AN APPLICATION OF MINING TECHNIQUE IN AN INSTRUCTION-EVALUATION SYSTEM

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ABSTRACT

IT IS HIGHLY EXPECTED TO IMPROVE THE EFFECTIVENESS OF LEARNING FOR USERS THROUGH A COMPUTER-AIDED INSTRUCTION SYSTEM (CAI) WHICH INCORPORATES ARTIFICIAL INTELLIGENCE (AI), LEARNING STRATEGY AND LEARNING MODEL. UNFORTUNATELY, MOST CAI SYSTEMS CANNOT GUARANTEE THE PROMOTION IN LEARNING FOR EACH SINGLE USER EVEN THOSE ADOPTED LEARNING STRATEGIES AND MODELS DESIGNED BY DOMAIN EXPERTS DELIBERATELY. SOME POSSIBLE REASONS HAVE BEEN REPORTED: (1) MISCONCEPTS FOR LEARNING COULD BE EMBEDDED WITHIN TUTORIALS; (2) QUESTIONS FOR EVALUATION ARE INAPPROPRIATELY DESIGNED IN DIFFICULTY. THIS STUDY TRIED TO OVERCOME THOSE PROBLEMS OF CAI SYSTEMS BY BOTH USING DATA MINING TECHNIQUE AND DESIGNING EVALUATION QUESTIONS OF FIVE-LEVEL DIFFICULTY. AN EXPERIMENT WAS DESIGNED TO COLLECT THE LEARNING TRAVERSALS OF STUDENTS OF JUNIOR HIGH SCHOOL TO USE A CAI SYSTEM. TO ANALYZE THOSE RECORDED LEARNING TRAVERSALS, SOME IMPLICIT BUT IMPORTANT CHARACTERISTICS OF THE CAI SYSTEM COULD BE ILLUSTRATED, INCLUDING IMPROPER SYSTEM PARAMETERS, INCOMPLETE TUTORIAL, MISCONCEPTS, SPECIAL RELATIONS BETWEEN TWO CONCEPTS FOR LEARNING, ETC. FURTHERMORE, THOSE FOUND SPECIAL RELATIONS BETWEEN CONCEPTS ARE VERIFIED BY COMPARING TO SOME KNOWN "ERROR PATTERN RELATIONS" BY HUMAN EXPERTS. THUS, THE PERFORMANCE OF A COMPUTER-AIDED INSTRUCTION SYSTEM COULD BE GREATLY IMPROVED BY FOLLOWING THE ANALYSIS PROCEDURE DESCRIBED IN THE RESEARCH.

Keywords : COMPUTER-AID INSTRUCTION SYSTEM, DATA MINING, SESSION PATH, SEQUENTIAL PATTERN, ERROR PATTERN RELATION

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