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An innovative approach to teaching research and evidence in health sciences

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IFLA WLIC Health and Biosciences Libraries

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Background and context

Providing effective and early research training to students is critical for developing competency in evidence-based professional practice (Callaghan, Lea, Mutton, & Whittlesea, 2011):

- Health Sciences at LTU teaches a Core First Year for all disciplines. Research skills embedded in Semester 1 of 1st year, at a very introductory level

- Students reported a need for more advanced content in 1st year, as a bridge and introduction to more challenging content in 2nd year

- Teaching staff also reported this as a critical need

- Multidisciplinary team of teaching, research and library staff formed a project group to investigate.

AIM

- To develop a flexible *and engaging* online teaching resource

- Major learning resource for new multi-disciplinary 1st year subject: Research and Evidence in Practice as a bridge to more challenging content in 2nd year

- Assist other students in research pathways, graduate entry Masters students, teaching staff in LTU's Hospital Clinical Schools

- Learning resource to be original content, that introduces students to the importance of the role research in clinical practice

- **Learning objectives**   Multidisciplinary working group / steering committee; diverse research experience and approaches; designed a faculty wide online survey.

- **Content**   Informal conversational style, with text, video, images and quizzes to engage and encourage deep learning

- **Platform**   Investigated options such as the Learning Management System, LibGuides, Website, and PebblePad

- **Piloting and revision**   Pilot with 2nd year students (>1000 students) use feedback to revise content for new subject. Rollout in Semester 2, 2014 in new 1st year subject HLT1RAE (2,000+ students)

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Development of learning outcomes

- Delphi-like approach, combined literature and suggestions from Reference Group

- Gauge the priority of introductory and advanced topics in the teaching of research methods and evidence-based practice (EBP)

- 42 staff from across the Faculty responded to the survey

- Good representation from individual disciplines and across staff with high to very high levels of experience in teaching and knowledge of this content

- Introductory topics rated > 3.5 / 5 were retained

- Introductory topics were grouped into three modules with four topics in each in an order sequential to the subject learning guide of this new subject

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Module 1:

Evidence for practice:

what why and how?

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- **Topic 1** Introduction to evidence for practice

Key learning outcome

Outline the background, rationale, key principles and processes of EBP

- **Topic 2** Ethics in research and practice

Key learning outcome

Explain how common ethical issues can impact on health research and practice

- **Topic 3** Asking questions to guide your search for evidence

Key learning outcome

Develop well built and answerable practice-related questions [step 1 of the 5-step approach]

- **Topic 4** Acquiring the evidence

Key learning outcome

Acquire, appraise, and apply relevant evidence to answer different types of practice-related questions [step 2 of the 5-step approach]

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Module 2:

Research design:

Methods, bias, reliability and validity

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- **Topic 1** Introduction to quantitative research design

Key learning outcome

Outline defining features of the strengths and limitations of different types of quantitative research

- **Topic 2** Introduction to qualitative research design

Key learning outcome

Outline defining features of the strengths and limitations of different types of qualitative research

- **Topic 3** Sources of bias and threats to validity in qualitative and quantitative research

Key learning outcome

Identify biases from research evidence and describe how they threaten internal and external validity

- **Topic 4** Reliability and rigor in quantitative research

Key learning outcome

Interpret from a journal article, statistics relating to measurement precision

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Module 3:

Measurement and analysis

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- **Topic 1** Outcome measures and scales of measurement in health research

  Key learning outcome

  Describe and categorise outcomes measurements in the context of a journal article

- **Topic 2** Introduction to descriptive statistics and statistical inference

  Key learning outcome

  Describe the inter relationships between normality and variance

- **Topic 3** Treatment effects: mean difference, odds ratio, risk ratio, mean difference

  Key learning outcome

  Interpret from a journal article, statistics relating to the treatment effect: mean difference, odds and risk ratio and confidence interval

- **Topic 4** Probability (p- values) statistical significance and power

  Key learning outcome

  Identify and explain statistical significance in the context of a journal article

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Content layout and design

- Intentionally designed to engage students / informal conversational style

- Carefully selected examples to encourage participation and engagement *("what is the relevance of this material to me?")*

- Innovative use of multimedia

  - Videos include humorous with Maths comedian to demonstrate the importance of each topic

  - Screen capture videos to guide students

  - Interviews and commentary relating to learning objectives and context

Humorous video content

- *What is the relevance of this material to me?*

- 'Personality' to explain "why" and motivate curiosity in research and evidence

- Math Comedian / National Numeracy Ambassador / TV personality

- **Simon Pampena**

- Four short (1-2min) humorous and professionally produced videos

- See pages 2, 15, 38, 79 – show example

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Video content with maths comedian

Interviews and commentary relating to learning objectives

- Academics, expert in their field of research provided 5 minute interviews relating their research to the learning objective of the topic

- 18 video interviews

- Well received by students, as contributing to their understanding of the topics

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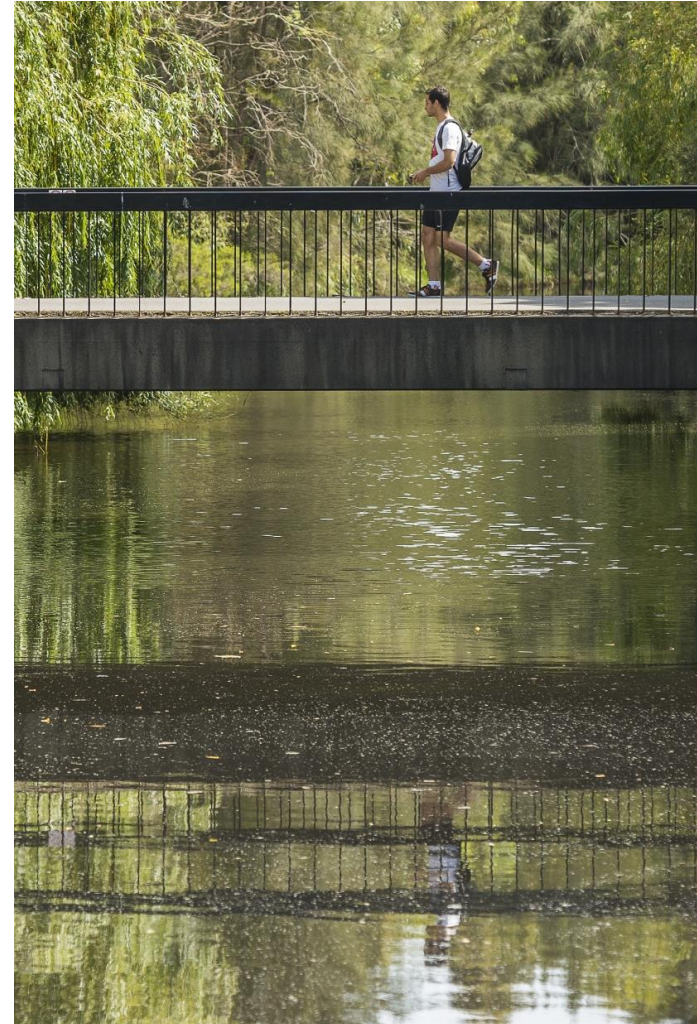UNIVERSITY · AUSTRALIA

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Peer Review

- 6 national and international EBP experts provided peer review on the modules / external to and not affiliated with La Trobe University.

- Questions for peer reviewers:

  – Overall, how do you rate the organisation of the modules/topics?

  – Overall, the level of intellectual challenge of the modules is?

  – Overall, the value of what is presented in the modules is?

  – Overall, the quality of this modules is?

  – Do the learning outcomes match the assessments tasks and do the learning activities support the assessment tasks?

  – Suggest any specific, practical changes which could improve learning in these modules?

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EBP Educators' responses:

- For **Organisation:**

    – two responded with 'very high' and four with 'high'.

- For **Intellectual Challenge**:

    – one responded with 'very high', four reported 'high' and one reported 'adequate'

- For **Value:**

    – three responded with 'very high' and three reported 'high';

- For **Quality:**

    – three responded with 'very high', one reported 'high' and two reported 'adequate'

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EBP Educators' feedback

- *"The use of 'people videos' and exemplars to illustrate key points were helpful and 'lightened' the content."*

- The educators were unanimous in indicating that the learning outcomes were achieved and appropriately assessed:

- *"The learning outcomes helped set expectations appropriately and mapped quite well to the content of each section"*

- *"These modules would be an excellent way to prep students for a class or could be used to follow up or reinforce learning, they provide a very good resource to support student learning"*

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Student feedback

Table 1: Mean student feedback on each module (n = 220)

	Module 1 (SD)	Module 2 (SD)	Module 3 (SD)
Intellectual challenge	3.5 (0.9)	3.8 (0.9)	4.0 (1.1)
Amount learned	3.8 (1.0)	3.7 (1.0)	3.6 (1.2)
Value of what was learned	3.8 (1.0)	3.6 (1.1)	3.6 (1.2)
Overall quality	3.9 (0.9)	3.7 (1.1)	3.7 (1.3)

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https://library.latrobe.edu.au/ebureau/

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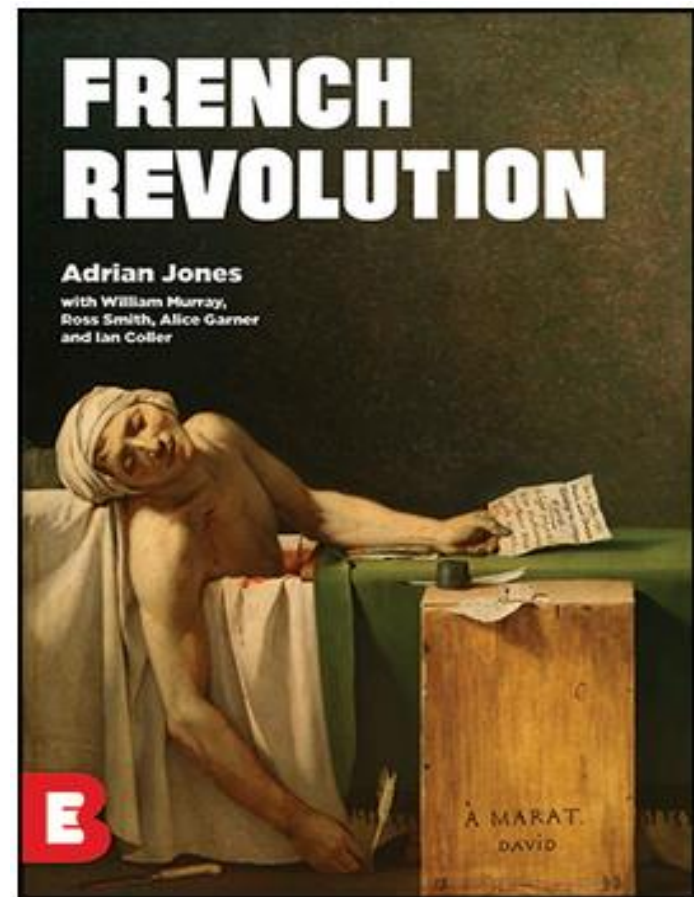
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About the eBureau

- Publishes engaging, high quality, open-access ebooks.

- Aim: invest in the development of quality open access resources to support online and blended learning.

- All resources are written by La Trobe University academics for La Trobe courses and subjects

- Provides academics with editing, design, copyright, peer review and online publishing services.
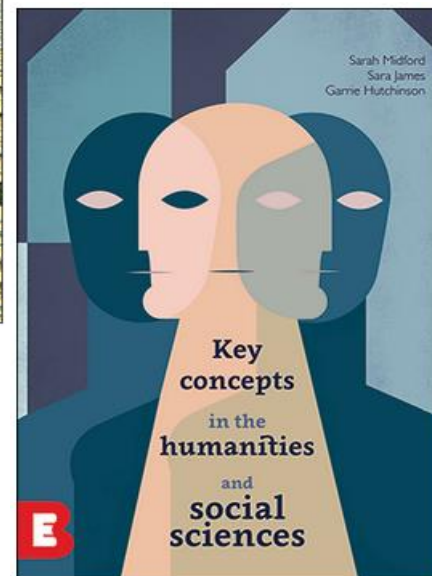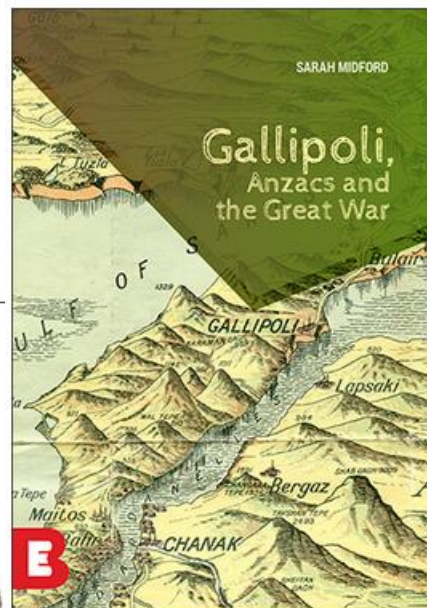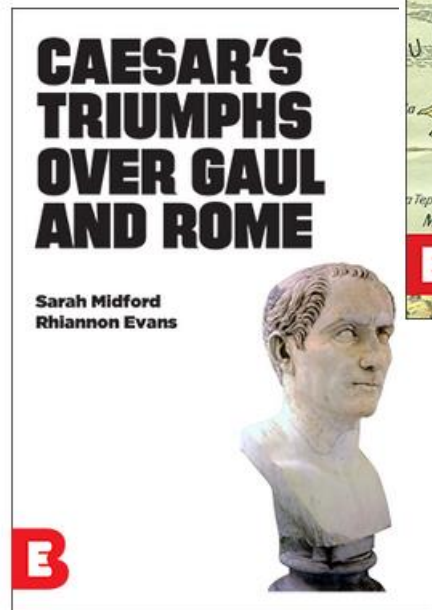
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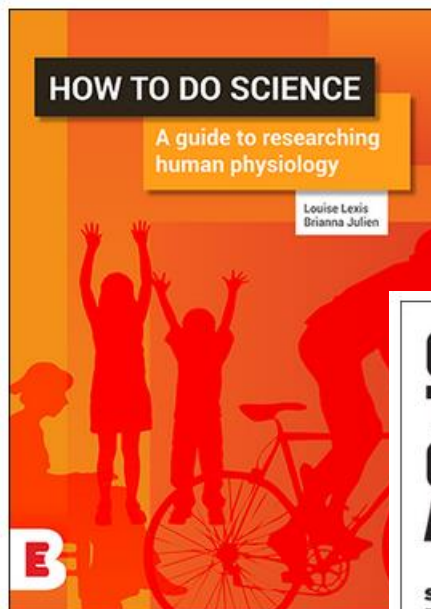UNIVERSITY • AUSTRALIA

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eBureau publishing process – Library

- Feasibility and discussion on suitability of content / Author agreements

- Design / Copyright compliance

- Copy editing and peer review

- Final publication and promotion

- Dissemination: Library website, Library catalogue, international catalogues, Jisc OA textbook catalogue and more …

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Current titles:

Research and Evidence in Practice

- Review and update of content from original modules in the LMS

- Video content available via Figshare

- Fillable tables enable the student to work on practice related activities

- Annotation and taking notes using sticky note tool in Adobe Acrobat

- Keywords link to the Glossary

- Published using Adobe InDesign

RESEARCH AND EVIDENCE IN PRACTICE

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Statistics

Research and Evidence in Practice published in December 2018

Downloads 6,612 / Video views 9,493

Semester 2: approx 2,000 students are using the etextbook in subject: Research and Evidence in Practice.

Statistics for Research and Evidence in Practice Dec 18 – Sept 19

Downloads by City (top 10)

City	Total Events
Melbourne	5,222
Bendigo	832
Sydney	170
Brisbane	59
Adelaide	42
(not set)	39
Shepparton - Mooroopna	32
Perth	21
Wodonga	20
Hobart	15

Total Downloads

Event Category	Total Events
Download Research evidence in practice - Low Res	5,614
Download Research evidence in practice - High Res	998

Total Downloads (19 Dec 2018 - 10 Sep 2019)

● Total Events

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Research and Evidence in Practice

Statistics international: Dec 18 – Sept 19

Total in-app clicks on "Research an...

7,011
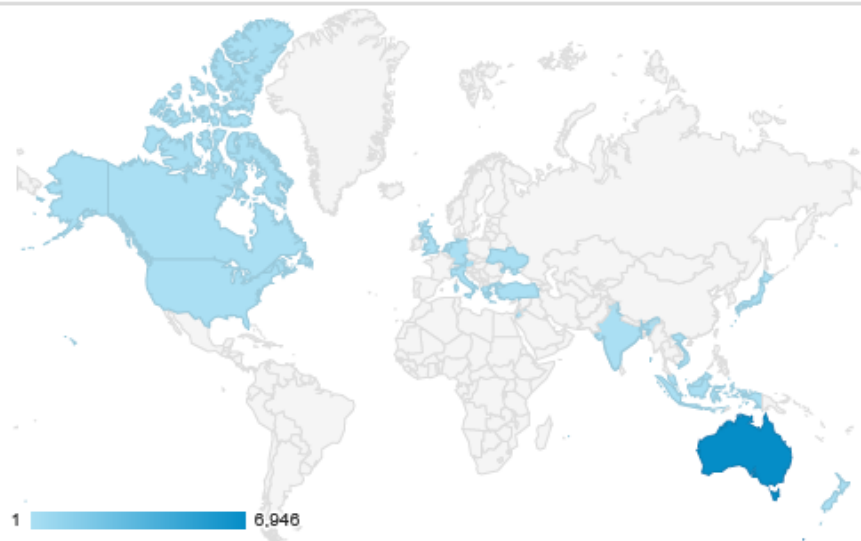% of Total: 76.82% (9,126)

Downloads by country

Country	Total Events
Australia	6,554
United Kingdom	6
Hong Kong	5
Italy	5
Malaysia	5
United States	5
Austria	4
Greece	4
Singapore	4
Canada	3

Total in-app clicks on "Research and Evidence in Practice" (19 Dec 2018 - 10 Sep 2019)

1   6,946

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Reflections

- Enhanced models of authentic learning experiences

- Careful planning and testing of content, design and usability, must include key stakeholders, educators and students

- Student focus on interactive learning: educational resources are interactive and multimedia laden

- Use of academic experts to provide context and authority to importance of topic and how it relates to patient care

- Supports students with easy access to this free textbook (2,000+ students)

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Reflections

- Academics able to publish their own unique teaching content in engaging, high quality, open-access etextbooks

- Showcases La Trobe academics' teaching content in an open access environment

- Supports clinicians in the workforce and teaching hospitals

- Contributes to international Open Access as Open Educational Resources (OERs) and Open Textbooks movement

- Provides new partnership opportunities for library staff and academics

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Questions?

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