

Practical Skills in Sport and Exercise Science

Peter Reaburn, Ben Dascombe, Rob Reed, Allan Jones, Jonathan Weyers

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Sport and exercise science is a fast-evolving discipline within the sciences. Its foundations began within physical education and evolved through health and physical education and the study of human movement science and kinesiology to become a stand-alone discipline within the sciences. As the discipline has evolved, the number and complexity of the practical skills required of professionals in the field have developed.

While practical work forms the cornerstone of all scientific knowledge, the training required in sport and exercise science is wide, covering the areas of physiology, kinanthropometry, biochemistry, statistics and nutrition, as well as the generic skills of working in teams, critical thinking, information literacy and communication. To be successful in these areas, students must develop a number of specific skills and abilities, ranging from those required to observe, measure, record and calculate accurately, to those associated with operating equipment in both the laboratory and the field. Students must also develop an ability to communicate information effectively in both written and verbal form. This book aims to provide support and guidance that will help students of exercise and sport science to maximise the development of their skills and abilities in all these areas.

The book has been written for students taking undergraduate and postgraduate degree courses in exercise and sport science. However, it will also be relevant to those taking related courses such as clinical dietetics, biomedical science, allied health and medicine. As with the other books in the *Practical Skills* series, we have tried to write in a concise and user-friendly style, giving key points and definitions, real-world illustrations and worked examples, tips and hints, 'how to' boxes and checklists – all designed to assist the student to become a better practitioner.

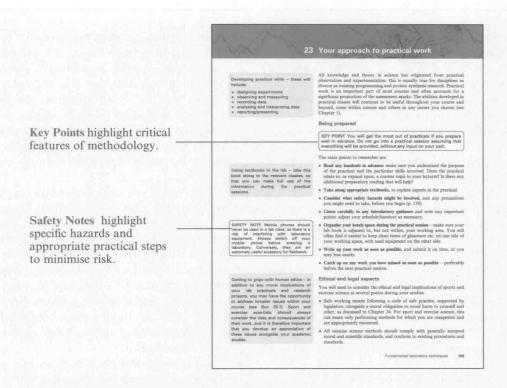
The book is a labour of love for the authors. The material included in *Practical Skills in Sport and Exercise Science* has been selected on the basis of our extensive teaching background and professional experience in working with both athletes and the general population as sport and exercise scientists. We hope that students will find this book useful in both the laboratory and the field, as well as in clinical and industry placements and during project and research work. The book is not intended to replace conventional laboratory handbooks or study guides, but to

provide information that will help students to maximise their learning. The book covers a wide range of general procedures such as preparing graphs, presenting research projects and tackling statistical analyses. We hope that lecturers will find that the text is an effective way to supplement the information given in practical classes, by acting as a highly comprehensive resource that exercise and sport science students can use across their whole degree programme and beyond as a 'must have' reference guide on their shelves.

Practical Skills in Sport and Exercise Science also aims to support the development of a broad range of skills. There are chapters dealing with the evaluation of information, the use of online resources and technologies, revision and examination skills. Given the breadth of material covered, we have tried to focus on the broad principles and key points, rather than providing recipe-like solutions for every potential scenario. However, each chapter is supported by a section giving key sources for further study, including Websites and conventional printed texts or key papers relevant to the topics discussed.

The writing of a comprehensive book such as this is demanding on both time and energy. It is also a team effort for all those involved. We would like to take this opportunity to thank the following colleagues and friends who have provided resources, comments, ideas and constructive feedback at various points during the writing of this book: Aaron Coutts, Greg Rowsell, Aaron Scanlan, Rob Stanton, Bill Aspden, Mitch Duncan, David Kelly and Jonathon Brown. To the Pearson Education team, especially Rufus Curnow and Dawn Phillips, thanks for your guidance and professionalism in working with us from afar. Finally, to our wives, partners and children, especially Claire, Rebecca and Megan Reaburn, Katie Dakin, Polly Reed, Angela Jones and Mary Weyers, a heartfelt thanks. This one's for you.

PETER REABURN
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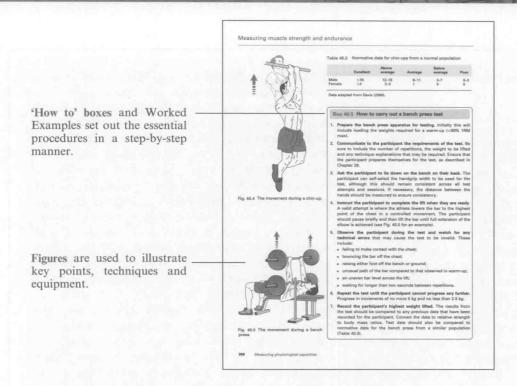


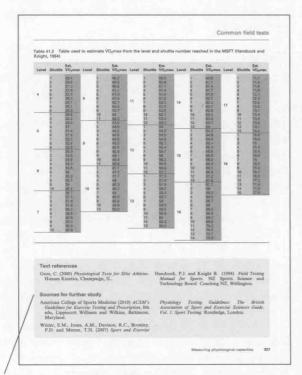


Tips and Hints provide useful hints and practical advice, and are highlighted in the text margin.



Definitions of key terms and concepts are highlighted in the margin.





Sources for further study – every chapter is supported by a section giving printed and electronic sources for further study.



Examples are included in the margins to illustrate important points without interrupting the flow of the main text.

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Text

Box 27.1 from Pre-exercise screening system 2005: Sports Medicine Australia (SMA) – Stage 1 Questionnaire, Sports Medicine Australia.

Photographs

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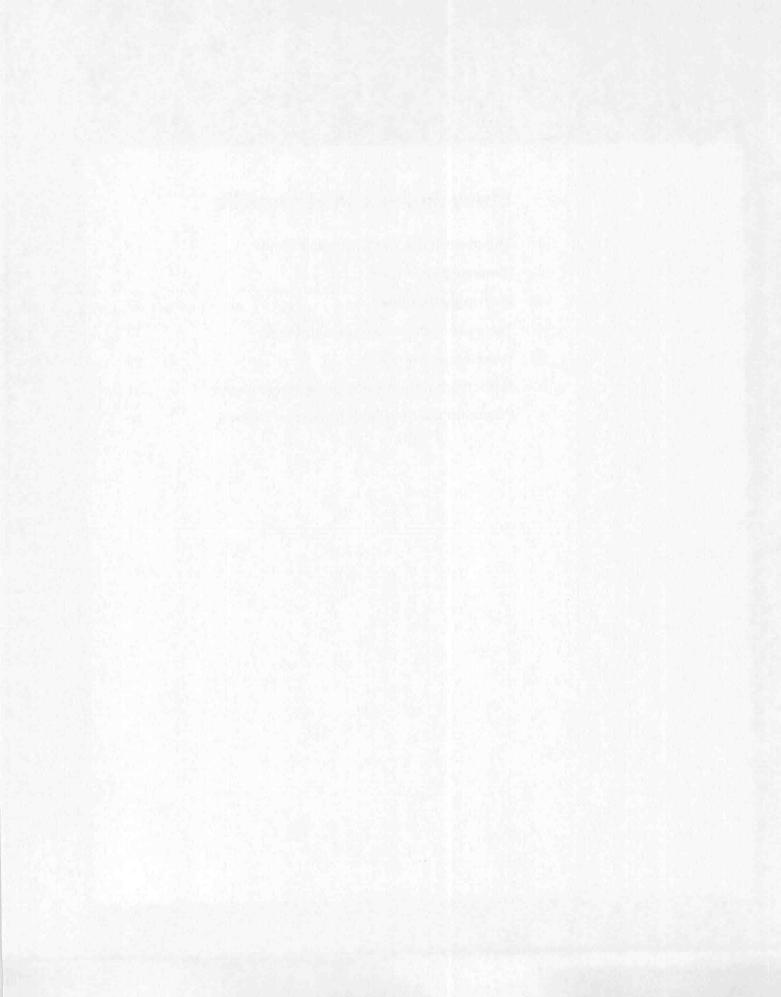
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1 The importance of transferable skills

Skills terminology - different phrases may be used to describe transferable skills, depending on place or context. These include:

- · UK: core skills, key skills, common skills, transferable skills;
- Australia: generic skills, graduate attributes. kev competencies, employability skills;
- New Zealand: essential skills;
- · Canada: employability skills;
- US: basic skills, necessary skills, workplace know-how.

Using course materials - study your course handbook and the schedules for each practical session to find out what skills you are expected to develop at each point in the curriculum. Usually the learning objectives/outcomes (p. 24) will describe the skills involved.

Example The skills involved in teamwork cannot be developed without a deeper understanding of the interrelationships involved in successful groups. The context will be different for every group and a flexible approach will always be required, according to the individuals involved and the nature of the task.

Transferable skills are those skills that apply across a variety of jobs and life contexts. They are known by many other names, depending on the country in which you are studying. Transferable skills are taking on increased importance in many countries. Employers across all industries now seek to ensure business success by recruiting and retaining employees who have a variety of skills and personal attributes, as well as the specific technical skills required in exercise and sport science.

Transferable skills are increasingly important because jobs today require flexibility, initiative and the ability to undertake many different tasks. Jobs are not as narrowly prescribed as in the past and are generally more service-orientated, making information and social skills increasingly important. Universities and colleges are also interested in the development of transferable skills as they encourage learners to be more reflective and self-directed.

This chapter outlines the range of transferable skills and their significance to sport and exercise scientists. It also indicates where practical skills fit into this scheme. Having a good understanding of this topic will help you to place your work at university in a wider context. You will also gain an insight into the qualities that employers expect you to have developed by the time you graduate. Awareness of these matters will be useful when carrying out personal development planning (PDP) as part of your studies.

The range of transferable skills

Tables 1.1 and 1.2 provide a comprehensive listing of university-level transferable skills under up to eight skills categories. There are many possible classifications - and a different one may be used in your institution or field of study. Note particularly that 'learning skills', while important, and rightly emphasised at the start of many courses, constitute only a subset of the skills acquired by most university

The phrase 'Practical Skills' in the title of this book indicates that there is a special subset of transferable skills related to work in the laboratory or field. However, although this text deals primarily with skills and techniques required for laboratory practicals, fieldwork and associated studies, a broader range of material is included. This is because the skills concerned are important, not only in sport and exercise sciences but also in the wider world. Examples include time management, evaluating information and communicating effectively.

KEY POINT Sport and exercise science is essentially a practical area of study, and therefore involves highly developed laboratory and field skills. The importance that your lecturers place on practical skills will probably be evident from the large proportion of curriculum time you will spend on practical work in your course.

The word 'skill' implies much more than the robotic learning of, for example, a laboratory procedure. Of course, some of the tasks you will be asked to carry out in practical classes will be repetitive. Certain

Table 1.1 Summary of Australian Chamber of Commerce and Industry and Business Council of Australia transferable skills (Australian Chamber of Commerce and Industry and Business Council of Australia, 2002)

Transferable skills	Relevant chapters in this textbook
Communication skills that contribute to productive and harmonious relations between employees and customers	4, 7, 10, 11, 12, 13, 14, 15, 16, 17, 22, 47, 48
Teamwork skills that contribute to productive working relationships and outcomes	3, 16, 17, 21, 22
Problem-solving skills that contribute to productive outcomes	8, 9, 10, 11, 12, 16, 17, 18, 21, 22, 52, 53, 54
Initiative and enterprise skills that contribute to innovative outcomes	3, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 21, 22, 52, 53, 54
Planning and organising skills that contribute to long-term and short-term strategic planning	2, 10, 11, 12, 13, 15, 16, 17, 19, 21, 22, 26, 46, 47, 48, 50, 54
Self-management skills that contribute to employee satisfaction and growth	2, 3, 4, 5, 7, 8, 9, 14, 15, 16, 17, 22, 47, 48
Learning skills that contribute to ongoing improvement and expansion in employee and company operations and outcomes	4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 21, 22
Technology skills that contribute to effective execution of tasks	8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 46, 47, 48, 49, 50, 51

Table 1.2 Example of a university list of transferable skills (taken from CQUniversity's Management Plan for Teaching and Learning, 2006–2011)

Generic skills	Attributes
Monitor the environment, develop strategies and capitalise on change	Enthusiasm for and commitment to their work
Acquire, evaluate and use information effectively	Self-confidence in managing themselves and others
Solve problems and apply scientific reasoning	Critical, creative and strategic thinking
Use information technology	Ethical behaviour towards others
Apply discipline-related theory to practice in both familiar and unfamiliar situations	Capability in and commitment to upholding professional values and ethics
Function effectively as team members and as team leaders	Commitment to learning throughout life
Communicate effectively	Willingness to challenge current knowledge and thinking
	Frequent reflection on and realistic evaluation of their performance and their plans to achieve personal and professional goals
	Readiness to participate in and ambition to lead regional and global societies, in both professional and personal roles

techniques require a high level of skill and attention to detail if accuracy and precision are to be attained, and the necessary competence often requires practice to make perfect. However, a deeper understanding of the context of a technique is important if the skill is to be appreciated fully and then transferred to a new situation. That is why this text is not simply a 'recipe book' of methods and why it includes background information, tips and worked examples.

Transferability of skills

Transferable skills are those that allow someone with knowledge, understanding or ability gained in one situation to adapt or extend this for application in a different context. In some cases, the transfer of a skill is immediately obvious. Take, for example, the ability to use a