
Brief overview of book

Integration and Implementation Sciences (I2S) is described in Disciplining Interdisciplinarity: Integration and Implementation Sciences for Researching Complex Real-World Problems by Gabriele Bammer [2], published by ANU E Press in January 2013.

This book helps collaborative research teams address complex real-world problems like widespread poverty, global climate change, organised crime, and escalating health care costs. It provides a systematic approach to:

1. Synthesising disciplinary and stakeholder knowledge,
2. Understanding and managing diverse unknowns, and
3. Providing integrated research support for policy and practice change.

Each of these three domains is organized around five questions:

1. For what and for whom?
2. Which knowledge, unknowns and aspects of policy or practice?
3. How?
4. Context?
5. Outcome?

This simple framework lays the foundations for developing compilations of concepts, methods and case studies about applying systems thinking, scoping and boundary setting, framing, dealing with values, harnessing and managing differences, undertaking dialogue, building models, applying common metrics, accepting unknowns, advocacy, engagement with policy and practice, understanding authorization, dealing with organizational facilitators and barriers, and much more.

The book makes a case for a new research style (integrative applied research) and a new discipline (Integration and Implementation Sciences or I2S) and advocates for progressing these through an I2S Development Drive. It builds on theory and practice-based research in multi-, inter- and trans-disciplinarity, post-normal science, systemic intervention, integrated assessment, sustainability
science, team science, mode 2, action research and other approaches.

The book concludes with 24 commentaries by Simon Bronitt; L. David Brown; Marcel Bursztyn and Maria Beatriz Maury (read their commentary in its original Portuguese (PDF 75KB)) [3]; Lawrence Cram; Ian Elsum; Holly J. Falk-Krzesinski; Fasilhuddin; Howard Gadlin and L. Michelle Bennett; Budi Haryanto; Julie Thompson Klein; Ted Lefroy; Catherine Lyall; M. Duane Nellis; Linda Neuhauser, Deborah O’Connell with Damien Farine, Michael O’Connor and Michael Dunlop; Michael O’Rourke; Christian Pohl; Merritt Polk; Alison Ritter; Alice Roughley; Michael Smithson; Daniel Walker; Michael Wesley; Glenn Withers. These begin a process of appraisal, discussion and debate across diverse networks.

Contents of Disciplining Interdisciplinarity

- Preface

Setting the Scene

- The Challenge and a New Approach (Taking a Specific Focus: Looking at one type of interdisciplinarity; Defining a New Research Style: Integrative Applied Research; Developing a Disciplinary Underpinning: Integration and Implementation Sciences (I2S); Responding to the Scale and Urgency of the Task: The I2S Development Drive; The Aims of this Book)
- Getting Specific: Three domains, a five-question framework and the overall approach (Three Domains; Definitions; Flesching Out the Three Domains: The five-question framework; I2S as a Storehouse; The Structure of the Book; Commentaries and Audiences)

Domain 1. Synthesising Disciplinary and Stakeholder Knowledge

- Introduction
- For What and for Whom?
- Which Knowledge? (Taking a Systems View; Scoping; Boundary Setting; Framing; Dealing with Values; Harnessing and Managing Differences; Dealing with the Six Categories)
- How? (Dialogue-Based Synthesis; Model-, Product- and Vision-Based Synthesis; Common Metric-Based Synthesis; Who Undertakes the Synthesis?; When is the Synthesis Undertaken?)
- Context? (Overall Context; Authorisation; Organisational Facilitators and Barriers)
- Outcome?
- Specialising in I2S (I2S for Team Leaders; I2S Disciplinary Specialists; I2S Appreciation for Other Integrative Applied Research Team Members)

Domain 2. Understanding and Managing Diverse Unknowns

- Introduction (The Inevitability and Challenges of Imperfection; Appreciating Different Kinds of Unknowns; Understanding Where Disciplines and Stakeholders Sit in Relation to Unknowns; Differentiating the First and Second Domains)
- For What and for Whom?
- Which Unknowns? (Taking a Systems View; Scoping; Boundary Setting; Framing; Dealing with Values; Harnessing and Managing Differences; Dealing with the Six Categories)
- How? (Reduction; Banishment; Acceptance; Surrender, Exploitation; Denial; Complexities in
Managing Unknowns; Who Undertakes the Consideration of Unknowns?; When is the Consideration of Unknowns Undertaken?)

- Context (Overall Context; Authorisation; Organisational Facilitators and Barriers)
- Outcome?
- Specialising in I2S (I2S for Team Leaders; I2S Disciplinary Specialists; I2S Appreciation for Other Integrative Applied Research Team Members)

Domain 3. Providing Integrated Research Support for Policy and Practice Change

- Introduction
- For What and for Whom?
- Which Aspects of Policy and Practice? (Taking a Systems View; Scoping; Boundary Setting; Framing; Dealing with Values; Harnessing and Managing Differences; Dealing with the Six Categories)
- How? (Communication; Advocacy; Engagement; Fresh Thinking on Complex Real-World Problems; Who is Involved in the Provision of Integrated Research Support?; When Does Provision of Integrated Research Support Occur?)
- Context? (Overall Context; Authorisation; Organisational Facilitators and Barriers)
- Outcome?
- Specialising in I2S (I2S for Team Leaders; I2S Disciplinary Specialists; I2S Appreciation for Other Integrative Applied Research Team Members; I2S Appreciation for Policy Makers and Practitioners)

I2S As A Whole

- Introduction
- For What and for Whom?
- Which Knowledge, Unknowns and Aspects of Policy and Practice? (Taking a Systems View; Scoping; Boundary Setting; Framing; Taking Values into Account; Harnessing and Managing Differences; Dealing with the Six Categories)
- How? (Value of Some Methods for More Than One Domain; Achieving Congruence between the Methods Used Across the Three Domains; Classification Using Reciprocity and Action-Orientation; By Whom and When?)
- Context? (Overall Context; Authorisation; Organisational Facilitators and Barriers)
- Outcome? (Peer Review; Necessary Conditions for Integrative Applied Research; Challenge of Imperfection; Summary of Questions to Guide Evaluation)
- Specialising in I2S (I2S for Team Leaders; I2S Disciplinary Specialists; I2S Appreciation for Other Integrative Applied Research Team Members; I2S Appreciation for Policy Makers and Practitioners)

Moving Forward

- A View of the Future (A Virtuous Cycle between Capacity, Demonstrated Success and Funding)
- How I2S Functions as a Discipline (Enhancing the Discipline by Working on Problems; Transmitting Findings; Fostering Widespread Awareness and Appreciating Different Levels of Expertise; Building Capacity)
- The Relationship of Integrative Applied Research and I2S to Multidisciplinarity and Transdisciplinarity (Multidisciplinary and Transdisciplinary Research; Enhancements that
I2S Can Provide: Hybrid Approaches)

- **The Scope and Feasibility of the I2S Development Drive** *(Scope; Establishing Proof-of-Concept; Countervailing Forces; Implications of Imperfection for I2S and the I2S Development Drive)*

**References**

**Commentaries**

- **Rationale and Key Themes** *(Keeping I2S Grounded in Research Practice; The Challenges of Providing Integrated Research Support for Policy and Practice Change; I2S as a Discipline and the Need for a Stronger Theoretical Base; Institutional Factors; Moving the I2S Development Drive Forward)*
- **An I2S Discipline: Legitimate, viable, useful?** *(Daniel Walker)*
- **Integration and Implementation Research: Would CSIRO contribute to, and benefit from, a more formalised I2S approach?** *(Deborah O’Connell, with Damien Farine, Michael O’Connor and Michael Dunlop)*
- **I2S: Prescriptive, descriptive or both?** *(Michael Smithson)*
- **I2S Needs Theory as Well as a Toolkit** *(Alison Ritter)*
- **Building Integration in Research and Practice** *(Alice Roughley)*
- **Building I2S into an Academic Program** *(Lawrence Cram)*
- **The Institutional Challenges of Changing the Academic Landscape** *(Catherine Lyall)*
- **The Brazilian Experience with Institutional Arrangements for Interdisciplinary Graduate Programs: I2S may provide a way forward** *(Marcel Bursztyn and Maria Beatriz Maury)*
- **Building Integration and Implementation Sciences: Five areas for development** *(L. David Brown)*
- **From the Classroom to the Field: Reflections from a Pakistani law-enforcement perspective** *(Fasihuddin)*
- **Moving Competitive Integrated Science Forward: A US land grant research university perspective** *(M. Duane Nellis)*
- **Interdisciplinary Research is about People as well as Concepts and Methods** *(Ted Lefroy)*
- **Creating the New University** *(Glenn Withers)*
- **Beyond ‘Dialogues of the Deaf’: Re-imagining policing and security research for policy and practice** *(Simon Bronitt)*
- **Applying the I2S Framework to Air Pollution and Health in Indonesia** *(Budi Haryanto)*
- **Integration and Implementation in Action at Mistra-Urban Futures: A transdisciplinary centre for sustainable urban development** *(Merritt Polk)*
- **Philosophy as a Theoretical Foundation for I2S** *(Michael O’Rourke)*
- **Interdisciplinarity without Borders** *(Howard Gadlin and L. Michelle Bennett)*
- **When the Network Becomes the Platform** *(Julie Thompson Klein)*
- **Tackling Integrative Applied Research: Lessons from the management of innovation** *(Ian Elsum)*
- **The Fourth Frontier** *(Michael Wesley)*
- **How Theory Can Help Set Priorities for the I2S Development Drive** *(Christian Pohl)*
- **I2S and Research Development Professionals: Time to develop a mutually advantageous relationship** *(Holly J. Falk-Krzesinski)*
- **Integration and Implementation Sciences: How it relates to scientific thinking and public health strategies** *(Linda Neuhauser)*
About the author of Disciplining Interdisciplinarity

When the book was published Gabriele Bammer [4] was a professor at The Australian National University, Director of the Research School of Population Health and of the National Centre for Epidemiology and Population Health, both in the ANU College of Medicine, Biology and Environment. She was also an ANU Public Policy Fellow and a Research Fellow in the Program in Criminal Justice Policy and Management at the John F. Kennedy School of Government at Harvard University, in addition to being the Program Leader on integration and implementation for the Australian Research Council Centre of Excellence in Policing and Security.

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