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CReME Workshop

Frameworks for analysing critical thinking

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Plan

- Welcome & intro
- Why frameworks?
- Situations where CT might occur (interactive)
- ACTIVITY 1 – How can we analyse CT?
- Frameworks for analysing CT (presentation)
- ACTIVITY 2 – Applying frameworks for CT
- Discussion and wrap-up

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ILOs

- Identify situations in a medical context, where critical thinking may take place.
- Identify different frameworks for the analysis of critical thinking.
- Apply and critique one or more of these frameworks.

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Why frameworks?

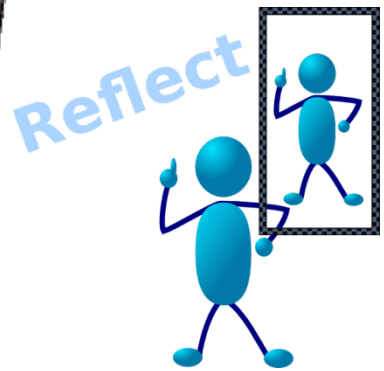
- To over come problems of abstract concepts
- To establish a common understanding
- To analyse a situation, phenomenon or activity
- To design interventions
- To look for evidence, generate hypotheses, conduct research

"There's nothing so practical as good theory" *(Lewis, Kurt)*

Where might you expect CT to occur?

?

Where might you expect CT to occur?



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ACTIVITY 1

How might you *analyse* critical thinking that occurs:

- When a medical student sits a situational judgement test?

- When a medical trainee is asked to suggest a possible diagnosis for a patient?

- When medical students participate in a PBL (problem-based learning) tutorial?

Frameworks

1. Da Silva & Dennick (2010)

2. Kamin et al (2003)

3. Garrison et al (2001)

Framework 1

Da Silva & Dennick (2010)

- **Corpus linguistics** = the study of language based on examples of 'real life' language use (McEnery and Wilson, 1996 in Rayson, 2003)

- **Corpora analysis** = Corpora analysis uses powerful computer programs to process written texts or transcripts of oral material. (Adolphs, 2004).

- Outputs = frequency distributions of nouns, or other parts of speech; frequency distributions of words associated with specified semantic categories such as words used to discuss anatomy, physiology or disease.

- First time CA has been used to analyse PBL

Example of software output

Relative frequency =

(Frequency of occurrence/ total number)x 100

Table 1: More frequent words

Word	Frequency	Relative Frequency
the	215	3.56
it	156	2.58
that	125	2.07
a	108	1.79
of	107	1.77
to	105	1.74
and	104	1.72
we	101	1.67
she	100	1.66
is	95	1.57
yeah	93	1.54
you	93	1.54
her	67	1.11
its	66	1.09
i	64	1.06
do	61	1.01
what	60	0.99
be	59	0.98
shes	58	0.96
nt	48	0.79
in	47	0.78
so	45	0.74
got	44	0.73
or	38	0.63
not	35	0.58
but	34	0.56
well	34	0.56

Framework 1

Da Silva & Dennick (2010)

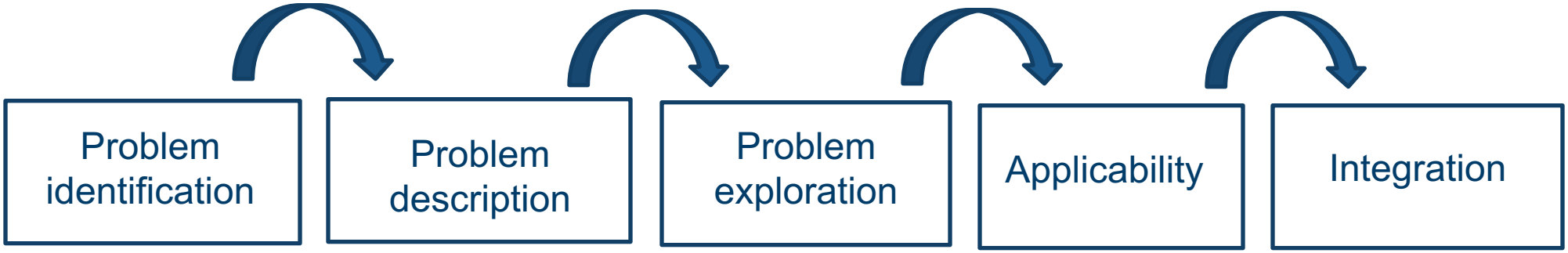
- **Questioning** - Making questions
- **Explaining** - A disease, biological mechanism,
- **Reasoning** - If X then Y

Framework 2

Kamin et al (2003) – and earlier

- Based on Dewey's (1933) concept of 'reflective thinking', adapted by Garrison (1991) > **5 stages of CT**
- Coding scheme - 35 indicators of critical thinking, 4 for group process
- **Critical thinking ratio** (-1 to+1)

5 stages of critical thinking



Garrison 1991 (problem = gap in knowledge)

Framework 2

List 1

Guide to Codes for 35 Indicators of Five Critical-thinking Stages and Four Group-process Issues*

Stage 1: Problem Identification
New information
- (NP^d) New problem-related information (Example: He was fine when Mom left for work.)
- (NP^s) Repeating information that has already been said (Example: Yeah, he's fussy.)
- (NI^d) Asking for information not provided yet (Example: How old is this kid? Nonexample: Have you ever seen a kid with this symptom?)
- (NI^s) Complaining or repeatedly asking for information that cannot be provided (Example: Why didn't they tell us if there were tears or not?)

Stage 2: Problem Description
Clarifying/agreeing on terms/concepts
- (A^d) Discuss ambiguities or facts to clear them up; push limits of knowledge (Example: Which immunization were you thinking about?)
- (AI^s) Ignoring or exhibiting impatience with ambiguities (Example: Why can't we just ask the patient instead of discussing this?); or asking facilitator to be content expert (Example: Will you tell me what Cushing's triad is?)
- (AI^d) Identify what the group or individual needs to know (learning issues); includes admitting when the answer is not known and agreeing which phenomena require explanation (Example: I don't know how you rule out ingestion.)
- (AF^s) Facilitator "pearls" – facilitator teaches rather than facilitating. Student responds yes/no to question with no explanation.

Bringing outside knowledge experience to bear on problem
- (OE^d) Drawing on personal experience (Example: I saw one of these kids last week and we did. . . .)
- (OE^s) Drawing on irrelevant personal experience, distracting group from case (Example: My brother used to do that with us.)

Stage 3: Problem Exploration
Linking ideas, interpretation
- (L^d) Linking facts or ideas (Example: Since his pressure is a little high and we are giving him fluids, it could go up, and if his fontanels are full, we would be worried about increasing the pressure.)
- (L^s) Repeating information without making inferences or offering an interpretation or stating that one shares the ideas or opinions stated without taking these further or adding any personal comments (Example: Right, absolutely.)
- (LT^d) Interpretation of data (what was said in text) (Example: It was hard to understand if that's like hypertonia, or if he's too tired to sit up, or if he was developmentally delayed prior to this event.)
- (LV^d) Interpretation of data (what was seen in video) (Example: No, because he looked like he had good tone.)

Framework 3

Garrison et al (2001)

- Based on Matthew Lipman's concept of the **Community of Inquiry** (CoI).
- CoI = group that undertakes an inquiry, or solves a problem, and does so via means of discourse.
- '[Reconstructs] experience and knowledge through the critical analysis of subject matter, questioning, and the challenging of assumptions' (*ibid*., p.7).

Matthew Lipman's Community of Inquiry

Cognitive presence

Social presence

Teaching presence

= critical thinking

Lipman, 1991

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Framework 3

Category of CP	Indicators	Socio-cognitive processes
Trigger	Sense of puzzlement	Asking questions
Exploration	Information exchange	Personal narrative, statement of facts
Integration	Connecting ideas	Integrating info from different sources
Resolution	Application of new ideas	Consensus on possible solution

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ACTIVITY 2

Using the transcripts and frameworks provided:

- Try marking up (a) transcript(s) for evidence of critical thinking

- Be prepared to discuss what you can conclude about critical thinking in the discourse represented in the transcripts

- Be prepared to discuss the utility of the frameworks

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Discussion

- Could you identify evidence for critical thinking, using these frameworks?
- What was your experience of using these frameworks?
- What are the pros and cons of the different frameworks?
- How might you apply these in your context?

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