

Quality of Methods and Reporting in Health Professions Education Research

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Quality

Degree of excellence; superiority in kind
- Merriam-Webster



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Assessing Scholarship

- Clear goals
 - Adequate preparation
 - Appropriate methods
 - Outstanding results
 - Reflective critique
 - Effective communication
- Purpose
- Methods
- Interpretation
- Reporting

Glassick CE. *Scholarship Assessed*. 1997



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Quality of reporting



Why are manuscripts rejected?

- Inappropriate statistics
- Over-interpretation of results
- Inappropriate instrumentation
- Biased or small sample
- Text difficult to follow
- Insufficient problem statement
- Inaccurate or insufficient data
- Incomplete or inaccurate literature review
- Insufficient data presented
- Defective tables or figures



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Why are manuscripts accepted?

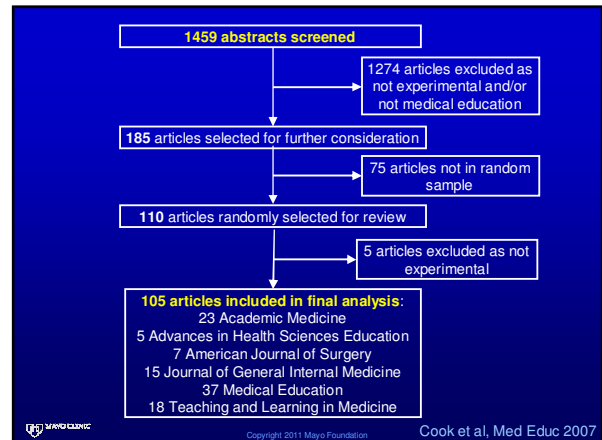
- Importance of the problem studied
- Excellence of writing
- Soundness of study design



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Study 1. 2003-2004, selected journals

- Experimental studies
 - Manipulate a variable, assess impact
- 6 journals: *Acad Med*, *Adv Health Sci Educ*, *Med Educ*, *Teach Learn Med*, *Am J Surg*, *J Gen Intern Med*
- January 2003 - December 2004
- 2 independent reviewers, consensus
- “Key features”, “informative abstracts”



Study 1. 2003-2004, selected journals

Literature review – discussed	45%
Conceptual framework – present	55
Statement study intent – present	76*
Statement study design – present	16
Study intervention – explicit	92
Control intervention – explicit	79
Ethical approval noted	42
* Statement of study intent <i>incomplete</i> for 98%	

Study 1. 2003-2004, selected journals

Abstracts

Rationale	63%	Intervention	52
Objective	80	Comparison	27 (46)
Design	19	Outcomes	61
Setting	28	Results (data)	46
Participants	40	Conclusions	92

Study 1. 2003-2004, selected journals

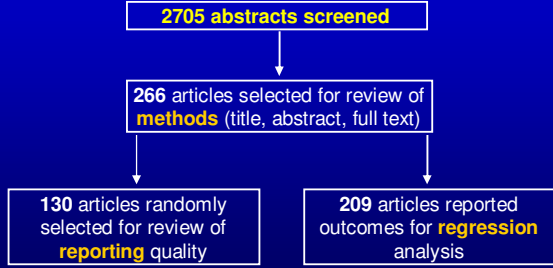
Summary - reporting problems

- Incomplete text
- Poorly described interventions (especially comparison group)
- Uninformative abstracts

Study 2. 1990 – 2008, Web-based learning

- Systematic search, any language, any journal; WBL + comparison point/group
- Independent, duplicate review
- Reporting quality: **STROBE**, “informative abstracts”
- Methodological quality: MERSQI, NOS
- Meta-analysis, meta-regression, ANOVA

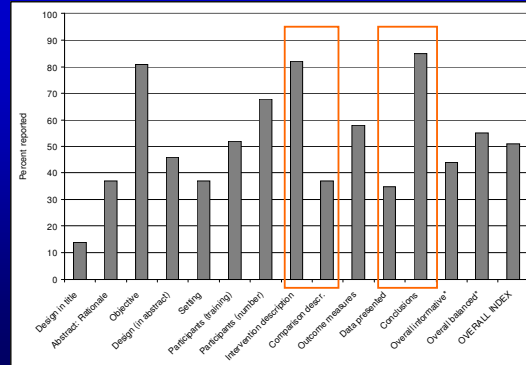
Study 2. 1990 – 2008, Web-based learning



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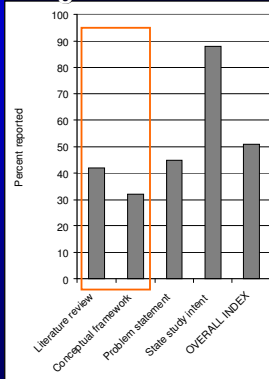
Reporting: Abstracts = 51%



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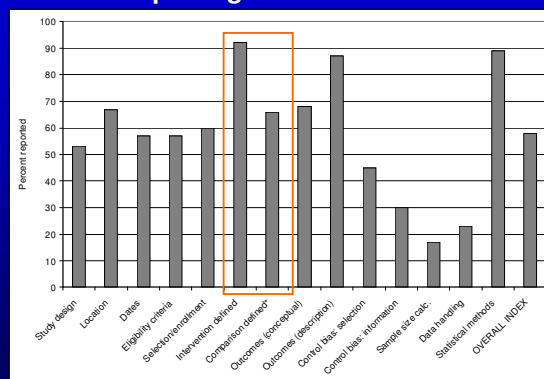
Reporting: Introduction = 51%



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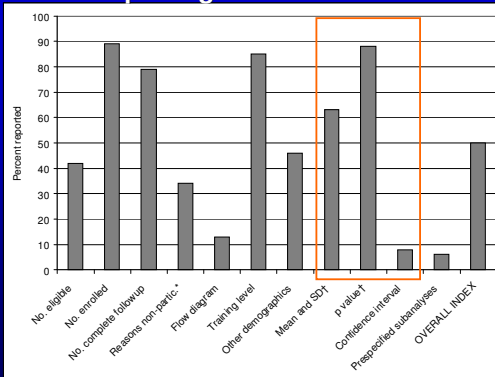
Reporting: Methods = 58%



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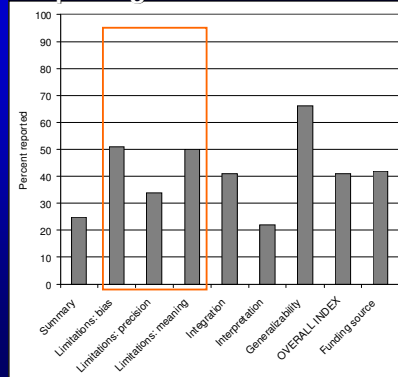
Reporting: Results = 50%



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Reporting: Discussion = 41%

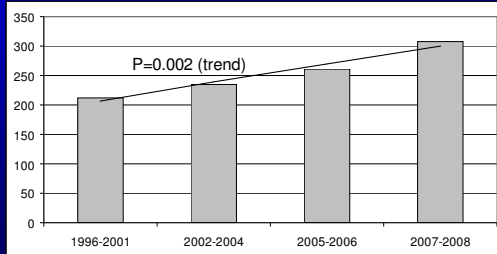


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Study 2. WBL

Reporting: Change over time



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Study 2. WBL

Reporting problems

- Poorly described interventions (esp. comparison group)
- Results incomplete (esp. CI's)
- Limitations not acknowledged
- Uninformative abstracts



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Why we need complete reporting

- Theory-oriented researcher
- Educator seeking to replicate educational intervention
- Researcher doing systematic review

➔ *Different needs*

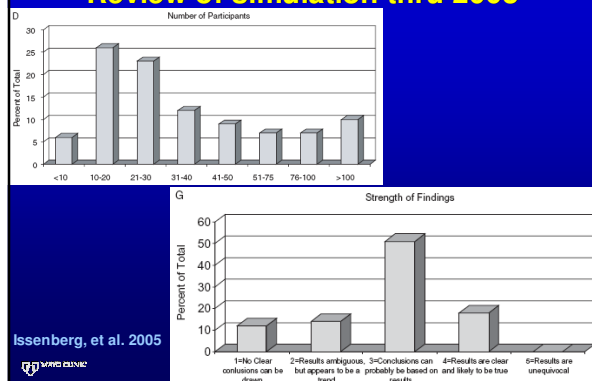


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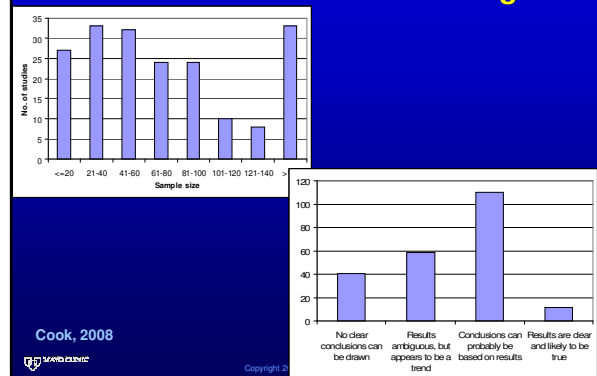
Quality of Methods

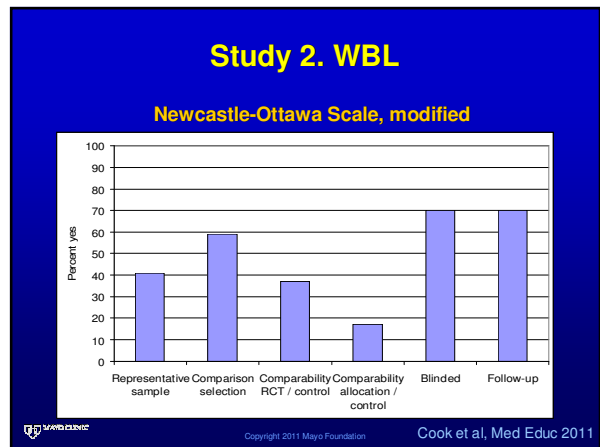
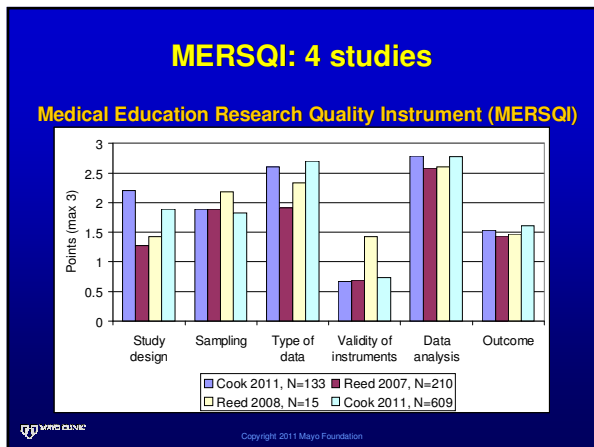
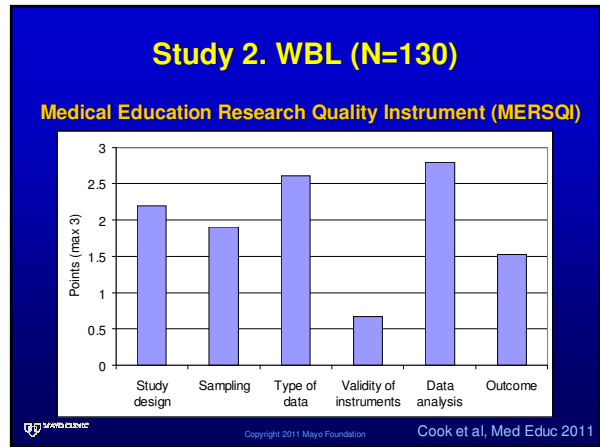
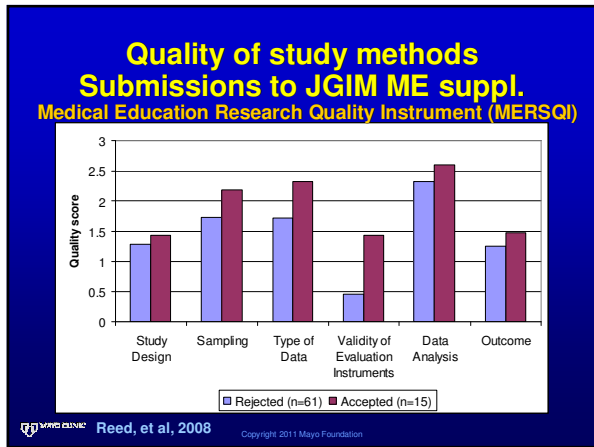
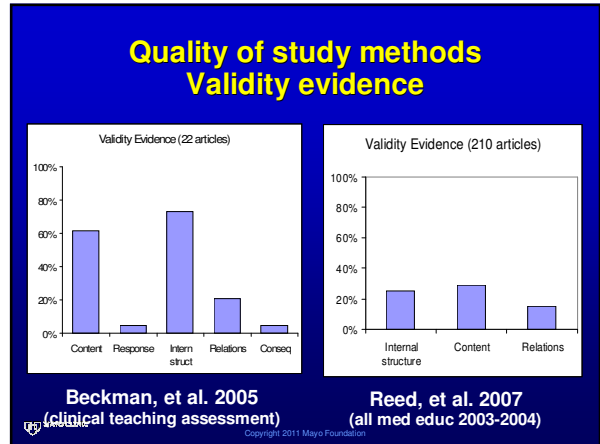
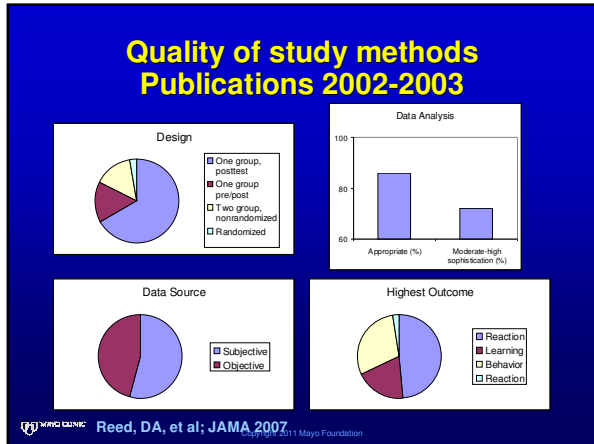


Review of simulation thru 2003



Review of Web-based learning





But does it matter?

Study 2. WBL Bias: |deviation from pooled est. |

Method quality	Hi	Low	P
Rep. sample	0.52	0.60	.49
Control grp	0.49	0.83	.013
Comparable	0.49	0.51	.81
Randomized	0.50	0.49	.94
Alloc. Concealed	0.54	0.50	.80
Learner blinded	0.46	0.58	.44
Assessor blinded	0.56	0.58	.84
Objective	0.55	0.70	.41
Follow-up	0.59	0.47	.32

Study 2. WBL Influential: meta-regression (Δ ES)

Method quality	NI	MC
Rep. sample	-0.07	0.27
Control grp	-0.35	-
Comparable	-	-0.21
Randomized	-	-0.03
Learner blinded	-0.23	-0.10
Assessor blinded	-0.06	-0.15
Objective	0.07	-
Follow-up	0.06	-0.12

Study 2. WBL

Methods

- Lots of methodological deficiencies ...
- But really didn't seem to bias results
 - EXCEPT 1-group pre-post
 - → larger effect size
- BUT did not evaluate **confounding**

"only randomized designs permit a clear causal link"

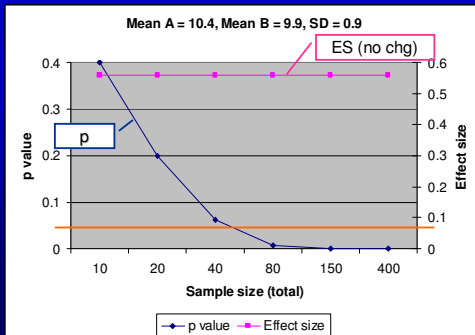
Study 2. WBL

- A final thought: Correlation
 - Reporting vs MERSQI, $\rho = 0.64$
 - Reporting vs NOS, $\rho = 0.57$
- ?? Why
 - Better methods skills = better reporting
 - More \$\$ = better methods & reporting
 - Better reporting = better data abstraction

Quality of Interpretations

To the untrained (or hurried) eye ...

Practical vs Statistical Significance



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RIME 2003

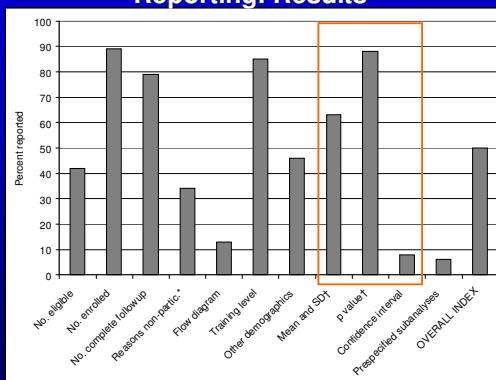
- 23 studies with quantitative data
 - 65% reported p value
 - 61% reported R²
 - 3 reported CI
 - 1 study reported E.S. for diff in means

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Wolf, 2004

Reporting: Results

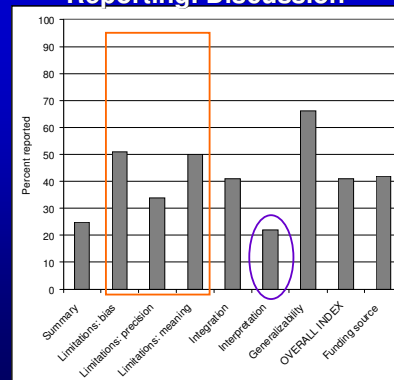


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Reporting: Discussion



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“Conclusion Bias” in CAI

	Author conclusions		
Reader	CAI better	CAI = trad	Trad better
Favor trad, significant	12	0	0
Favor trad, NSD	5	8	0
Favor CAI, NSD	2	8	1
Favor CAI, significant	0	1	0

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Cohen et al, 1992

Study 2. WBL “Conclusion Bias” in CAI revisited

- Authors vs Us
- Overall concordance ICC = 0.81 ... but

	Author conclusions		
Reader (us)	CAI better	CAI = comp	Comp better
CAI better	78	1	0
CAI = comp	8	38	0
Comp better	1	2	2

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Quality of Purpose (Question)



Is the Purpose important?

- "It is more important to understand the question than to find the answer." – Morrison (2001)
- "The single most important component of a study is the research question" – Bordage and Dawson (2003)

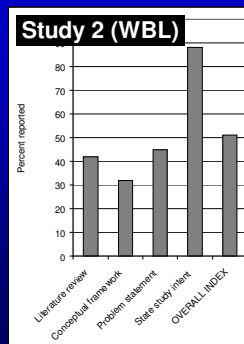


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Reporting of study purpose

Study 1 (6 journals)

- Critical literature review – 45%
- Conceptual framework – 55%
- Statement study intent – 76%



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Advance the science

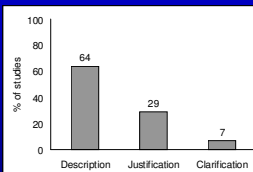
- **Description**
 - Case report, case series
- **Justification**
 - Does it work (evaluation of existing intervention)?
- **Clarification**
 - Why or how does it work (and how can it be improved)?



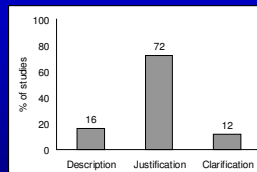
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Prevalence of research purposes in published literature



All PBL research
1970-2005
N=850
(Schmidt, 2005)



All experiments
2003-2004
N=105
(Cook, 2008)



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