

**The Design, Development and Evaluation of  
an Online, Interactive, Formative Assessment Tool  
for Medical Education**

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## **Abstract**

Rapid changes in medical practices used across the world over the last twenty years have led to significant issues in allowing medical students' access to patients with commonly occurring conditions. Equally significant changes in medical education systems have stressed the need for more authentic, problem solving curricula. One of the methods that can be used to address this apparent discordance between education and clinical practice is the use of technology to give students access to pedagogically sound learning activities.

Online formative assessment using case-based scenarios provides students with the ability to assess their own progress in their studies in their own time and at their own pace. Supplemented by sufficient relevant images and video, students can experience an authentic means of assessment that can be used to complement their ward-based education.

This thesis discusses the need for such online formative assessment systems and details the design, development and evaluation of such a system. The conclusion from this research is that with appropriate assessment strategies, students can be motivated to use online formative assessment for learning activities. It will be shown that there is sufficient evidence to suggest that such systems can be used to improve student outcomes in their field of interest, in this case Surgery.





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## Declaration

Candidate: Edward Palmer  
Student Number: 1065043  
Award: PhD  
University: University of Adelaide  
Faculty: Health Sciences  
School: Medicine  
Principal Supervisor: Associate Professor Peter Devitt  
Associate Supervisor: Professor Geoffrey Crisp  
Date: 18/12/2010

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\* (Palmer & Devitt, 2007a, 2007c, 2008)



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## Acronyms

AAC	advanced audio coding
ADSL	asymmetric digital subscriber line
ASP	active server pages
BBC	British Broadcasting Corporation
CAL	computer-assisted learning
CASE	Computer Aided Simulation of the Clinical Environment
CD	compact disc
CDC	Control Data Corporation
CD-ROM	compact disc read only memory
CEX	clinical evaluation exercise
COMET	Computerized Modular Exercise Templates
CPR	cardiopulmonary resuscitation
CTT	classical test theory
DEC	Digital Equipment Corporation
DVD	digital versatile disc
ELI	Educause Learning Initiative
FDA	Food and Drug Administration
GMC	General Medical Council
IBM	International Business Machines
ICU	intensive care unit
IRT	item response theory
JPEG	Joint Photographic Experts Group
kB	kilobyte
LCD	liquid crystal display
MB	megabyte
MBBS	Bachelor of Medicine and Bachelor of Surgery
MCQ	multiple-choice question
MEQ	modified essay question
MP3	Moving Picture Experts Group Audio Layer 3

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NZ	New Zealand
OOP	object oriented programming
OSCE	objective structured clinical examination
PBL	problem-based learning
PDA	personal digital assistant
PHP	personal home page (hypertext preprocessor)
RECAP	recall, comprehension and application
SAT	Scholastic Aptitude Test
SC	script concordance
SOLO	structure of observed learning outcomes
UK	United Kingdom
US	United States
VHS	video home system