Demo:

McBAGEL: A Shared and Structured Electronic Workspace for Problem-Based Learning

Roland Hübscher (roland@cc.gatech.edu, 404-894-9218)
Cindy Hmelo (ceh@cc.gatech.edu, 404-894-9104)
N. Hari Narayanan (narayan@cc.gatech.edu, 404-894-9104)
Mark Guzdial (guzdial@cc.gatech.edu, 404-894-5618)
Janet L. Kolodner (jlk@cc.gatech.edu, 404-894-3285)

EduTech Institute
College of Computing
Georgia Institute of Technology
Atlanta, GA 30332-0280

Abstract

Our approach to learning is based on the premises that learning is facilitated by generative problem solving, collaborative work on problems, and use of multiple cases; that knowledge construction and skill acquisition can be scaffolded through software; and that a computer environment which integrates a shared and structured electronic workspace can effectively support all of the above. McBAGEL (Multiple Case-Based Approach to Generative Environments for Learning) is a computer environment integrating many of these functions. McBAGEL has profited from the close interaction between its designers and its users: the middle school students and teachers. The first extended field tests of McBAGEL will be conducted in spring 1996 in several middle schools around Atlanta.

Hardware requirements

A Macintosh with a color monitor (14" or larger).

McBAGEL: A Shared and Structured Electronic Workspace for Problem-Based Learning

Our approach to learning is based on the premises that learning is facilitated by generative problem solving, collaborative work on problems, and use of multiple cases; that knowledge construction and skill acquisition can be scaffolded through software; and that a computer environment which integrates a shared and structured electronic workspace can effectively support all of the above. McBAGEL (Multiple Case-Based Approach to Generative Environments for Learning) is a computer environment integrating many of these functions. McBAGEL has profited from the close interaction between its designers and its users: the middle school students and teachers. The first extended field tests of McBAGEL will be conducted in spring 1996 in several middle schools around Atlanta.

We are calling this software an *electronic learning space*. Our goal is that it support both solving problems and learning from those experiences. The design is informed by problem-based learning (an educational methodology) and case-based reasoning (a cognitive theory).

McBAGEL serves several purposes. It provides shared space for record keeping, integrated access to support tools and workspaces, and a framework for attaching software-realized scaffolding. McBAGEL's major screen (Figure 1) provides easy movement between the workspaces supported by different tools, based on PBL's (Problem-Based Learning) white boards. As they are working on problems, students record facts of a problem situation, ideas (or hypotheses) about solutions, what needs to be learned or found out, and an action plan for moving forward. Students can easily connect together the entries in each of the columns and also annotate entries. When fully implemented, entries can also be linked to media that support them, such as spreadsheets, reports, simulations, or repositories on the world-wide web. Through the tools button, McBAGEL provides

access to collaboration tools, simulation tools, computation tools, design tools, resources, and writing tools, some specialized to the problem students are working on, some general purpose.

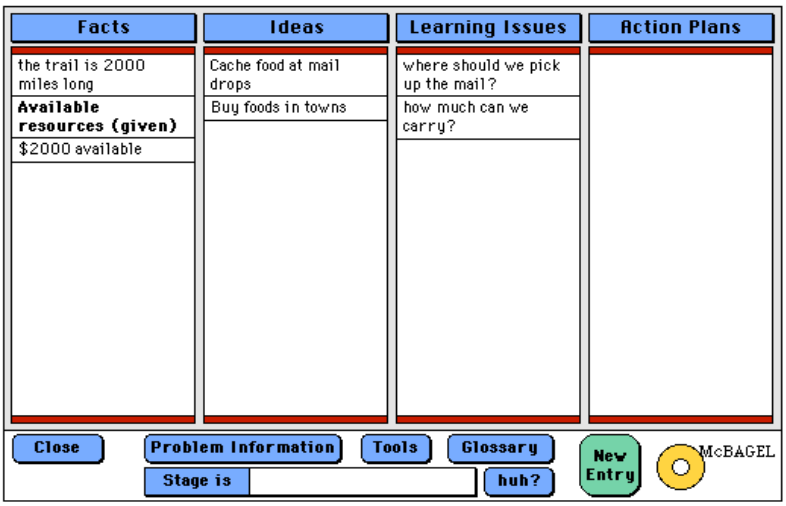

Figure 1: McBAGEL's main screen.

We envision students using McBAGEL in several ways. Sometimes they will work collaboratively around a computer, taking turns in the driver's seat in different collaborative sessions, filling in the columns of the record-keeping page and examining resources and/or running simulations together. Other times they will work individually, with access to recordings of the group's deliberations.

Scaffolding is implemented in several ways. The buttons at the top of the screen (Figure 1) are popup menus that provide subcategories for facts, ideas, etc., which can also be used to further structure the entries in the columns. The tools screen helps students select tools based on needed functionality. Our current focus of research is providing additional scaffolding for reflection and guidance through the problem solving stages.