Book review

Experimental design for the Life Sciences (2nd Edition)

By Graeme D. Ruxton and Nick Colgrave

162pp., Oxford University Press, 2006, ISBN p78-0-19-928511-2 (Pbk), £17.99

This is an excellent book for learning how to approach the design of experimental and, indeed, observational work. It avoids the usual inclusion of statistical detail that turns many students off while retaining all the key issues that are necessary for planning studies that produce good science.

The scope of this second edition is not significantly different from the material covered in the predecessor, but large sections have been rewritten, sometimes extensively. In addition, the authors have added a number of learning features (Key definitions, Statistics boxes, Self-test questions with answers, take-home messages, Boxes, outlines and summaries and flow charts for statistical decision-making) which have made the book much more usable as a learning/teaching tool. This is not a maths book founded around statistics, a fact that will enhance its appeal to typical biological sciences students! Where appropriate, however, students are directed to other resources to provide statistical support. As the authors point out, “you don’t need to be a mathematician to understand simple but effective designs” and they demonstrate this very well in the content of their book.

Chapter 1 explains with great clarity why the design and planning of experiments/observations is so critical to a successful piece of work. Chapter 2 is an excellent account of the nature of hypotheses and their role in designing good studies. It also includes a section on the importance of pilot studies. Chapter 3 focuses on variation and its relationship to replication and sampling, again very well written for undergraduates. Chapter 4 introduces the basic strategic design option and chapter 5 discusses the problems associated with taking measurements and recording data. Chapter 6 pulls these themes together under ‘Final Thoughts’.

This book can help all readers to design more effective experiments. For an embryonic scientist, it provides a short-cut route to effective experiments without going through a painful trial and error process. For more experienced scientists, the text should also stimulate them to think about the way they currently design experiments, and may lead them to better designs in future. The book is rich in practical advice; the emphasis throughout is that good experimental design is about clear thinking and biological understanding, not necessarily mathematical or statistical complexity.

There is also a companion web site for follow up by staff and students, which

includes all the figures from the book as free downloads
www.oup.com/uk/best.textbooks/biology/ruxtoncolegrave

I commend this book to all those who struggle to get students to think seriously about designing good scientific studies.

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