Cooperative Learning for Co-designing Serious Games at School: a Case Study

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Introduction
Children can be involved in the design of products for them by using specific participatory design methods (Fails et al., 2013). Gamified Co-design with Cooperative learning (GaCoCo) is a co-design method conceived for creating concepts and low-fidelity prototypes of educational games for children, by working with them and their teachers at school. GaCoCo was first introduced in (Dodero et al., 2014a) and used in 2013 and 2014 studies, e.g., see (Dodero et al., 2014b). In this paper, we highlight problems emerged when planning GaCoCo studies and concerning the participation of children as game designers. A case study illustrates how cooperative learning and gamification helped in tackling them.

Problems
Co-design studies, in general, and GaCoCo studies, in particular, can involve:
- product design experts and co-design experts,
- teachers, experts of their class,
- children acting as concept or prototype designers.

Such different stakeholders bring in their own requirements with respect to the product under design, especially for complex products like serious games. Specifically, the first problem we faced when planning GaCoCo studies was: how can we empower and enable children to create concepts or prototypes of serious games, as independently as possible of their player expertise and of game designer’s ideas? Ad-hoc game frameworks and prototype material for children were created for that.

A second problem stemmed from school-class’ heterogeneity, in terms of learner skills and values. The question we faced was: how can we allow diverse children to cooperate, leveraging on everybody’s potentials, so as to foster intra-group co-design dynamics in the creation of serious games? To tackle that, we opted for specific cooperative learning principles and methods, under the guidance of a cooperative learning expert. In particular, we selected specific cooperative learning rules and roles for children, and made them catchy via gamified objects. We illustrate how we did so with the following case study.

Case Study
The study was a long-term intervention with a primary school class of 15 8-9 olds in 2014. It also involved their class teacher, a game and co-design expert, and a co-design expert acting as passive observer. The study aimed at using GaCoCo for creating concepts and prototypes of serious games. The study was organized in 6 daily missions, each of circa 2 hours and in
different weeks. Children were divided in four groups of three or four members. Groups were created by the class teacher who, in each mission, introduced or reminded cooperative learning rules and assigned roles to group members.

The group ambassador is an example of a cooperative learning role for children adopted in our study. Ambassadors ask for clarifications; more generally, they are responsible of exchanging information with the teacher and game design expert. Roles were conveyed via specific objects. For instance, ambassadors had their gamified object, the expert card, for asking the help of the game expert at critical points. See the left illustration below. Examples of cooperative learning rules that we employed were:

- Ru1) to take turns in voicing opinions,
- Ru2) to reconcile different views concerning game concepts or prototypes.

Gamified objects were designed for making rules clear and easy to recognize. For example, each group had a “scepter” for organizing turns in speaking (Ru1). It gave its holder the right to talk. Each child could vote on different views (Ru2) by drawing smileys on a blackboard signaling-disk. See the right illustration.

A mixed-method approach was used for gathering qualitative and quantitative data. Overall, results concerning group cooperation are positive. During each mission, the passive observer took notes (also) concerning group behavior. At the end of each mission, the teacher was interviewed to give her feedback on groups. According to both observer and teacher, the majority of groups cooperated. A sociogram test (Moreno, 1946) was also distributed to the class one week before and one after the study. The test allows us to track social relations between group members. In the pre-test, children defined as marginalized by their teacher received in fact less relation choices by their classmates. However, in the post-test, the same children became less isolated receiving more choices by their group-mates, further indicating that all children were included in the group work.
Bibliography


