

# Using Games to Model and Evaluate Collaborative Learning

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**Abstract:** Collaborative learning in classrooms requires carefully crafted environments – both technical and social. This paper presents a model describing how to design socio-technical environments that will promote collaboration in group activities. A software tool was developed based on this model for use in conducting experiments in collaborative learning. Preliminary testing with this system revealed strengths and weaknesses of the system, which are being addressed in on-going research.

## The Problem

Quantitative research in collaborative learning is difficult because it is hard to measure collaboration for a number of reasons. We have developed and tested a series of simple games designed to provide students an experience of collaborative learning – an experience that can be quantified along key dimensions or “indexes of collaboration.” Such a game provides a useful tool for conducting controlled experiments in collaborative learning. We provide a model that specifies the experiment’s initial conditions and activity structure, allowing the researcher to control these variables and quantify an interesting set of indicators.

## The Model

One way to increase the probability that some types of collaborative interactions will occur during an experimental study is to carefully design the situation. Numerous independent variables have been studied in order to determine the conditions under which collaborative learning is efficient. Our model defines a set of elements to consider in order to specify the initial characteristics of the groups (see Figure 1).

## The Games

A game – called *Chase the cheese* – is played by four persons, each with a computer (see Figure 2). The computers are physically distant and the only communication allowed is computer-mediated. This paper is part of our larger effort, that includes, for example, studies using additional collaboration games based on the same model (MemoMet, ColorWay, TeamQuest) and a larger theoretical context including design patterns and collaborative scenarios as well as qualitative interaction analyses of students using scientific simulations.

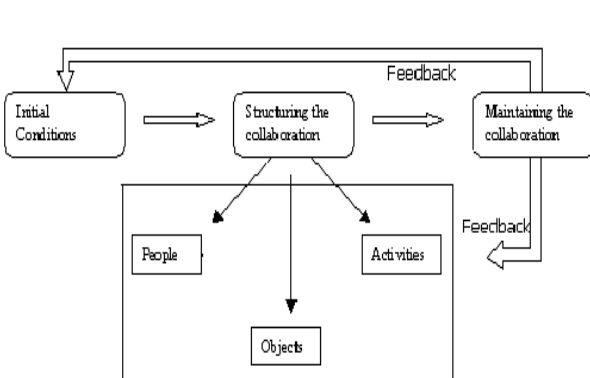


Figure 1: Model Proposed

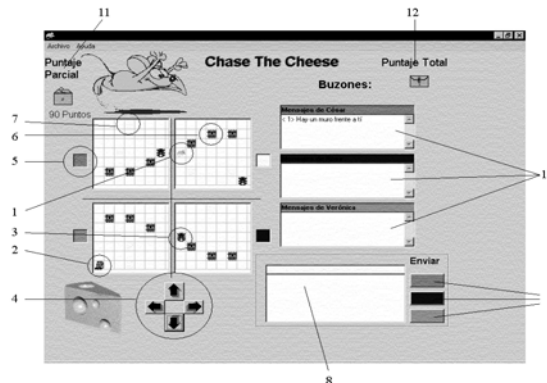


Figure 2: Game Interface