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ACFA7004

Research Methods & Professional Development

Lecture 4 - Literature Review Writing, Theoretical and Conceptual Frameworks

Trawsnewid Addysg; Trawsnewid Bywydau
Transforming Education; Transforming Lives



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Use Week 3 sources to explain what is known and what remains unclear

Week 4 shifts from finding papers to synthesising knowledge and framing the proposed study.

1

Gather

Week 3: relevant, critiqued sources.

2

Group

Identify concepts, themes and debates.

3

Synthesise

Connect evidence and evaluate its quality.

4

Frame

Choose theory and map relationships.

Destination

A critical review argument plus a defensible theoretical or conceptual framework.

By the end of Week 4, you should be able to...

- 1 Compare**
Distinguish narrative, critical, scoping and systematic review approaches.
- 2 Organise**
Structure a review around concepts, themes or methodological debates.
- 3 Synthesise**
Write critical paragraphs that compare, evaluate and connect studies.
- 4 Select**
Justify the use of a relevant theoretical perspective when appropriate.
- 5 Develop**
Build and explain a conceptual framework aligned with the research question.

01 What a literature review does

Build a coherent account of the field, not a collection of article summaries.

It interprets the evidence to justify the study

Establish knowledge

What is reasonably known, and from which bodies of research?

Examine debate

Where do results, definitions or approaches differ?

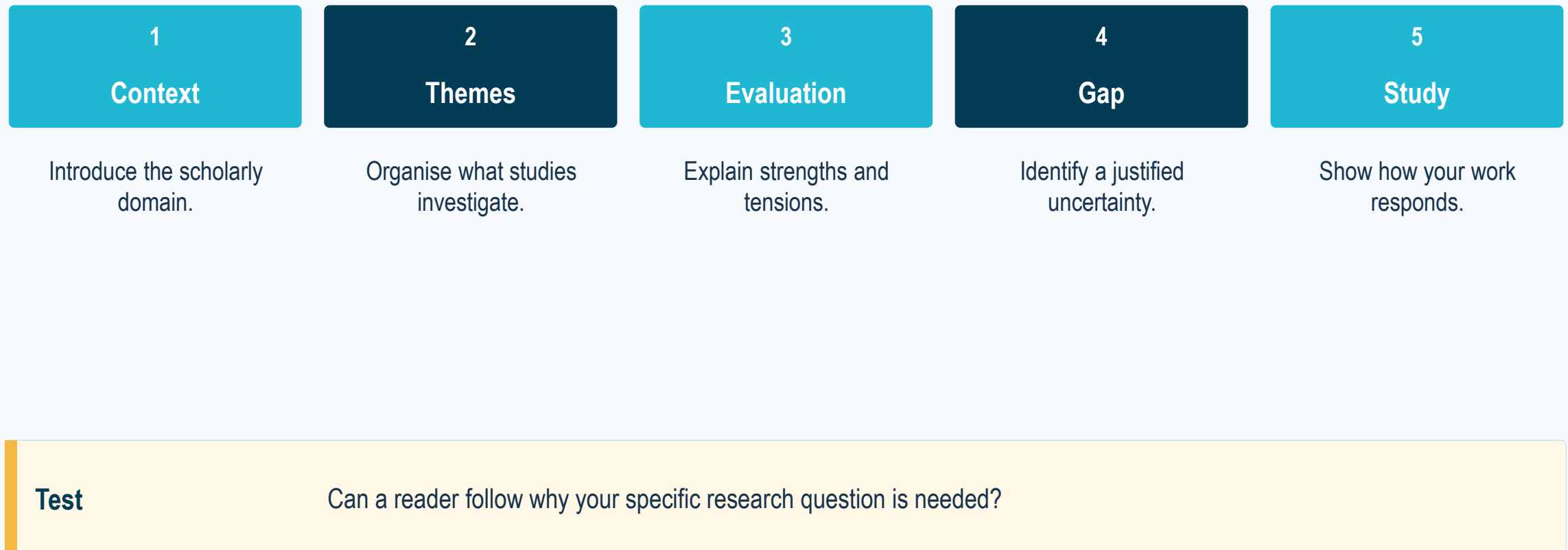
Justify contribution

Which specific uncertainty will your project address, and why?

Important

An effective review uses evidence to support claims, then links those claims to the research problem.

Every section should support the research rationale



Choose an approach that matches the question

Narrative / integrative

Develop a reasoned overview and thematic synthesis; selection procedures should still be explained.

Critical review

Examine theoretical, conceptual and methodological strengths, tensions and assumptions.

Scoping review

Map the extent and categories of an emerging or diverse research area.

Systematic review

Follow a predefined, transparent protocol to answer a focused review question.

Use PRISMA when a systematic review is actually planned

Protocol

Specify review question, search sources, eligibility and appraisal methods before selection.

Study selection

Document identification, duplicate removal, screening and inclusion decisions.

Reporting

PRISMA 2020 provides checklist and flow-diagram reporting guidance, not a substitute for a review method.

Scope

For a standard dissertation literature review, do not imply formal PRISMA compliance without applying the requirements.

A clear beginning, a themed argument, and a reasoned ending

Introduction

Scope, rationale, review focus, definitions and organisation.

Themed body

Concepts, key studies, comparisons, methodological limitations and debates.

Conclusion and gap

What is established, what is uncertain and how your study responds.

Choose a structure

Thematic writing is often clearer than one paragraph per paper.

A literature review should connect studies

Study-by-study summary

"Paper A used a survey. Paper B tested guided prompts.
Paper C interviewed students."

Each sentence stands alone.

Critical synthesis

"Across the studies, methods differ in their ability to assess independent skill, creating uncertainty about whether self-reported benefits translate into performance."

The papers named here are illustrative, invented studies.



Three useful structures, with different purposes

By theme

Cluster recurring concepts: AI guidance, learner autonomy, debugging outcomes.

By method

Compare surveys, experiments, interviews and how methods affect findings.

Over time

Show developments and turning points; avoid a date-by-date catalogue.

Create comparisons across sources, not isolated reading notes

Theme	Source A	Source B	Source C	Synthesis question
Assistance	Frequent self-report	Guided prompts tested	Reliance described	How is "AI support" defined?
Evidence	Survey association	Short task performance	Interview accounts	What can each design establish?
Limits	Self-report bias	Short intervention	Small purposive sample	Which uncertainties remain?

Example only

Sources A, B and C are teaching scenarios, not published articles.

Build a thematic outline from three sources

8 MINUTES

Cluster and explain

From three of your Week 3 papers, identify two shared themes, one disagreement and one methodological limitation. Give each theme a useful review-section heading.

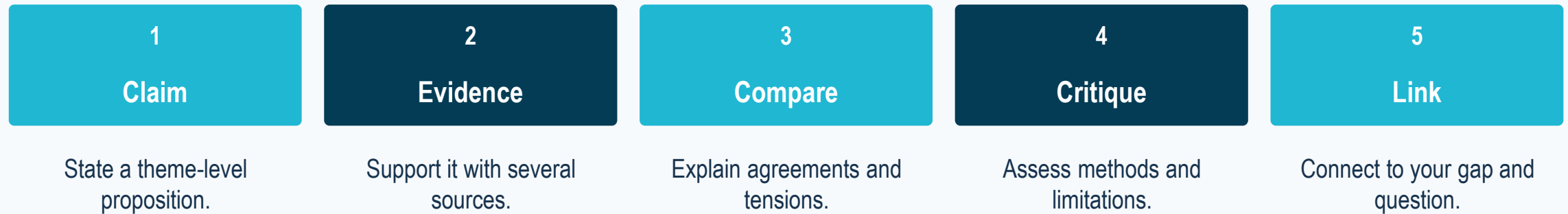
Produce

Two themed headings and a one-sentence rationale for each.

02 Critical synthesis and writing

Turn evidence into evaluative paragraphs with a clear scholarly voice.

Move beyond description to interpret evidence



Writing rule

Do not claim all studies agree unless the scope, methods and findings truly support it.

Use the same three studies to practise synthesis

Study A: survey

120 students report AI use and confidence; debugging accuracy not directly measured.

Study B: classroom trial

Two groups complete tasks after guided AI prompts; measured outcome covers one module.

Study C: interviews

15 students describe benefits and dependence; no independent performance test.

Teaching scenario

These descriptions are invented solely for classroom writing practice.

A model paragraph with transparent limitations

The illustrative studies suggest that students perceive generative AI as useful during debugging, but the strength of evidence for independent skill development varies by research design. The survey provides breadth of reported experience, while the classroom comparison offers a more direct performance measure within a single module. Interview findings illuminate possible dependence, yet cannot establish its prevalence. Together, these studies motivate a further investigation using clearly defined independent debugging tasks.

Notice

Theme-level claim + comparison + methodological caution + explicit research need.

Five moves make the writing analytical

1 Topic sentence

Present a theme, issue or contestable claim.

2 Evidence

Select findings from relevant, credible sources.

3 Comparison

Explain similarities, differences or developments.

4 Evaluation

Judge methods, quality, context and implications.

5 Link forward

Relate the argument to the research gap or next theme.

Use comparison, contrast and appropriate caution

Agreement

"Several studies converge on..."; "Consistent with..."

Disagreement

"In contrast..."; "A different result emerges when..."

Methodological caution

"The small sample limits..."; "This design cannot establish..."

Research need

"The combined evidence leaves unclear..."; "This suggests a need to..."

Do not hide disagreement: explain it

Different constructs

A study of confidence may not match one of objective skill.

Different populations

First-year students and professional programmers may respond differently.

Different intervention

Free use and scaffolded prompts are not equivalent.

Ask

Can differences in context, measures or methods explain the apparent contradiction?

A gap is specific and supported by the reviewed literature

Empirical gap

Little evidence about a particular group, setting or outcome.

Methodological gap

Prior designs or measures cannot answer a key part of the question.

Conceptual or theory gap

Definitions or explanations remain ambiguous or poorly integrated.

Avoid

"No one has researched this" is rarely defensible without a thorough search.

Your voice develops an argument; citations show its basis

- 1 Paraphrase**

Explain the finding in your own phrasing without altering its meaning.
- 2 Attribute**

Cite each non-original claim at an appropriate point in the text.
- 3 Compare**

Use multiple references when a statement is supported by several studies.
- 4 Distinguish**

Separate source findings from your interpretation and proposed study.
- 5 Verify**

Check every reference against the actual document.

Rewrite a summary as critical synthesis

9 MINUTES

Transform this draft

"Paper A studied students. Paper B examined debugging tests. Paper C used interviews. All papers are about AI." Rewrite it into 4-5 sentences that compare evidence, qualify conclusions and identify a concrete gap.

Produce

One evaluative paragraph using at least two methodological comparisons.

What a stronger paragraph should achieve

Shared theme

AI support during debugging is the organising concept.

Evidence quality

Experiences, task outcomes and interview claims measure different things.

Careful conclusion

The independent-skill question remains incompletely addressed.

Peer feedback

Underline the claim, box comparisons, circle limitations and mark the final gap statement.

03 Theoretical frameworks

Use theory as an explanatory lens where it fits the research question.

A selected body of theory that informs how you interpret a problem

Key constructs

Theory offers established concepts and definitions.

Expected relationships

Theory proposes mechanisms or explanations to examine.

Interpretive lens

Theory guides questions, measures and interpretation.

Distinct purpose

A literature review evaluates studies; a theoretical framework explains which lens helps understand them.

Select rather than decorate

- 1 Relevance**

Does the theory address your research problem and phenomenon?
- 2 Concept clarity**

Are the constructs defined and understood in your context?
- 3 Evidence**

Has the theory been used or challenged in related research?
- 4 Competing views**

Would another theory offer a different explanation?
- 5 Feasibility**

Can the theory inform your data collection or analysis?

Cognitive load theory as one possible perspective

Theory selection here is for demonstration, not an assertion that the study will confirm its predictions.

Underlying idea

Learning activities draw on limited working-memory resources.

Application to AI assistance

Guidance may reduce some processing demands but also alter the practice learners perform.

Research implication

Measure more than immediate success: consider independent task performance after assistance.

Foundational reading

J. Sweller, "Cognitive load during problem solving: Effects on learning," Cognitive Science, 1988.

Keep the levels of explanation separate

Theoretical proposition

A theory offers a more general explanation of how cognitive effort, support and learning may interact.

Study-specific hypothesis

A testable prediction might compare later independent debugging scores for two defined instructional conditions.

A qualitative study may use theory to sensitise interpretation without testing a statistical hypothesis.



Explain selection and boundaries

1

Name

State the theory and cite its source.

2

Define

Explain key constructs correctly.

3

Justify

Show why it fits the research question.

4

Apply

Connect constructs to the planned study.

5

Limit

Acknowledge what it may not explain.

A good paragraph

The framework section must explain what the theory helps you see and what it leaves uncertain.

04 Conceptual frameworks

Build a study-specific map of concepts and possible relationships.

Related, but not interchangeable

Theoretical framework

Grounded in established theory or theories. Supplies concepts, assumptions or an explanatory lens.

Conceptual framework

Researcher-developed model of the specific study, integrating relevant concepts, evidence and possibly theory.

Some disciplines combine these in one section; use your programme guidance for structure.

Define the elements before drawing arrows

Central concepts

What phenomena, constructs or variables matter?

Proposed links

Which relationships are predicted, explored or described?

Context or boundaries

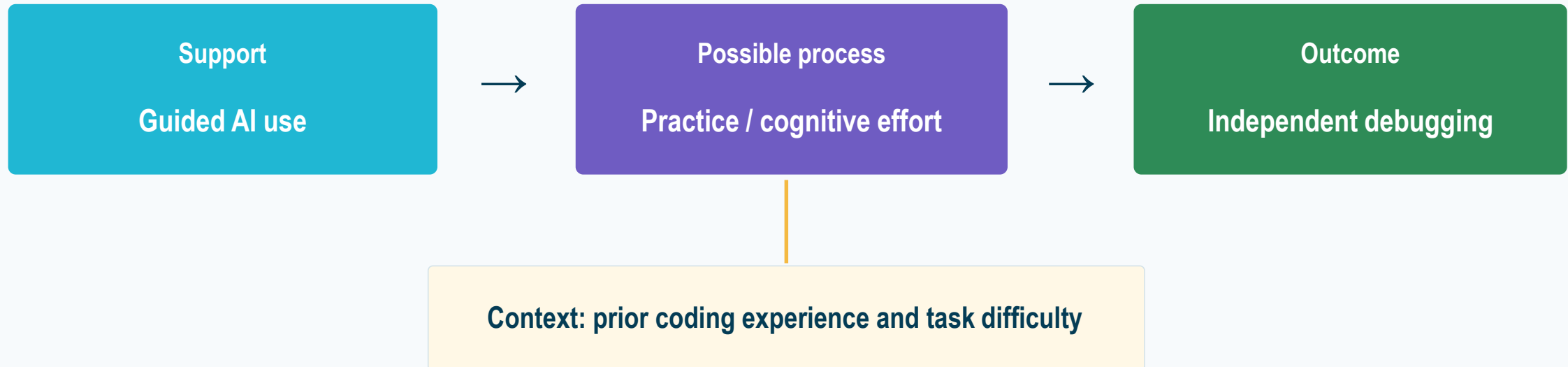
In which population, environment or conditions?

Evidence and theory

Which studies or theoretical ideas justify each link?

A map for the guided-AI debugging study

Proposed relationships are hypotheses to investigate, not established findings.



Interpretation

The boxes are constructs; arrows are proposed links to justify using evidence or theory.

Operationalise what your framework represents

Element	Definition for this study	Possible observation or measure
Guided AI use	Access with structured prompting rules	Condition: guided / comparison
Learning process	How students approach debugging problems	Think-aloud notes or process logs
Independent performance	Ability to debug without AI assistance	Blinded rubric on later task
Prior experience	Baseline programming familiarity	Pre-test or prior module result

Match the visual grammar to the research design

Quantitative or evaluative design

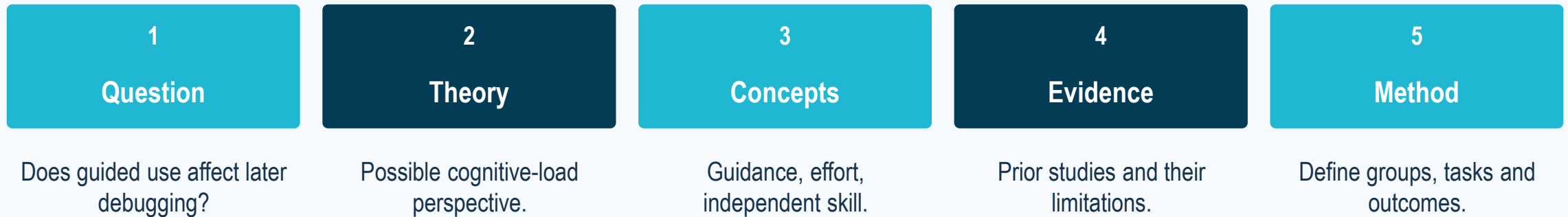
Arrows can represent proposed directional relationships, provided variables, measures and assumptions are explicit.

Qualitative or exploratory design

Use connected concepts, contextual relationships or sensitising ideas without implying tested causality.

Do not draw a causal arrow solely because two concepts appear together in the literature.

Your framework must lead to workable research decisions



Quality test

For every construct, explain its source, role, and how the study could investigate it.

Six traps and the correction

Unexplained arrows

State why each relationship is proposed.

Too many boxes

Keep only the constructs needed for the question.

Undefined terms

Provide operational or analytical definitions.

Theory chosen by name

Explain why its assumptions fit the problem.

Mismatch with method

Use a design capable of investigating the framework.

Framework as decoration

Refer back to it in methods and interpretation.

Sketch a model for your own proposal

12 MINUTES

Draw and defend

Select 3-5 key concepts from the literature, sketch links between them, name one relevant theory if justified, and explain how you would examine at least two elements.

Produce

An annotated framework diagram plus a 120-word justification.

Use five questions to test the draft

- | | | |
|---|--------------------|--|
| 1 | Purpose | Does the diagram help answer a precise research question? |
| 2 | Evidence | Can you explain which sources justify each component? |
| 3 | Clarity | Are constructs distinct, named and defined? |
| 4 | Meaning | Do all lines, arrows and conditions have an interpretation? |
| 5 | Feasibility | Can planned methods observe or explore the important elements? |

05 Integrated writing workshop

Create the review outline and framework for your research proposal.

Apply Week 3 evidence directly to Week 4 writing

Part A: literature argument

Outline 3 themes; write a 250-350 word critical synthesis using verified sources; end with a defensible gap.

Part B: framework

Draw and label a study-specific conceptual framework; justify theory choice if applicable.

Submission check

Cite real sources and label all illustrative examples as such.

Use the same criteria to self-assess and give feedback

Coherence

Review sections build towards a specific problem and question.

Critical depth

Sources are compared and their methods or limitations evaluated.

Conceptual clarity

Framework constructs and any links are explained and justified.

Integrity

Claims, quotations and references are traceable and accurate.

Choose and explain the best answer

1

A review should primarily...

A. List papers B. Evaluate a body of evidence C. Count pages

2

PRISMA 2020 primarily provides...

A. A general theory B. Reporting guidance C. A sampling method

3

A conceptual framework is...

A. A study-specific concept map B. A bibliography

4

What justifies a proposed arrow?

A. Its appearance B. Evidence, theory and a clear interpretation

Evidence, interpretation and research design must align

Synthesis over summary

Build themed claims supported by critically evaluated studies.

Theory with purpose

Choose a lens only when it improves the explanation.

Framework with meaning

Define concepts, justify relationships and link to method.

Next step

Use the review and framework to refine the methodology and data requirements of your proposal.

Reading to support the updated Week 4 material

1. Rocco, T. S. and Plakhotnik, M. S., "Literature Reviews, Conceptual Frameworks, and Theoretical Frameworks," Human Resource Development Review, 2009.
2. Sweller, J., "Cognitive load during problem solving: Effects on learning," Cognitive Science, vol. 12, no. 2, 1988.
3. Page, M. J. et al., "The PRISMA 2020 statement," BMJ, vol. 372, n71, 2021.
4. PRISMA 2020 resources: prisma-statement.org/prisma-2020.
5. Course materials: Literature Review Part 1; Part 2 SLR; Literature Survey Handout; Research Process/Aim/Objectives.

Questions?

Leave with a critical review outline, a literature gap and a justified conceptual framework.