Unit 2

Evaluating Research Resource Results = Evaluating Published Research

• Evaluating Research (CS)
• Evaluating Publications (DM)

David Macnaughton & Christoph Schmidt-Supprian
• Following on from Unit 1:
  – You’ve developed a search strategy, assembled nice lists of resources ...
  – … and now what?

• You need to evaluate their usefulness!

• How?
  – Today, we’ll focus on two methods:
1. Analytical framework
   - 6-point checklist
   - Qualitative criteria (mostly)
   - Requires your

2. Citation analysis
   - Online tools
   - Quantitative criteria
   - Requires a
Topics for Today

• Introduction: the importance of evaluation
• Critical analysis using the analytical framework
• Interlude: the scholarly communication process
• [Short break?]
• Citation analysis (bibliometrics)
  – How do I evaluate a paper?
  – How do I evaluate a journal?
  – How do I evaluate an author?
• Questions and Quiz
Aims

• To examine the importance of critical thinking skills and to consider the use of an *analytical framework*
• To look at methods of identifying and interpreting *research performance data* as a measure of information quality and relevance

Learning Outcomes

• Apply criteria for critical appraisal
• Use an analytical approach to evaluating information
• Use online citation analysis tools when evaluating research
• Contextualise information in your own research area
Importance of Evaluation

- Your own research
  - Aims to contribute to the body of knowledge in your field
  - Stands on the shoulder of giants (or not): literature review

- Ask of each publication, each “information resource”:
  - Is it relevant to my research topic?
  - Is it any good?

- A critical approach to evaluation helps determine relevance and value to your field.
The quality conundrum

- Ideally, you want to build on quality research
- Low quality resources can have their place (might even be rationale for own research)
- Key: demonstrate awareness of limitations; utilise strengths

Question: What are marks of quality?
Importance of Evaluation

Scholarly resources
• aimed at experts
• disseminate research within a discipline
• use of scientific methods to make claims that are valid and trustworthy
• independent
• based on clearly referenced sources and documentation

Popular resources
• aimed at a wider public
• entertain, inform
• promote viewpoints, sell products & services
• may represent vested interests
• based on personal accounts and opinion
**Problem:** not all scholarly publications are what they seem

- 2 case studies (see Online Module)
  - Faked data (Woo Suk Hwang)
  - Vested interest (Andrew Wakefield)

**Question:** would you have spotted these?
• Another case study: Reinhart, Rogoff... and Herndon (BBC News Magazine, 19 April 2013)
  – “Famous academic paper often used to make the case for austerity cuts contains major errors ... spotted by a student doing his homework.”

  ➢ Mistakes
  ➢ Raw data was incomplete, calculations not adjusted accordingly, results skewed
  ➢ Consequences??
More about the “MMR Controversy” (Wakefield’s Research):

- [The Lancet 02/28/98, Vol. 351 Issue 9103, p637](#)
- [The Lancet 06/03/04, Volume 363 Issue 9411, p750](#)
- [The Lancet 06/02/10, Volume 375 Issue 9713, p445](#)
- [Andrew Wakefield responds to article about journal retraction of autism study report](#)
- [Why did the Lancet take so long?](#)
Some Further Case Studies:

- [Ben Goldacre at TED July 2011](#)
- [Science journal ‘expression of concern’](#)
- [Dutch Psychologist Diederik Stapel Relinquishes His Ph.D](#)
- ‘Plastic Fantastic’
- ‘Elsevier published 6 fake journals’
- ‘Merck published fake journal’
- ‘Merchants of Doubt'
Conclusions from these case studies:

- Maintain critical approach
- Maintain analytical & reflective mindset
- Distinguish between popular reception and actual content of research
- Far-reaching implications of research = increased critical vigilance
An Analytical Framework

Analysis of your research question and considerations of the types of information needed to ‘answer’ this question as part of your search strategy will have laid the basis for effective evaluation of the information you find.

The process of either selecting or rejecting a piece of information will be governed by critical evaluation of its ‘value’ to your field of research.

This section considers the use of the following criteria for evaluating information found as part of your information search strategy.

Click on each of the tabs, in turn, to examine each of the six criteria.
Analytical Framework

The 6 criteria for evaluation:

1. Relevance
2. Authority
3. Methods
4. Objectivity
5. Presentation
6. Currency
"Does the publication help me answer my research question?"

- **Key:** context of your own project
- **Method:** screen for general clues ("technical reading")
- **Aim:** only read full content of the truly relevant publications
Analytical Framework: 1. Relevance

• Criteria
  – **Level:** is its detail appropriate to your needs?
  – **Geography:** does it concern only countries or regions not related to your research?
  – **Context:** how does it relate to the “body of knowledge” in your field? Unique insights? Confirmed/refuted by other research?
  – **Emphasis:** does it approach the topic from an appropriate angle? Relevant methodology?
Analytical Framework: 1. Relevance

- **Procedure**
  - Consider entry in catalogue or database: title, subject descriptors, other keywords
  - Then consider table of contents, index (books); abstract (journal articles); other preliminary and concluding material (preface, introduction, summary); even illustrations
  - If still undecided sample a chapter...
  - **Websites**: title bar, document title, links to and from the site, author

**Example**
Consider credentials of author(s) and publisher:

- **Author** - established expert?
  - Academic or professional qualifications, institutional affiliation(s), endorsements by other experts, subjects of other publications
  - Known for a particular perspective, mission or bias?
  - Citation analysis: has their research been frequently cited? What is their ‘h index’? Where published? Peer-reviewed? Impact factor?

- **Publisher** – known for publishing experts?
  - Type: commercial, non-profit, government, research, educational?
  - Vested interest? Contactable?
• **Websites**
  - How well established? (‘about’ or ‘who we are’ pages)
  - When was the site last **updated**?
  - Evidence of **sponsorship**?
  - Who links to this site? (Google advanced search)
  - Who wrote the content and is that person **contactable**?
  - **URL** suffix for type of organisation or country of origin:
    - Commercial company? (.com or .co.uk or .biz)
    - A non-profit organisation? (.org)
    - A government body? (.gov)
    - A research/educational organisation? (.org or .ac.uk or .edu)

(see also the ‘[Internet Detective](#)’
Method of Production and Methodology =

- 3a. Type of Publication
- 3b. Type of Research
Analytical Framework: 3a. Type of Publication

• Traditional publications
  – Academic journals, trade journals, magazines, newspapers, monographs (“books”), conference proceedings, (systematic) reviews

• New formats
  – Blogs, wikis, discussion lists, open access journals, open (institutional) repositories
  – Anyone can publish on the Web…
  – ... but not necessarily inferior quality; requires particularly careful (2. Authority) check
Analytical Framework: 3a. Type of Publication

Things to check:

- “About” information (e.g. [About the BMJ](#))
- Editorial policy, board (e.g. [BMJ Ed. Advisory Board](#))
- Author guidelines (e.g. [BMJ Resources for Authors](#))
- Peer reviewed? Impact factor?

**Peer-review:** process by which an academic journal passes a paper submitted for publication to independent experts for comments on its suitability and worth; refereeing.

Useful resource:

- [Ulrich’s](#) Periodicals Directory
Evaluate the Methodology + Method(s)

- Transparent? Relevant to your needs?
- Validity
  - Appropriate to research question? (e.g. sampling)
  - Data accurate and trustworthy? (e.g. data analysis)
- Reliability
  - Reproducible, likely to yield similar results? (e.g. sampling, controls)
Analytical Framework: 3b. Type of Research

Validity & Reliability

1. Good reliability, poor validity.
2. Poor reliability, good validity (on average).
3. Good reliability, good validity.

[From New Jersey Dept. of Health, via Google Images, 27 Nov. 2012]
What is the objective of the research?

- Vested interests, personal or organisational objectives ought to be disclosed
- Check sponsors; be extra careful in case of controversial topics (e.g. GM foods, climate change)

- Check the evidence – would you come to the same conclusions as the author(s)?
- Check the literature review and references – are all relevant points of view considered?
Analytical Framework: 5. Presentation

How is the information presented?
Consider:

- Colour & font, general appearance
- Language, grammar, writing style: meaning clear?
- Structure and layout: logical?
- Use of diagrams and images
- Quality of reproduction
- Advertising: intrusive?
How up to date is the research?

Consider:

- Is it clear when the information was produced?
  - Publication sometimes years after research
  - Newer not necessarily better
- Does the date of the information meet your requirements?
- Is it obsolete or has it been superseded?
• **Traditional Approach**: from informal to formal, communication of research at every stage
  - **Informal**: meetings, discussions, seminars, emails, blogs, social networking sites
  - Report ongoing research at **conference**
  - Publication in an academic **journal**
  - Indexed in research/bibliographic **databases/repositories**

• A ‘**periodical**’ published regularly/at set intervals (includes magazines, newspapers, newsletters). An ‘academic journal’ is a **peer-reviewed** scholarly periodical aimed at specialists and researchers. ‘Scholarly communication’: dissemination of new **ideas, theories, research** in academic journals
• ‘Peer-reviewed’/‘refereed’ – academic/scholarly
  ‘The process by which an academic journal passes a paper submitted for publication to independent experts for comments on it’s suitability and worth; refereeing’.

• Accepted/rejected: contribution to the field/new ideas, bias/conflicts of interest, suitability for journal

• Types: Double-blind, Single-bind, Open

• Future: Open online peer-review? e.g. blogs, Twitter
  [See: ‘Peer-review: a guide for researchers’]
Citation Analysis = Bibliometrics

How many times a paper or researcher is cited by other scholars in the field; assumes influential researchers/authors and important works cited more often than others.

How do you find out?
1. **Web of Knowledge** (Thomson Reuters) Covers 9,000+ peer-reviewed journals
2. **Scopus** (Elsevier) Similar to Web of Science; covers 16,000+ peer-reviewed journals; more than 4,000 international publishers; 1996 on (not yet available in UCC)
3. **Google Scholar** provides links to ‘cited by’ information
4. **Scimago Country & Journal Rank Database** details journals and country-specific scientific indicators developed from the information contained in ‘Scopus.’
• **Impact Factor- limitations**

Very useful tools, but IF not a measure of true **quality** of a journal, e.g.:

• **current popularity** of topic and **availability** journal may give higher IF

• based on an **average over all articles**: underestimates the citations of the top cited article, exaggerates the number of citations of the average article

• **comparison** of impact factors between different fields is invalid e.g. not relevant for literature, where the most important publications are books citing other books

• **only the ISI database journals** are used; undercounts the number of citations from other journals e.g. in ‘less-developed’ countries, other languages (American bias)

• **Why has the paper been cited?** e.g. Wakefield

• **50% of papers are never cited**
• Impact Factor- some limitations (contd.)
• ‘Like nuclear energy, the impact factor is a mixed blessing.’
• ‘The use of journal impacts in evaluating individuals has its inherent dangers. In an ideal world, evaluators would read each article and make personal judgments.’


N.B. See also Unit 6: Section 6.6 ‘Deciding Where to Publish’
• Final word:

• Cannot always rely on impact factors, times cited etc.
• Each researcher must make their own judgment about the quality and suitability of any article or information source.
• Depends a lot on the context i.e. how the research is to be used or referred to in your literature review. You may need to draw on material from newspapers, conferences, web material etc. with no peer review available.
• Refer to the framework/checklist outlined above and check with your supervisor when in doubt.
• Evaluation is an art; there no perfect indicator of quality. You need to look for clues, and ultimately judge on the basis of usefulness for your research question
QUESTIONS & QUIZ