# Effects of Ubiquitous 360° Learning Environment on Clinical Histotechnology Competence

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**Abstract :** Rapid technological development and digitalization has affected also on higher education. During last twenty years multiple of electronic and mobile learning (e-learning, m-learning) platforms have been developed and have become prevalent in many universities and in the all fields of education. Ubiquitous learning (u-learning) is not that widely known or used. Ubiquitous learning environments (ULE) are the new era of computer-assisted learning. They are based on ubiquitous technology and computing that fuses the learner seamlessly into learning process by using sensing technology as tags, badges or barcodes and smart devices like smartphones and tablets. ULE combines real-life learning situations into virtual aspects and can be flexible used in anytime and anyplace. The aim of this study was to assess the effects of ubiquitous 360 o learning environment on higher education students' clinical histotechnology competence. A quasi-experimental study design was used. 57 students in biomedical laboratory science degree program was assigned voluntarily to experiment (n=29) and to control group (n=28). Experimental group studied via ubiquitous 360o learning environment and control group via traditional web-based learning environment (WLE) in a 8-week educational intervention. Ubiquitous 360o learning environment (ULE) combined authentic learning environment (histotechnology laboratory), digital environment (virtual laboratory), virtual microscope, multimedia learning content, interactive communication tools, electronic library and quick response barcodes placed into authentic laboratory. Web-based learning environment contained equal content and components with the exception of the use of mobile device, interactive communication tools and quick response barcodes. Competence of clinical histotechnology was assessed by using knowledge test and self-report developed for this study. Data was collected electronically before and after clinical histotechnology course and analysed by using descriptive statistics. Differences among groups were identified by using Wilcoxon test and differences between groups by using Mann-Whitney U-test. Statistically significant differences among groups were identified in both groups (p<0.001). Competence scores in post-test were higher in both groups, than in pre-test. Differences between groups were very small and not statistically significant. In this study the learning environment have developed based on 360o technology and successfully implemented into higher education context. And students' competence increases when ubiquitous learning environment were used. In the future, ULE can be used as a learning management system for any learning situation in health sciences. More studies are needed to show differences between ULE and WLE.

**Keywords :** competence, higher education, histotechnology, ubiquitous learning, u-learning, 360o