

# ENHANCING THE QUALITY OF INDEPENDENT STUDY ON PLACEMENT:

## Development of a mobile learning toolkit to enhance bioscience learning in health care settings

It is vital to employers that health care graduates have the skills to work effectively in clinical settings. A working knowledge of physiology and bioscience is considered an essential basis for safe and effective practice (Nursing and Midwifery Council (NMC), 2010; National Institute for Clinical Excellence (NICE), 2007). Yet research over decades repeatedly suggests that health care students often experience difficulty understanding and applying bioscience knowledge in practice (Davies *et al.*, 2010; McVicar *et al.*, 2013).

At BCU we undertook a study in 2010 to investigate nursing students' perceptions about learning bioscience (Fell and James, 2012). The results from this study, alongside feedback from National Student Satisfaction surveys, backed up findings in the literature and highlighted the need to incorporate more active and applied teaching methods to support student learning of bioscience not only in the classroom but also within the clinical setting.

Colleagues within Health the Sciences Department therefore have been seeking ways to address how best to support students in *all* learning environments, particularly during the period those students are out on placement. Approximately half of the curriculum is taught out in clinical practice and we wanted to find a means to enhance the quality of independent study during placement time.

A revolutionary change has occurred in mobile technology usage over the last couple of years. Mobile devices have become ubiquitous and it has even been reported that mobiles will overtake fixed internet access by 2014 (Bosomworth, 2012). With such substantial development in smart/mobile communication devices and mobile application platforms in recent years, a range of these technologies are being currently used by students to support their directed and independent learning activities (Bowen & Matthew, 2012). Whilst there is much literature which supports the use of mobile learning in general education, there is less research to support its use in the healthcare setting. The literature to date has focussed on the use of mobile technology for clinical skill acquisition and indicates a potential niche for active learning in the clinical arena, as well as providing an exciting innovative and creative way to learn and engage with learning (Clay 2011; Casebourne, 2012).



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### The 'Mobile Application Learning Toolkit' (MALT) Project

The MALT project aims to develop and evaluate a mobile learning toolkit of applied bioscience resources consisting of an electronic web based App and associated laminated lanyard cards in order to help students acquire and consolidate physiological knowledge and apply it in practice.

Lanyard cards, containing key facts, are included as part of the toolkit to enable students to access resources whilst in a clinical setting where technology may not be available. QR codes, located on the lanyard cards, will provide direct links to the more detailed information available on the web based app. Consequently, the electronic app and laminated lanyard cards can be used independently or with in conjunction with each other.

It is hoped that the project will provide information on the potential of both electronic and non-electronic forms of mobile learning to enhance student engagement with the learning process within the healthcare setting. This project therefore represents exciting new frontiers in pedagogy and addresses a very clear need as identified in the literature.

Partly funded through the Higher Education Academy Departmental Teaching Development Grant scheme, the project involves close collaboration between health scientists, academics, health professionals, student partners and TETL learning technologists to name but a few!

### What are health care students' views on mobile learning?

As an initial step we undertook a survey to explore what our students' views were on the use of mobile technologies for learning and what design features they would prefer in an electronic App.

Questionnaires were completed by 219 healthcare students from three undergraduate programmes: BSc Nursing (n=109), BSc Speech & Language Therapy (SLT) (n=62) & DipHE Operating Department Practitioners (ODP) (n=48).

The findings from this survey clearly show that a high percentage of students are familiar with mobile technology. On average 81% of students regularly accessed the internet through mobile technology. Familiarity with Apps was also evident with 91% of health care students downloading and using an App for their phone, computer or tablet

Preferred Learning Style/Design Features Identified	Design Features Incorporated in Toolkit
Visual forms of learning preferred by a majority of students (75% (ODP), 65% (SLT), and 56% (Nursing)).	Diagrams, animations and videos feature heavily within toolkit.
64 % of students considered the ability of the app to be interactive as very important.	The app contains an option in all sections for students to complete interactive activities.
86% required an app which is easy to navigate.	Learning technologist have designed the app to be user friendly. This requires confirmation through evaluation to ensure students find this to be the case.
Opinion was divided as to whether an app should contain brief notes (47%) or more detailed content.	The app contains an option for more detailed information and also includes flashcards which contains key points only.

Table 1. Preferred design features identified in survey

and 64% of students reporting using Apps on a day to day basis. Nonetheless, only 20% of students reported using physiology related 'Apps' to learn or understand the concepts of A&P. This highlights the potential value of developing an app specifically applied to bioscience in healthcare.

Key features students identified in aiding their learning are highlighted in table on the previous page. You can also see how these findings have informed design features of the mobile learning toolkit.

### **Mobile Learning Toolkit Design**

So what does our App contain, what does it look like and how have we incorporated these design features into the app?

The Bioscience App allows students to review aspects of physiology and bioscience, consolidate such knowledge by engaging with a range of activities to test understanding, as well as the opportunity to review additional case studies to assist with applying such knowledge.

### **Content**

The pilot toolkit is based around the respiratory system and contains sections relating to key physiological principles, pathophysiology of common disorders, pharmacology of medicines and reviews the physiological basis of common diagnostic tests.

Case studies are provided to help students apply physiology to practice. The case studies have been developed in conjunction with qualified health professionals. Where possible the data has been taken from real cases including audio recordings of real patients talking about their condition.

For students who prefer more information on topics, the main body of the App contains comprehensive notes, together with diagrams, animations & videos. Pop up clinical points are

interspersed throughout to help students apply this knowledge to practice and audio clips are incorporated into each section so that students can choose to listen to the content if desired. These were recorded by student partners.

For students who prefer short succinct key points however, we have included flashcards within the electronic App. These are also available as laminated lanyard cards.

### **Activities**

The electronic version of the App contains a range of interactive activities for students to access within each section. These include quizzes including MCQs, true / false, missing word, matching pairs & list sorting exercises. In many of these activities students can review their answers.

### **Student Engagement**

This has been very much a collaborative effort with students playing a key role in project development. Three student partners from across the professions (one nursing, one SLT & one ODP) have been involved as partners through the student opportunity scheme. Their roles have included inputting into the design and development of the resources, particularly in relation to the quizzes and also in the initial research aspects of the project. They presented their work alongside academics at the HEA Health & Social Care conference in May and have contributed to internal and external publications.

### **Where Next?**

A pilot toolkit, focussing on the respiratory system, is currently in development and is due to be completed by January 2014. At this point we will be undertaking an evaluation of this mobile resource. A sample of BSc (Hons) Nursing and DipHE ODP students will use the toolkit whilst they are out on placement. Evaluation will consider

both the efficacy of the toolkit in terms of student engagement (via usage data, questionnaire and focus group interviews) and also in terms of acquisition and application of knowledge (via randomly controlled pre- and post-tests).

Mobile learning offers the potential for the introduction of more dynamic and creative learning and teaching both on and off campus.

We await the results of the evaluation with interest to ascertain if students feel that the bioscience mobile learning toolkit does actually enhance their learning whilst on placement.



## Acknowledgements

### MALT Project Team Include:

#### Academic partners:

Dr Patricia Fell  
Dr Salim Khan  
Dr Pat James  
Dr Vivek Indramohan

#### Student partners:

Victoria Lynne; BSc Nursing  
Carrie Munroe; BSc SLT  
Bernadette Smith; ODP

#### Academic advisor & animator:

Roger McFadden

#### Clinical advisors:

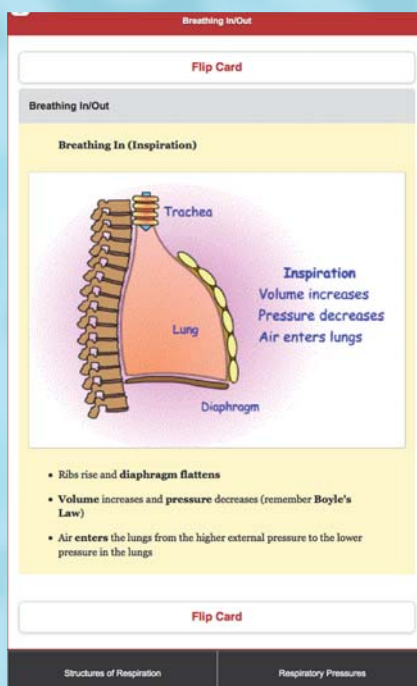
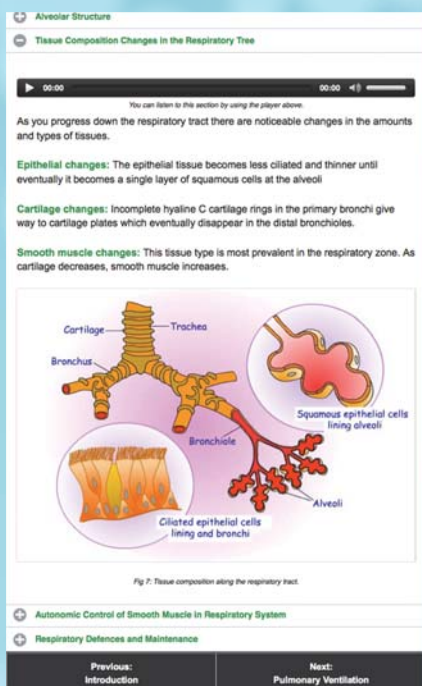
Nicky Taylor; (Advanced Nurse Practitioner Primary Care)  
Alex Harmer

#### Learning Technologists:

Mark Hetherington; CELT  
Dario Faniglione; CELT

#### Videos:

Tom Warrender; Classroom Medics



Screen shots of the MALT web app: clockwise from top left; home screen, video content, Audio and image content, and flash card content