bypassing the database completely. The brevity of the trial curtailed opportunities for the groups to continue to develop and critique this work, nonetheless a tangible outcome of the collaboration had eventuated, being a set of draft design proposals to address part of the original purpose. Except for the external email contributions, these proposals were now available in a shared repository for review by other groups, critique or further use.

Second trial

Given the mixed outcomes of the first trial, and based upon student feedback, observations and reflection by the authors, the second trial took the different approach of assigning a ranking task to the participants. The collaborative database was substantially redesigned, to simplify aspects of the interface, and more specifically support the goals of this second trial. The common task was more tightly defined, less ambitious in scope, and was designed to encourage greater interaction between the student groups. Again the trial involved a Tele-project, but this time built upon the work already done in the previous collaboration.

The goal was for each group (two AUT students, combined with two or more Uppsala groups of four) to individually critique and score, then rank an assigned set of three design proposals. These proposals had been stored within the previous collaborative database and thus were available for this critique.

Once the individual ranking had been achieved, the combined group were to appoint a group leader who would produce a final ranking reflecting a consensus of the overall group opinion. This phase of the trial was intended to generate dialogue between members of the group, and demonstrate the issues associated with gaining agreement within teams across time, space and cultural boundaries. The trial took place over a four-week period and required students in addition to conducting the assigned task, to report progress on-line individually each week and conduct a final online evaluation of the trial at the conclusion of the exercise. Some of the steps in this trial are given below:

TABLE 1
SCHEDULE FOR THE SECOND TRIAL

Session Date	Time (NZST)	Task
Monday 20/09/99	6:00 - 7:00pm	Register and form groups, research allocated groups design proposals
Wednesday 22/09/99	6:40 - 7:00 pm	Review merits of design proposals Report week1 progress (individually)
Monday 27/09/99		Individually score the three design proposals
Wednesday 29/09/99	6:45 - 7:00 pm	Individually rank the proposals Report week2 progress (individually)
Monday 11/10/99	6:45 – 7:00 pm	Achieve final group consensus on rankings
Wednesday 14/10/99	6:30 – 7:00 pm	Conclude and enter final group rankings Report week4 progress (individually)

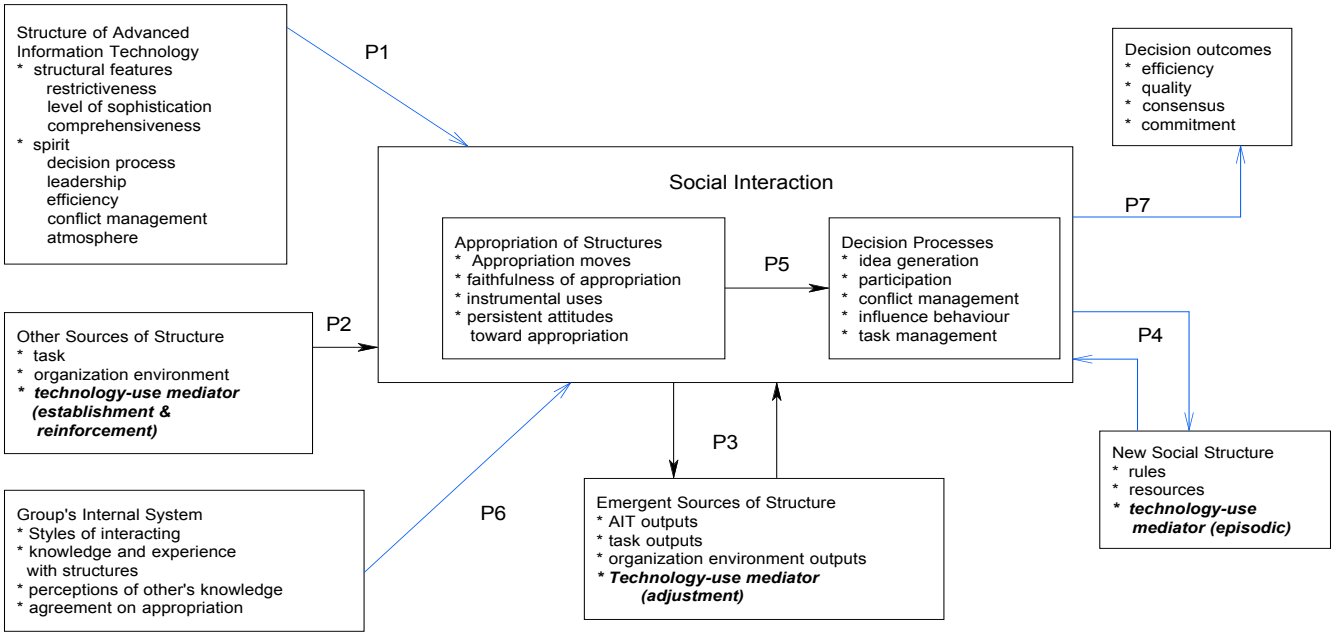
The trial proceeded more effectively this time, with active contributions from most participants, and six of the nine groups concluding with a joint ranking, reflecting differing degrees of consensus. Again some work between groups had occurred off-line via email, but many groups did use the public discussion area of the database to moderate effect.

There are a number of subtle ethical issues in projects of this nature. The work of oral face-to-face class groups is ephemeral unless recorded in writing. The work of electronic asynchronous groups generates a permanent record of contributors' work, which is stored in the database. Since this was an exploratory learning activity in which students were both co-learners and research "subjects", this project conformed to the AUT definition of a "research project" and thus required formal ethical and project approval. The ethical dimension had been addressed less formally in the course of teaching in the first trial, where students had been asked for consent to re-use their entries, which work formed the basis for the second trial.

A MODEL FOR FACILITATING COLLABORATIVE TELE-PROJECTS

The process of conducting collaborative Tele-projects seems to involve a hugely complex interplay of variables. Combined into an educational setting, they certainly defy simple classification. The limitations of experimental and hypothesis testing research based upon natural science methods make choice of research method a challenge. Action research is now actively used in practice settings to give researchers access to the process of educational change and different techniques for its evaluation [7], [8]. The research reviewed here has occurred within an action research framework, which involves cycles of action and reflection. In the course of this reflective process, and in an

attempt to better understand the dimensions of this form of learning, the Group Support Systems literature has been perused in search of suitable frameworks. An extension of Adaptive Structuration (AST) Theory [5], [6] has been adopted as a useful explanatory framework to enable some of the key elements of the facilitator's or (in this case) teacher's role to be identified. It is hoped that by applying this Extended AST (EAST) framework, the elements that must be given focus, how they interact, and what interventions are likely to be most effective may be explored.



P1. AIT's (Advanced Information Technologies) provide social structures that can be described in terms of their features and spirit. To the extent that AIT's vary in their spirit and structural feature sets, different forms of social interaction are encouraged by the technology.
P2. Use of AIT structures may vary depending on the task, the environment, and other contingencies that offer alternative sources of social structures.
P3. New sources of structure emerge as the technology, task and environmental structures are applied during the course of social interaction.
P4. New social structures emerge in group interaction as the rules and resources of an AIT are appropriated in a given context and then reproduced in group interaction over time.
P5. Group decision processes will vary depending on the nature of AIT appropriations.
P6. The nature of AIT appropriations will vary depending on the group's internal system.
P7. Given AIT and other sources of social structure, $n_1 \ldots n_k$, and ideal appropriation processes, and decision processes that fit the task at hand, then desired outcomes of AIT use will result.

FIGURE 1
SUMMARY OF MAJOR CONSTRUCTS AND PROPOSITIONS OF EXTENDED AST (EAST) MODEL. [5], [6]

As can be seen, this framework suggests a complex set of interactions which shape the use of *AIT's,* or in this case more specifically the use of *GroupWare* to support the collaborative trial. The extension to *AST* in the model above lies in the introduction of the role played by the *technology use mediator* [9], in this case the teacher as facilitator of the collaborative trial. This role is suggested to operate as:
1) an *Other Source of Structure* at the establishment of a trial, or to reinforce the modes of use that are desired by the participants;
2) an *Emergent Source Of Structure* during the trial itself, while the AIT is in use,
3) a means of bringing about a *New Social Structure* through episodic change

By using the above framework, we can conceive of a collaborative Tele-project via a classic input-process-output model, which is dynamic and non-deterministic, as is true of any learning situation, no matter our hopes and goals as educators. While the framework may not give us ready answers, it gives us a mechanism by which to study, change and better understand the elements of the process.