ABSTRACT

Comprehending complex object-oriented software systems is a major factor in successful evolution of computer systems. For years, researchers have tried to understand the program comprehension process and how the level of expertise is influenced by it. This paper examines the effectiveness of animation on student understanding and proposes a three-step modeling to be used in software development related to program analysis and design. We also define object-oriented information types on program comprehension, associated to extraction of program entities and relationships from the source code. The results show the importance of appropriate utilizing of animations; the soundness of the proposed three-step modeling in analysis and design of real-life objects; and the accuracy of the formulated information types in assessing the student knowledge and understanding. We propose and study several teaching strategies, involving the proposed approaches and presenting the object-oriented paradigms, which lead to improved student performance in object oriented programming, and enhance student understanding and learning.