Assessment for Teaching

Assessment for Teaching is a comprehensive and highly practical introduction to assessment and learning in primary and secondary school settings.

Grounded in contemporary, evidence-based research, this book treats assessment as a source of data that informs teaching strategies. It replaces a deficit model of assessment with a development model: a framework which recognises the importance of identifying what the student is ready to learn, rather than ‘teaching to the test’. The book also promotes collaboration between teachers in professional learning teams – encouraging the sharing of assessment data and team-based interpretation – to improve student outcomes and to plan goals for students based on a development scale.

Each chapter contains:
- an exercise for applying the course content to classroom practice
- a response template for the exercise
- guidelines on assessing the value of the exercise in a professional learning team
- a short test for participants to cross-check their understanding of the course content.

Further examples of test questions are also available on the companion website at www.cambridge.edu.au/academic/arcots.

Written by a team of experts from the Assessment Research Centre at the University of Melbourne, this is an essential resource for both pre-service and in-service teachers.

Patrick Griffin holds the Chair of Education (Assessment) at the University of Melbourne and is Associate Dean of the Graduate School of Education. He is the Director of the Assessment Research Centre and Executive Director of the Assessment and Teaching of 21st Century Skills project.
# Contents

Abbreviations vii  
Contributors ix  
Figures xi  
Tables xiii  
Preface: A collaborative approach to assessment for teaching xv  
*Patrick Griffin*

**INTRODUCTION: ASSESSMENT IS FOR TEACHING**  
*Patrick Griffin and Esther Care*  

**CHAPTER 1**  
PROFESSIONAL LEARNING TEAMS AND DECISION-MAKING  
*Patrick Griffin and Pam Robertson*  

**CHAPTER 2**  
DEVELOPMENTAL TEACHING AND ASSESSMENT  
*Danielle Hutchinson, Michael Francis and Patrick Griffin*  

**CHAPTER 3**  
CONDUCTING ASSESSMENTS  
*Masa Pavlovic, Nafisa Awwal, Roz Mountain and Danielle Hutchinson*  

**CHAPTER 4**  
TEAM-BASED INTERPRETATION  
*Michael Francis, Pam Robertson and Danielle Hutchinson*  

**CHAPTER 5**  
CULTURAL CHANGE AND ASSESSMENT  
*Esther Care and Patrick Griffin*  

**CHAPTER 6**  
JUDGEMENT-BASED ASSESSMENT  
*Patrick Griffin and Pam Robertson*  

**CHAPTER 7**  
WRITING ASSESSMENT RUBRICS  
*Patrick Griffin and Pam Robertson*  

**CHAPTER 8**  
TEST CONSTRUCTION  
*Patrick Griffin and Esther Care*  

**CHAPTER 9**  
DERIVING A CRITERION-REFERENCED FRAMEWORK  
*Patrick Griffin and Pam Robertson*  

**CHAPTER 10**  
MODIFIED GUTTMAN ANALYSIS  
*Patrick Griffin, Pam Robertson and Danielle Hutchinson*  

**CHAPTER 11**  
INTERPRETING DATA TO EVALUATE PROGRESS  
*Patrick Griffin, Pam Robertson and Danielle Hutchinson*
## Contents

### CHAPTER 12      DEVELOPMENTAL ASSESSMENT FOR STUDENTS WITH ADDITIONAL NEEDS
  Kerry Woods and Roz Mountain  
  234

### CHAPTER 13     CASE STUDY: WARRAGUL REGIONAL COLLEGE
  Esther Care  
  250

Appendix A: Using the online tests and reports  
  Masa Pavlovic and Naftsa Awwal  
  265

Appendix B: FAQ for PLT  
  Patrick Griffin  
  278

Appendix C: School leaders and assessment  
  Michael Francis and Patrick Griffin  
  293

References  
  312

Index  
  318
# Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALP</td>
<td>Assessment and Learning Partnerships</td>
</tr>
<tr>
<td>ARC</td>
<td>Assessment Research Centre</td>
</tr>
<tr>
<td>ARCOTS</td>
<td>Assessment Research Centre Online Testing System</td>
</tr>
<tr>
<td>ATAR</td>
<td>Australian Tertiary Admission Rank</td>
</tr>
<tr>
<td>CARL</td>
<td>curriculum, assessment and reporting leader</td>
</tr>
<tr>
<td>CAT</td>
<td>common assessment task</td>
</tr>
<tr>
<td>IRT</td>
<td>item response theory</td>
</tr>
<tr>
<td>LOTE</td>
<td>languages other than English</td>
</tr>
<tr>
<td>MIP</td>
<td>Managed Individual Pathway</td>
</tr>
<tr>
<td>NAPLAN</td>
<td>National Assessment Program – Literacy and Numeracy</td>
</tr>
<tr>
<td>OECD</td>
<td>Organization for Economic Co-operation and Development</td>
</tr>
<tr>
<td>PISA</td>
<td>Program for International Student Assessment</td>
</tr>
<tr>
<td>PLT</td>
<td>professional learning team</td>
</tr>
<tr>
<td>SOLO</td>
<td>Structure of the Observed Learning Outcome [taxonomy]</td>
</tr>
<tr>
<td>SOSE</td>
<td>Study of Society and the Environment</td>
</tr>
<tr>
<td>SWANs</td>
<td>students with additional needs</td>
</tr>
<tr>
<td>TIMSS</td>
<td>Trends in International Mathematics and Science Study</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
</tr>
<tr>
<td>ZAD</td>
<td>zone of actual development</td>
</tr>
<tr>
<td>ZPD</td>
<td>zone of proximal development</td>
</tr>
</tbody>
</table>
Contributors

Nafisa Awwal has a Bachelor of Computer Science (MIS) and completed her Master of Information Management and Systems at Monash University. In her present role at the Assessment Research Centre, University of Melbourne, she is involved in the design and development of web-based educational assessment and reporting tools. She has also worked on projects that have included data management and analysis, item writing, and test and scale development.

Esther Care is an Associate Professor in the Graduate School of Education, University of Melbourne. She specialises in assessment and is the Deputy Director of the Assessment Research Centre. She is a Fellow of the Australian Psychological Society and coordinates the educational psychology programs at the university. Her doctoral work focused on measurement of vocational interests and aptitudes, and since that time she has extended her psychometric interests in the areas of educational assessment, assessment of early literacy and collaborative problem-solving.

Michael Francis is Coordinator of Assessment, Learning and Teaching (Secondary) and a Teaching Specialist at the Assessment Research Centre, University of Melbourne. In a career in education spanning 44 years, he has been Director of International Schools (P–12) in Cambodia, Denmark and Botswana, worked as Principal Consultant (Ministerial) in Victoria and been employed in the Aga Khan Education Service in Kenya. He has also worked as Academic Director of RMIT University’s pre-university program in Indonesia, and as a teaching volunteer in Tonga. He was the principal of several Victorian government secondary schools before taking his career overseas. In 1994, Michael was awarded the Commonwealth Relations Trust Fellowship in Education at the Institute of Education, University of London.

Patrick Griffin holds the Chair of Education (Assessment) at the University of Melbourne and is Associate Dean of the Graduate School of Education. He is the Director of the Assessment Research Centre and Executive Director of the Assessment and Teaching of 21st Century Skills Project. He has published widely on assessment and evaluation topics that include competency, language proficiency, industrial literacy, school literacy, numeracy profile development, portfolio assessment, and online assessment and calibration.

Danielle Hutchinson coordinates teaching for the Assessment Research Centre, University of Melbourne. She has designed and implemented teaching programs in the Master of Teaching and Master of Instructional Leadership within the Melbourne Graduate School of Education. Danielle also coordinates the delivery of the Assessment and Learning Partnerships (ALP) professional development program.
Contributors

She has designed and implemented professional development courses for the Bastow Institute, which is the leadership institute for the Department of Education and Early Childhood Development in Victoria. Prior to working at the University of Melbourne, Danielle taught in the independent and Catholic school sectors in New South Wales.

Roz Mountain is a Research Fellow at the Assessment Research Centre, University of Melbourne, with research interests in assessment of students with additional learning needs, assessment of early numeracy skills and support for teachers in inclusive settings. She has a Bachelor of Science (Hons) (Applied Mathematics) from the University of the Witwatersrand and a Graduate Diploma in Psychology from Monash University. She has worked on projects involving assessment for teaching, running teaching strategy workshops, evaluating school improvement policy and developing professional learning modules for assessment of students with additional needs.

Masa Pavlovic has worked in the fields of educational assessment, test development, data management and analysis, neurosciences and software development for the past 10 years. Her primary role within the Assessment Research Centre, University of Melbourne involves working on test development, including item writing and banking for a number of projects requiring assessments in numeracy, literacy and problem-solving. She has also undertaken work on a variety of projects that have included research design, data management and analysis of large-scale studies, as well as test and scale development. Masa has been working on the Assessment and Learning Partnerships research program since 2009.

Pam Robertson worked for many years as a secondary teacher of mathematics and science. In her current role at the Assessment Research Centre, University of Melbourne, she has worked on projects relating to developmental learning and the use of assessment data to inform teaching. For her Master’s degree thesis, Pam developed an instrument to measure the functioning of professional learning teams and a developmental progression of team functioning. She also provides professional development for teachers in the areas of assessment use and professional learning teams.

Kerry Woods is a Research Fellow and Lecturer at the Assessment Research Centre, University of Melbourne, where she has specialised in the design and use of surveys and achievement testing materials for large-scale programs of evaluation. She has conducted evaluation studies of the deployment of native-speaking English teachers in Hong Kong and of the impact of new technologies on learning outcomes for students in primary, secondary and special education schools. Since 2006, her research interests have centred on the design and validation of measures of communication and literacy to support teachers’ decisions about the instruction of their students with learning difficulties. Her work has led to the development of an integrated program of advice and support for teachers of students with additional learning needs.
Figures

1.1 Five steps from measurement to policy 21
1.2 The PLT cycle 23
2.1 Schematic diagram of levels of increasing competence 29
2.2 Schematic diagram of student development showing ZAD and ZPD 32
2.3 NAPLAN progressions (derived) 44
2.4 Interpreting a Learning Readiness Report 46
4.1 Five steps from measurement to policy 71
4.2 The PLT cycle 74
4.3 A basic PLT log template 78
4.4 An advanced PLT log template 79
4.5 An advanced PLT log for literacy 80
4.6 Class report used for grouping students 82
6.1 A taxonomy of assessment and response types 109
6.2 The structure of a developmental assessment framework 116
6.3 Framework for collaborative problem-solving in ATC21STM 122
7.1a A rubric-writing template for an individual rubric 138
7.1b Example of the use of the rubric-writing template for an individual rubric 139
7.2a A rubric-writing template for multiple rubrics 139
7.2b An example of a rubric-writing template for multiple rubrics 140
7.3 Derived progression for a design process using Bloom’s Taxonomy 141
7.4 A panelled set of rubrics 143
9.1 Variable map 176
9.2 Variable map identifying quality criteria 177
9.3 Using a variable map to identify levels 178
9.4 Using the variable map to incorporate criteria 179
9.5 Map representing levels of difficulty on the developmental progression 180
9.6 Substitution of skills for criterion codes 181
9.7 Identifying levels at which students are ready to learn 181
9.8 Pairwise comparison 183
10.1 Example of a Learning Readiness Report 189
10.2 Unsorted data 194
10.3 Sorted data 195
10.4 Interpreting a Guttman chart 196
10.5 Identifying sources of error in a Guttman chart 198
10.6 Interpreting a Guttman chart 202
### Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.7</td>
<td>A partial-credit Guttman chart</td>
<td>206</td>
</tr>
<tr>
<td>10.8</td>
<td>A partial-credit Guttman chart for social skills in the ATC21S project</td>
<td>207</td>
</tr>
<tr>
<td>11.1</td>
<td>Example of a student profile report</td>
<td>214</td>
</tr>
<tr>
<td>11.2</td>
<td>Class report showing students at different stages of skill and understanding at two points in time</td>
<td>218</td>
</tr>
<tr>
<td>11.3</td>
<td>A sample log file discussing a teacher’s analysis of test targeting</td>
<td>220</td>
</tr>
<tr>
<td>11.4</td>
<td>Student growth between testing times 1 and 2</td>
<td>221</td>
</tr>
<tr>
<td>11.5</td>
<td>Comparison of growth across upper and lower ability groups</td>
<td>222</td>
</tr>
<tr>
<td>11.6</td>
<td>Three scenarios showing two classes, testing times 1 and 2, upper and lower 25 per cent of each class</td>
<td>223</td>
</tr>
<tr>
<td>11.7</td>
<td>A teaching model based on Vygotsky</td>
<td>227</td>
</tr>
<tr>
<td>11.8</td>
<td>Example of weekly targeted teaching plan for reading comprehension adapted from Lilydale Primary School</td>
<td>229</td>
</tr>
<tr>
<td>11.9</td>
<td>De-identified section of a class report</td>
<td>232</td>
</tr>
<tr>
<td>12.1</td>
<td>The PLT cycle of assessment, planning, implementation and review</td>
<td>239</td>
</tr>
<tr>
<td>13.1</td>
<td>Curriculum team evaluation of evidence-based practices</td>
<td>255</td>
</tr>
<tr>
<td>13.2</td>
<td>The Warragul Regional College inquiry cycle</td>
<td>257</td>
</tr>
<tr>
<td>A.1</td>
<td>User registration for test access</td>
<td>267</td>
</tr>
<tr>
<td>A.2</td>
<td>Testing and reporting system main page</td>
<td>267</td>
</tr>
<tr>
<td>A.3</td>
<td>Teacher login page</td>
<td>268</td>
</tr>
<tr>
<td>A.4</td>
<td>Student login page</td>
<td>268</td>
</tr>
<tr>
<td>A.5</td>
<td>Order of tests</td>
<td>270</td>
</tr>
<tr>
<td>A.6</td>
<td>Test targeting for reading comprehension</td>
<td>270</td>
</tr>
<tr>
<td>A.7</td>
<td>Test targeting for numeracy</td>
<td>271</td>
</tr>
<tr>
<td>A.8</td>
<td>Test targeting for problem-solving</td>
<td>271</td>
</tr>
<tr>
<td>A.9</td>
<td>ARCOTS test menu page</td>
<td>272</td>
</tr>
<tr>
<td>A.10</td>
<td>Test page for the yellow numeracy test</td>
<td>273</td>
</tr>
<tr>
<td>A.11</td>
<td>Test page for the aqua reading comprehension test</td>
<td>273</td>
</tr>
<tr>
<td>A.12</td>
<td>Distinction between completed and uncompleted items</td>
<td>274</td>
</tr>
<tr>
<td>A.13</td>
<td>Example of an item with an answer recorded from a previous attempt</td>
<td>274</td>
</tr>
<tr>
<td>A.14</td>
<td>Response function for an item showing difficulty = 1.2 (where the probability of a correct answer is 0.5 or 50 per cent)</td>
<td>276</td>
</tr>
<tr>
<td>A.15</td>
<td>Response function for three yes/no items of varying difficulties</td>
<td>277</td>
</tr>
<tr>
<td>C.1</td>
<td>Five steps from measurement to policy</td>
<td>297</td>
</tr>
<tr>
<td>C.2</td>
<td>The PLT cycle</td>
<td>298</td>
</tr>
<tr>
<td>C.3</td>
<td>Example of a Guttman chart</td>
<td>304</td>
</tr>
</tbody>
</table>
Tables

2.1 Summary of referencing frameworks 31
2.2 Comparison of examples of developmental frameworks 37
2.3 Bloom’s Revised Taxonomy 38
2.4 A simple hypothetical progression using Bloom’s Taxonomy and adapted to one aspect of the use of PowerPoint in a presentation 39
2.5 SOLO taxonomy 40
2.6 SOLO adapted for the task of a book review 40
2.7 Dreyfus’s model of skill acquisition 41
2.8 A simple hypothetical progression using the Dreyfus model adapted for cooking skills 41
2.9 Krathwohl’s Taxonomy of the Affective Domain 42
2.10 A simple hypothetical progression using Krathwohl’s Taxonomy and adapted for study skills 42
4.1 PLT vocabulary linked to the Anderson and Krathwohl taxonomy 84
4.2 Progression of PLT activities 87
5.1 Eight levels of school leadership involvement 94
5.2 Sergiovanni’s (1992) five leadership domains as described by Griffin and Care (2012) 98
5.3 Hierarchical levels in symbolic and cultural PLT leadership 99
5.4 Krathwohl and developmental assessment 100
5.5 Dreyfus and developmental assessment 102
5.6 Anderson and Krathwohl and developmental assessment 103
5.7 Progression of PLT engagement 104
6.1 Examples of the components of developmental assessment frameworks 118
6.2 Social skills in collaborative problem-solving 119
6.3 Cognitive skills in collaborative problem-solving 121
7.1 Flawed rubric to assess basketball 133
7.2 Improved rubric to assess basketball 134
7.3 Flawed rubric for assessing technical aspects of writing 135
7.4 Improved rubric for assessing technical aspects of writing 135
7.5 Flawed science rubric 136
7.6 Improved science rubric 136
7.7 Flawed rubric on volume in a class presentation 137
7.8 Improved rubric on volume in a class presentation 137
7.9 Elaboration of the engage phase 146
7.10 Elaboration of the explore phase 148
Tables

7.11 Elaboration of the explain phase 150
7.12 Elaboration of the elaborate phase 152
7.13 Elaboration of the evaluate phase 154
8.1 Blueprint for a test of understanding Asia in arts, SOSE and English 161
8.2 Blueprint for a reading test 162
8.3 Application of Bloom’s Taxonomy to assessment items 164
8.4 Example of decision-making when skills-auditing 168
10.1 Skills common to instructional groups identified in Figure 10.6 203
12.1 Literacy learning progression: Making meaning from symbols and text 240
12.2 An example of a PLT log for a student working at the second level on the literacy progression 245
13.1 Warragul Regional College Strategic Plan 2012 252
13.2 The Curriculum Teams’ Curriculum 258
A.1 Recommended minimum requirements for accessing the tests 266
C.1 Assessment-for-teaching principles and derived developmental progression 308
Preface: A collaborative approach to assessment for teaching

Patrick Griffin

About this book

This is not just another book on assessment. Many of you will have read generalised books on assessment, and some of you will even have written them. I published one myself in the 1990s. This book is different: it takes a clinical approach to assessment and the use of data in the classroom. It is about changing the culture of schools based on the use of assessment data and developing skills among teachers to enable them to use assessment information to make decisions about targeted teaching intervention. The book introduces a new kind of thinking, though some of the content is not new – note the case study written in 1970 that concludes the Introduction.

The approach described here is simple, but it is not simplistic; rather, it demands conceptual reasoning and higher-order thinking. In the six years during which a program based on this approach has been taught at the University of Melbourne, it has developed and matured. We now know that pre-service teachers can cope with this use of assessment and that in-service teachers can also change their practices in the light of it. Over 1500 teachers have participated in the program through online and face-to-face delivery. Over 3000 student teachers have studied the program and many have told us that they were able to secure employment because of their knowledge of this approach to assessment. Many of the 1500 practising teachers who have participated in the online program have testified that it has changed their way of thinking about the use of assessment data and the ways in which they can help teachers to organise classrooms. Of course, some did not change.

There is no point in adding to the assessment literature based on translating psychometric theory and multiple-choice test design. This is not a book that regurgitates the old ideas about assessment wrapped up in the language of psychometrics. Instead, it takes a new approach. The old ways of teaching principles of measurement, specifications and item analysis for multiple-choice test design have had many consequences. Teachers have become alienated from testing because of the complexity of the process and the lack of meaning for their teaching practice. Despite the fact that the deficit method has been in schools for more than 100 years and it continues to fail, teachers persist in identifying deficits and trying to fix them without a scaffolding approach to intervention. Parents have been asked – even encouraged – to endorse a deficit model of teaching and learning. Teachers are afraid to take a new
Preface

approach in case that doesn’t work either. So instead, they continue with a system that we (and they) know is not effective.

Systems of education reinforce these old approaches by ranking students and schools using statistical comparisons to goad schools into action by focusing only on improving scores. In such a context, where the emphasis is on methods of objective test development, teachers are expected to have an advanced knowledge of statistics and quantitative methods. Consultants feed on this expectation by offering programs and in-service courses on how to interpret test and statistical data. Quite often, they provide well-meaning but misleading advice, and teachers become even more alienated from assessment. They focus on low scores and the dangers of failure when they should be focusing on all students and the celebration of every individual student’s successes. The problem is exacerbated by teachers working in isolation rather than in collaborative teams such as those we discuss in this book. In general, their assessment literacy is not profound, and the current assessment literature adds to and reinforces the confusion around the use of assessment data to improve teaching. So the teaching profession seeks comfort in rhetoric. It offers the rhetoric of assessment of, as and for learning. There is a rhetorical thrust towards what is called authentic assessment. I often wonder what is meant by this, and what inauthentic assessment might be.

Under these conditions, assessment and teaching regress into a sea of folk wisdom about the use of assessment data. Most of the common ideas of best practice in authentic assessment are, in fact, no more than folk tales spread by discussion groups through which people are looking for answers that don’t involve an ocean of statistics. In this book, some recognition is given to the old style of approach to assessment (see Chapter 8) without taking it to the same lengths as other textbooks.

For years now, the areas of assessment and curriculum have been combined in education administration and teacher training. Curriculum specialists have been the major providers of information about assessment. If assessment specialists were to provide information about curriculum and teaching, there would be an outcry, but because everybody has been assessed – everybody has sat tests and suffered under the weight of oppressive assessment – we all regard ourselves as experts and we are all looking for different ways and means of getting information about learning. But our knowledge of assessment in general is often not a result of experiential learning. Instead, it is a result of experiencing failure – either to understand the process of assessment or to link the concept of assessment to the ideas of success and the lack of it.

This book eschews the concept of failure and takes a developmental approach involving targeted intervention under the rhetoric of readiness to learn. It assumes that everybody can succeed, and that all we need to do is find out what they are ready to learn and able to learn when encouraged by teachers who draw on professional knowledge of background factors to guide their interventions.
Jay McTighe and Grant Wiggins (2004) developed the idea of a process called backward mapping. They recommend the following steps:

- Review the assessment task to identify prerequisite knowledge and skills.
- Develop driving questions (to organise the learning unit), revisit the essential teaching questions and break them down.
- Outline major teaching points for each question.
- Identify formative assessment procedures.

This is not the focus of the approach presented in this book. The basic difference is a shift away from assessment questions to an emphasis on a level of development and a zone of proximal development. The intervention at that zone is the major emphasis. Hence ours is more of a forward mapping than a backward mapping approach.

A developmental approach makes no assumptions about the effects of background factors on teaching and learning. In a deficit model, student demographics such as age, gender, race, socio-economic status, language background, intellectual capacity and other factors are treated as explanations for why people have failed to learn. A developmental method views that approach as a search for excuses. This book encourages teachers to identify, within a developmental paradigm, the point where students are ready to learn, and to intervene appropriately at that point. Then the factors listed above – age, gender, race, socio-economic status, language background, intellectual capacity and so on – determine how the intervention takes place, not why the student is struggling. We assume that if these factors are taken into account in the professional judgement of teachers to select the appropriate intervention strategy, then every student will learn. Under this approach, the ideas of remediation and deficit make no sense at all. We also strongly advocate that teachers work in collaborative teams, removing the isolation of individual teachers making decisions without the support of their peers.

It is important that a consistent stance is taken into account in reading each chapter of this book. The focus is on teachers working in teams – which does not mean team teaching – in order to collaborate on evidence-based decision-making that can improve student learning markedly. Our published papers on the research underpinning this program, some of which are provided on a website that accompanies this book, present almost irrefutable evidence of the impact of peer-group collaboration on teachers and targeted intervention. The evidence shows that collaboration among teachers yields significant and important gains among students. But it requires a cultural change in schools, and this cultural change is an integral part of the success that schools can enjoy if a collaborative, evidence-based approach to the use of assessment data is implemented on a whole-school basis.

We make no apologies for what at times can be a confronting approach that challenges the ways in which teachers use assessment data and how assessment is
Preface

reported. We regard the teacher as a facilitator, not an expert who passes all necessary information to the students. In the digital age, students can quite readily gain information via the internet and other sources. Our role as teachers needs to change to that of facilitators, as outlined in the case study in the Introduction to this book, which demonstrates the effectiveness of our approach in the 1970s. It is even more important now. Students need to be taught how to critically appraise information as well as to access it. Teachers need to show students how to access information, but also give them the problem-solving and critical appraisal skills that are necessary in the digital age. Education – both teaching and curriculum – needs to change. And if this is to happen, assessment must change.

How to use this book

This book is about the necessary change in assessment. It links the new ideas to teaching and learning, assessment and reporting, and curriculum resources. All three areas or domains need to be rethought and redeveloped. We hope this book is a beginning. With this in mind, a set of Learning Objectives is provided at the beginning of each chapter, identifying what we hope you will gain by reading the chapter. We invite you to explore the ideas presented in each chapter and, together with your fellow students or colleagues, exercise your right to challenge the concepts, ideas and instructions that are included. We encourage you not to simply accept the written word but to challenge and discuss the content. In order to encourage this discussion, we ask you to apply the ideas in practice. For those in pre-service programs, the opportunity to apply them will be limited, although tutorial groups and placements in schools may provide opportunities for discussion and challenge. For in-service programs, we ask teachers to apply the ideas in the classroom and evaluate their effectiveness for both student learning and teaching practice. Our premise is that if these practices do not change or improve student learning, they are not worth implementing. The whole point is to help promote, accelerate and support student growth along a developmental continuum. The application in practice is important because the observation of student engagement and learning is a critical indicator of success, no matter which approach is being used. Finally, at the end of every chapter there is a series of Check Your Progress questions to help you assess your understanding. Throughout the chapters, we also ask you to engage in other exercises that will help you and your fellow learners or colleagues check whether you have understood, or even agreed with, the approach suggested.

The book has a particular structure to help deal with its dual purpose: while it is written primarily for pre-service education, it is also written to meet the needs of in-service teachers. It would be folly to change the approach of only pre-service programs if the new approach were unwelcome in the schools where graduates seek work.
The Introduction illustrates a mathematics approach in a secondary school. Each has led to the ideas embedded in this book.

Chapter 1 outlines the book’s major concepts and ideas, and provides a rationale for each of these.

Chapter 2 discusses our approach to developmental teaching and assessment. It is critical of the deficit model and encourages the reader to take a developmental approach using a series of developmental paradigms and frameworks. It shows how assessment data can be used to identify the zone of proximal development.

Chapter 3 describes the procedure for conducting assessments, and explains why it is important that these assessment administration instructions are followed closely. An example is provided of an online assessment system that gives immediate and detailed feedback to teachers and students.

Chapter 4 shows how these successful approaches to team-based learning can help teachers develop collaborative practices based on the professional use of data. This is the first stage in what we describe as a cultural change in schools, which extends to staffrooms, professional meetings and classroom teaching. It emphasises the need to focus on teaching decisions that are informed by evidence rather than inference.

Chapter 5 describes the role of the school and team leadership in both enhancing and reinforcing the cultural change that is needed. While the book is targeted at pre-service and in-service teachers, it is critical that everyone understands the important role that leadership and cultural change play in improving the use of assessment data in teaching decisions.

Chapter 6 explores subjective assessment, otherwise known as judgement-based assessment, and provides a method that our research has shown produces reliable and valid data on which inferences about learning and intervention can be based.

Chapter 7 shows how judgement-based assessment can be interpreted within a developmental paradigm, and provides a systematic approach to the writing of assessment rubrics and the interpretation of data linked directly to teaching intervention.

Chapter 8 acknowledges the notion of test design for more objective assessment. It is perhaps the only part of this book that gives recognition to the old forms of measurement-oriented assessment. Those who wish to study more of this form of assessment can consult the plethora of books and articles available on test design and multiple-choice testing.

Chapter 9 suggests that it does not matter whether the assessment approach is subjective or objective. The important things are that assessment data be interpreted within a developmental paradigm and that the developmental paradigm be defined by a ‘construct’ or over-arching concept. This chapter empowers teachers to design assessments that can be used to identify an underlying developmental progression that can be linked directly to teaching.
Preface

Chapter 10 takes this exercise a little further. It illustrates how a relatively simple method of item analysis can be used to identify zones of proximal development. Early in the chapter, the emphasis is on dichotomous data (derived from assessments that allow only two responses – yes/no, true/false and so on). In an extension of this idea, the item analysis is applied to rating scales and rubrics such as those discussed in Chapters 6 and 7.

Chapter 11 brings all of this together in reports that are designed for individual students (the learning readiness report), for teachers (the class report) and for parents (the profile report). The use of these reports is then linked directly to teaching intervention rather than taking a summative approach that addresses what has been learned and whether this is acceptable or unacceptable. The reports are formative, and we take the view that they should be helping students to learn, teachers to teach and parents to understand the overall performance of the student and the growth that has taken place regardless of age, gender, race, socio-economic status, language background or intellectual capacity. Development is about growth and the impact of teaching on student learning.

Chapter 12 illustrates the application of these ideas to the teaching of students with additional needs. It summarises the approach described in the preceding chapters with a focus on students who have disabilities and special educational requirements.

Chapter 13 provides a case study of a secondary school where the approach described in this book has been implemented. It illustrates how this approach to assessment requires not only a cultural change among teachers, but an administrative and organisational change in the school, demonstrating a whole-school approach to assessment for teaching.

Appendix A describes how to use the online tests and reports that are available via a link provided with this book, which offers short-term access to the ARCOTS system to provide some practice with online testing and reporting.

Appendix B deals with some of the common issues that have arisen over the past few years in the research that informs this book. These are covered in the form of frequently asked questions for professional learning teams.

Finally, Appendix C provides a condensed version of the overall approach for school leaders.

Pre-service teachers should focus on the Introduction and Chapters 1–3, followed by Chapters 6–11. They would also benefit from reading the implementation chapters, Chapters 12 and 13. In-service practising teachers should read all the chapters, including Chapters 4 and 5 on cultural change. School leaders and principals should focus on the Introduction, Chapters 1–5 and 12–13, and Appendix C. We hope the book offers something for everyone in your course or school, and that we are educating student teachers to take their place in a supportive and informed professional
environment when they start teaching. We encourage all participants in education to read the relevant sections of the book.

We hope you enjoy this book but, more than that, we hope it helps you to improve evidence-based decisions and teaching interventions, and that students ultimately are the beneficiaries.