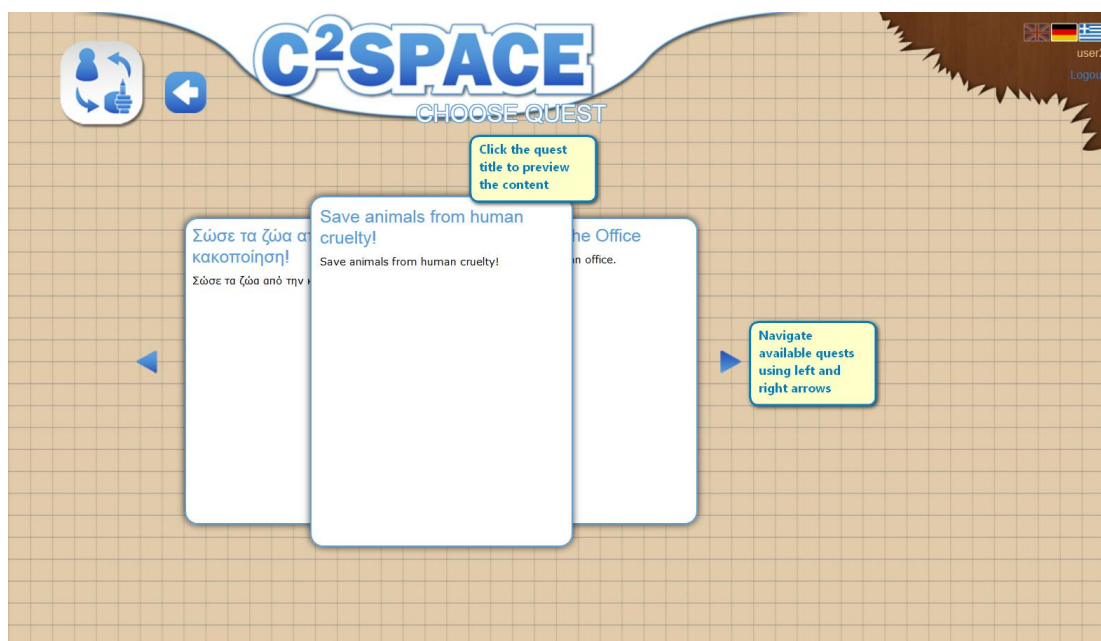
'My Content'

The 'My Content' area is almost identical to visiting another user's page. In this case it is not possible to tag one's own artefacts, but the tags left by other users are displayed. 'My Content' is intended to be a permanent repository of all of the creative activities carried out in the C²Learn virtual environment.



'My Awards'

In the 'My Awards' area a learner can see what awards (if any) they have been given by their teacher and peers. The types of awards and means by which awards can be attained will expand in future C²Space releases.



'My Quests'

When accessing available content the first screen shows an overview of the available Quests. Quests are the headline activities which are expected to be explored through the missions and challenges over a number of classroom sessions. The teacher should inform the students which quest is valid for the given class.

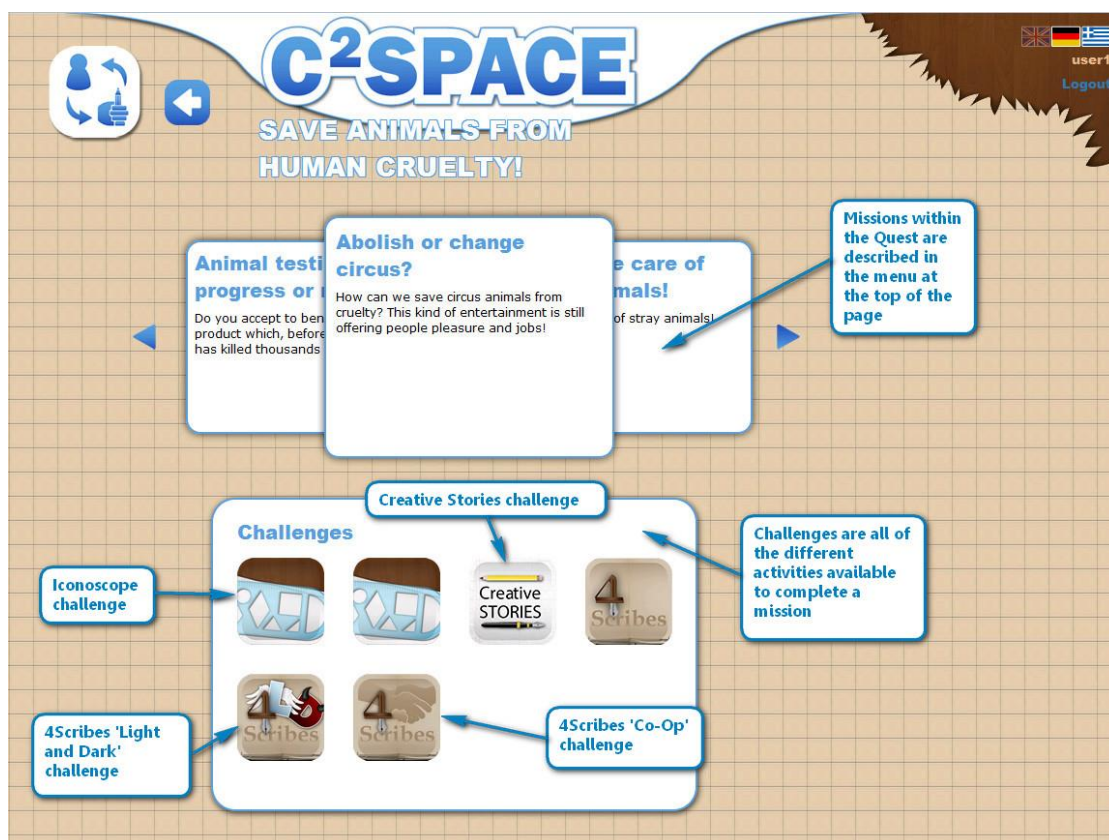


Figure 1: Selecting a mission and challenge

A quest is composed of a number of missions, and each mission is composed of one or more challenges. Within the context of the quest the teacher will assign students or groups of students to challenges to be completed during the classroom session.

- A 4Scribes game – of any type – requires *either* three or four players
- An iconoscope session requires *anywhere from* three to twelve players
- A creative story game is currently a single player experience with input from the artificial intelligence service.

The learner finds their assigned challenge in the overview page and touches the icon. This launches an overview screen which provides the full detail of the challenge and asks the learner to either 'Take the Challenge' or return to the quest page.

Number of user accounts

A single installation of C²Space supports a defined number of users (80 users by default). This number has been provided in order to support pilots using two full classes and giving them the possibility to interact with each other if desired through the community functionality. If more accounts are required it is simply a case of installing another virtual environment but learners on different installations CANNOT interact with each other in the virtual environment.

Educator's Checklist: Do these before using C²Space in the classroom

- Do you have the URL for your C²Space installation?
- Set your username and password
- Assign user accounts to student and make a note of which account is assigned to which student
- Create some custom awards
- Validate that all necessary content is present as Quests, Missions, and Challenges
- Ensure that each device has a version of 4Scribes, Iconoscope and Creative Stories installed on it
- Read this manual – you did read until here, right?

STAY TUNED: WWW.C2LEARN.EU

CONTACT US: INFO@C2LEARN.EU



The C²Learn project has been supported by the European Commission through the Seventh Framework Programme (FP7), under grant agreement no 318480 (November 2012 – October 2015). The contents of this document do not represent the views of the European Commission and the Commission cannot be held responsible for any use which may be made of the information contained therein. Responsibility for the information and views set out in this document lies entirely with the authors. ©C²Learn Consortium 2015. Reproduction authorised provided the source is acknowledged.

