Assessing professionals through computer adaptive testing

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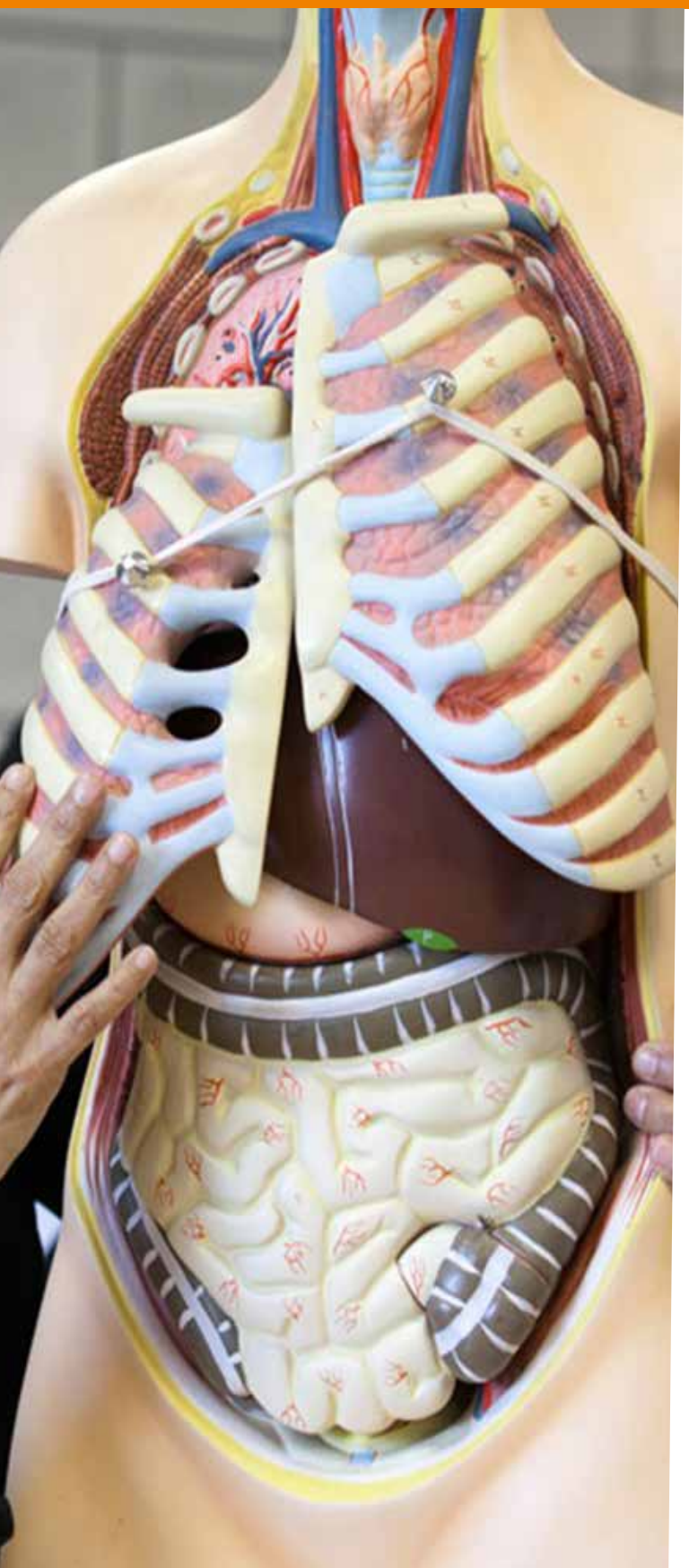
Helping the medical industry to set and improve standards with computer adaptive testing



The need to assess ability and knowledge are perhaps most prevalent in high-stakes testing, upon which entire careers can hinge. The commonality shared by ability and knowledge examinations is their purpose to verify critical attributes that are not only fundamental to professional success but, in many cases, can mean the difference between saving lives and putting them at risk.

Computer-based testing: The remedy for testing many medical professionals

Today, Pearson VUE, the computer-based testing (CBT) business of Pearson, delivers tests on behalf of nearly 450 organiations and institutions worldwide – over 100 of which operate in the medical industry and test the knowledge and ability of candidates hoping to enter specific professions.

In addition to ensuring greater security, integrity and flexibility, computer-based delivery of these types of examinations provides additional assessment data that cannot be captured with paper and pencil tests. For example, timing data allows test sponsors to analyse how long candidates spend on individual test questions.

Precise and reliable assessment

Some test sponsors use a sophisticated method of administering CBT known as computer adaptive testing (CAT). This mode of administration presents candidates with questions and continuously calculates their ability on the fly. When a candidate answers a question correctly the estimate of his ability is increased and he is presented with a more difficult question. When a candidate answers a question incorrectly, the estimate of his ability is decreased and he is presented with an easier question. With this individualised method the selection of questions maximises the precision of the examination. Since the difficulty of each examination is targeted to ability, the candidate receives a test that is neither too easy or too hard for them. CAT draws

questions from a large item bank and test questions are selected across the test blueprint. Thus, candidates see a well balanced examination from both a content and difficulty perspective.

Australian Medical Council Limited

In 2008, the Australian Medical Council (AMC), following trials of computer delivery systems, entered a multi-year agreement with Pearson VUE to effectively assess candidate ability via delivery of a computer-based examination.

Formed following the government's encouragement to run examinations offshore, the partnership provides AMC with a robustly secure solution for candidates pursuing clinical careers

The independent national standards body for medical education and training then spent the next three years establishing a computer adaptive examination. The AMC realised that not only would an adaptive solution meet its blueprint and prove an advanced security measure, but it would also ensure that candidate ability is measured, as opposed to test-wiseness. One of the first actions the AMC took to establish an effective adaptive solution was to initiate a series of item development
workshops to understand how to write item types and differentiate between easy, medium and difficult questions. The integrity of the solution soon became apparent, as candidates are served questions based on their response.

This ensures that candidates receive an individualised examination, targeted to their ability. This arrangement ensures literally millions of permutations of the examination.

An extensive programme of trials and evaluation of the computer adaptive test was implemented by the AMC in 2009 and 2010 with support and technical assistance from Pearson VUE. The trials, together with input from the Pearson VUE psychometricians, enabled the AMC to fine-tune the test prior to its launch in 2011.

"The examination has enjoyed significant growth recently, with annual delivery increasing by 40% from 2009 to 2010"

Candidates are able to undertake the multiple-choice examination in a single 3½ hour session at any of the nine centres located within Australia or at one of the 20 others worldwide, forming an internationally accessible route to medical accreditation. Delivering over 4,000 examinations during test events held on a monthly basis throughout the year, the AMC's use of computer-based delivery has

Susan Buick, Programme Director for Examinations Development & Risk Management at the AMC, advocates the benefits of computer adaptive testing

relieved it of time-consuming administrative processes. With no need to transport examination papers, and with assessment data available online, the AMC continues to enjoy a hassle-free approach to administering examinations and reviewing their effectiveness.

Susan Buick, Programme Director, Examinations Development & Risk Management at the AMC, said:

"Our transition from pencil and paper to CBT, subsequently followed by our use of computer adaptive testing, has freed resources to focus on other aspects of our operations. We believe that CAT would benefit a number of affiliated councils, such as those for dentistry, pharmacy and optometry especially as the National Registration System will require them to increase their testing processes in future years. We encourage these councils to convert to CBT and if possible, CAT for improved efficiencies and performance."

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