CONCEPT MAPS IN INTELLIGENT TUTORS FOR PROGRAMMING*

STUDENT POSTER ABSTRACT

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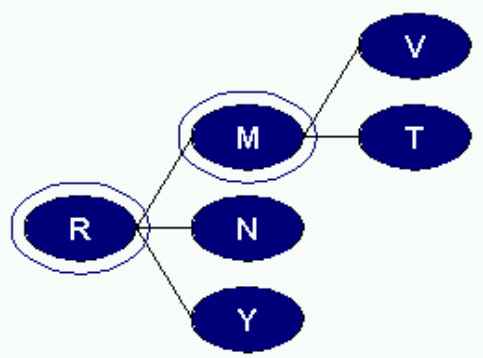
At Ramapo College of New Jersey, intelligent tutors, called problets, are being developed for programming concepts. We want to integrate concept maps into these tutors. They will be used for discovery learning, active learning, navigation, problem selection and to open the student model.

Discovery Learning: In problets, students explore a concept map that has already been built for them. They click on a leaf node to expand its children (if any) or click on an intermediate node to collapse its subtree. Initially the tree can be displayed to any depth.



Active Learning: In problets, we plan to have the user build their own concept maps. Currently we provide the students with a list of concepts (in the form of nodes) and have them connect the nodes, thus creating the relationships between the concepts. These features should improve the student's structural knowledge. We plan to test this hypothesis.

Navigation: Concept maps can help with navigation in the tutor by allowing the user to go from a node in the tree directly to the concept he/she wants to review. They can direct the user to a section where he/she can read about the specific concept, practice solving problems or get tested.

Open Student Model: Concept maps can also be used to open the student model to inspection. In the concept map, each node is shaded proportional to the level of proficiency of the student on the concept. For example, if the student is working on *loops* consisting of *for*, *while* and *do loops*, as soon as he/she has finished *for loops* the *loops* node is shaded 33%.

Problem Selection: Concept maps can be used to let the user choose the concept on which to solve the next problem. Since each node represents a concept, the student can clearly see the concepts that need additional practice and click on the corresponding nodes. The student is not done until all the concepts are learned, i.e., all the nodes are shaded a minimum of say, 70%. Will giving the student the power to select the next problem rather than deciding it for him/her help improve learning or the pace of learning?
