

## **Ontology-Based Recommender System for a Learning Sequence in Programming Languages**

### **ABSTRACT**

The same learning process in educational systems could be boring and time consuming for some learners. This problem arises from the lack of personalized learning sequence for learners with different knowledge level. Recommender systems play an important role in assisting the learners to find suitable learning materials and personalized learning sequence. Use of ontology for knowledge representation in knowledge-based recommender systems would facilitate sharing, reuse and common terminology. Since programming concepts have logical relationships among together so, traditional education systems are more stressful and very time-consuming. This paper aims to propose an ontology-based recommender system to present a Personalized Learning Sequence in Programming (PLSP) domain which is depended to learner's knowledge level. A recommender module and, the knowledge base module are integrated together in the proposed framework. The recommender module as the main module in the framework, has three stages which is working based on semantic rules and ontology representation. Evaluation of the system was carried out by comparing the non-recommender system (web-based search) using 32 ICT respondents. Results demonstrate that the participants who used the proposed system spent 1119 seconds to find the suitable learning path in comparison to those who used a non-recommender system (3480 seconds) in the same learning material. It means that learners who follow learning path with PLSP, are more suitable for them. Furthermore, the average mean value of usability test is 4.47, (5 maximum scale) which indicates that the system proved to be useful, was easy to use, and satisfied the users.