

SUPPORTING BOTANICAL LITERACY IN THE UNDERGRADUATE SCIENCE CURRICULUM AND BEYOND WITH A BESPOKE CAMPUS APP

Lachlan Pettit, Matthew Pye, Xiaolong Wang, Rosanne Quinnell

Presenting Authors: Lachlan Pettit (lpet2422@uni.sydney.edu.au) and Xiaolong Wang (bio.eru@sydney.edu.au)
School of Biological Sciences, Faculty of Science, The University of Sydney, Camperdown NSW 2006, Australia

KEYWORDS: botanical literacy, mobile technologies, botany, biology teaching and learning

BACKGROUND

For almost 100 years it has been acknowledged that the participation in the study of plants at university level has been in decline (Nichols 1919, Hershey 1993, Uno 1994, Drea 2011). It is unlikely that there is a single cause to which this decline can be attributed, however new and emerging biology disciplines (genetics, genomics, proteomics, molecular biology) have impacted on the amount of Botany being taught and when given a choice of using plants or animals to illustrate a concept animal examples dominate (Hershey 1996). This botanical underrepresentation is considered cyclic in that less interest in botany generated at the undergraduate level will lead to fewer educators with sufficient botanical knowledge, in turn leading to again lower levels of botanical representation (Hershey 1993, Uno 1994). At the University of Sydney, we are offering a revised botany curriculum where the number of units of study dedicated to the study of plants has been reduced by half. In the Botany curriculum we now offer, it is crucial to offer maximum engagement with all aspects of Botany and this includes improved engagement with the plants on campus.

DESCRIPTION OF INTERVENTION

We have developed an app that presents an annotated map of the campus vegetation that can be aligned to the undergraduate biology curriculum. Each plant included in the map is described and phylogenetic information is provided. We have created an illustrated botanical glossary to further support learning *'in situ'*, that is learning not only 'just in time' but 'just in place'. Critically, this intervention included undergraduate student participation and the 'proof of concept' – the web-based version of the intervention- was a project undertaken by Lachlan Pettit as his project for Advanced Botany (BIOL2923). We are cognizant that developments such as these that exploit mobile technologies have enormous potential to present the importance of plants in a number of frames beyond the purely scientific. With this in mind, we are ensuring that the app design is aligned with a scientific phylogeny and that the design can be extended to include indigenous phylogenies and links to national initiatives such as Climate Watch. Mobile technologies are improving, especially mapping resolutions.

TECHNICAL SPECIFICATIONS OF THE APP

iOS app:

Development Environment: Xcode 6 & Swift
Target devices: iPhone 4 and above
Main features: Plant mapping, navigation, plant information, slideshows
Frameworks: *Foundation, CoreGraphics, UIKit, MapKit*

Web app:

Architecture: *HTML5 + CSS3*
Target devices: Mac, PC, Mobile devices
Main features: Plant mapping, plant information, slideshows, integrated quiz, glossary of terms

CONCLUSIONS

Through a blend of good design and innovative mobile technologies we hope to increase botanical awareness and reconnect people with the plants around them. We have high expectations that by using the app to investigate the diverse campus flora we can engage students more effectively. As this project is taken forward it will align with the University of Sydney's Aboriginal and Torres Strait Islander integrated strategy: Wingara Murra – Bunga Barrabugu.

ACKNOWLEDGEMENTS

We thank the School of Biological Sciences for the Summer Scholarship awarded to Lachlan Pettit in 2013. We thank the staff of the Grounds Unit, Facilities Management and Services, University of Sydney for access to ArborPlan.

REFERENCES

- Drea, S. (2011). The end of the botany degree in the UK. *Bioscience Education E-journal*, 17. Retrieved June 9, 2014, from <http://journals.heacademy.ac.uk/doi/full/10.3108/beej.17.2>
- Hershey, D.R. (1996). A historical perspective on problems in botany teaching. *The American Biology Teacher*, 58(6): 340-347.
- Nichols, G.E. (1919). The general biology course and the teaching of elementary botany and zoology in American colleges and universities. *Science*, 50: (509-517).
- Uno, G. E. (1994). The state of precollege botanical education. *The American Biology Teacher* 56(5): 263-267.

Proceedings of the Australian Conference on Science and Mathematics Education, University of Sydney, Sept 29th to Sept 30th, 2014, page 71, ISBN Number 978-0-9871834-3-9.