

# I. **SENSEMAKING WITH CONCEPT MAPPING**



# COURSE CONTEXT & DESIGN PROBLEM

<b>Context</b>	Online undergraduate Information Science course
<b>Design Problem</b>	Students struggled to see how system-design concepts relate in meaningful ways.
<b>Instructional Solution</b>	Designed a two-step concept mapping task (Individual Map to Group Map) requiring collaboration to merge and refine ideas.
<b>Tools Used</b>	CmapTools, synchronous video meeting
<b>Key Impact</b>	Supported deeper explanation of relationships between concepts. Students actively engaged in comparing and merging their understanding.

# INSTRUCTIONAL DESIGN SOLUTION:A TWO-STEP CONCEPT MAPPING TASK

## Learner Instructions (summarized):

- Create an individual map identifying key concepts.
- Meet in a group of three online.
- Build one **shared concept map** (min 20 concepts)
- Label relationships clearly.
- Submit final map.

## Design Elements Included:

- Clear prompt + structured instructions
- Minimum concept count to guide depth
- Use of visual mapping to scaffold understanding
- Collaboration guidelines to support negotiation

## setup

### PART 1: Individual remaps

**Full teams:** as homework, all students individually read **Chapter 14** (pp. 509-544) and then make a Cmap of the reading to turn in before due date

**Jigsaw teams:** as homework, all students individually read **Chapter 14** and then make a Cmap of section 1 (pp. 509-527) **or** section 2 (pp. 527-544) **or** section 3 (pp. 521-536), turn it in before due date

**data:** pre-collaboration individual maps and maps of the two reading sections

**Cmap tutorial:** how to use the software and what maps look like

**How to use CmapTools & Adobe Connect**

**interaction:** should we try to control the collaboration with explicit scaffolds and terms or not?

### PART 2: Groups online

**Collaboration:** online, triads/dyads work in Cmap to create a common map for their team, turn it in.  
**Reflection paper:** In your own words, describe the group activity and group dynamics, did you like it?

**data:** collaboration team maps & descriptions of the small group dynamics

### PART 3: Posttest

**Posttest Individual activity:** Chapter Quiz, draw a map of the content, survey items

**data:** quiz scores, survey info , post-collaboration individual maps

Attendee List (1)

- Hosts (2)
  - Amy Hughes Garbrick
  - Amy Hughes Garbrick 2
- Presenters (3)
  - Robert White
  - John J Smith
  - Red Cardinal
- Participants (0)

Chat (Everyone)

(04/01/2012 19:59) Amy Hughes Garbrick: Hi John!

(04/01/2012 20:00) Amy Hughes Garbrick: Hi Bob

Amy Hughes Garbrick: hi Red

Video

```

graph TD
    SDLC[Systems Development Life Cycle] --> Investigation[Investigation]
    SDLC --> Analysis[Analysis]
    SDLC --> Design[Design]
    SDLC --> Development[Development]
    SDLC --> Implementation[Implementation]
    SDLC --> Maintenance[Maintenance]
    SDLC --> Refinement[Refinement]

    Investigation --> Economic[\"Economic Feasibility\"]
    Investigation --> Technical[\"Technical Feasibility\"]

    Analysis --> IOR[\"Input/Output Requirements\"]
    Analysis --> Storage[\"Storage Requirements\"]

    Design --> Prototype[\"prototype\"]

    Development --> Alpha[\"Alpha Testing\"]
    Development --> Beta[\"Beta Testing\"]

    Implementation --> TechSupport[\"Technical Support\"]

    Maintenance --> Repairing[\"Repairing\"]

    Refinement --> Stepwise[Stepwise Refinement]
    Refinement --> Control[Control Structure]
    Refinement --> Coding[Coding]
    Refinement --> Testing[Testing]
    Refinement --> Assembly[Assembly]
    Refinement --> Machine[Machine]

    Stepwise --> Control
    Control --> algorithm[algorithm]
    algorithm --> Languages[Languages]
    Languages --> HighLevel[High-level]
    Languages --> LowLevel[Low-level]
    Languages --> Query[Query]
    Languages --> Macro[Macro]

    Coding --> Languages
    Testing --> Languages
    Assembly --> Languages
    Machine --> Languages

    HighLevel --> Java[Java]
    HighLevel --> Cpp[C++]
    HighLevel --> Basic[BASIC]
    HighLevel --> C[C]
    HighLevel --> CSharp[C#]
    HighLevel --> Cobol[COBOL]

    LowLevel --> Repetition[Repetition]
    LowLevel --> Arithmetic[Arithmetic]
    LowLevel --> Comparison[Comparison]
    LowLevel --> Alphabetic[Alphabetic Codes]
  
```

# IMPACTS & REFINEMENTS

## Impact Observed:

- Students engaged actively in comparing and merging their understanding.
- Groups with balanced preparation had richer conversations.
- The structure supported deeper explanation of relationships between concepts.

## Design Reflection & Iteration

- Reduce pre-workload to avoid cognitive overload.
- Provide guiding questions for negotiation (e.g., “Why connect these?”).
- Add a short post-reflection to solidify understanding.

•[https://members.aect.org/pdf/Proceedings/proceedings21/2021/21\\_10.pdf](https://members.aect.org/pdf/Proceedings/proceedings21/2021/21_10.pdf)