Selecting Medical Students: an Australian Case Study

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Statement by the author

I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary institution.

I would like to thank the Faculty of Medicine, Dentistry and Health Sciences at UWA for permission to use data collected as part of the review of the selection process of students into Medicine and Dentistry, which I undertook in 2005/06 on behalf of the faculty; and Professor Geoff Riley for chairing the committee which oversaw this review. I wish to acknowledge the contribution of Professor Ian Puddey, Dean of the Faculty of Medicine, Dentistry and Health Sciences, in running the regression analyses in SPSS which form part of the predictive validity study presented in this study. I am grateful to Associate Professor Judy Stratton, the chair of the faculty Selection Committee in 1997, for asking me to become involved in the selection process.

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Abstract

The recognition that medical practitioners require more than simply a high level of academic ability to function successfully in their profession, together with a sharp increase in the number of academically qualified applicants to medical courses, has led to new ways of selecting medical students. Consequently the selection of students into the high-stakes course of medicine has become an area of considerable interest and research activity. The issues involved in selection are now prominent in the medical and medical education literature published in the UK, the USA, Australia, New Zealand and Canada, and in some European countries. At the same time as the introduction of new selection procedures, and independently of it, due to advances in pedagogy the nature of the medical curriculum has also changed. Changes have been characterised by the use of problem-based learning, and an emphasis on self-directed learning, as well as an increase in interaction between the students in classes and between students and their teachers. The recognition that problem-solving, communication and interaction skills in the courses, in addition to the requisite intellectual capacity, would enhance performance as practitioners, has reinforced the need for students to be selected on a different set of attributes from those used previously.

In Australia, changes in the way in which medical students are selected were initiated by the University of Newcastle in the early 1990s, with the introduction of some tests of cognitive skills and an interview. Over the following ten years, the other Australian undergraduate medical schools followed suit and a three-component selection process developed in an attempt to differentiate among the high-calibre applicants to medical courses, by identifying additional important skills and attributes. The three components are

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the academic score, results on an aptitude test and results on a selection interview. Two of the nine undergraduate medical schools chose not to use a selection interview.

The focus of this thesis is on evaluating the new selection processes and investigating the consequences of the admission of school-leaver applicants into undergraduate medical courses, where the Tertiary Entrance Rank (TER) is the academic criterion for determining suitability to undertake tertiary studies. Each undergraduate medical school has developed its own unique way to operationalise the selection of its students. However, the use of the Undergraduate Medicine and Health Sciences Admissions Test (UMAT), which developed out of the University of Newcastle’s test of cognitive skills, and the conduct of an interview for a select group of applicants are common to these practices. The implementation of the new selection processes has not been without its critics, mainly from within the medical profession. This thesis studies the issues which underlie the three components of selection (the TER, the UMAT and a selection interview) and uses as a case study the particular process used to select students into the six-year undergraduate medical course at The University of Western Australia (UWA).

The UWA selection process involves applicants passing a threshold score on each of the three components and then being ranked by a mechanism which combines the three scores with equal weight. This is a compensatory system in which applicants can compensate for a score near the threshold on one component by high scores on the other two components. This study showed that the resultant cohort is eclectic in its characteristics, with the full range of scores (above the threshold) in each component being represented.
Both qualitative and quantitative methods of data collection were used to address the issues surrounding the way in which medical students are selected and the outcomes of such processes. First, semi-structured interviews were held with different groups of stakeholders, including the staff at secondary schools which prepare the students for tertiary entrance; academic and administrative staff at The University of Western Australia (UWA); academic and administrative staff at other Australian universities; and senior staff at the major teaching hospitals in Western Australia. Secondly, quantitative studies on UWA data addressed the predictive validity of the components of selection; inter-rater reliability and the internal consistency of the data sets from the selection interview; and the attrition rate in the course.

Outcomes from the research showed that in general, the reactions from stakeholders have been positive. Importantly, academic levels amongst medical students and recent graduates do not appear to have been eroded by the new process, in which the academic threshold has been lowered. The UMAT is a contentious national test which has had its validity as a selection instrument questioned. A recent construct and content validity study on the UMAT (Mercer and Chiavaroli, 2006) has gone some way towards settling some of these issues, but the question of predictive validity has yet to be addressed adequately. The existence of commercially available preparation courses has been controversial because of the equity issues involved for those applicants who for some reason do not have access to such courses.

The selection interview, one of the three components of selection, conducted by the Faculty of Medicine, Dentistry and Health Sciences at UWA, whilst attracting criticism from some
for appearing stilted and overly prescriptive, was judged to be robust and rigorous by many of those directly involved in its implementation. Furthermore a high proportion of medical students were judged by their teachers to have good communication skills, which is a positive outcome for future members of the profession. A study to quantify reliability indices for the UWA selection interviews indicated high levels of inter-rater reliability and internal consistency of the ratings data produced.

The predictive validity study conducted as part of this study showed the two major predictors of course outcomes at UWA to be the TER and female gender. The TER predicts outcomes in the knowledge-based units across the course and in some clinically-based units in the later years. However, the interview score (in particular the Communication Skills component) and scores on the first section of UMAT (Logical reasoning and problem solving) also predict outcomes in some of the clinically-based units.

The results of these studies are encouraging to those who believe that the new selection process, whilst imperfect, has gone some way towards solving the problems attached to selection based solely on academic merit. The question now becomes how to improve further on the selection of medical students and to do so in an evidence-based way. The characteristics to be included in selection remain controversial. The rigorous assessment of such characteristics needs to be addressed in the longer term and will be an evolving issue, as the medical curriculum and the nature of the profession also continue to change.
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Preface

In 1997, I was approached by the chair of the Faculty Selection Committee of the (then) Faculty of Medicine and Dentistry at UWA and asked to advise this committee on a method of combining the three component scores which were to be used in ranking applicants to both Medicine and Dentistry. At that time I was working at UWA as Director of the Institutional Research Unit, a service unit in Planning Services which provided research services to the wider university community. Plans were in place for the new system of selecting medical and dental students to be operational by 1998, for the intake of students starting in 1999.

I worked with the faculty in developing the ranking process and in the course of this work I became a member of the Faculty Selection Committee by invitation. When work started in 1998 on developing the selection interview I also became involved, based on some previous work I had done at Murdoch University on devising rating scales for performance assessments. As a result I became a member of the inaugural Interview Committee. In 2001 when the UMAT Technical Subcommittee was formed I was nominated as the faculty’s representative on this group. Subsequently in 2005, when I was employed part-time as a Senior Lecturer in the faculty office, I also became the UWA representative on the UMAT Test Management Committee. I have retained membership of all these committees and except for several short periods when I have been away or engaged in the review of the UWA selection process in 2005/06, during which time I stood down from the Interview Committee, I have been a member of the working party which continually updates and develops the selection interview. As a member of the two faculty committees, the Faculty
Selection Committee and the Interview Committee, I have undertaken relevant statistical work over the years to inform the committees of the outcomes of their policies. My role as a committee member has been to contribute to the implementation and evaluation of policies. Almost all the data collected in relation to the new selection process and its outcomes, in the ten years since its introduction, have been collected and analysed by me. This includes some work undertaken as the Director of the Institutional Research Unit and other work done while working in a part-time capacity for this unit in 2004.

In 2002, in collaboration with personnel from the Australian Council for Educational Research I helped to write a proposal, which developed into a two-stage project, culminating in 2006 in a report published for the UMAT Consortium. This report was known as *UMAT: A Validity Study, A review of the underlying constructs and an analysis of the content of the Undergraduate Medicine and Health Sciences Admission Test* and was a joint project between UWA and the Australian Council for Educational Research (ACER). Brief summaries from this report are found in Chapter 4 in the section on UMAT. My thanks go to ACER and the UMAT Consortium for permission to include these summaries.

In 2003, I made the decision to undertake doctoral studies in the selection of school-leaver applicants to Medicine, beyond the ongoing research that was required for the Faculty of Medicine, Dentistry and Health Sciences. Subsequently, in 2005 the Vice Chancellor of UWA and Dean of the Faculty of Medicine, Dentistry and Health Sciences together initiated a review of the selection process of students into Medicine and Dentistry at UWA. I was appointed to undertake this review, which dealt with the admission of both Standard
(school-leaver) and Non-standard (some tertiary study) students into both these courses. The faculty gave me permission to use, in my own research, data which were collected in the course of the review. The study presented here represents a part of the area covered by the review, namely the admission of school-leaver students into Medicine. This aspect was of particular interest to me due to the many factors surrounding it, such as the effects of different types of secondary schooling.

The three projects, the UMAT Validity Study, the review of the selection process at UWA and the study presented in this thesis have different emphases, but of course, much in common. Naturally a good deal of the literature reviewed is relevant to each of them. All three have proved interesting and worthwhile. Ten years later, I remain grateful to the faculty for involving me in this complex and fascinating area.