

# **Core 4Ts game – User Guide**

## Introduction

The core 4Ts game is a tangible board game that provides guidance to teachers in the conceptualisation (i.e. the initial design stage) of collaborative learning activities for their students. In other words, the *game is aimed at supporting groups of teachers in the design of collaborative activities for learners*.

In the following of this document, which is intended as a *User Guide* for teachers/players, the game is described.

## The 4Ts model

Theoretically speaking, the need for this game is determined by the intrinsic complexity of the design task when collaborative and technology-enhanced learning interventions are the desired outcomes (Lakkala, 2007). The variables at play in the decision making process and their interactions require thorough consideration of pros and cons of all the design choices made.

Thus, to support this complex design process, the game is built upon a theoretical model, called "4Ts model" (Pozzi et al., 2013), that is briefly explained below.

The 4Ts model defines and frames collaborative learning activities in terms of four elements: TASK (activity that students are requested to carry out); aggregation in TEAMs (student groupings for tackling tasks), TIME (task phases and scheduling), and TECHNOLOGY (the environment in which the activity takes place, with its tools and resources).

Any time a teacher starts designing a collaborative activity, they need to define the intended learning objectives to be achieved by the students, to identify the contents to be addressed and to analyse the context (in terms of contextual constraints and characteristics of the target population).

Then, they will need to choose a Task to be assigned to students, the Technologies that will be used to accomplish the Task, the social structure of the class (organisation in Teams), as well as the Time schedule.

As represented in Figure 1, any choice made on one of the variables impacts on all the others, so the design process is iterative in nature.



Figure 1 - The 4Ts model (Persico & Pozzi, 2013)

Examples of Tasks include:

- Preparing a document (textual or hyper medial)
- Reading and studying
- Preparing a presentation
- Preparing a list of questions
- Commenting others' work
- Carrying out an assignment
- Solving a problem
- Making an interview (to an expert...).

Examples of Teams include:

- Individual learner
- Dyad
- Small group
- Medium sized group
- Large group
- Plenary.

Examples of Technologies include:

- Forum
- PowerPoint/Prezi, or other presentation tools
- Wiki
- Whiteboard
- Video-conference
- WWW
- Text/video editor.

The Time component includes: duration (hours, days, months, etc.) and organisation in phases (one phase, two phases, more phases, etc.).

In order to support teachers when they are not yet familiar with the notion of collaborative learning, it is possible to use 'collaborative Techniques' (Pozzi & Persico, 2011) that are patterns, or models, of already existing collaborative activities. They are content-independent and can be taken up and adopted to specific contexts.

Examples of these collaborative Techniques include:

- Brainstorming
- Discussion
- Peer Review
- Case study
- Role Play
- Jigsaw
- Pyramid.

Any collaborative technique can be described in terms of the 4Ts (Task, Time, Team, Technology). As an example, in Figure 2 you can see a Jigsaw described using the 4Ts model. It should be noted that, for each Technique mentioned above, the deck contains one card for each phase needed to carry out the whole technique. In Appendix 1, you can find the descriptions of a number of collaborative techniques that are used in the game.

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		138	70	139	71	
			PROJECTOR		PROJECTOR	
		107	102	109	103	

Figure 2 - Example of a Jigsaw according to the 4Ts model

All the notions mentioned above (Task, Team, Time, Technology and Technique) are used in the game, as it is explained in the sections below.

## The core 4Ts game

As already mentioned, the core 4Ts game is a means to engage teachers in an interactive, social process of co-decision making centred on the four elements (the four Ts) and the relationships among them in a learning path.

Initially, the core game was developed in a tangible format, i.e. in paper.

The paper game is composed of a board and 4 decks of cards. The board represents the Time component (4 columns = 4 weeks) and has also room for the definition of the learning goals, the contents and the context (see Figure 3).



Figure 3 - The board of the paper game

The decks contain cards for the Tasks, the Teams, the Technologies and the Techniques. A complete list of the cards is available in Appendix 2.



Figure 4 - Cards in the paper game

Each card contains a definition and indications as far as possible connections/relationships with other cards (see Figure 5).

22
JIGSAW - PHASET (EXPERT GROUPS)
In Phase I of a Jigsaw, the teacher presents the general topic and then splits the learners into groups (so called Expert Groups), each of which corresponds to a specific sub-topic. For example, if the topic is World War 1, the groups might respectively be devoted to the causes (G1), the main events (G2), the resolution of the conflict (G3) and its consequences (G4). Each group is expected to study selected materials concerning their sub-topic, prepare a presentation and give a talk to the other groups.
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Figure 5 - Example of front and back of a technique card

### Paper game setting

To play the paper game, you need to print the board and the cards. Cards and board are in English.

Playing with the paper game

To play the game, groups of teachers (from 2 to 8 persons) (from now on, 'players') sit around the board and discuss to define the Context, the Goals, as well as the Contents of the activity. They need to write down on a piece of blank paper their decisions and put the papers down, to fill the specific fields in (left side of the board).

Then, they can start looking at the cards, manipulate and read them, discuss pros and cons and make decisions together about which cards to put on the board, thus conceptualising their collaborative activity (Figure 6). The game is played in real time; there is no 'turn taking' and all the players are free to contribute to the discussion as they like.



Figure 6 -Players playing with the paper game

Players need to <u>READ the contents of the cards</u> and follow the indications, so to make decisions regarding (Technique), Task, Teams and Technology (Figure 7).

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Figure 7 – Example of a paper board with Technique

### Gamification mechanics in the paper game

The game is featured with 3 levels of difficulty:

- Level 1 (entry level) is quite scaffolded and implies using (and starting the design process with) the Techniques deck.
- Level 2 (advanced level): is less scaffolded and implies skipping the Techniques cards and playing directly with the Task/Team/Technology decks.
- Level 3 (expert level): wild cards are available at this stage, to allow users to add new cards.

Level 1 is recommended for student teachers and teachers who need to become familiar with the Techniques. Level 2, instead, allows for more flexible designs. Level 3 is completely free. It is recommended that at a first use the choice of the level is suggested by the tutor (if the game is used for example in the context of a training imitative).

The use of levels can be triggered through 'guessing games' that can be provided to players on paper sheets. For example, to trigger Level 1, players can be assigned (or be asked to pick up) a guessing game sheet, where they will find their guessing game, asking them to guess how a fictitious Master Teacher would design one of the Techniques of the game (see Figure 8).



Figure 8 – Example of a guessing game to trigger use of Level 1 in the paper game

## Appendix 1 - Description of collaborative techniques

#### Introduction

This Appendix contains the description of a set of collaborative learning techniques. The following description is based on the 4Ts model, that sees the design of collaborative activities as a decision making process involving, mainly, 4 variables: the Task to be carried out, the Time allotted for that task, the dimension and composition of the Teams and the Technology necessary for to carry out the task. The 4Ts game too refers to these techniques.

#### Techniques

In the following, we use the term "technique" to refer to patterns or schemes that can be used to design and scaffold students' collaboration while teaching any type of content. They can therefore be applied to the teaching of maths, physics, history, literature, geography, foreign languages, music, etc. Techniques usually entail different phases of work, each described by defining the task, time, technology and teams. So, in the following, the techniques are described by explaining, phase by phase, what the students should do (Task), how long for (Time), with what technology (Technology) with what kinds of groups (Teams). Needless to say, techniques should not be intended as rigid "cages" for designing collaborative activities. Rather, in teaching practice, teachers can adapt these techniques to their needs and also create new ones.

#### Jigsaw

This technique entails two phases with different student groupings: a first phase where so called "expert" groups are formed and a second phase carried out by "jigsaw groups". During the first phase, the Task of the expert groups will be to study in depth a different aspect or facet of a given general topic (or case or problem) and produce a synthesis or a presentation concerning that aspect. In the second phase, each jigsaw groups should include at least one member for each of the expert groups. The task of the jigsaw groups will be to produce an artefact (e.g. a written or oral presentation), reflecting all the different facets of the problem studied in the first phase by the expert groups. Thus, each expert of the jigsaw will bring to the group the competence acquired in the first phase and his/her contribution will be essential to produce a comprehensive artefact.

This method lends itself very well to deal with topics that can be studied under different facets or subtopics. For example, if the class is studying living cells, in the first phase the teacher can divide the class in expert groups, each tasked to study one sub-topic: one group of students learns about the nucleus, another learns about the mitochondria, another learns about the cell wall, and so on. The groups are then reconfigured into jigsaw groups; where each child is an expert of the sub-topic studied in the first phase and thus contributes to the jigsaw group work by bringing the knowledge of that sub-topic, so that the final artefact reflects the whole topic, that is, in our example, the living cell (from <a href="https://www.teachervision.com/group-work/jigsaw-groups-for-cooperative-learning">https://www.teachervision.com/group-work/jigsaw-groups-for-cooperative-learning</a>). The jigsaw is also frequently used in geography and history, to analyse a war in terms of its different facets (causes, effects, main event, people involved, etc) or a place (territory, economy, agriculture, culture, etc). Putting together the expert knowledge in the final artefact allows the student to gain a global view of the whole subject.

Below you can find an example of a Jigsaw organised in class. In the game you can also opt for another variant of the Jigsaw (i.e. the online Jigsaw) and choose whether to have it synchronous (with Videoconferencing system) or asynchronous (with Forum).



#### Peer review

This technique usually involves three phases; in the first phase the students produce an artefact (e.g. a document, a map, an oral presentation); in the second students are asked to provide feedback on the artefact produced by someone else in the first phase, in the third and last phase students modify their original artefact based on the feedback received. The peer review is based on "reciprocal teaching" principles, according to which it is essential that students compare the product of their work to that of their peers. The reflection triggered by the comparison (during the second phase) has a positive impact on self-assessment skills, especially when a rubric is provided, in the form of a list of criteria informing the feedback. Learning is therefore the compound outcome of the self-assessment engendered by both the feedback received and the feedback given. With this technique, there is a wide range of choices concerning team arrangements: students can work individually, in dyads or in teams in all the phases, or even work in teams in the first phase and then provide individual feedback to one or more of the teams and then come back to the original teams in the last phase. Crinon (2012), reports an example of peer review carried out with primary school students aged 9 to 11. The students were required throughout the year to write several episodes of an adventure novel, which they then exchanged via email with another group of students, providing reciprocal feedback so that the authors could revise their work in the last phase.

Below you can find an example of a Peer Review organised for small groups and in class (No communication technology). In the game you can also opt for another variant of the Peer Review (i.e. the online Peer Review). Moreover, you can choose different team sizes, provided that you keep them coherent among the phases.



#### Role Play

With this technique, participants "play a role", i.e., they put themselves in the shoes of someone else (whose perspective on the content may be different from their own) so that they better appreciate their point of view. There are two phases to this technique: the first phase entails role uptake and study of materials (keeping an eye on the role taken), the second entails producing a common artefact by negotiating with peers its content from the perspective previously assumed. This technique can be useful, for example, for language learning: students are assigned a role, given materials to study and a problem to solve (e.g. finding their way in a foreign city). Simulating interactions with local people, students practice the use of the language in context and acquire relevant terminology (see for example Kasim, 2015). The Role Play technique is also frequently used in WebQuests, an inquiry-oriented lesson format in which most or all the information that learners work with are web based.

Below you can find an example of a Role Play organised online (in a mixed mode, i.e. asynchronously and synchronously). In the game you can also opt for another variant of the Role Play (i.e. in class).

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SELECTED SELECTED STUDY MATERIALS		TECHICKORY VIDEOCONFERENCINO SYSTEM			

#### Pyramid

This technique usually has at least three phases and it is used when there is a need for convergence of a large group on a shared solution for a wicked problem, i.e. one that does not have only one right solution. In the first phase, each student devises a solution to the problem. In the second phase, dyads or groups of three work together by comparing the individual solutions and working out a better one by negotiating between the individual solutions. In the subsequent phases, groups merge and participants build new "shared" solutions based on those elaborated during the previous phase, until the whole cohort of students produces a single solution progressively built on top of the pre-existing ones. For example, if you want your students to prepare an interview for an expert or a privileged witness, in the first phase you can ask learners to study individually some materials and then prepare a draft containing a list of questions to be asked. In the second phase students in dyads or small groups will have the task to share their lists, merge and re-organize them and produce a new comprehensive list. In the third phase students will be organised in progressively larger groups and merge the lists produced by the previous teams. The final phase will be when the whole cohort has to produce a list agreed upon by all participants. In some variants, the list is provided at the beginning and the task is to order the list items according to some given priority criteria.

Below you can find an example of a Pyramid (for problem solving) organised online in asynchronous mode and envisaging the following "team flow": individual->pairs->small groups->plenary. In the game you can also opt for other variants, choosing different group sizes, provided that you keep them coherent among the phases. Moreover, in the game there is another instance of the Pyramid (for list preparation), which differs for tasks in respect to the previous one.



#### Discussion

This technique has a low degree of structuredness, and can thus be enacted in many different ways. Here, we propose to make sure that discussion is grounded on knowledge of the topic and that it is not open ended, but oriented to produce an artefact, because this is considered an important factor to facilitate interactions. In this view, we can distinguish two main phases: in the first phase students are asked to study learning material concerning a given problem (or case or topic) assigned by the tutor, while in the second they work in groups to negotiate their solution to the problem and produce an artefact reflecting the negotiation results. The discussion technique lends itself to tackling complex problems where critical thinking, reflection and creativity can be fostered through peer interactions. For example, if a class is studying a debatable issue, like the responsibilities of the different countries involved in a war or the different positions about euthanasia, in the first phase the teacher can provide to the students some documents explaining the different points of view, in the second phase the task will be to debate and produce a synthesis of the team position, by elaborating a text or a presentation concerning the different facets or shared view about the issue.

Below you can find an example of a Discussion (towards text) to be held in class. In the game you can also opt for another variant of the Discussion (i.e. the online Discussion). Moreover, you can choose different Tasks, thus creating other variants of the Discussion (i.e. towards artefact, towards assignment).

WE	EK 1	WE	EK 2	WEEK 3	WEEK 4 📃
DISCUSS (ALL CAS	ION - PHASE I IES)	DISCUSS TEXT) - P	ION (TOWARDS HASE II		
TASSE FINDING MATERIALS	TIME INDIVIDUAL LEARNERS	WRITING A TEXT	TEAN (4) SMALL GROUPS		
INDHVILOUY SOURCE OF MATERIALS FOR LEARNING		18CHHOLOUY NO COMMUNICATION TECHNOLOGY 107	TEXTEDITOR		
THEE DEBATING	TUM Tật PLENARY				
NO COMMUNICATION TECHNOLOGY					

#### Case study

Case studies in education can be used in many different ways, here we propose a possible structure oriented to support problem solving. In Phase 1 of a Case Study, the teacher presents a topic - typically a problem - and provides learners with material for them to study, containing information needed to solve the problem. Then the learners, in pairs or small groups, are asked to solve that problem and produce a possible solution. In Phase 2, the learners individually examine the different solutions and then debate in plenary the pros and cons of each solution.

Below you can find an example of a Case Study to be carried in a mixed mode (i.e. part online and part in class). In the game you can also opt for the full online or the full in class variants.



#### References of Appendix 1

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Pozzi, F., Ceregini, A., Persico, D. (2015). ProgeTTTTare l'apprendimento con 4T. TD Tecnologie Didattiche, 23(3), 132-138. <u>https://doi.org/10.17471/2499-4324/813</u>

# Appendix 2 - Complete list of cards

One full 4Ts game deck is composed of 155 cards:

TECHNIQUES (19 cards, 1 each)	TASKS (52 cards, 4 each)
JIGSAW – Phase I (EXPERT GROUPS) JIGSAW – Phase II (JIGSAW GROUPS) PEER REVIEW – Phase I PEER REVIEW – Phase II PEER REVIEW – Phase II CASE STUDY – Phase I CASE STUDY – Phase I PYRAMID (FOR LIST PREPARATION) – Phase I PYRAMID (FOR LIST PREPARATION) – Phase II PYRAMID (FOR LIST PREPARATION) – Phase II PYRAMID (FOR LIST PREPARATION) – Phase II PYRAMID (FOR PROBLEM SOLVING) – Phase I PYRAMID (FOR PROBLEM SOLVING) – Phase I PYRAMID (FOR PROBLEM SOLVING) – Phase II PYRAMID (FOR PROBLEM SOLVING) – Phase II PYRAMID (FOR PROBLEM SOLVING) – Phase II PISCUSSION – Phase I (ALL CASES) DISCUSSION (TOWARDS ASSIGNMENT) – Phase II DISCUSSION (TOWARDS ARTEFACT) – Phase II	WRITING A TEXT STUDYING FINDING MATERIALS PREPARING A PRESENTATION PREPARING A LIST OF QUESTIONS COMMENTING ON SOMEONE ELSE'S WORK PRESENTING WORK CARRYING OUT AN ASSIGNMENT SOLVING A PROBLEM INTERVIEWING AN EXPERT ASSUMING ROLES PRODUCING AN ARTEFACT DEBATING
TECHNOLOGIES (44 cards, 4 each)	TEAMS (24 cards, 4 each)
TECHNOLOGIES (44 cards, 4 each) FORUM PRESENTATION SOFTWARE WIKI SOFTWARE INTERACTIVE WHITEBOARD (IWB) VIDEO CONFERENCING SYSTEM SELECTED STUDY MATERIAL SOURCE OF MATERIALS FOR LEARNING TEXT EDITOR PROJECTOR NO COMMUNICATION TECHNOLOGY MATERIALS AND TOOLS FOR PRACTICE	TEAMS (24 cards, 4 each) INDIVIDUAL LEARNERS PAIRS SMALL GROUPS MEDIUM-SIZED GROUPS LARGE GROUPS PLENARY
TECHNOLOGIES (44 cards, 4 each) FORUM PRESENTATION SOFTWARE WIKI SOFTWARE INTERACTIVE WHITEBOARD (IWB) VIDEO CONFERENCING SYSTEM SELECTED STUDY MATERIAL SOURCE OF MATERIALS FOR LEARNING TEXT EDITOR PROJECTOR NO COMMUNICATION TECHNOLOGY MATERIALS AND TOOLS FOR PRACTICE SPECIAL CARDS (2 cards, 1 each)	TEAMS (24 cards, 4 each) INDIVIDUAL LEARNERS PAIRS SMALL GROUPS MEDIUM-SIZED GROUPS LARGE GROUPS PLENARY WILDCARDS (14 cards)

