APPENDIX

A CSCL SCRIPTING PATTERN LANGUAGE

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This appendix presents an illustrative CSCL scripting pattern language that enables the generation of CSCL scripts grounded in practice. This pattern language fits in with the conceptual model proposed in Chapter 3 "**Pattern languages for generating CSCL scripts: from a conceptual model to the design of a real situation**" of the *E-learning Design Patterns Book* edited by Peter Goodyear and Simos Retalis.

1 Collaborative learning flow level

Pattern 1.1 JIGSAW **

… within a collaborative learning scenario in which SCRIPTED COLLABORATION (pattern 11 from (E-LEN, 2005)) is seen as a remedy for situations where free collaboration does not lead to learning, it may be necessary to plan how groups will perform a set interrelated activities. This pattern gives the organization of a collaborative learning flow for a context in which several small groups are facing the study of a lot of information for the resolution of the same problem.

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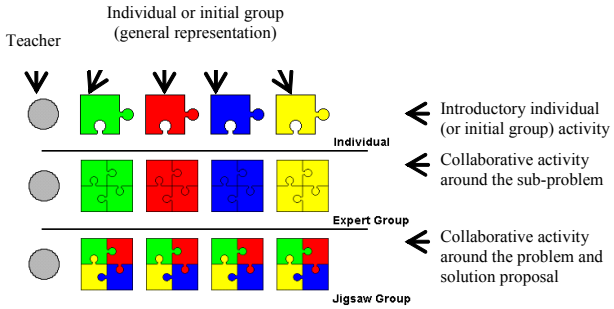
If groups of students face resolution of a complex problem/task that can be easily divided into sections or independent sub-problems, an adequate collaborative learning flow may be planned.

The flow of collaborative learning activities to be followed in order to solve a complex divisible task should promote the following educational benefits (Aronson & Thibodeau, 1992; Clarke, 1994; Johnson & Johnson, 1999):

- To promote the feeling that team members need each other to succeed (positive interdependence)
- To foster discussion in order to construct students' knowledge
- To ensure that students must contribute their fare share (individual accountability)

However, the solution for structuring collaboration in order to tackle this problem may be complex and probably more appropriate for collaborative learning experienced teachers and learners. It may be best suited for the end of the semester when the students are comfortable with group work.
Therefore:

Structure the learning flow so that each student (individual or initial group) in a group ("Jigsaw Group") studies or work around a particular sub-problem. Then, encourage the students of different groups who study the same problem meet in an "Expert Group" for exchanging ideas. These temporary focus groups become experts in the section of the problem given to them. At last, students of each "Jigsaw group" meet to contribute with its "expertise" in order to solve the whole problem.



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Patterns that **complement** this pattern: the learning flow of a whole educational unit might comprise this Jigsaw structure preceded or followed by other set of activities, which can be organized as other patterns at the collaborative learning flow level – PYRAMID (Pattern 1.2), BRAINSTORMING (Pattern 1.4), TPS (Pattern 1.3), SIMULATION (Pattern 1.5), TAPPS (Pattern 1.6). If necessary, the learning flow can be enriched according to ENRICHING THE LEARNING PROCESS (Pattern 1.7) or preceded by INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1).

Patterns that **complete** this pattern: some of the Jigsaw phases might be planned according to other collaborative learning flows –PYRAMID (Pattern 1.2), TPS (Pattern 1.3), BRAINSTORMING (Pattern 1.4), TAPPS (Pattern 1.6), or activities – INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1), DISCUSSION GROUP (Pattern 2.2), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5). The groups indicated by the Jigsaw structure may be formed according to FREE GROUP FORMATION (Pattern 4.2), CONTROLLED GROUP FORMATION (Pattern 4.3).

Pattern 1.2 PYRAMID **

(AKA SNOWBALL)

… within a collaborative learning scenario in which SCRIPTED COLLABORATION (pattern 11 from (E-LEN, 2005)) is seen as a remedy for situations where free collaboration does not lead to learning, it may be necessary to plan how groups will perform a set interrelated activities. This pattern gives the organization of a collaborative learning flow for a context in which several students face the collaborative resolution of the same problem.

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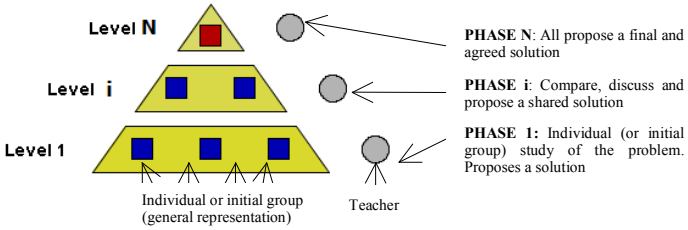
If groups of students face resolution of a complex problem/task, usually without a concrete solution, whose resolution implies the achievement of gradual consensus among all the students, an adequate collaborative learning flow may be planned.

The flow of collaborative learning activities to be followed in order to solve a complex task, whose resolution implies the achievement of gradual consensus, might promote the following educational benefits (Davis, 2002; Gibbs, 1995):

- To promote the feeling that team members need each other to succeed (positive interdependence)
- To foster discussion in order to construct students' knowledge
- To enable the development of negotiation skills

The risk involved in structuring collaboration so that a gradual consensus is achieved is medium. That is, the experience needed in collaborative learning needed is not too high.
Therefore:

Structure the learning flow so that the students start (individually or forming an initial small group) studying the problem and proposing an initial solution. Then, encourage groups (usually pairs) to compare and discuss their proposals and, finally, propose a new shared solution. Guide the students so that the groups join in larger groups in order to generate new agreed proposals. At the end, all the students may propose a final and agreed solution.



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Patterns that **complement** this pattern: the learning flow of a whole educational unit might comprise this Pyramid structure preceded or followed by other set of activities, which can be organized as other patterns (or even the same pattern) at the collaborative learning flow level – JIGSAW (Pattern 1.1), BRAINSTORMING (Pattern 1.4), TPS (Pattern 1.3), SIMULATION (Pattern 1.5), TAPPS (Pattern 1.6). If necessary, the learning flow can be enriched according to ENRICHING THE LEARNING PROCESSES (Pattern 1.7) or preceded by INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1).

Patterns that **complete** this pattern: some of the Pyramid levels might be planned according to other collaborative learning flows – JIGSAW (Pattern 1.1), TPS (Pattern 1.3), BRAINSTORMING (Pattern 1.4), TAPPS (Pattern 1.6), or activities – INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1), DISCUSSION GROUP (Pattern 2.2), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5). The groups indicated by the Pyramid structure may be formed according to FREE GROUP FORMATION (Pattern 4.2), CONTROLLED GROUP FORMATION (Pattern 4.3).

Pattern 1.3 THINK-PAIR-SHARE (TPS) **

… within a collaborative learning scenario in which SCRIPTED COLLABORATION (pattern 11 from (E-LEN, 2005)) is seen as a remedy for situations where free collaboration does not lead to learning, it may be necessary to plan how groups will perform a set interrelated activities. This pattern gives the organization of a collaborative learning flow for a context in which students are paired to solve a challenging or open-ended question.

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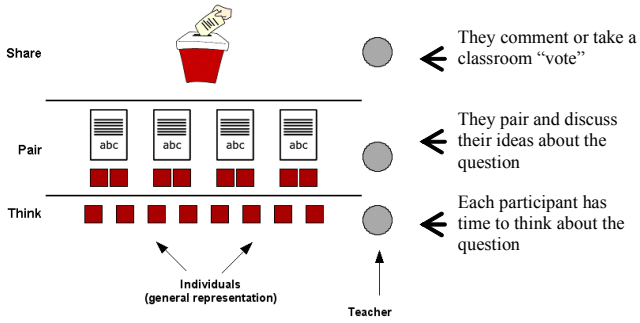
If groups of students face resolution of a challenging or open-ended question, an adequate collaborative learning flow may be planned.

Students are much more willing to respond after they have had a chance to discuss their ideas with a classmate because if the answer is wrong, the embarrassment is shared. Also, the responses received are often more intellectually concise since students have had a chance to reflect on their ideas with the one another. The flow of collaborative learning activities to be followed in order to solve a challenging or open-ended question, might promote the following educational benefits (NISE, 1997; Millis & Cottell, 1998):

- To promote the feeling that team members need each other to succeed (positive interdependence).
- To foster discussion in order to construct students' knowledge.
- To focus students' attention on a particular topic.
- To give a chance to formulate answers by retrieving information from long-term memory.

The solution for structuring collaboration in order to tackle this problem may be ideally suited for individuals who are new to collaborative learning.
Therefore:

Structure the learning flow so that each student has time to think about the question. Then, encourage them to pair and discuss their ideas about the question. Finally, they may comment or take a classroom "vote".



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Patterns that **complement** this pattern: the learning flow of a whole educational unit might comprise this TPS structure preceded or followed by other set of activities, which can be organized as other patterns at the collaborative learning flow level – JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), BRAINSTORMING (Pattern 1.4), SIMULATION (Pattern 1.5), TAPPS (Pattern 1.6). If necessary, the learning flow can be enriched according to ENRICHING THE LEARNING PROCESSES (Pattern 1.7) or preceded by INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1).

Patterns that **complete** this pattern: some of the TPS phases might be planned according to other collaborative learning flows – JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), BRAINSTORMING (Pattern 1.4), TAPPS (Pattern 1.6), or activities – INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1), DISCUSSION GROUP (Pattern 2.2), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5). The groups indicated by the TPS structure may be formed according to FREE GROUP FORMATION (Pattern 4.2), CONTROLLED GROUP FORMATION (Pattern 4.3).

Pattern 1.4 BRAINSTORMING**

(AKA ROUNDTABLE)

… within a collaborative learning scenario in which SCRIPTED COLLABORATION (pattern 11 from (E-LEN, 2005)) is seen as a remedy for situations where free collaboration does not lead to learning, it may be necessary to plan how groups will perform a set interrelated activities. This pattern gives the organization of a collaborative learning flow for a context in which several students face the generation of a large number of ideas.

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If groups of students face the resolution of a problem whose solution requires the generation of a large number of possible answers/ideas in a short period of time, an adequate collaborative learning flow may be planned.

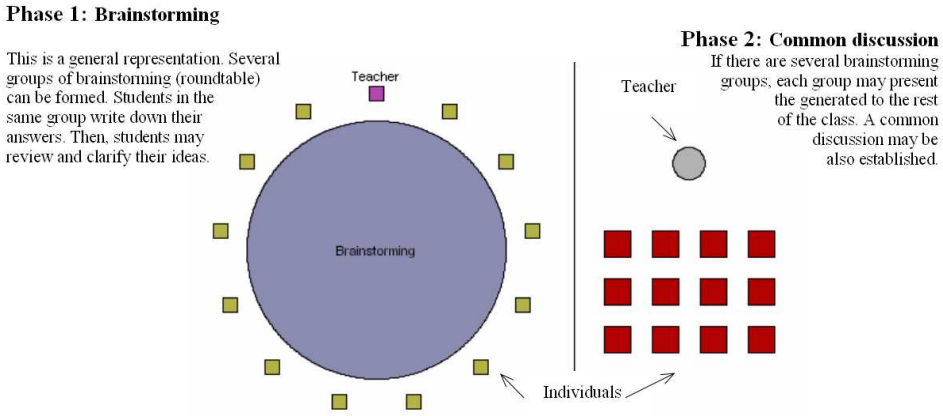
The flow of collaborative learning activities to be followed in order to solve a task, whose resolution implies the generation of a large number of possible answers/ideas in a short period of time, might promote the following educational benefits (NISE, 1997; Millis & Cottell, 1998):

- To encourage learners to take risks in sharing their ideas
- To demonstrate students that their knowledge and their language abilities are valued and accepted
- To teach acceptance and respect for individual differences
- To focus students' attention on a particular topic

The solution for structuring collaboration so that a large number of ideas are generated may be ideally suited for newly formed groups, since they do not need to clarify their ideas.

Therefore:

Structure the learning flow so that students in the same group write down their answers to stated question. Explanations, evaluations, and questions are not permitted as the ideas are generated. This process might continue until students run out of possible solutions. After that, encourage each group to review and clarify their ideas. If needed, the group may present the generated ideas to the rest of the class.



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Patterns that **complement** this pattern: the learning flow of a whole educational unit might comprise this Brainstorming structure preceded or followed by other set of activities, which can be organized as other patterns at the collaborative learning flow level – JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), SIMULATION (Pattern 1.5), TAPPS (Pattern 1.6). If necessary, the learning flow can be enriched according to ENRICHING THE LEARNING PROCESSES (Pattern 1.7) or preceded by INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1).

Patterns that **complete** this pattern: some of the Brainstorming phases might be planned according to other collaborative learning flows – JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), TAPPS (Pattern 1.6), or activities – INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1), DISCUSSION GROUP (Pattern 2.2), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5). The groups indicated by the TPS structure may be formed according to FREE GROUP FORMATION (Pattern 4.2), CONTROLLED GROUP FORMATION (Pattern 4.3). Each brainstorming group may comprise a FACILITATOR (Pattern 4.1).

Pattern 1.5 SIMULATION **

(AKA ROLE-PLAY)

… within a collaborative learning scenario in which SCRIPTED COLLABORATION (pattern 11 from (E-LEN, 2005)) is seen as a remedy for situations where free collaboration does not lead to learning, it may be necessary to plan how groups will perform a set interrelated activities. This pattern gives the organization of a collaborative learning flow for a context in which the members of one or several groups perform a character in a simulation.

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If groups of students face a problem whose resolution implies the simulation of a situation in which several characters are involved, an adequate collaborative learning flow may be planned.

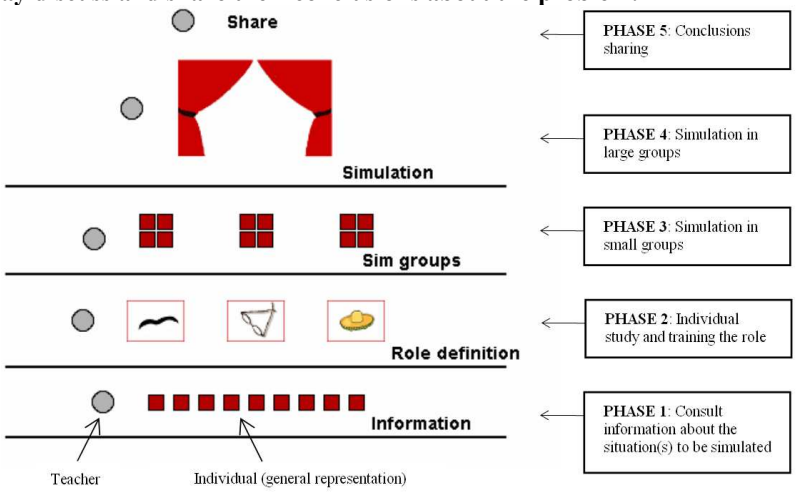
The flow of collaborative learning activities to be followed in order to solve a task, whose resolution implies the simulation of a situation in which several characters are involved, might promote the following educational benefits (Paulsen, 1995):

- To promote the feeling that team members need each other to succeed (positive independence)
- To ensure that students must contribute their fare share (individual accountability)
- To help students feel as well as understand the dynamics of a complex situation

The risk involved in charring out a simulation/role play is medium or high. Role-plays are usually hard to organize in large classes and that students may feel too shy or too time restricted to participate effectively in real-time simulations.

Therefore:

Structure the learning flow so that each student consults information about the problem/situation to be simulated and prepare the role of their character. Then, encourage the students in the same simulation group (usually small groups) perform a particular situation related to the problem. After that, the trained simulations may be performed to the rest of the class (large group). Finally, the whole class may discuss and share their conclusions about the problem.



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Patterns that **complement** this pattern: the learning flow of a whole educational unit might comprise this Simulation structure preceded or followed by other set of activities, which can be organized as other patterns at the collaborative learning flow level – JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), BRAINSTORMING (Pattern 1.4), TAPPS (Pattern 1.6). If necessary, the learning flow can be enriched according to ENRICHING THE LEARNING PROCESSES (Pattern 1.7) or preceded by INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1).

Patterns that **complete** this pattern: some of the Simulation phases might be planned according to other collaborative learning flows – JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), TAPPS (Pattern 1.6), or activities – INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1), DISCUSSION GROUP (Pattern 2.2), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5). The groups indicated by the TPS structure may be formed according to FREE GROUP FORMATION (Pattern 4.2), CONTROLLED GROUP FORMATION (Pattern 4.3).

Pattern 1.6 THINKING ALOUD PAIR PROBLEM SOLVING (TAPPS) **

… within a collaborative learning scenario in which SCRIPTED COLLABORATION (pattern 11 from (E-LEN, 2005)) is seen as a remedy for situations where free collaboration does not lead to learning, it may be necessary to plan how groups will perform a set interrelated activities. This pattern gives the organization of a collaborative learning flow for a context in which several students are paired and given a series of problems.

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If students face a series of problems whose solutions imply reasoning processes, an adequate collaborative learning flow may be planned.

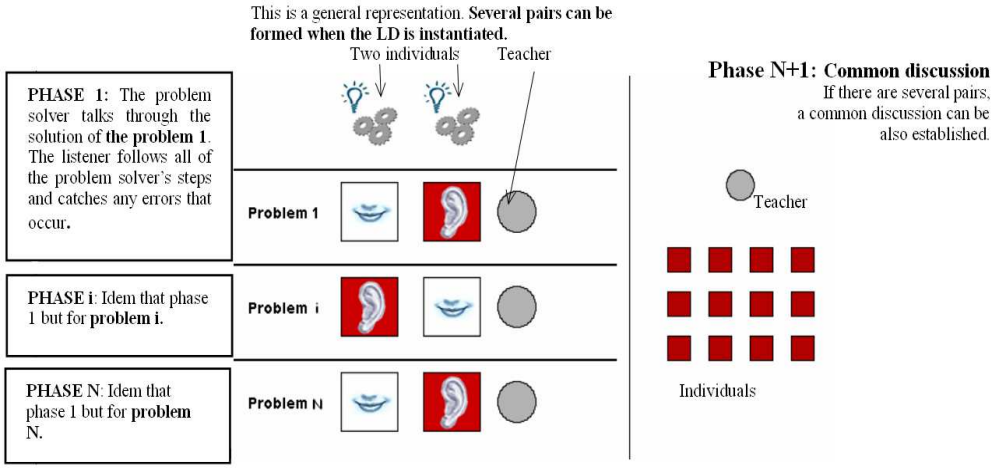
The flow of collaborative learning activities to be followed in order to solve a series of problems whose solutions imply reasoning processes, might promote the following educational benefits (NISE, 1997; Millis & Cottell, 1998; Slavin, 1995):

- To foster discussion in order to construct students' knowledge
- To permit students to rehearse the concepts and produce a deeper understanding of the material
- To encourage analytical reasoning skills
- To support problem solving skills

The risk involved in structuring collaboration so that a series of problems are reasoned in pairs is medium. That is, the experience needed in collaborative learning needed is not too high.

Therefore:

Structure the learning flow so that students are paired and given a series of problems. Give the two students specific roles that switch with each problem: Problem Solver and Listener. The problem solver reads aloud and talks through the solution of the problem. The other (the Listener) follows the Problem Solver's steps and catches any errors that occur. The Listener may ask questions if the Problem Solver's thought process becomes unclear. The question asked, however, should not guide the problem solver to a solution nor should they explicitly highlight a specific error except to comment that an error has been made.



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Patterns that **complement** this pattern: the learning flow of a whole educational unit might comprise this TAPPS structure preceded or followed by other set of activities, which can be organized as other patterns at the collaborative learning flow level – JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), BRAINSTORMING (Pattern 1.4), SIMULATION (Pattern 1.5). In necessary, the learning flow can be enriched according to ENRICHING THE LEARNING PROCESSES (Pattern 1.7) or preceded by INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1).

Patterns that **complete** this pattern: the phase N+1 of the TAPPS phases might be planned according to other collaborative learning flows – JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), BRAINSTORMING (Pattern 1.4), or activities – DISCUSSION GROUP (Pattern 2.2), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5). The groups indicated by the TPS structure may be formed according to FREE GROUP FORMATION (Pattern 4.2), CONTROLLED GROUP FORMATION (Pattern 4.3).

Pattern 1.7 ENRICHING THE LEARNING PROCESS

… within a collaborative learning scenario in which SCRIPTED COLLABORATION (pattern 11 from (E-LEN, 2005)) is seen as a remedy for situations where free collaboration does not lead to learning, this pattern proposes how to enrich the learning process for a synchronous context in which the process of the concurrent activities included in a scrip, which are performed simultaneously by different groups, is not the same.

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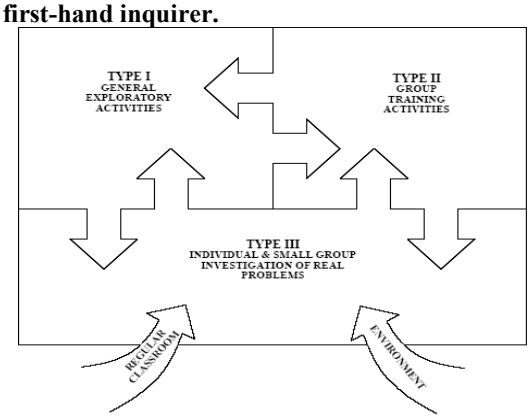
How can the learning process be designed so that the (group of) students that perform some activities at faster rates can employ the time till the rest of the group finish (note that in collaborative learning synchronization of group activities is a key issue) to escalate the level and quality of the learning experiences?

The reasons of why the progress of different group of students is different may be, for instance, the different backgrounds of the members of the groups, their organizational skills or the particular skills needed to perform a particular task (artistic skills, technological skills).

Apart from the feeling of boredom that can appear among the groups that finish first (and might wait for the rest of the groups before continuing with the next activity, maybe because they have to form different groups), in Education it is advisable to provide students with the opportunities, resources and encouragement necessary to achieve their maximum potential without decreasing their motivation (Renzulli & Reis, 2005).

Therefore:

Apply the know-how of gifted education to improve the learning process (the collaboration script) in a way that some enriching challenging complementary activities are provided for the (groups of) students that already completed any (basic or curricular) activity of the design. Note that enriching activities might be planned following an organized approach with clear goals (related to the general objectives of the whole learning design) and a definable structure. Three types of enrichment activities can be considered: type 1 suggest exposing students to a wide variety of topics, hobbies, places that would not ordinarily be covered in the curriculum, type II consists of training general activities that promotes the development of processes such as creative thinking or communication skills, and type III may be devoted to students who become interested in pursuing a self-selected area and have the time necessary for advanced content acquisition and process training in which they assume the role of a first-hand inquirer.



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Patterns that **complement** this pattern: enriching activities may precede, follow or be included within collaborative learning flow structures – JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), BRAINSTORMING (Pattern 1.4), SIMULATION (Pattern 1.5), TAPPS (Pattern 1.6).

Patterns that **complete** this pattern: enriching activities may be planned according to other collaborative learning flows – JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), BRAINSTORMING (Pattern 1.4), TAPPS (Pattern 1.6), or activities – DISCUSSION GROUP (Pattern 2.2), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5).

2 Activity level

Pattern 2.1 INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS *

… within a scripted collaborative learning scenario whose flow of activities may be structured according to patterns at the collaborative learning flow JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), BRAINSTORMING (Pattern 1.4), SIMULATION (Pattern 1.5), TAPPS (Pattern 1.6), this pattern proposes to consider an introductory activity explaining the collaborative learning design for a context in which meaningful learning and positive interdependence are desired to be fostered.

***

Students may be aware of the collaborative learning process that they will perform so that their learning is potentially meaningful and so that positive interdependence among the members of the groups is encouraged. This pattern discusses how this might be accomplished.

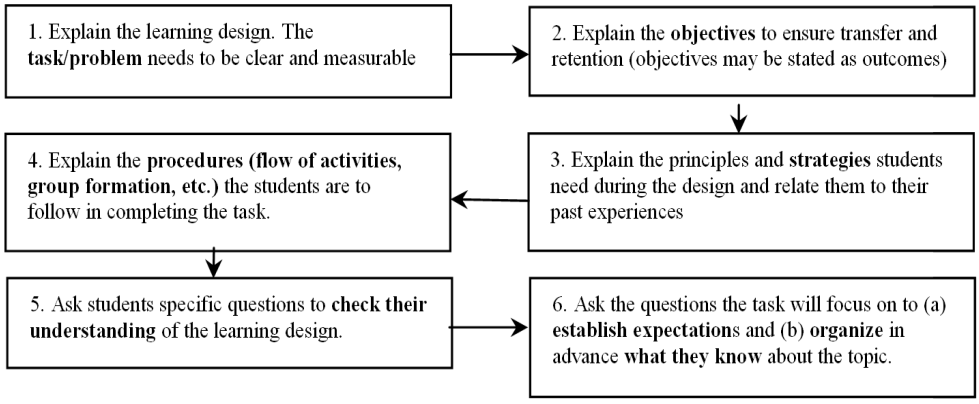
One of the principles of instruction is that *learning is facilitated when learners are shown the task that will be able to do or the problem they will be able to solve as a result of completing a module or course*, i.e. *learning is facilitated when learners are engaged at the problem or task level not just the operation of action level* (the actions and operations that comprise the tasks). *Showing learners the task or problem they will be able to solve is more effective that stating abstract learning objectives* (Merril, 2002).

On the other hand, many researchers (such as (Dillenbourg, 1999)) in order to differentiate cooperation vs. collaboration, emphasise the contributions of group members and associate cooperative with division of labour procedures and collaborative with equality of contributions to the same problem solution. In this sense, collaboration scripts, which are often complex (risky) learning processes, need a high degree of *positive interdependence* so that the performance and interaction in a collaborative learning setting is successful (Strijbos, Martens, & Jochems, 2004). Positive interdependence refers to the perception that a member of the group is linked with others in a way so that (s)he cannot succeed unless they do (and vice versa); i.e., their work benefits (s)he and her/his work benefits them (Johnson & Johnson, 1999). It promotes cohesion and a heightened sense of belonging to a group.

In order to promote the feeling that team members need each other to succeed, it is necessary to let students be aware of the whole collaborative learning process they will perform, so that they understand: Why the are going to collaborate? How is going to be the collaboration (coordination among groups, etc.)? How dependent is their performance on the performance of the others?

Therefore:

Include in the learning flow an introductory activity that explains the whole learning design: present the task (or problem) they will solve and the flow (sequence) of activities they will perform (including the different groups they may form) in order to complete the task.



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Patterns that **complement** this pattern: this type of introductory activity might precede other activities – DISCUSSION GROUP (Pattern 2.2), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5).

Patterns that **complete** this pattern: a FACILITATOR (Pattern 4.1) may be in charge of keeping awareness of the whole learning design. Use GUIDING QUESTIONS (Pattern 3.3) to check if the learning design has been understood.

Pattern 2.2 DISCUSSION GROUP

A version of this pattern appears in (Goodyear, 2005).

… within a scripted collaborative learning scenario whose flow of activities may be structured according to patterns at the collaborative learning flow JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), BRAINSTORMING (Pattern 1.4), there may be activities devoted to discussion. This pattern is mainly concerned with the establishment of appropriate organizational forms for knowledge sharing, questioning and critique.

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Discussion groups are the most common way of organizing activity in networked learning environments. The degree to which a discussion is structured, and the choice of structure, is key in determining how successfully the discussion will promote learning for the participants.

Discussions can be relatively structured or relatively unstructured, and they may also change their character over a period of time. It is not uncommon for a teacher to set up a discussion in quite a formal or structured way, and for the structure then to soften as time goes by - for example, as the participants take hold of the conversation, opening up and following new lines of interest.

The structure of a discussion should be such that it increases the likelihood of:

a) an active and substantial discussion, with plenty of on task contributions
b) the students coming away from the discussion with a good understanding of the contributions made
c) contributions being made by all members of the group and 'listened' to by all other members of the group.

Unstructured discussions run the risks of (for example)

- not getting going properly within the time available
- dissipating into a number of loosely related strands that fail to engage effectively with subject being studied
- dissolving into monologues or two way conversations that fail to involve the whole group.

(Pilkington & Walker,) have demonstrated the value of assigning explicit group roles in online discussion groups. Some writers, for example, (McConnell, 2000) are not sure about the validity of the teacher setting specific structuring devices, preferring to make the group itself responsible for determining how it wants to discuss things, or carry out its work more generally.

Therefore:

Start the discussion by establishing its structure. Make the rules and timetable for this structure explicit to all the members of the group. Where there is little time available to the group for the discussion, and/or the members of the group are inexperienced at holding online discussions, the teacher/facilitator should set the structure. Where the students are to set their own structure, the teacher/facilitator should give them support and ideas about how to do this, and encourage them to do so in a fair and timely way.

***

Patterns that **complement** this pattern: this type of activity might follow or precede other activities – INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5).

Patterns that specialize this pattern: PREPARING FRUITFUL DISCUSSIONS USING SURVEYS (Pattern 2.3), ENRICHING DISCUSSIONS BY GENERATING COGNITIVE CONFLICTS (Pattern 2.4).

Patterns that **complete** this pattern: GUIDING QUESTIONS (Pattern 3.3), FACILITATOR (Pattern 4.1), FREE GROUP FORMATION (Pattern 4.2), CONTROLLED GROUP FORMATION (Pattern 4.3).

Pattern 2.3 PREPARING FRUIFUL DISCUSSIONS USING SURVEYS *

… an activity organized according to DISCUSSION GROUP (Pattern 2.2) may consider the results of a previous activity or their ideas about a subject posed by the teacher.

***

The exploration of contradictory views in a discussion can promote a deeper understanding of a subject. It can stimulate each participant to develop their own opinions and explore their reason for them.

Discussions are not sometimes much fruitful because of a lack of structure of the ideas to debate. Another reason that causes this problem is that very often participants do not know the opinions and ideas of the rest of participants (Gómez, Rubia, Dimitriadis, & Martínez, 2002; Martínez-Monés et al., 2005).

Unstructured discussions run the risks of:

- not getting going properly within the time available,
- dissipating into a number of loosely related strands that fail to engage effectively with subject being studied,
- dissolving into monologues or two way conversations that fail to involve the whole group.

Therefore:

Before the discussion takes place, prepare a survey or questionnaire with questions related to the topics that might be particularly discussed. The students might answer the survey thus enabling them to organize their ideas and helping them to find arguments to defend their opinions on the main topics.

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Patterns that **complement** this pattern: this organization may precede ENRICHING DISCUSSIONS BY GENERATING COGNITIVE CONFLICTS (Pattern 2.4) and might follow or precede other types of activities – INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5).

Patterns that **complete** this pattern: MANAGING OF ON-LINE QUESTIONNAIRES (Pattern 3.2), GUIDING QUESTIONS (Pattern 3.3), FACILITATOR (Pattern 4.1).

Pattern 2.4 ENRICHING DISCUSSIONS BY GENERATING COGNITIVE CONFLICTS *

… an activity organized according to DISCUSSION GROUP (Pattern 2.2) may consider the results of a previous activity or their ideas about a subject posed by the teacher.

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Sometimes students are reluctant to challenge each other's different views on a particular subject or the results from a particular activity during a discussion.
When a student raises a different view or result after having being asked by the facilitator, the others have not reflected on the potential causes of the different approaches. Therefore, the other students avoid being involved in the discussion as they are not confident on what to argue (Johnson & Johnson, 1999; Gómez et al., 2002; Martínez-Monés et al., 2005).
Therefore:

Before the discussion takes place, the students should know, in advance, the others' point of views or their outcomes from the learning activity they are going to discuss about. Also, they should have enough time to reflect on why there are different approaches. Sometimes, those reflections may generate cognitive conflicts enabling the students to notice that their opinions or their results may be wrong, thus generating new questions and new approaches to the discussed issue they had not thought of and thus generating learning. Sometimes (especially when there is not a unique answer to a question) the reflection on the differences may help the students to think of arguments to reinforce their opinions or to defend their results. The availability of those arguments may motivate the student to take part in the subsequent discussion.

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Patterns that **complement** this pattern: this organization may follow PREPARING FRUIFUL DISCUSSIONS USING SURVEYS (Pattern 2.3) and might follow or precede other types of activities – INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5).

Patterns that **complete** this pattern: STRUCTURED SPACE FOR GROUP TASKS (Pattern 3.1), GUIDING QUESTIONS (Pattern 3.3), FACILITATOR (Pattern 4.1), FREE GROUP FORMATION (Pattern 4.2), CONTROLLED GROUP FORMATION (Pattern 4.3).

Pattern 2.5 THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING

A version of this pattern appears in (TELL, 2005) by S. Bartoluzzi and P. Goodyear.

… within a scripted collaborative learning scenario whose flow of activities may be structured according to patterns at the collaborative learning flow JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), BRAINSTORMING (Pattern 1.4), there may be activities devoted to creation of an artifact to be assess. How we assess students' work is one of the most significant decisions we make in educational design, not just because of issues of fairness and accuracy but also because how we set out to test students affects how they approach their work as learners. Assessment techniques need to be valid and reliable but they also drive learning.

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Assessment regimes which prioritize technical measurement issues, such as validity and reliability, may ignore the effects of the test on students' approaches to learning. On the other hand, we do need to assess students' work, and our approaches must be fair and reasonable.

Students take assessment tasks very seriously, especially when the grade they get for a task affects their final qualification, or the speed with which they progress to the completion of their studies. The nature of the assessment regime on a course unit affects how students approach their study (Biggs, 1999). For example, if the assessment regime consists mainly or exclusively of an end-of-course formal examination (time limited, unseen exam paper, no access to books or notes, etc), then students are much more likely to take a surface approach to study. This tendency will be strengthened further if they feel the curriculum is overloaded with content. Surface study strategies include rote memorisation and avoidance of reading material that is outside the core of the course. The knowledge developed through surface approaches tends to be inert and fragmented – hard to apply (Renkl, Mandl, & Gruber, 1996). Since we value the acquisition of flexibly organised, well-integrated and applicable knowledge – what can be called working knowledge – then we need assessment strategies that favour deep rather than surface learning (Biggs, 1999). Deep learning involves the personal construction of meaning, learning for understanding, learning processes which transform current conceptions, etc). Rather than leaving assessment till the finish of the course, where it marks the end of learning, it can be possible, and advantageous, to make the assessment task the vehicle for learning (Knight, 1995). An example is where the students' main activity on a course is a project-like assessment task. This can also change the relationship between the materials students read and the assessment task. Instead of the assessment being a test of how well the materials have been memorised, the materials become a resource for the assessment project. A key aspect is that the assessment task must be one of the main things – if not the main thing – on which the students focus during their period of study. It is possible for the students' work to be distributed across a small number of such tasks, but too great a number will create an incoherent learning experience.

Therefore:

Put a project-like assessment task at the heart of your course unit. Give students a lot of control over how they will carry out the task and make sure they have sufficient time to plan and execute it well. Let them have a strong voice in deciding exactly what the assessment task will consist of. Do not introduce other assessment tasks unless really necessary – such things can easily act as distractions and will dissipate the student's intellectual energy.

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Patterns that complement this pattern: this type of activity might follow or precede other activities – INTRODUCTORY ACTIVITY: LEARNING DESIGN AWARENESS (Pattern 2.1), DISCUSSION GROUP (Pattern 2.2).

Patterns that complete this pattern: STRUCTURED SPACE FOR GROUP TASKS (Pattern 3.1), GUIDING QUESTIONS (Pattern 3.3), FACILITATOR (Pattern 4.1), FREE GROUP FORMATION (Pattern 4.2).

3 Resource level

Pattern 3.1 STRUCTURED SPACE FOR GROUP TASKS

A version of this pattern appears in (TELL, 2005) by S. Bartoluzzi and P. Goodyear.

… a collaborative activity – ENRICHING DISCUSSIONS BY GENERATING COGNITIVE CONFLICTS (Pattern 1.7), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5) – may require an online space to facilitate their work.

***

Sometimes students require an online space that facilitates their collaboration.
In some situations, it makes sense to leave to each group the decisions about what tools, etc, they will use. This is particularly important where one of the intended learning benefits is that students become more capable at organising and managing their own online collaborative activity. (Learning to become a virtual team-worker, etc). However, in many cases, it simply distracts the group's attention from the main task at hand and can make the early part of their work together much less effective.
This is another case where getting the right balance between structure and freedom can be achieved through providing an adequate starting framework – in this case, a reasonably well-configured online space for a small group task – but ensuring that groups can modify the space to suit their own preferences and emerging needs.
In many small group tasks, the group members need (i) somewhere to discuss their work (a space for planning, and monitoring the work as it goes along), (ii) somewhere to share a growing pool of relevant resources (e.g. useful papers they have identified, etc), (iii) somewhere to lodge the evolving versions of their joint product. Neither a discussion-oriented tool nor a shared editing tool is quite right for all purposes. Discussion tools, such as a threaded discussion forum are good for helping with the structure and flow of a discussion about planning, but don't help much with document management, version control, etc. Document repositories can be good for sharing resources, and some will allow annotation. But they aren't good for discussion. Collaborative writing tools, such as a wiki, are good for some kinds of joint document production, but aren't so useful for discussing the process of document production. Ideally, one needs to be able to provide each of these things, in some reconfigurable, customisable environment. If students do not have the will or the skills to do the customisation, then what you provide must be adequate for their task. But it should not imprison those students who do have the skills and the will to improve the tools to hand.
Therefore:

Ensure that the set of collaboration tools you make available to students can support sharing of resources and products and group processes.

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Patterns that **complement** this pattern: MANAGING OF ON-LINE QUESTIONNAIRES (Pattern 3.2).

Patterns that **complete** this pattern: depending on the collaboration tools available in the structured space the principles of other patterns may be considered – FACILITATOR (Pattern 4.1), FREE GROUP FORMATION (Pattern 4.2), CONTROLLED GROUP FORMATION (Pattern 4.3).□

Pattern 3.2 MANAGEMENT OF ON-LINE QUESTIONNAIRES**

A version of this pattern appears in (Avgeriou, Papasalouros, Retalis, & Skordalakis, 2003; TELL, 2005)

… a collaborative activity – PREPARING FRUIFUL DISCUSSIONS USING SURVEYS (Pattern 2.3), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5) – may require the use of web-based questionnaires.

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How can web-based questionnaires be created, delivered and graded?
The administration of on-line tests for the assessment of students is a common task for the majority of learning systems. The creation and delivery of questions and tests over the Web is a complicated task due to the interactive, sophisticated nature of the web-based questionnaires.
Therefore:

Provide a mechanism for the creation of on-line questions: closed-end questions with predefined answers, that are able to be automatically graded and open-end questions, which need to be graded by an instructor. Allow the Instructors that create the questions, to be able to allocate a grade to each question. Also give them the ability to announce the schedule of on-line tests so that students are informed in time. Develop a run-time system for the delivery of the tests at the time scheduled, the automatic grading of closed-end questions, the automatic submission of answers to open-end questions to the Instructors and the storage of the results into the students' records. In case of self-assessment questionnaires, assign particular questions to learning units where the student should check the knowledge she/he is supposed to have obtained. The run-time system should make these questions available to the students whenever they access the particular learning units.

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Patterns that **complement** this pattern: STRUCTURED SPACE FOR GROUP TASK (Pattern 3.1).

Patterns that **complete** this pattern: GUIDING QUESTIONS (Pattern 3.3).

Pattern 3.3 GUIDING QUESTIONS

… a collaborative activity – DISCUSSION GROUP (Pattern 2.2), ENRICHING DISCUSSIONS BY GENERATING COGNITIVE CONFLICTS (Pattern 2.4), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5) – may provide some hints supporting decision making about the completion of tasks.

***

A group of students that collaboratively perform a learning task are not sure on the criteria for deciding whether they have completed it or whether it fulfils the expected results.
For some learning tasks in which the students do not have a clear knowledge of the expected outcomes, it may be difficult for them to decide when the task is completed. This may be due to their fear of not having done enough work or lack of ability for judging themselves. Some kind of conflict resolution (Johnson & Johnson, 1999) might be used for achieving a consensus on that but it would just be based on personal opinions and therefore the students, for the same reasons, would not be very confident on that. Also, the teacher might take the decision (or even just impose a time constraint) but the students would still not know why the task is completed.
Therefore:

Provide the students with a list of questions that they might be capable of answering as they advance with the task. The questions might not only deal with procedural issues (e.g., have you finished the introductory section of the document?) but mainly with the content of the activity itself. These questions would help the students to focus on important issues of the task as well as potentially generate cognitive conflicts with their previous knowledge or with the knowledge they are producing by means of the activity itself. Also, the students may be aware of the importance of self-posing questions on what they are learning as a way of enhancing and enlarging their knowledge (i.e. there might not only be an improvement of the task "tangible" outcome but also an improvement of the learning process itself).

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Patterns that **complement** this pattern: STRUCTURED SPACE FOR GROUP TASK (Pattern 3.1), MANAGING OF ON-LINE QUESTIONNAIRES (Pattern 3.2).

4 Roles and common collaborative mechanisms level

Pattern 4.1 FACILITATOR*

Facilitating the work that a group has to collaboratively accomplish is a recurring problem in the context of collaborative learning flows – BRAINSTORMING (Pattern 1.4), activities – DISCUSSION GROUP (Pattern 2.2), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5) and supporting tools – STRUCTURED SPACE FOR GROUP TASKS (Pattern 3.1), MANAGEMENT OF ON-LINE QUESTIONNAIRES (Pattern 3.2).

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Students might be guided towards greater independence (autonomous learning) in collaborative learning situations and, at the same time, towards effective collaboration.
Autonomous learning is an important issue in education, which foster a greater independence of the students. This issue may be also considered in collaborative learning. Promoting self-organization helps to a large extent the achievement of greater independence. A group self-organizes by developing and sharing roles for team members, sharing workloads, etc. (Martínez-Monés et al., 2005). Allowing students to freely form groups and organize the work within groups might also promote students' responsibility. However, fostering this independence should not damage effective collaboration (Paulsen, 1995; Davie, 1989).
Therefore:

Become a facilitator: motivate, introduce deadlines, help people get started, give them feedback, weave the contributions of different participants together, get it un-stuck when necessary, make sure all have opportunity to participate and learn, deal with individuals who are disruptive or get off the track, bring in new material to freshen it up periodically, and get feedback from the group on how things are going and what might happen next.

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Patterns that **complement** this pattern: FREE GROUP FORMATION (Pattern 4.2), CONTROLLED GROUP FORMATION (Pattern 4.3).

Pattern 4.2 FREE GROUP FORMATION

Partly based on the patterns FORMING GROUPS FOR GROUP WORK WITHIN A CLASSROOM CONTEXT and FORMING GROUPS FOR COLLABORATIVE KNOWLEDGE BUILDING included in (E-LEN, 2005) by Gaby Lutgens.

Forming groups is necessary to comply with the types of groups indicated by collaborative learning flows – JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), BRAINSTORMING (Pattern 1.4), SIMULATION (Pattern 1.5), TAPPS (Pattern 1.6), the specific groups demanded by activities – DISCUSSION GROUP (Pattern 2.2), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5) and, even, the functionality provided by supporting tools – STRUCTURED SPACE FOR GROUP TASKS (Pattern 3.1). This pattern gives an approach to group formation for a context in which a group of students tackle a large demanding assignment.

***

How can a group of students be formed when they are asked to work on a large demanding assignment?

Generally, groups should be heterogeneous, should not isolate minority students and should be formed by the teachers (NISE, 1997). However, it is important that students feel comfortable, especially when the assignment is large, demanding and product-oriented and have a strong importance related to grading. Simply allocating the same mark of every student in a group can lead to the problem of free-riders (Cronholm & Melin, 2006). In fact, there are many problems related to difference preferences that may emerge and obstruct learning. Different wishes about working times, geographical distance between the students, diverse study techniques or ways of thinking, differences in motivation (different level of ambition related to grading, commitments to the task and to the goal of the course) may lead to group conflict and non-creative group climate. Social sensitivity is an important aspect when assembling groups (Cronholm & Melin, 2006).

Therefore:

Ask students their opinion related to group formation. Let them form the groups themselves, if they prefer so. You might instead opt for a semi-free group formation approach where the students only select part of the members of their group.

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Patterns that **complement** this pattern: FACILITATOR (Pattern 4.1).

Patterns that are **alternative** to this pattern: CONTROLLED GROUP FORMATION (Pattern 4.3).

Pattern 4.3 CONTROLLED GROUP FORMATION

Partly based on the patterns FORMING GROUPS FOR GROUP WORK WITHIN A CLASSROOM CONTEXT and FORMING GROUPS FOR COLLABORATIVE KNOWLEDGE BUILDING included in (E-LEN, 2005) by Gaby Lutgens.

Forming groups is necessary to comply with the types of groups indicated by collaborative learning flows – JIGSAW (Pattern 1.1), PYRAMID (Pattern 1.2), TPS (Pattern 1.3), BRAINSTORMING (Pattern 1.4), SIMULATION (Pattern 1.5), TAPPS (Pattern 1.6), the specific groups demanded by activities – DISCUSSION GROUP (Pattern 2.2), THE ASSESSMENT TASK AS A VEHICLE FOR LEARNING (Pattern 2.5) and, even, the functionality provided by supporting tools – STRUCTURED SPACE FOR GROUP TASKS (Pattern 3.1). This pattern gives an approach to group formation for a context in which a group of students tackle an assignment for limited duration and which benefits from diverse or conflict knowledge.

***

How can a group of students be formed when they are asked to work on an assignment to collaborative build knowledge?
Heterogeneous groups with members with different skills and knowledge are considered to be more effective that homogenous groups in terms of sharing ideas and experiences to learn about topics or gain new insights. Heterogeneous groups provide opportunities to meet new people o people with different profile or divergent knowledge. This improves skills such as conflict management, ability to understand other people's needs, communication and the ability to collaborate. They also prevent the isolation of minority students. However, it is difficult to find a method that guarantee balanced groups (NISE, 1997). On the other hand, randomly allocating students to groups is considered closer to real future professional life of the students (Cronholm & Melin, 2006).
Therefore:

There are many ways to form potentially heterogeneous groups. Assemble heterogeneous groups taking into account student outcomes in previous activities, their profile, or their academic strengths. You may instead form the groups randomly (e.g. count off students with numbers and ask the students who have each number meet), or considering a common characteristic not related with the task (e.g. ask the students born in the same month join).

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Patterns that **complement** this pattern: FACILITATOR (Pattern 4.1).

Patterns that are **alternative** to this pattern: FREE GROUP FORMATION (Pattern 4.2).

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