

Application for Enhancing Student Experience in Laboratory Teaching

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We have developed a web based application to improve demonstrating and assessment practice in a laboratory environment. This has been used successfully for the last two years in delivering teaching for SPA4321 – Introduction to C++ Programming and for SPA4601 - Professional Skills for Scientists in the School of Physics and Astronomy. Demonstrators are equipped with inexpensive tablets to access the web-based application and use them to perform in class assessment during lab sessions.

Assessment



Demonstrator View

Provides a list of students to be visited
Ordered from top-left to bottom-right by attainment
No. of visits recorded, time since last visit displayed
Encourages pro-active demonstration
Ensures students don't get "missed"

Demonstrators use tablet (7")
Simple workflow in lab
Visit monitoring
Intuitive touch interface
Minimizes training required



Assessment



Category view

Provides list of assessment categories
Shows current achievement – shaded stars
UI to record visits

Skills based assessment
Multiple tries allowed
points awarded when competence shown
Instant Feedback
helps direct student learning for next session



Assessment view

Pop-up shows elements of assessment in category
Shows current achievement with shaded stars
Text serves as reminder to demonstrator



Future work

Finish student view
Allow multiple modules (global admin view pictured)
Improved admin interface (add/remove students etc)
Assessment designer
Expand usage beyond SPA and central hosting

A php application served by Apache provides RESTful access to a MongoDB database – running on a secure virtual machine provided by SPA. The client is a JavaScript application built on the AngularJS platform. Authentication is handled via idcheck integration. The application and assessment data are cached on the device and survive loss of power and network connectivity – ensuring that assessment is not impacted by temporary losses of WiFi or operator error. Physical security is maintained by distributing devices at the beginning of a session and collecting them at the end. We gratefully acknowledge the support of the Drapers' Fund for Innovation in Learning and Teaching in the further development of this application.