ABSTRACT

Currently, computer-based education becomes more popular and much research has been done to produce a better and effective educational system in enhancing the student's ability to learn. This project is focused on developing Intelligent Tutoring System (ITS) for learning vector in mathematics. A domain knowledge, student knowledge and pedagogical knowledge modules are included in ITS. Mathematics is an important subject to be learnt for almost any field of learning beginning from primary school up to tertiary education. Mathematics topics such as Vector and Mechanics are more difficult to learn compared to topics like Algebra and Trigonometry. Usually, many students encounter difficulties in understanding vector and solving problems in the topic. They have difficulties in applying vector concepts in a variety of problems pertaining to various application areas. Students misinterpret the statements of the problems and their inability to visualize the direction of the vector results in major miscalculation. ITS developed here which is known as VECITS allows students to learn the concepts of vector and improve their learning by providing a domain knowledge section and tutorial section. In the domain knowledge section, the system explains the theory of vector and gives a better understanding in a particular subdivision of the topic. In the tutorial section, students are asked to input the answer and the system will diagnose the answer line by line and gives an immediate response as to whether the answer is correct or not. If the answer is incorrect, the system will explain the error and instruct them what they are supposed to do next. When the correct answer is obtained, the student is instructed to proceed with the next stage of solving the problem or if the final stage is reached, he is congratulated and the student can attempt the next problem. The system will guide the student to answer the questions by providing help tutor and hint. The student has to continue answering the particular question until he gets the correct answer. With this multimedia courseware, whereby animation in colour is used to depict the situation involving vector theory, the traditional roles of teachers and learners are being changed. Individualised tutoring with a two-way feedback is provided. VECITS is able to monitor the student's performance and provide guidance towards the correct solutions of the problems.