Medical Education Journal Club

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Disclosure Information

Activity Directors / Planners / Reviewers / Faculty

Name	Role	Disclosure / Resolution
Carla S. Lupi, MD	Activity Director/Planner/ Speaker	Dr. Lupi reports no relevant financial relationships.
Vivian Obeso, MD	Planner/Speaker	Dr. Obeso reports no relevant financial relationships.
Christian Castro, PhD	Planner	Mr. Castro reports no relevant financial relationships.
Melissa Ward-Peterson, MPH	Planner	Ms. Ward-Peterson reports no relevant financial relationships.

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Learning Objectives

- Be able to list the search results for one medical education database consulted in the design of a course or teaching session.
- Conduct a critical appraisal of an article in the medical education research.
- Identify the applicability of research results to one's own course or teaching session.

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Medical Education Journal Club

- Establish a forum for faculty to share and discuss recent literature in medical education
- Use best evidence in medical education literature to evaluate and advance current practices in our educational program
- Establish a culture that promotes curricular innovation and change in an evidence-based manner
- Stimulate educational scholarship

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Effectiveness of Case-Based Learning. A BEME Systematic Review: BEME Guide No. 23

- http://www.youtube.com/watch?v=73W4VfQmUrl&feature=player_detailpage

- BEME Guide No. 23
- Medical Teacher 2012;34


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"... AND MR. FEDWORTH'S MARKING OF THE OTHER COMMITTEE MEMBERS WAS INTERPRETED AS THE ONLY "WAY" WRE..."

- “Claims are made for CBL as an effective learning and teaching method”
- “very little evidence is quoted or generated to support these claims”

Topic Review Group (TRG)

- Range of expertise in curriculum development
- General pract, peds, pathology, psychology, physiology, midwifery, e-learning, communication skills, research methodolgy, medical student

- Explore, analyze and synthesize the evidence relating to the effectiveness of CBL

- 1. To identify the published empirical evidence on the effectivess of CBL
- 2. Analyze the strengths and limitations of the studies
- 3. Propose a definition for CBL

Questions

- How is CBL defined?
- What methods are used and advocated?
- What are students and educators view on CBL?
- Is CBL effective?
- In what ways is CBL effective?
- How does CBL promote learning?

Relevance

- Currently on the path to continued promotion and implementation of a Case Base-Learning curriculum

Systematic Review

- Inclusion
  - Medicine, dentistry, vet, nursing, mid wifery, social care and allied health professions
  - Outcomes data (not merely descriptions)
  - Not limited to english
  - After 1965
- Exclusion
  - Failed to meet inclusion criteria
  - PBL

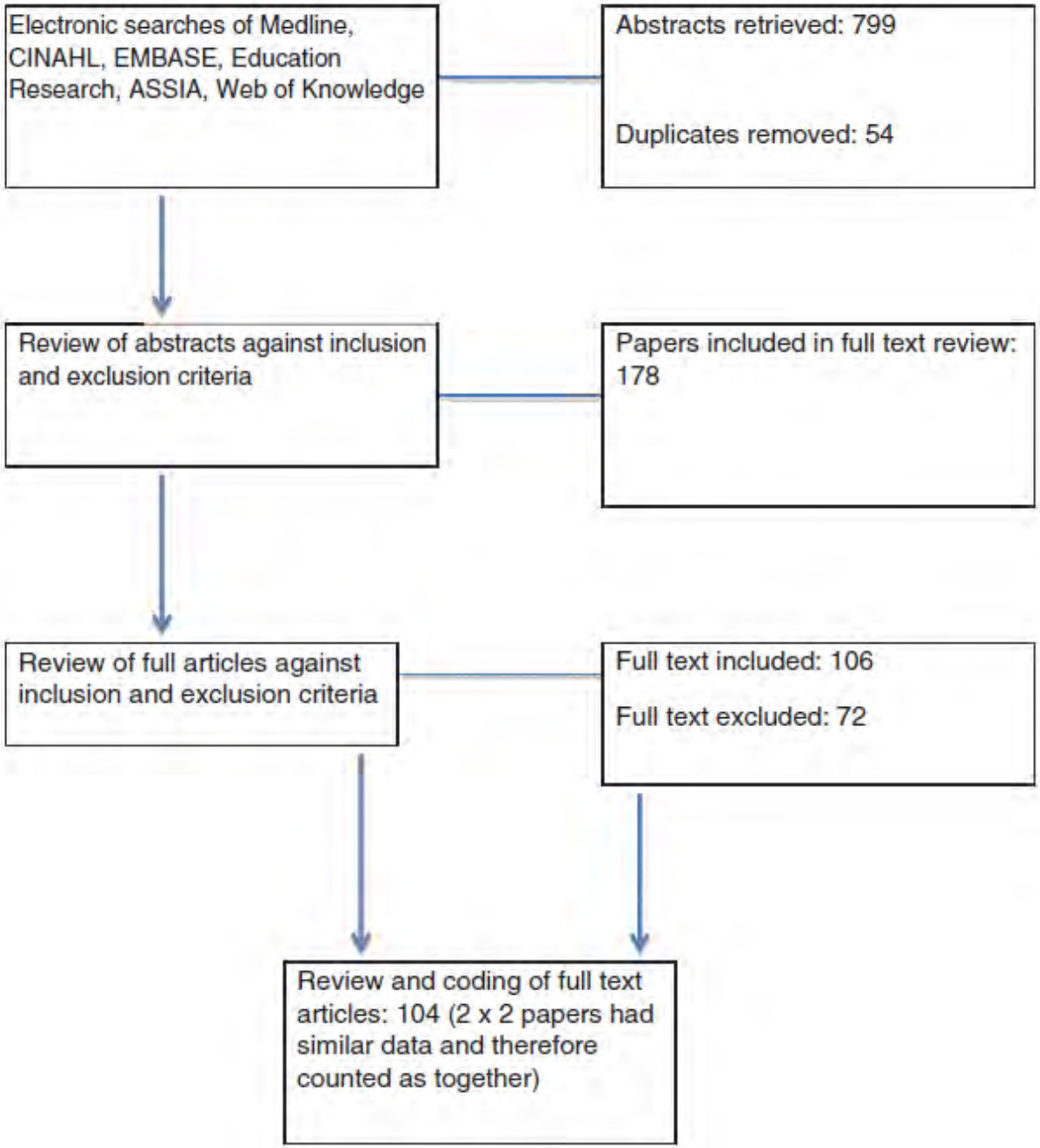
Search Strategy

Table 1. Results from databases.

Database	Total abstracts	Excluded	Duplicates	Full papers	Excluded full	Coded
Medline	173	94		79	30	49
CINAHL	53	37	2	14	4	10
EMBASE	71	47	7	17	6	11
Education research	115	92	4	19	6	13
ASSIA	13	6	6	1	0	1
WoK	374	291	35	48	26	22

- 2 Reviewer – 173 Medline
- 1 Reviewer – Wok, ASSIA
- 1 Reviewer – CINAHL, EMBASE, ER

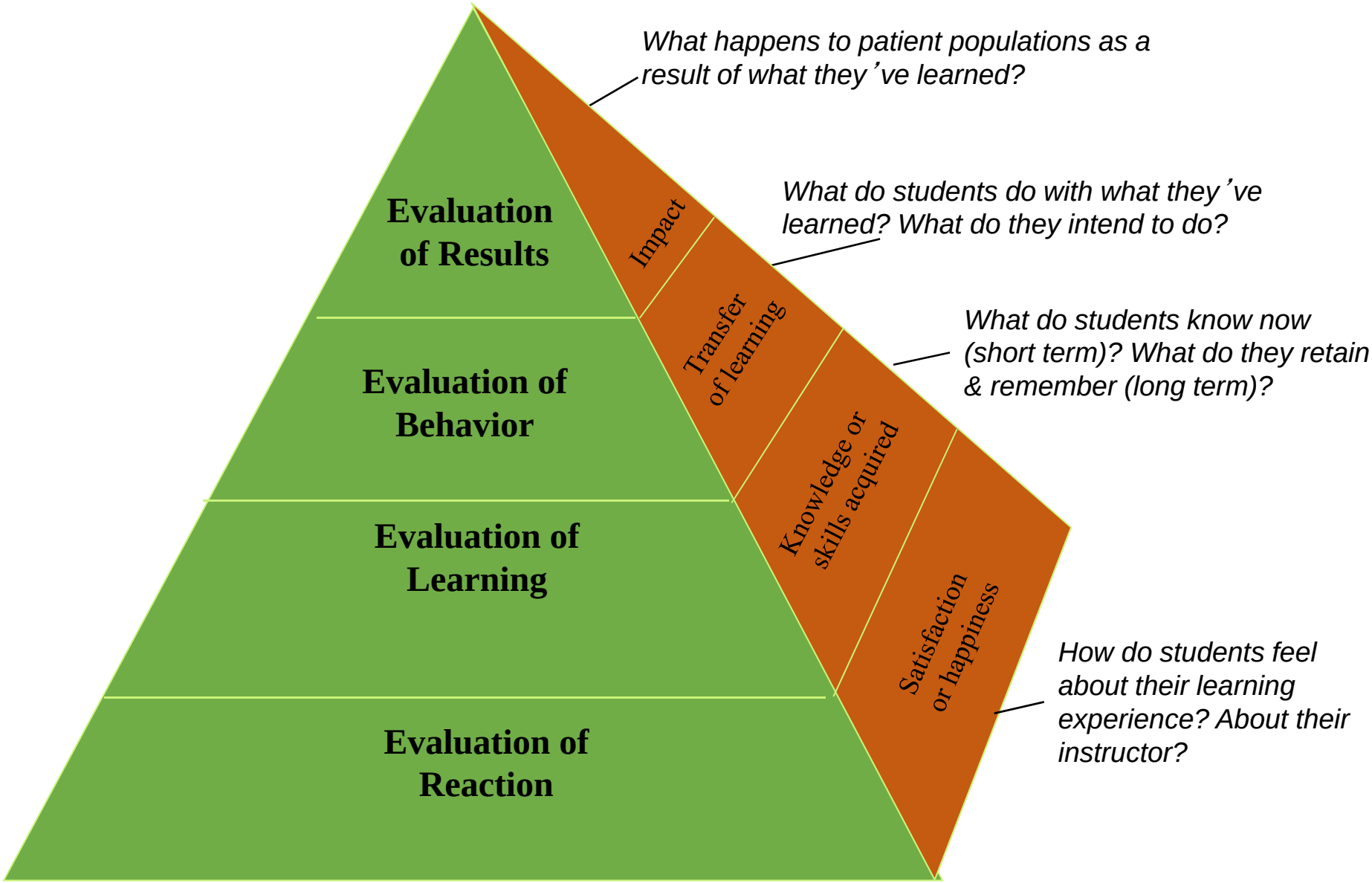
Appendix 2: Flow diagram of literature search and paper selection



Coding

- Standard: title, author, coder, inclusion criteria, location, number of students, research design, impact Kirkpatrick hierachy
- (1Reaction, 2Learning, 3Behavior, 4Results)

- Modified (added): topic, learning outcomes, years, text/space answer subsidiary questions
- Strength of findings (1-5)
- Overall Impression (poor – excellent)


Evaluation of Results
Evaluation of Behavior
Evaluation of Learning
Evaluation of Reaction
Impact
Transfer of learning
Knowledge or skills acquired
Satisfaction or happiness
What happens to patient populations as a result of what they've learned?
What do students do with what they've learned? What do they intend to do?
What do students know now (short term)? What do they retain & remember (long term)?
How do students feel about their learning experience? About their instructor?

Criteria for Judging

- #participants
- #cohorts
- Comparison of cohorts
- Outcomes data – level 2 or beyond
- Attempts at exploring how CBL is effective
- Clear description of analytic method

Rater Reliability

- Inter rater agreement exercise
- 7 members coded 3 papers
- 1 Reviewer
- Papers 3-5 - 2nd coder

Data Analysis

Table 2. Coding based on first review.

Kirkpatrick level	1 student reaction	86
	2a change in attitude	9
	2b change in knowledge	41
	3 change in behaviour	0
	4 organisational change	0
Strength of findings	1	29
	2	40
	3	22
	4	13
	5	0
Overall impression	Poor	53
	Acceptable	38
	Good	13
	Excellent	0

- High Quality = 3-5 + excellent, good or acceptable

Table 3. Double coding ($n = 34$).

Coding	Reviewer 1	Reviewer 2
Excellent + 4		1
Good + 4	13	8
Acceptable + 4		2
Poor + 4		1
Good + 3		3
Acceptable + 3	19	9
Poor + 3	2	1
Good + 2		1
Acceptable + 2		5
Poor + 2		0
Acceptable + 1		1
Poor + 1		2
Total significant papers	34	23

- 104 papers
- 23 Significant papers

Table 4. Geographical location.

Location	Number in full sample ($n = 104$)	Number in significant sample ($n = 23$)
UK	5	0
Other Europe	19	6
Asia	9	0
North America	54	14
South America	1	0
Africa	2	0
Australasia	14	3

Table 5. Year of publication.

Year	Number in full sample ($n = 104$)	Number in significant sample ($n = 23$)
2010	6	2
2009	9	1
2008	12	2
2007	15	5
2006	14	4
2005	9	5
2004	6	1
2003	1	0
2002	10	1
2001	2	1
2000	3	0
1990–1999	14	1
Pre-1990	3	0

Table 6. Professions of students.

Student profession	Number in full sample ($n = 104$)	Number in significant sample ($n = 23$)
Chiropractic	1	0
Dentistry	5	1
Medicine	68	15
Nursing	9	2
Paramedic	2	0
Pharmacy	2	0
Psychology	3	1
Social science	1	1
Speech pathology	1	0
Veterinary	5	3
Mixed	7	0

Table 7. Number of students in studies.

Total number	Number in full sample ($n = 104$)	Number in significant sample ($n = 23$)
Fewer than 50	22	2
51–100	13	4
101–200	32	9
Over than 200	21	7
Not given	16	1 (but 4 years data)

Note: The smallest study had six students and the largest over a 1000 (exact number not given).

Table 8. Number of students learning together on cases per group.

Number in group	Number in full sample ($n = 104$)	Number in significant sample ($n = 23$)
Working alone	13	4
2–15	41	7
16–30	5	2
More than 30	9 (usually whole year group)	2
Not given	36	8

Design

- S = Single cohort - all students same intervention -
- M = multiple cohorts, different interventions for comparison of cohorts or control
- MY = similar intervention over different year groups and no comparison
- MH = same intervention, historical controls

Design

- Single Cohorts 63(61%)
- Multiple/Comparison 30(29%)
- Different year 9(8%)
- Historical 2(2%)
- OUTCOME DATA

Post 78 (75%)

Pre/post 23 (22%)

During and post 3 (3%)

Data Analysis

- Narrative Synthesis Approach to compare, contrast and synthesize data

- Guided by the theory of inquiry based learning

Confirmation, Structured, Guided, Open

Results

- 104 -Definition, methods/learning activities, student and faculty views, effectiveness level 2
- Summarized:
  - Significant Single Cohort (10)
  - Significant comparison (13)

Definitions of CBL

- GOALS, CONTENT, PROCESS

- GOAL
- Authentic cases
- Added breadth of presentation to prepare them for clinical practice
- Opportunities for formulating diagnosis and plans
- Explain how underlying mechanisms relate to identifying and treating illness
- Changing the traditional role of student and faculty
- Revising instructional goals and design

- Content
  - Real life- authentic cases

- Process
- Linking of theory to practice
- Bridge learning knowledge/working life
- Mirroring the decision making process of workplace
- Active discussion
- Participation
- Cooperative learning

Methods of CBL used and Advocated

Table 8. Number of students learning together on cases per group.

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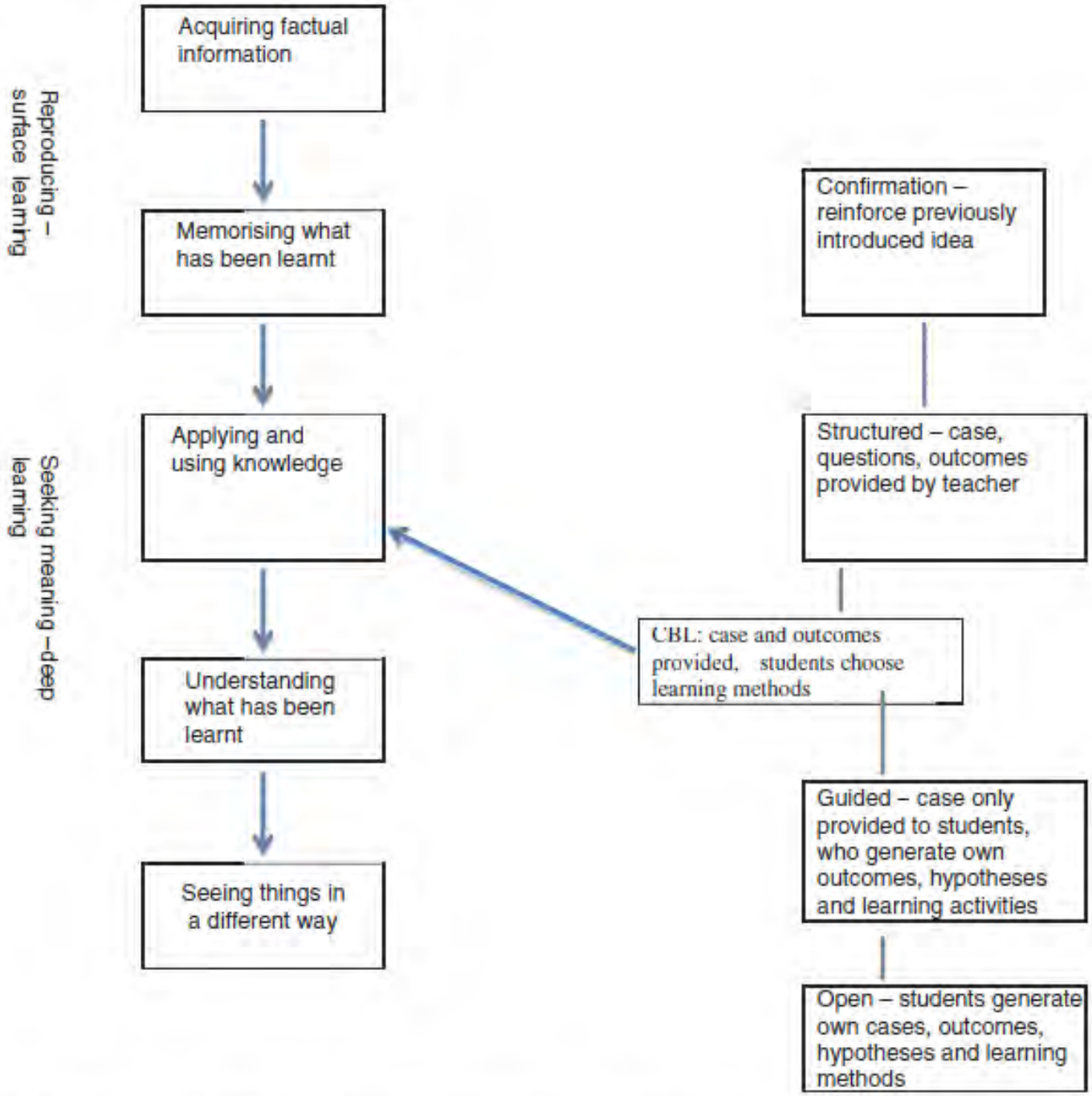


Figure 1. Student learning in CBL on an inquiry-based continuum (adapted from Entwistle 2009 and Banchi & Bell 2008).

Learning Outcome

- Only 35 included learning outcomes

Is CBL Effective
Kirpatrick Level One

- http://youtu.be/0aGmtQlRnt4

Is CBL Effective

- Level 1 Student Reaction
- Liked highly, satisfied, stimulated, motivated, challenged, helpful, value, appreciated, real life relevance, gain in confidence, helped apply knowledge, valuable, wanted more, bolstered personal interest, clinical problem solving, made anatomy more relevant, improved clinical skills, increased confidence in making problem lists, increased confidence in choosing tests, promoted independent learning and critical thinking:

- CBL or a Small Group effect???

- Mixed reaction: does not prepare for summative assessment, work load, preferred small group to large group, more structure, clearer instructions, some struggled with self-directed learning
- Unstructured – more enjoyable (Sutyak, 1996)
- Enjoyed but not as a replacement for traditional classroom teaching (Radon 2006)

Level 2 – Change in knowledge

- Knowledge (5 studies)
- Clinical Reasoning Skills (2)
- Skills (1)

How does it work Statements...

- As good as real patients
- Improves student understanding
- Overcome misconceptions
- **Active participation**
- Aid development of **applied reasoning**
- Learning style did not influence the learning experience
- *Maturity effect*

Level 2

- Majority of papers found no difference between CBL cohorts or students having other interventions

Kirkpatrick Level	Level 1	Level 2		
No. of papers N= 104	**#88 (85%)**	**# 48 (46%)**	**Level 2 +CBL Significant**	**No Difference Significant**
Significant Papers Total= 23 **= High Quality** **=3-5 =Acce,Good or Excellent**	#6 Worthwhile -Variable -Enjoyed more/links theory -Learned through discussion -Satisfied -Increased motivation		#8 -Reduced misconceptions -Changed pathology scores -Working through errors helps -Better results -Increased importance psychosocial/cultural issues -Enhances learning and collaboration -Preferred CBL to PBL - positive to group work	#9 -Variable -No Difference in exams -No change in critical thinking -No Difference with PBL -No Difference CBL and TBL -No Difference -No Difference -No change in knowledge -No Difference in Simulation and CBL

Limitations

- Subjective –
- Judgment criteria – non specific
- Inter rater reliability exercise- poor description/weak
- Most outcome data – Level 1
- "How it works"– subjective statements
- Lack of Description regarding structure/nature of cases –
- Lack of rigor involving whether cases fit an Inquiry based method/delivery?
- Definition of CBL – Broad
- Small Group effect ??

Thoughts.....

- Approach to Clinical Medicine is complex
- Hoping, wishing, gambling?
- Assuming that "Case" or "Patient Based Discussions are enough to teach students how doctors think?
- Is it enough to Frame the case, walk through, elicit discuss, prompt/ask, guide, self –directed,

Objectives?

- ***Confirmation of Medical Knowledge***
- ***Linking Basic Science with Clinical Med***
- ***Application Knowledge***
- ***Clinical Skills***
- ***Clinical Reasoning***
- Awareness/Integration of Special Topics
- Collaboration
- Group Dynamics
- Individualized Assessment
- Individualized Feedback

Faculty Training

Learner Level of training

- Milestones
- Clinical Reasoning Objectives/Curriculum

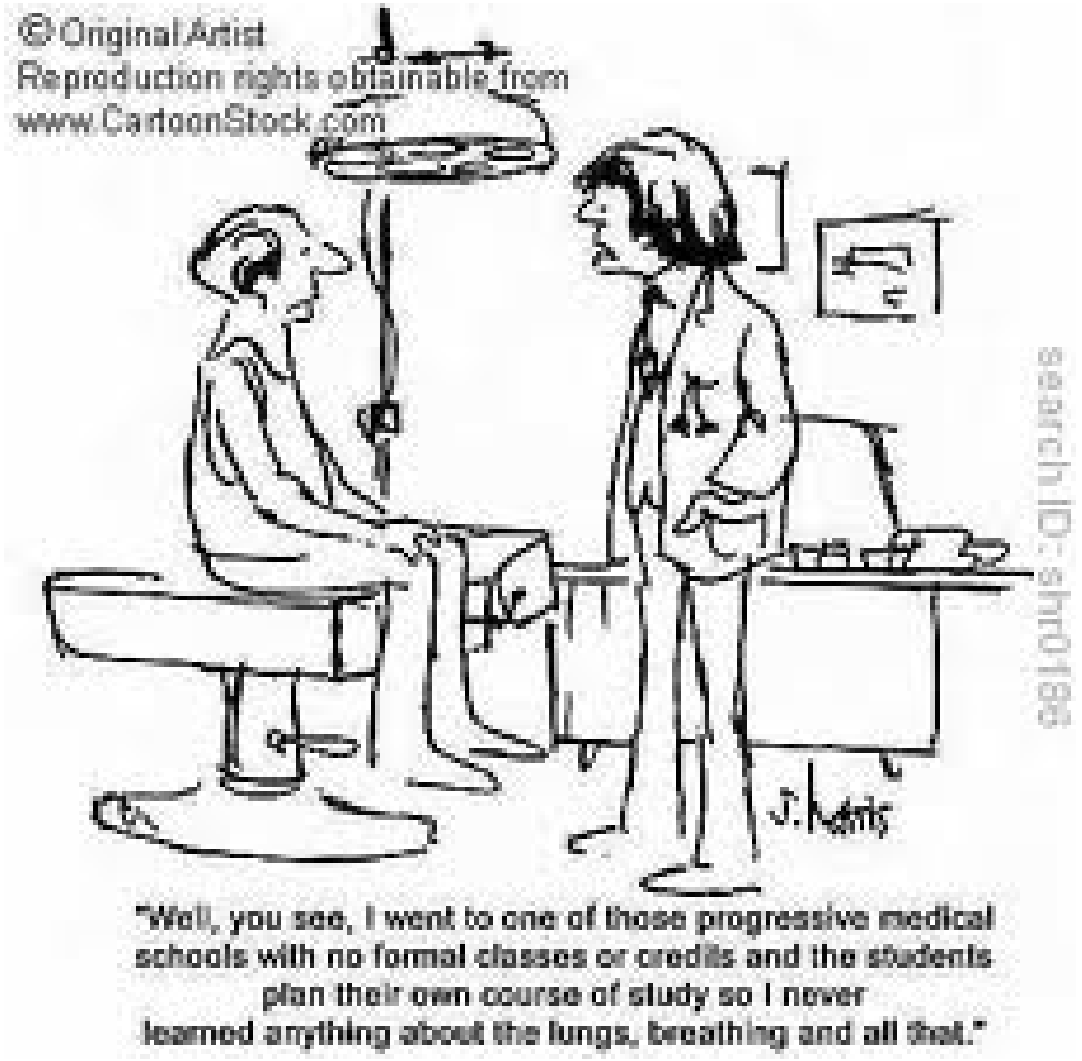
- Impact on CASE STRUCTURE

- Complexity, Multiple Solutions, Uncertainty,
- Transitioning – Novice to Experienced
- Robust Case Base Curriculum – 3rd /4th year ??????

Critical Thinking, Clinical Reasoning….
How doctors think…..

- Expert Knowledge
  - Explicit knowledge/Facts
  - Procedures
- Tacit Knowledge
  - Pattern Recognition
  - Perceptual Discrimination
  - Judgment
  - Mental Models –critical for gaining insight
- CBL – opportunity to identify flaws in mental models and adapt more accurate, comprehensive or useful ones

- IMSH 2014, Gary Klein
- Lou Oberndorf Lecture on Innovation in Healthcare Simulation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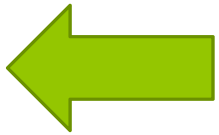
"Well, you see, I went to one of those progressive medical schools with no formal classes or credits and the students plan their own course of study so I never learned anything about the lungs, breathing and all that."

Inquiry Based Learning On a continuum?

- Confirmation
  - CBL customized early learner
- Structure



  - CBL
- Guided

- Open PBL -- GOAL? Assessment?

- Measure Outcomes and Performance
- Improve Learning

- SMART

Future

- Defining CBL
- How much structure?
- Does this vary as students mature?
- Case Delivery
- Does it prepare students?
- Does it translate to practice?
- Does it extend or limit clinical reasoning process?

Please complete the CME survey to receive credit for attendance.

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