Young science community

Source: Craft, A. *et al* (eds) (2001) *Creativity in Education*, London, Continuum, p.184–7

This technology is not introduced discretely, but on a need-to-know basis. Initially the students use it as a graphics tool simply to draw the roaches, but gradually they are encouraged to enter questions onto the CSILE database, so that the Knowledge Forum can be used to support and scaffold their scientific thinking. As the work develops, students gradually enter

'...one or two pressing questions into the database. Questions ranged from, "What kind of food do they prefer?" to "What did cockroaches evolve from?" And because these questions were stored in a database, each child's question could be "heard" and resources gathered to support a child's pursuit of knowledge in a particular interest area. The students also found it very exciting to be adding notes to build up the database. In the course of a week 100 new notes had been entered!' (Caswell and Lamon, 1999, p. 143)

The database showed the students' questions falling into specific categories (see fig. 13.2: Cockroach database). These were used by Bev Caswell to inform the creation of small research groups, variously studying: perception, learning, communication, evolution and anatomy. A variety of other activities was integrated into the classroom setting, such as the collective composition of a cockroach song, the design and carrying out of real experiments, and visits to the Zoological lab to watch a dissection and meet expert zoologists. Finally each group contributed to the making of a cockroach documentary video. The reproduction group asked the Zoo lab for a female roach so they could film an experiment 'live'; the ecology group filmed food experiments they had carried out, whilst the evolution group wrote a script and dressed like scientists to film their section of the documentary.

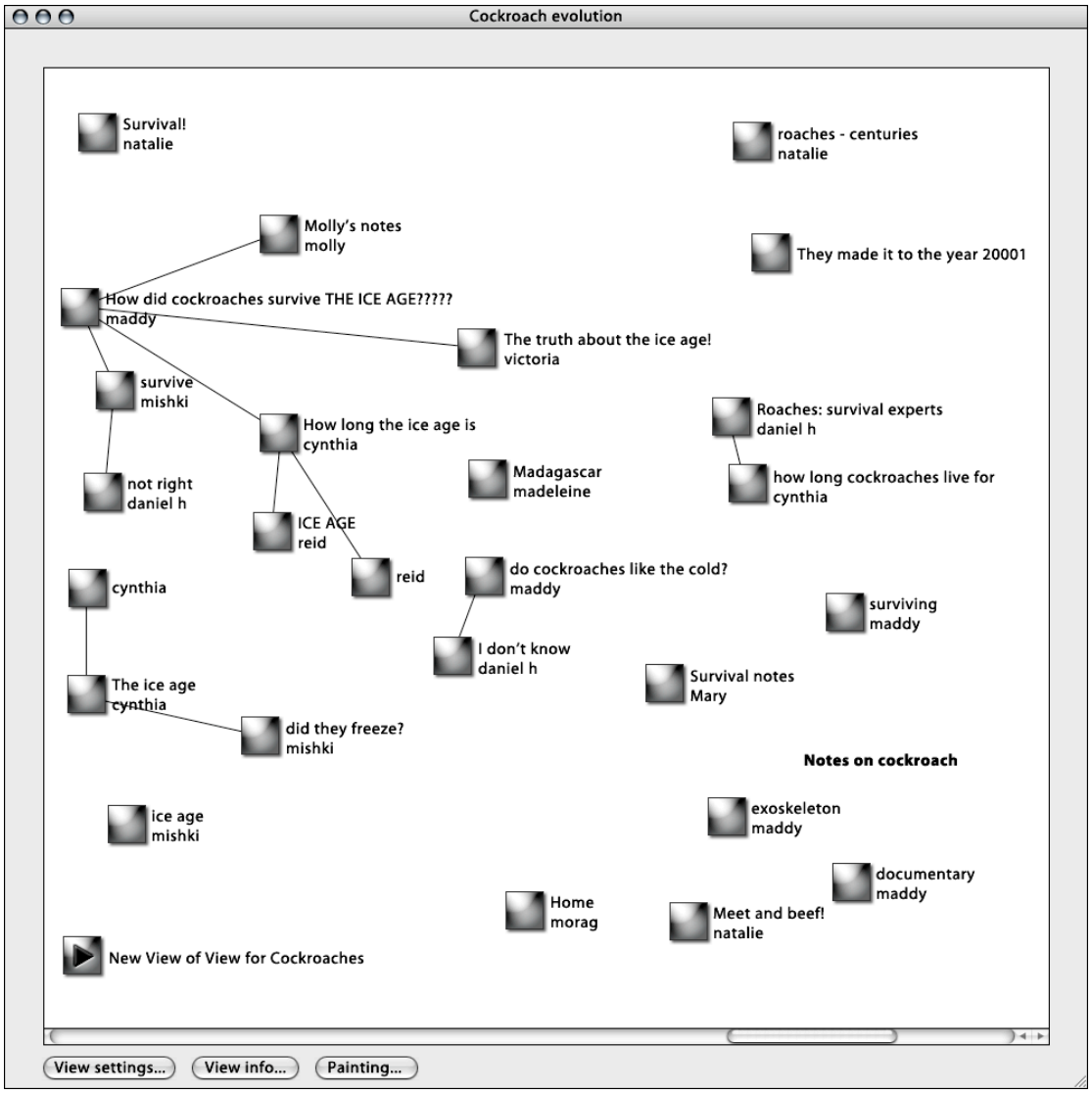

Figure 13.2: Cockroach database

The detailed student case studies gathered by a classroom researcher, Mary Lamon, document the progress and development of students' thinking across the ten-week period. For example, as a result of one student's curiosity after reading a book about the Ice Age, the evolution group decides to investigate 'How Did the Madagascan roaches survive in the Ice Age?' This problem is entered into the CSILE database and the group plan and carry out a real experiment, concluding: 'Cockroaches don't like hot areas, they like room temperature'. As a follow-up, Caswell invites a graduate student to give a lesson on the Ice Age which is followed up by new entries into the Forum. (See Figures 13.3, 13.4, 13.5 and 13.6.)

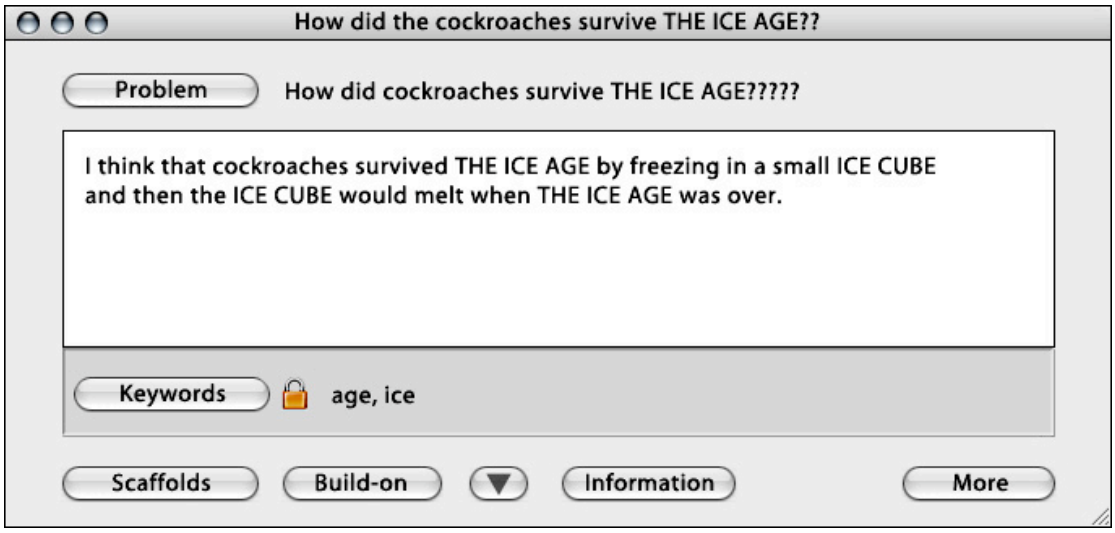

Figure 13.3: How did cockroaches survive the Ice Age?

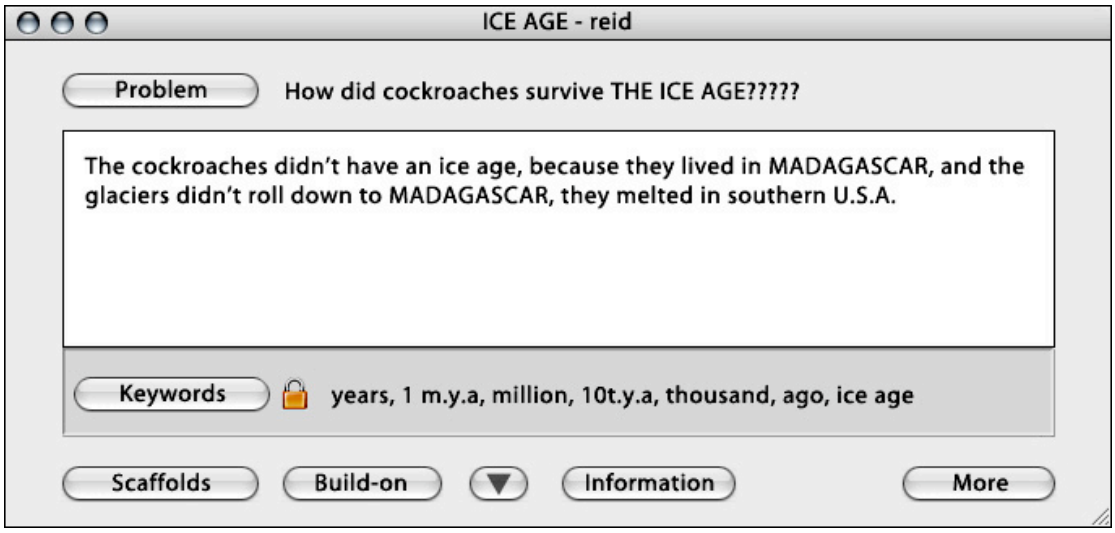

Figure 13.4: Ice Age – Reid

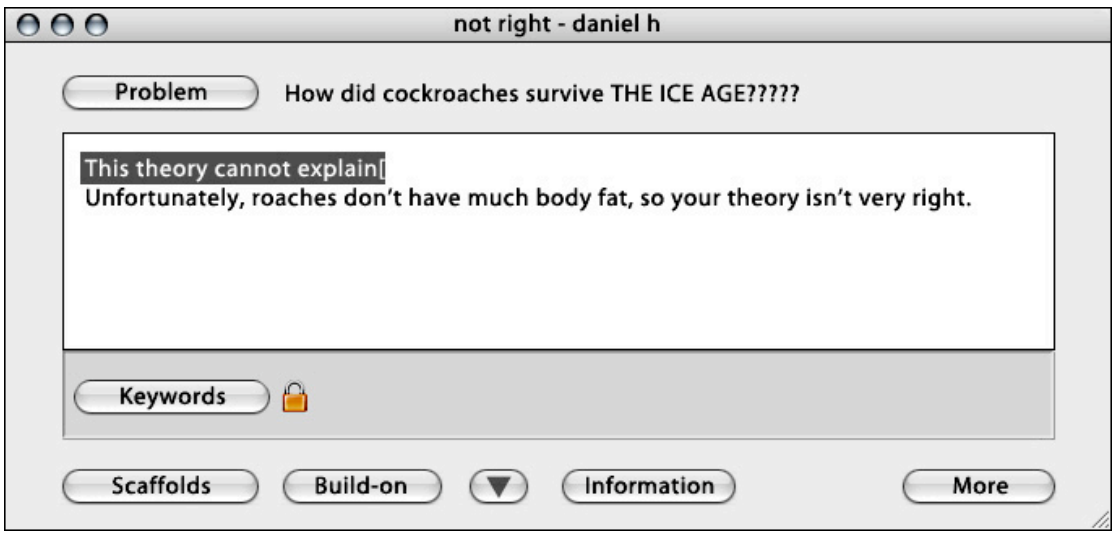

Figure 13.5: Not right – Daniel

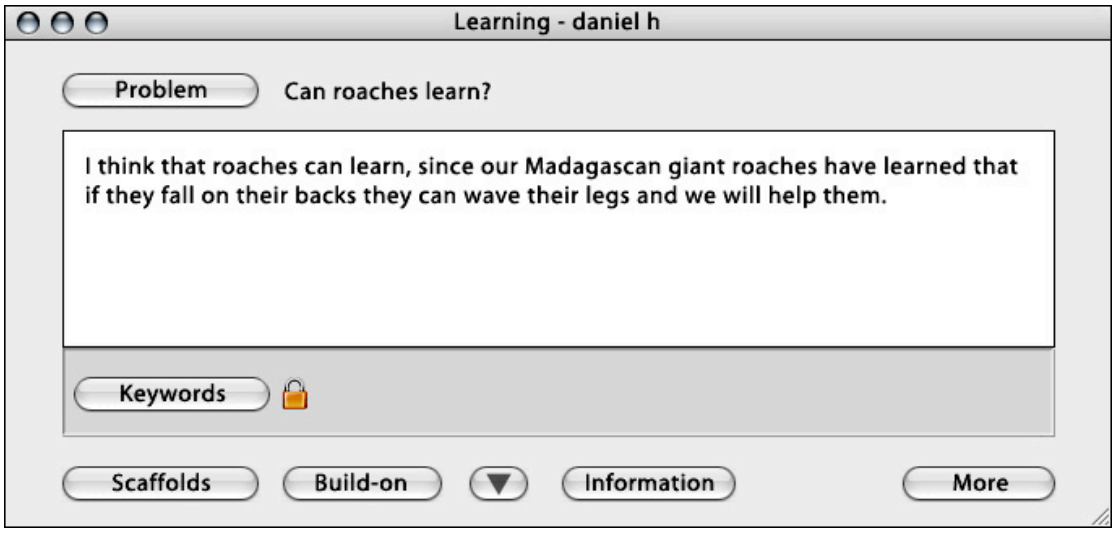

Figure 13.6: Can cockroaches learn?

Caswell is explicit about her intention to create a scientific community which can provide students with a variety of opportunities to reflect on ideas, to hypothesise and which allows for multiple ways of developing understanding. They believe that the understanding of 'deep disciplinary content' knowledge can only grow through a combination of individual as well as group learning activities, as well as through access to a wide range of human and other resources. As the young scientific community develops, both teachers and students become fully engaged and passionate about their new field of study. What is particularly distinctive about this community is the use of 'public forums', such as authentic research reports and the cockroach documentary. These convey to students that a creative process of knowledge building is of value both individually and for the group as a whole. On the visit to the Lab Caswell observed that the young students were no longer satisfied with superficial answers to questions, they wanted a 'Let's discuss our findings and pursue our interest together' approach, operating as a real scientific community outside, as well as within the classroom.

Technologies common to scientific laboratories, hands-on investigations, lab books, as well as the more complex Knowledge Forum software are integral to the work. The latter is pivotal to the whole project because it provides students with a cumulative database, as well as a means of recording information and ideas. It acts as a tool for making thinking explicit, encouraging creative thinking – the making of inspired hypotheses, the articulation of probing questions, the blending of others' findings with one's own, and the intensive attempt to solve authentic problems.

'My theory is that you are right that roaches can learn,' Daniel comments after one experiment. 'And I think you have a very good experiment. But how can your experiment proof tha (sic) roaches learn?'