

David Coniam · Peter Falvey

Validating Technological Innovation

The Introduction and Implementation of
Onscreen Marking in Hong Kong

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Foreword

Validating Technological Innovation: The Introduction and Implementation of Onscreen Marking in Hong Kong is not only a coherent account of a series of validation studies linked to the implementation of onscreen marking (OSM) in Hong Kong, it is a book representing a 35-year research collaboration of the two authors who have in-depth knowledge about the context of the research. Mostly importantly, it is a book about the future of the field. It is challenging to predict the future in the current world of ours with many uncertainties, but I have no doubt that validation research of onscreen marking will increase, and this book will be read by many researchers for years to come.

As the new millennium was getting underway, in January 2000, Lyle Bachman's article, entitled 'Modern language testing at the turn of the century: assuring that what we count counts', appeared in *Language Testing* (Volume 17). The article is a 40-plus-page comprehensive review of language testing in the 1980s and 1990s, drawing on more than 200 published works. The personal, retrospective paper focuses on a wide range of areas that developed mainly in the 1990s, including: (a) research methodology; (b) practical advances; (c) factors that affect performance on language tests; (d) authentic, or performance, assessments; and (e) concerns with the ethics of language testing and professionalising the field' (Bachman 2000, p.4).

Under (b), Bachman lists computer-based assessment as one of practical advances in the field of language testing pointing to the increasing use of computer technology in the development and delivery of language tests. He stated that 'On the practical side, advances in the technology of test design and development, along with the availability and use of ever more sophisticated computer- and web-based applications for test administration, scoring and analysis, have resulted in a greater range of test formats and assessment procedures than has ever been available'. In this, Bachman cautions the field that 'the challenge in applying such technologies to language assessment will be to recognise not only the potential benefits but also the limitations of these technologies, and not let the psychometric and technological tails wag the applied linguistics dog' (p. 9). In discussing the future and what lies ahead, Bachman states that 'the abstract technical debate about dimensionality and the appropriateness of different IRT models has, I believe, been replaced with a

much more pragmatic focus on practical applications, particularly with respect to performance assessments that involve raters and computer-based tests' (p. 22). Bachman did not specifically discuss onscreen marking, but the above statements clearly direct us to the challenges we are facing in the use of computer-assisted assessment over traditional paper methods. In this sense, this book presenting a coherent series of research studies into onscreen assessment of continuous writing and its impact upon markers' judgements is, therefore, both timely and important.

As the two authors point out, onscreen marking (the marking of examination scripts on screen instead of on paper) is being used much more frequently as technology develops. Over the past 10 years, there has been a worldwide move towards OSM. Indeed, OSM can offer many benefits over traditional paper methods. However, in transferring from one medium to another, it is crucial to understand the extent to which the new medium may alter the nature of traditional assessment practice and affect marking reliability through empirical evidence, evidence that is provided by this book.

This book is unique in a number of ways. First, it charts the development of the validity of OSM in the implementation of OSM across the board in Hong Kong, i.e. in *every* subject in the public school leaving examination system. The book further provides a series of validation studies over time, which began, in 2009, with the publication of Coniam (2009a), the first description of what became, by 2014/2015, a series of validation studies of OSM in the school public examinations system in Hong Kong, operated by the Hong Kong Examinations and Assessment Authority (HKEAA). In total, nine validation studies were carried out and published by David Coniam, sometimes with co-writers (Alison Sau-chu Yeung [Chap. 7], Zi Yan [Chaps. 10, 12 and 13] and Peter Falvey, the co-author of this book).

Second, the book provides a coherent picture, from a disparate series of validation research studies, backed by useful background information on Hong Kong's education and assessment history, the HKEAA and its work (Chap. 2), a pictorial representation of the OSM process taken from screenshots (Chap. 3) and an introduction to the methodological approaches and tools used in the quantitative and qualitative studies on the OSM process. Therefore, this mixture of background information and research input makes this book extremely useful for readers and other academics within other similar educational contexts. In this sense, the book also provides a useful template for authorities/jurisdictions who want to carry out thorough validation studies in preparation for the wholesale implementation of OSM.

Third, the book is a labour of love from two authors who have had a long, productive association as writers, researchers, teachers, publishers and colleagues stretching over 35 years within the Hong Kong language education context and internationally. Much of this long association started in Hong Kong where they both have an in-depth knowledge of the education and examination system and have established good working relations with the HKEAA and the Education Bureau of the Government of the Hong Kong Special Administrative Region. Such a collaborative connection between test users and test developers and educators and ministries of education is rare in other education contexts. Further, much of the long

association between the authors has a background in assessment (many books, chapters in books and article publications). David and Peter have spent 20 years on language benchmarking (with a lot of publications) and now OSM. They both have a background with examination authorities (David with the HKEAA where he was an HKEAA officer and long-time examination developer and Peter with Cambridge Assessment where he was an advisory consultant on secondment from his specialist work with the British Council). Such a unique relationship in assessment and in-depth understanding of the Hong Kong context is reflected in the coherence of this programme of research.

Validating Technological Innovation: The Introduction and Implementation of Onscreen Marking in Hong Kong not only brings the most recent work on OSM situated in a unique context of education but also makes many new and significant contributions to the field, which I believe have the potential to help test developers and test users all over the world.

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Reference

Bachman, L.F. (2000). Modern language testing at the turn of the century: Assuring that what we count counts. *Language Testing*, 17(1), 1–42.

Acknowledgements

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Christina Lee of the Hong Kong Examinations and Assessment Authority (HKEAA) provided her expertise and experience to create and write Chaps. 2 and 3. Chapter 2 ‘The Role of the Hong Kong Examinations and Assessment Authority’ introduces the reader to the background to the development and implementation of OSM in Hong Kong and describes the processes that the innovation went through. In Chap. 3, ‘Onscreen Marking System’, Christina, through the use of screen-grabs demonstrates for the reader what the markers physically see on the screen as they process and mark scripts and record their marks.

We are also grateful to Alison Sau-chu Yeung (Chap. 7) and Zi Yan (Chaps. 10, 12, and 13) for their contributions to papers that they co-wrote with the authors and for their consent to publish their papers.

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Finally, we would like to thank Professor Liying Cheng of Queens University, Kingston, Ontario, for writing a Foreword. She is an extremely busy academic, working in the field of examinations and assessment, and we are grateful to her for her efforts at a particularly busy time in her work cycle.

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Common Abbreviations Used in the Book

BAFS	Business, accounting and financial studies
CMI	Chinese medium of instruction
CTT	Classical test theory
DIF	Differential item functioning
EMI	English medium of instruction
‘gaokao’	National College entrance examination
GSLPA	Graduating students’ language proficiency assessment
HKALE	Hong Kong advanced level examinations
HKCEE	Hong Kong certificate of education examination
HKDSE	Hong Kong diploma of secondary education
HKEAA	Hong Kong examination and assessment authority
HKIEd	Hong Kong Institute of Education
HKSAR	Hong Kong Special Administrative Region
ICT	Information and communication technology
IELTS	International English language testing system
LPAT	Language proficiency assessment for teachers
LS	Liberal studies
MFRM	Many-Facet Rasch measurement
OSM	Onscreen marking
PBM	Paper-based marking
TSA	Territory-wide system assessment
UEC	HKALE use of English examination

Introduction

Abstract This introductory chapter introduces the reader to our purpose in writing this book, viz. to provide a coherent account of the design and implementation of onscreen marking of examination scripts in public examinations in Hong Kong by linking a number of validation studies between 2009 and 2012. We explain why we chose to take the nine validation studies on OSM which had been previously published and bind them together into a coherent whole by surrounding them with an explanatory background to Hong Kong's educational and assessment history and by setting out relevant research in this area from around the world. A short description of each chapter is then provided.

Overview of Book Structure

The purpose of this book is to provide those involved in public examinations and other scholars interested in assessment and evaluation with a coherent account of a series of validation studies linked to the implementation of onscreen marking (OSM) in Hong Kong. Onscreen marking (the marking of examination scripts on screen instead of on paper) is being used more and more often as technology develops. This series of validation studies began, in 2009, with the publication of Coniam (2009a), the first description of what became, by 2014/2015, a series of validation studies of OSM in the school public examinations system in Hong Kong, operated by the Hong Kong Examinations and Assessment Authority (HKEAA). In all, a total of nine validation studies were carried out and published by David Coniam, sometimes with co-writers (Alison Sau-chu Yeung, Zi Yan and Peter Falvey, the co-author of this book). The co-authors and the publications in which the articles originally appeared are provided at the end of each abstract in the descriptions of the relevant chapters below.

It quickly became apparent to the authors that a number of assessment scholars were unable to access all the papers easily as a coherent whole. After discussion, the authors agreed to consolidate the validation studies in the production of a book

consisting of 14 chapters. The four opening chapters would be completely new. Chapter 1, entitled ‘The Hong Kong Education and Assessment Systems’, helps to orientate readers to the history of Hong Kong’s education system and its curricula in addition to its changing assessment curricula, particularly the wide-ranging changes that occurred after Hong Kong was handed back to China in 1997. Chapter 2, written by Christina Lee of the HKEAA provides an account of the role of the HKEAA in the process of inaugurating, developing and implementing OSM. Lee makes clear our relationship with the HKEAA, and that the research studies we conducted were conducted independently and not associated with, sponsored by or funded by the HKEAA. Chapter 3 uses screen grabs to pictorially help the reader understand the processes that markers go through when undergoing training, qualifying and live marking on OSM. Chapter 4, entitled ‘Review of Research into Onscreen Marking and a Description of the Methodological Approaches and Analytical Tools Used in the Validation Studies’, describes two things: the research literature on OSM and the methodological approaches used in the validation studies together with a description of the analytical tools used in the data analysis. The chapter also describes how the book is unique.

After the four opening chapters, the validation studies are presented in Chaps. 5, 6, 7, 8, 9, 10, 11, 12, and 13 which update, refresh and where necessary revise and re-write the original nine journal articles in such a way as to reveal the processes that occurred during the initiation and completion of the studies and to make that process coherent to the reader. The revising of the chapters makes clear the links between the chapters and the events/reactions from stakeholders that influenced the direction of subsequent studies and how they were reported in subsequent chapters, e.g. enlarging studies from one subject area to more than one subject area to, eventually, coverage of all subjects in Chap. 13 and, for example, reacting to stakeholders’ views in the study described in Chap. 9. Chapter 14 summarises what has gone before and concludes the book.

Chapters 5, 6, 7, 8, 9, 10, 11, 12, and 13: The Validation Studies

This section presents an overview of the contents of Chaps. 5, 6, 7, 8, 9, 10, 11, 12, and 13.

Chapter 5

Chapter 5 describes the first validation study. It is entitled ‘The First Study: Comparing OSM and PBM (Paper-Based Marking) in English Language HKCEE (Year 11) Essays Using Classical Statistics and Rasch Measurement’. There were four hypotheses: two related to marker attitude and two to statistics. The first was

that markers would be sufficiently competent technologically to function effectively within the new OSM medium. The second was that markers would not be negative about the OSM medium, showing no preference for either marking medium. These hypotheses investigated the crucial issues of technological competence and marker attitudes towards OSM, without which the implementation of OSM would be invalid and marker attitudes could affect the successful implementation of the innovation. Overwhelmingly negative attitudes towards OSM could have affected the validity of the innovation.

The third and most essential hypothesis was that inter-marker reliability between the two marking mediums would be comparable to inter-marker reliability achieved between markers marking on paper. The fourth, equally essential hypothesis was that the marking medium would not affect scores awarded to test takers, with test takers obtaining the same score whether their scripts were marked on screen or on paper. These two hypotheses were critical in that stakeholder confidence would be badly shaken if inter-marker reliability was not comparable and if different scores were to be awarded in paper-based marking and onscreen marking.

This study originally appeared as: Coniam, D. (2009). A comparison of onscreen and paper-based marking in the Hong Kong public examination system. *Educational Research and Evaluation*, 15(3), 243–263.

Chapter 6

Chapter 6 is entitled ‘A Qualitative Study of the Response of Markers Towards Onscreen and Paper-Based Marking’. It uses the same markers as the study in Chap. 5. It investigates the in-depth responses not only of those who had experience of OSM but of those who formerly had marked only on paper. It discusses marker attitudes towards various issues. The first topic investigates IT proficiency and the markers’ ability to cope with the technical demands of OSM. This is followed by five other issues that arose during the semi-structured interviews, some of which had not been revealed in the quantitative survey described in Chap. 5, viz. reading on screen, views on the reliability and efficiency of marking by OSM, training and standardisation, attitudes towards OSM marking centres and views on working from home.

This study originally appeared as: Falvey, P. and Coniam, D. (2010). A qualitative study of the response of markers towards onscreen and paper-based marking. *Melbourne Papers in Language Testing*, 15(1), 1–26.

Chapter 7

Chapter 7 is entitled ‘Markers’ Perceptions of the Onscreen Marking of Liberal Studies in the Hong Kong Public Examination System’. The hypotheses in this quantitatively based study relate to the attitudes of markers of liberal studies (LS) to