Software Olympics

Thesis:

The capabilities of student computers has taken a critical step forward in the past two years as (i) 32-bit computers and operating systems become the norm for affordable student computers, and (ii) object-based, interactive programming languages and protocols are entering common. This raises the possibility that instructional software can be created which can operate on affordable equipment which can offer vivid simulations of the physical and natural world and vivid recreations of historic settings and objects. At present very few software products used for instruction do more than present indexes and displays. The interaction takes the form of choosing among pre-recorded media. This is the summer when software developers can take a giant step forward in developing products which permit vivid interactions with simulated devices, adventures in simulated cities, and provide other experiences which require continuous interaction on the part of the operator and which respond plausibly to operator commands. Opportunities will explode as RISCs enter consumer products next year.

One feature of the new software tools is that the objects developed can, in principle, be reused. A mass spectrometer developed for a physics lab can be imported and used in an adventure where a simulated submarine is sent to solve a mystery on the ocean bottom. A software model of 17th century London can be used as a backdrop for a recreation of Cavendish's experiments and provide appropriate context. The enterprise can be advanced if some thought is given to the interoperability standards by all participants. Given reusability, a reservoir of material can be created that can permit instructors to develop compelling instructional packages with much less effort than would be required if all objects were created from scratch. The kernel of such standards has already emerged through such tools as VRML and Java.

The Presidential Software Sweepstakes [OK OK so invent a better title]

To jump-start the process, a series of teams would be charged with developing an interactive environment that would provide the basis for a series of contests at the end of a summer. Each team would be sponsored by a university and industry consortia which would supply training for the participants and possibly a site and donated or loaned computers. Clearly some participants could work at school or at home much of the time. The White House would provide a forum for the final contests and some virtual awards.

During a 2-3 month summer project, each team would be expected to provide the framework for a simulated contest which would include the following elements:

-- a complete simulated environment based on physical reality with documentation embedded in the environment. The environment could be a national park, an ancient city, the solar system, the interior of a cell.

-- an adventure which participants could either compete with each other or compete in scores. This could be a race of simulated clipper ships across a stormy Atlantic. Solving

a crime in 18th century Williamsburg. A contest between operators of a simulated hawk and operators of a simulated rabbit. A race to construct a simulated bridge over a river using the materials at hand (including equipment to measure material strengths and test designs). A virtual theater performance contest using avatars as actors.

-- the environment and objects in the environment would be reusable objects that meet a set of agreed standards.

-- the objects would be "peer reviewed" by the university community and contain some kind of agreed-upon internal documentation as a standard object element.

Objectives:

1. generate ideas for using simulated environments and other advanced software tools to create compelling learning tools
2. provide an environment which combines experts in the subject matter to be taught with people skilled in advanced software development
3. teach students and instructors new tools for creating software products
4. test methods for ensuring the reusability and interoperability of objects developed as environments are generated
5. provide a legacy of reusable objects which can form the base of a growing market/exchange of peer-reviewed objects for instruction
6. stimulate national interest in advanced software tools for learning
7. have a ball