

## Abstract

E-learning and learning management system (LMS) has become one of the solutions that can overcome the time and space limitations problems in the learning process. But in fact, both of these have not been able to deal with the differences in the characteristics of learners whose given the same treatment by their teachers. Each individual has characteristic of their own and also have different learning styles. In addition, each individual has a working memory capacity (WMC), which allows them to receive and store information within a certain period. WMC level can be different for each individual. Past research has shown that the quality of learners will increase if the learning style and WMC that they have adapted to the treatment of teachers in providing materials and others. Learners' learning needs that are not fulfilled can lead to difficulties to understand the material and decrease the evaluation results

Therefore, in this study, learning management system is created and can meet the needs of learners in the learning process that is adapted to the learning style and WMC which they belong. This study consists of several phases or methodology, such as analysis system design, implementation in experiment form and evaluate the result of experiment. In this LMS, literature-based approach is implemented that can detect the behavior of learners while using LMS. Then the system can process behavior pattern and produce personalized content in the form of adaptive presentation adapted to the learning style and working memory capacity.

In the experiment, the students are given two different treatments, the learning material is given without adaptive learning system and learning material is given with the implementation of adaptive learning system that is adapted to their learning style and WMC. Based on the test results by the experiment, it can be seen that the results of the evaluation of learners after getting an adaptive learning system is better than the results of evaluation of students without getting an adaptive learning system as indicated by a score of  $t = -6885$  on testing using the technique of paired samples t-test. Moreover, the significance of the test is less than 0.05 which indicates that there are differences in the results of the evaluation of learners after being given an adaptive learning system than without adaptive systems. From the test results, it can be concluded that with the results of recommendation and personalization of content, the differences in the character of learners can be addressed and the quality of their learning and teaching can also be enhanced.

**Keyword:** learning style, working memory, adaptive presentation