Non-obtrusive Determination of Learning Styles in Adaptive Web-Based Learning

Robert O. Oboko, Peter W. Wagacha, Elijah Omwenga, and Ziki Odotte, School of Computing and Informatics, University of Nairobi, tel no +254 4444 919
Email {roboko, wagacha, eomwenga, zodotte}@uonbi.ac.ke

Arno Libotton
Faculty of Psychology and Educational Sciences, Free University of Brussels tel no +32, Email arno.libotton@skynet.be

ABSTRACT

The Internet has revolutionalized the lives of people around the world. Many services have become available courtesy of the Internet. One of these services is web-based learning, which is now being used to educate students in schools and colleges as well as for staff training in organizations and for lifelong learning - anybody can participate in web-based learning. Clearly, the people who use this service are diverse and therefore there is need to incorporate an adaptive dimension to the web-based educational media, in efforts to address individual differences. Adaptivity is made with regard to different learner traits such as cognitive styles, learning styles, level of knowledge and the learner's attitude. In the case of learning styles, there are many learning style models existing. One of them is the VARK model, which encourages the provision of appropriate multi-media content to the learner. Learning styles for different people are usually determined using learning style questionnaires. But the learning style of a learner can vary over time as learning with

hypermedia goes on. Therefore, in this research, an intelligent computer program based on a machine-learning algorithm called Naïve Bayes Classifier was used to accurately predict a learner's learning style at any point in time during learning with 83% accuracy. This made it possible for the web-based system to provide learning depending on a learner's current learning style, hence improving various aspects of learning.

***Key words**: Learning styles, learner model, machine learning for learner modeling, web-based learning, adaptivity, instructional design*