

Details for Submitting a Chapter to the Next Book in the ICTMA Series

Proposed for Springer Book Series: **International Perspectives on the Teaching and Learning of Mathematical Modelling**

Tentative Title: *Crossing and Researching Boundaries in Mathematical Modelling Education*

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Proposed sections of the book:

- New approaches from crossing boundaries in research, teaching and practice
- Researching boundaries in mathematical modelling education
- Pedagogical issues for teaching and learning using mathematical modelling or applications
- Influences of technology on modelling or applications
- Assessment of mathematical modelling in schools and universities
- Applicability of mathematical modelling and applications at different levels of schooling and in tertiary education
- Examples of modelling and applications in practice

The book will commence with a scholarly analytical introduction by the editorial team relating the work in the volume to previous ICTMA volumes, ICMI study volumes and other significant research work in the field. There will also be an index at the end, a statement about the reviewing process and a list of referees, and a list of corresponding authors and emails (see last three ICTMA books.)

All proposed chapters should be submitted **ONLY** to this book for consideration and should be original work not published, or about to be published, elsewhere. Each conference participant in parallel sessions can be a named author on at most two chapters, only one of which can be a single authored chapter. All authors should be named from first draft of the proposed chapter.

Springer is now insisting on a standard style in keeping with ePublishing so there are some non-negotiable aspects to style which you must note in writing your chapter.

In detail:

[ALL plenaries to be submitted by November 15, 2015. These will be reviewed by an editor and one Executive Committee member. These should be at most 15 pages (equivalent of 7875 words maximum) and have no more than 10 diagrams otherwise the details are as follows. Discussants are allowed a maximum of 5 pages (2625 words maximum).]

We require chapters in the following format:

1. A cover page of your metadata (see example in an appendix to this set of instructions). This page is not considered in your page count. Include 6 key words for indexing (see ICTMA13/14/15/16 index for examples). These are for search engines to use so must appear exactly as worded in the text of the chapter. Make sure your postal address is complete including an institution and street address for a courier to deliver books. The metadata and similar details on your chapter first page **MUST** be identical. This is inserted automatically later from the metadata.

2. A maximum of **9 pages (4725 words max – less with diagrams etc) for chapters arising from parallel sessions including abstract, references, graphics, appendices, figures and tables.** [Do not clutter the page with text and diagrams. Figures and diagrams are to be of highest quality for black and white publishing. More than 6 figures is excessive for a 9 page chapter. Part diagrams which are clearly separate must be labelled a, b, c etcetera and referred to in the same manner as other diagrams. Springer Copy editors will place these **at the top of the page no matter where you expect them to appear.** This could be the same page or the next page. Write your text with this in mind. One **typeset page is 525 words!**

You should suggest to the editors which sub-section your chapter could be in; however, the editors reserve their right to final grouping of chapters and naming of section headings or parts of the book.

3. **The title** should be left justified [**Bold Title case regular text 16 pt** with 12 pt space after], followed by author(s) name(s) [**Bold regular text 12 point**], and affiliation(s) of author(s) (Department and Institution) [*italics 12 point*] in this order on separate lines; all in Times New Roman.

4. All chapters must have an **abstract**. The abstract must be **no longer than 10 lines**. Please note that the abstract summarises the content and forms part of the 9 pages of the chapter. In addition, the abstract will appear online at SpringerLink and be available with unrestricted access. This allows unregistered users to read the abstract as a teaser for the complete chapter. **DO NOT** include citations. [Springer style will incorporate the entire reference into the abstract otherwise.] The abstract starts with the word **Abstract** in bold on the first line and the entire abstract is left and right justified. [regular text 12 point, space before and after 12 point]

5. The chapter is to be written in British English using MS Word, **Times New Roman, 12-point font, single line space, and 6 points after paragraphs**. Please follow this guideline strictly. Use A4 paper size with margins set as follows: top and bottom 3.8 cm; left and right 2.7 cm as in this document. In all text, use the word “chapter” to refer to your submission not “paper”. Each section within a chapter is referred to as “section” not “chapter”. [For Cross referencing by hyperlinks refer to the chapter or section number, for example, see Chap. 3 or see Sect. 3.4.2. Do not refer to the page number.]

The first paragraph under a heading is not indented. All following paragraphs have an indented first line.

6. **Headings:** Please use the decimal system of headings with no more than three levels;

Example: **1** **Section [Bold Title case regular text 14 pt] 12 pt space either side**
 1.1 ***Sub section [Bold Title case italic text 14 pt] 12pt space either side***
 1.1.1 **Sub-subsection [Bold Title case regular text 12pt] 12pt space either side**

7. **Footnotes** should use 12 point font. They are not to be used for reference citations.

8. **Graphics** should be inserted at appropriate places in the text with its appropriate size. Please do not decrease too much. They also need to be readable in the reduced block size of the book, i.e., a frame of **115 by 180 mm**.

9. Citations and References

All chapters **MUST** include an adequate review of the relevant international literature with citations setting your contribution to the field in the context of other work (and your previous work, if relevant).

Citations

All references should be cited in the text. The author-date method of citation should be used directly in text.

Example:

According to Thompson (1992), conceptions about several entities come from beliefs.

For author name/s and year of publication in parentheses:

one author (Kuntze 2011),

two authors (Rosa and Orey 2013),

three authors or more (Yanagimoto et al. 2015);

References not cited must be removed.

When referring to multiple authors, list these alphabetically on first author not date (e.g., Ang 2013; Blum 2007; Stillman et al. 2009).

Reference List

Each chapter must contain a reference list of its own headed "**References**". This heading is not numbered. Entries in the list must be listed alphabetically. The rules for alphabetisation are:

- first, all works by the author alone, ordered chronologically by year of publication,
- next, all works by the author with a coauthor, ordered alphabetically by coauthor,
- finally, all works by the author with several coauthors, ordered chronologically by year of publication.

The references must use APA style formatting, but with the Springer SocPsych style adaption, which is less rigorous; see the examples below. ALL details need to be included by you.

Journal article

- Brown, J. P. (2015). Complexities of digital technology use and the teaching and learning of function. *Computers & Education, 87*, 112-122.
- Harris, M., Karper, E., Stacks, G., Hoffman, D., DeNiro, R., Cruz, P., et al. (2001). Writing labs and the Hollywood connection. *Journal of Film Writing, 44*(3), 213-245.
- Stillman, G. (1998). Engagement with task context of application tasks: Student performance and teacher beliefs. *Nordic Studies in Mathematics Education, 6* (3-4), 51-70.
- Stillman, G. (2000). Impact of prior knowledge of task context on approaches to applications tasks. *Journal of Mathematical Behavior, 19* (1), 333-361.
- Villarreal, M.E., Esteley, C.B., & M.V. Mina (2010). Modeling empowered by information communication technologies. *ZDM—The International Journal on Mathematics Education, 42*(3-4), 405-419.

Journal article only by DOI

- Charpin, J.P.F., O'Hara, S., & McKey, D. (2013). Mathematical modelling at secondary school: The MACSI-Clongowes Wood College experience. *International Journal of Mathematical Education in Science and Technology*. DOI: 10.1080/0020739X.2012.756552
- Tan, L.S., & Ang, K.C. (2015). A school-based professional development program for teachers of mathematical modeling in Singapore. *Journal of Mathematics Teacher Education*. DOI 10.1007/s10857-015-9305-z

Book

- Kaur, B., & Dindyal, J. (Eds.). (2010). *Mathematical applications and modelling* (Yearbook 2010 of the Association of Mathematics Educators). Singapore: World Scientific.
- Kaiser, G., Blum, W., Borromeo Ferri, R., & Stillman, G. (Eds.). (2011). *Trends in teaching and learning of mathematical modeling*. New York: Springer.

Book chapter

- Galbraith, P. (2007). Dreaming a 'possible dream': More windmills to conquer. In P. Galbraith, W. Blum, & S. Khan (Eds.), *Mathematical modelling: Education, engineering and economics* (pp. 44-62). Chichester: Horwood.
- Gruenwald, N., Sauerbier, G., Zverkova, T., & Klymchuk, S. (2007). Models of ecology in teaching engineering mathematics. In C. Haines, P. Galbraith, W. Blum, & S. Khan (Eds.), *Mathematical modelling: Education, engineering and economics* (pp. 314-322). Chichester: Horwood.
- Julie, C., & Mudaly, V. (2007). Mathematical modelling of social issues in school mathematics in South Africa. In W. Blum, P. Galbraith, H.-W. Henn, & M. Niss (Eds.), *Modelling and applications in mathematics education: The 14th ICMI study* (pp. 503-510). New York: Springer.
- Larsen, C., Harel, G., Oehrtman, M., Zandieh, M., Rasmussen, C., Speiser, R., et al. (2010). Modeling perspectives in math education research. In R. Lesh, P.L. Galbraith, C.R. Haines, A. Hurford (Eds.), *Modeling students' mathematical modeling competencies* (pp. 61-71). New York: Springer.
- Stake, R. (2005). Qualitative case studies. In N. Denzin & Y. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 443-466). Thousand Oaks: Sage.

Stillman, G. A., Brown, J. P., & Galbraith, P. L. (2008). Research into the teaching and learning of applications and modelling in Australasia. In H. Forgasz et al. (Eds.), *Research in mathematics education in Australasia 2004–2007* (pp. 141–164). Rotterdam: Sense.

Conference Papers

Brown, J. (2007). Early notions of functions in a technology-rich teaching and learning environment (TRTLE). In J. Watson & K. Beswick (Eds.), *Proceedings of MERGA30* (Vol. 1, pp. 153–162). Adelaide: MERGA.

Edwards, I. (2005). New wine in old skins. In W. Moroney & C. Stocks (Eds.), *Quality mathematics in the middle years* (pp. 73–81). Adelaide: AAMT.

Newspaper Article

Green, G. (2009, January 14). Big cat discovery casts little doubt. *The Courier Mail*, p. 17.

Newsletters

Kaiser, G., Sriraman, B., Blomhøj, M., & Garcia, J. (2007). Report from the CERME5 working group modelling and applications – Differentiating perspectives and delineating commonalities. *ICTMA Newsletter*, 1(1), 6–10.

Online Document (no DOI available)

Abou-Allaban, Y., Dell, M. L., Greenberg, W., Lomax, J., Peteet, J., Torres, M., & Cowell, V. (2006). Religious/spiritual commitments and psychiatric practice. Resource document. American Psychiatric Association. http://www.psych.org/edu/other_res/lib_archives/archives/200604.pdf. Accessed 25 June 2007.

Organisation for the Promotion of Responsible Tuna Fisheries. (2006). *A graph of fish catches of Bluefin tuna*. <http://www.oprt.or.jp/c27.htm> Accessed 22 Feb 2013.

Theses and Dissertations

Scott-Wilson, R. (2014). *An analysis of learning characteristics, processes and representations in mathematical modelling of middle school learners with special educational needs* (Doctor of Philosophy thesis). Stellenbosch University, Cape Town, South Africa.

10. Quotations

For **short quotations** (less than 40 words), these should be embedded in the text in regular font, within “quotation marks”. All quotes need source information including Author, year, page.

Long quotes (40 words or more) are indented 0.5 cm either side as shown and no quotation marks are used. Use 10 point font.

Examples:

Kaiser and Sriraman (2006) note that within modelling in mathematics education “the apparent uniform terminology and its usage masks a great variety of approaches” (p. 302) and so propose a classification to distinguish the “various perspectives according to their central aims” (p. 303). The perspectives include

Realistic or applied modelling (pragmatic-utilitarian goals, i.e. solving real world problems, understanding of the real world, promotion of modelling competencies); *Educational modelling*: differentiated in (a) didactical modelling and (b) conceptual modelling (Pedagogical and subject-related goals: (a) Structuring of learning processes and its promotion (b) Concept introduction and development). (p. 304)

11. Sources

If you copy figures, or tables from other works, you must obtain **permission** from the copyright holder (usually the original publisher) for both the print and online format. Please enclose the signed permission with the manuscript. Please be aware that some publishers do not grant electronic rights for free and that Springer will not be able to refund any costs that may have been incurred in receiving these permissions. As an alternative, material from a

different source should be used that grants permission. The source must be acknowledged in the legend or table heading (see Sect. 13). If the source is in a foreign language, please provide a translation.

12. Transcripts

Transcripts are in 12 point, regular font and no quotation marks. There is 6 point before the beginning of a transcript and 6 points after the end of the entire transcript.

Jim: Sine over?

Ozzie: No the angle not the [stops]. It's like reverse.

Ahmed: Sin?

Jim: I remember it's reverse. You do that full stop. Yeah, you do the one on top [pointing to \tan^{-1} on his graphing calculator].

13. Figures, diagrams, tables, equations, literal texts, tasks:

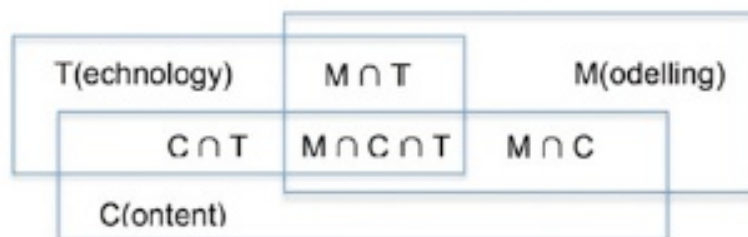
Figure and Diagrams

These must be **clearly readable** (i.e., the point size must be large enough to see every piece of text clearly) and clearly able to be reproduced in black and white, not colour. Figures **must be referred to in the text** (e.g., see Fig. 2.4.). At the start of a sentence use Figure 2.4 but Fig. 2.4 elsewhere.

- When preparing your figures, size figures to fit in the page width. The figures should be one of two sizes: 78 mm or 117 mm wide and not higher than 198 mm.
- Number the figures consecutively using the chapter number (e.g., Fig. 1.1). All figure parts should be denoted by bold lowercase letters (**a**, **b**, **c**, etc.). You can group 3 smaller figures with named parts in 117 mm wide figure.
- Each figure should have a **concise** caption describing accurately what the figure depicts. Include the captions in the text file of the manuscript, not in the figure file.
- Figure captions begin with the term **Fig.** in bold type, followed by the figure number, also in bold type.
- No punctuation is to be included after the number, nor is any punctuation to be placed at the end of the caption.
- Identify all elements found in the figure in the figure caption; and use rectangles, circles, etc., as coordinate points in graphs.
- **Identify previously published material** by giving the original source in the form of a reference citation at the end of the figure caption.

Example Figure 78 mm wide:

Fig. 7.1 Modelling (M), mathematics content (C), and technology (T) interactions (Galbraith et al. 2007, p. 131)



Example Figure 117 mm wide:

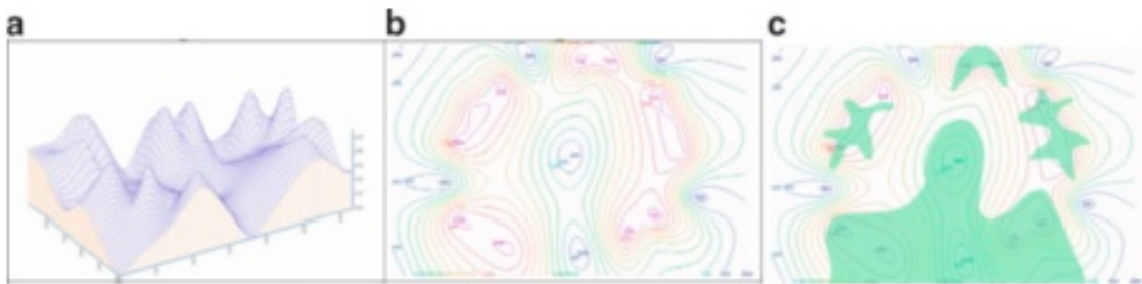


Fig. 4.1 The ideas of a course conceived as a terrain (a) (b) (c.f., Zawojewski et al. 2013, p. 492). Mapping progress (c) (c.f., Zawojewski et al. 2013, p. 498)

Tables

The tables will be numbered consecutively using the chapter number (e.g., Table 1.1). So ensure that all the tables are numbered consecutively and cited in the text in the correct order.

Give each table a **heading**.

To format the table columns, use the **table function**.

Do **not** use the space bar to separate columns, and do **not** use Excel to create tables.

Make sure you make your tables so they fit in the text block when printed. Very large tables are sometimes printed vertically on a separate page reducing your available space.

Example Table 1

Table 20.1 Identification of student use of prior knowledge in the tasks

Student	Type and use of prior knowledge in TT and PP task	
	<i>Academic</i>	<i>Encyclopaedic</i>
Tanya	–	Enhancing decision making [TT] Enables student to relate to context [both] Facilitates the checking of progress [PP]
Tabitha	Enhances understanding [TT] Enables student to relate to context [TT] Selects mathematical model [PP] Enhancing decision making [PP]	Enhancing decision making [both] Facilitates the checking of progress [PP] Enhances understanding [PP]

Example Table 2

Table 1.1 Mean numbers of correct (C), proportional (P), and other (O) answers on three problems

	Proportional problems		Additive problems			Constant problems		
	C	O	C	P	O	C	P	O
SC-condition	2.61	0.39	0.65	2.08	0.26	0.24	2.08	0.68
CS-condition	2.76	0.24	1.11	1.86	0.03	1.00	1.70	0.30
Total	2.68	0.32	0.88	1.97	0.15	0.61	1.89	0.49

Table notes should be used in accordance with APA style at the foot of the table in 10 point beginning with “*Note.*” These should be listed on separate lines in the following sequence:

General comments referring to entire table

Explanations of abbreviations in a run-in list

Asterisk(s) (p values), followed by any column, row or cell specific notes using superscript lowercase letters (i.e., ^{a, b, c}).

NOTE: Use column headers of the same size as this will determine the spacing of the numerical data in your columns (e.g., using Strongly Agree, Agree, Disagree and Strongly Disagree will result in widely different spacing and the copy editors will not change this.)

For text tables the cells are set up with hanging indents if the context is more than one line. This will be done by the copy editors regardless of what the table looks like. Refer to Tables by number (e.g., in Table 2.1) not expressions such as “in the Table below”.

Tasks or Problems

If presenting a task used in a classroom or study, present this within a borderless rectangular box with grey shading (as shown below).

Platypus Task

The platypus is an endangered species that may become extinct unless action is taken to save it. An annual survey held in a nearby national park showed an alarming decrease in the number of platypus over the years 1993-1998. Two sets of data representing a platypus population before and after an intervention project, were presented. Find a model to represent platypus numbers over time for both data sets. Questions then considered included: did the intervention improve the situation, what was the predicted population a decade later, and when would the population return to the initial value?

When referring to the task use Italics on title, for example, *Platypus Task*.

Equations

- Equations of the type $a^2 + b^2 = c^2$ can be written as normal text. Use italics as shown and a space before and after each term / symbol.

- For all other equations, please use MathType or the Microsoft equation editor, and insert the graphic into your text file as an object. Prepare the whole equation in this way and not just part of it.
- Note: If you use Word 2007, do not create the equations with the default equation editor. Use MathType or the Microsoft equation editor instead which can be accessed via Insert Object from the Insert ribbon.

Literal Text

In order to distinguish the literal text of computer programs from running text, we recommend using a font such as *Arial* or *Helvetica*.

If you need a font for your programs in which every character has the same width, please use *Courier*.

14. Spelling, Punctuation and Expression

Please note the following terms, spelling and abbreviations (when inside parentheses): “modelling”, “e.g.”, “i.e.” “student”.

Use “mathematics” not “math” or “maths”, “examination” not “exam”, “modelling” and “mathematics” should not normally have a capital/upper case “M”. Reduce use of capitalisation to a minimum. Use better expression than “get”.

15. Abbreviations

Write abbreviations in full if in text but abbreviate when in parentheses, for example, “modelling tasks (e.g., the *Ferris Wheel*) were used with Year 9 students”. Exception: use (See Fig. 2.1) instead of (s. Fig. 2.1).

16. Acknowledgements

Acknowledgements should be in 10 point and come after the chapter concludes but before the references.

17. Appendices

These are set before the references.

Save your chapter as a doc NOT a docx as follows if a regular chapter from the parallel sessions: RP_Author family name(s)_date.doc For example, RP_Wake_15Sept15.doc or RP_GalbraithStillmanBrown_15Sept15.doc
For Plenaries or Discussants please use the following: PL_Burghes_15Nov15.doc or PD_Kaiser_15Nov15.doc

Appendix: METADATA (to be submitted with first draft of chapter)

Chapter Title:

For the corresponding Author:

Given Name

Department

Institution/Organisation

Address (full postal address not a PO Box number)

Email

For each additional Co-Author:

Family Name

Given Name

Department

Institution/Organisation

Address (full postal address not a PO Box number)

Email

Abstract (10 lines only with NO citations)

Keywords (at least 6 for indexing see previous books in series)

Proposed Section of Book:

Originality:

We hereby certify that this chapter is not being submitted for consideration for publication elsewhere and is original, unpublished work:

[To be signed by ALL authors.]

Send your chapter to ictma15@acu.edu.au no later than September, 15th 2015 from a regular paper and November, 15th 2015. Use ictma17 in the subject line. You will receive an acknowledging email.

Checklist (for author use only – not to be submitted)

Metadata	Title	<input type="checkbox"/>
	Name(s) of author(s)	<input type="checkbox"/>
	Complete Mailing address(es)	<input type="checkbox"/>
	e-mail address(es)	<input type="checkbox"/>
	Keywords	<input type="checkbox"/>
Headings	Decimal numbers	<input type="checkbox"/>
Abstract	Abstract for chapter included (10 lines, no citations)	<input type="checkbox"/>
Text	Text in Times New Roman, special characters in Symbol or Unicode	<input type="checkbox"/>
References	Reference lists included at the end of chapter	<input type="checkbox"/>
	Citations in text agree with the reference list	<input type="checkbox"/>
	All entries in the reference list mentioned in the text	<input type="checkbox"/>
	References complete and follow the guidelines	<input type="checkbox"/>
Abbreviations	Author abbreviations follow only after first time use written in full	<input type="checkbox"/>
Figures	All figures mentioned in text and complete	<input type="checkbox"/>
	Consecutively numbered within a chapter	<input type="checkbox"/>
	Consecutively cited in text	<input type="checkbox"/>
	Legends included in the text	<input type="checkbox"/>
	Clearly readable in Black and white	<input type="checkbox"/>
Tables	Prepared with the table function	<input type="checkbox"/>
	Consecutively numbered within a chapter	<input type="checkbox"/>
	Consecutively cited in text	<input type="checkbox"/>
Electronic manuscript	Used file name format with current date of submission	<input type="checkbox"/>
	Files saved as Word doc files	<input type="checkbox"/>
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