Question 3, p. 113

State an aim of importance to you, such as health, ecology, self-worth, or vocational skill.

- How would you refine this aim into an educational goal?
- What would be taught in order to help learners make progress toward this aim?

Question 5, page 113

- What do you believe is the function of the school?
- Is there something the school can do better than any other agency?
- From your answer, what might be used in deciding what and what not to teach?
What’s the Purpose of the Curriculum?

- Your text says:
  - "... Those at all levels of schooling should constantly question the purpose of curriculum."
  - Why?

Decide the purpose of (and what’s in) the curriculum

- Society
  - Boards of education, federal and state agencies, publishers, national forums for reform
- Institutions/organizations
  - Administrators, managers, faculty groups, parents, customers
- Instruction
  - Teachers and instructors
- Personal
  - Individual Learners

What does the Curriculum really do?

- Select and arrange content.
- Achieve aims, goals, and objectives.
- Transmit important and desirable knowledge of the culture.
Needs Analysis Model

- The process by which education and training needs are defined and priorities set.
  - Looking for the discrepancy that exists between an acceptable state of achievement and an observed learner state.
  - Or the difference between what ought to be and what is.

Needs Analysis Steps

- Formulating a set of tentative goals statements
- Assigning priority to goal areas
- Determining acceptability of learner performance
- Translating high priority goals into plans.

Formulating a set of tentative goals/competencies, objectives statements

- Collect them from curriculum guides, textbooks, evaluation studies, trade associations, professional societies, VERSO, etc.
  - Take care getting them from instructors and teachers. . . They will get their chance to influence the curriculum later.
Assigning priority to goal areas

- This is done by teachers, instructors, advisory committees, managers, administrators, etc.
  - Remember, you never have enough time to cover everything learners need to know or be able to do.
  - Try to teach the things they need help learning.

A simplified way of setting priorities

- What is must know stuff?
- What is good to know stuff?
- What is not important nice to know stuff?

Determining acceptability of learner performance

- Have a panel of experienced observers rate the present acceptability of learners
- Second way -- Actually measure the level of performance of a sample of learners and compare it to an acceptable ranking.
- The widest gaps between what the goal standard is and the students' rating shows where the need is.
Translating high priority goals into plans.

- Now it is time to create the new:
  - materials of teachers/instructors
  - materials for learners
  - evaluation/measurement plans

Select and Arrange Content

- Scope
- Sequence

Content

- Many are concerned with knowing how instead of knowing what!
What is Curriculum Content?

- Facts
- Observations
- Data
- Perceptions
- Discernments
- Sensibilities
- Designs
- Solutions
- Explanations
- Principles
- Definitions
- Skills
- Processes
- Decision making
- Communicating
- Values
- Beliefs

Knowledge, Process, Values

Question

- Which is the real curriculum?
  - The knowledge selected for a course or program?
  - The content knowledge student has learned at the end of instruction?

Question

- Which is more important?
  - Identifying the knowledge to be learned?
  - Selecting a process that will help the student learn the content?
Question

• Is it important for us to:
  • teach the content to learners till they “know” it
  • or, until they “know what to do with it?”

What is verbal learning?
Most students’ learning is “verbal learning.”

• Students have little prior knowledge on which to base understanding.
• They can learn knowledge, but for them, it is only information unless they have a basis for which to apply it to their prior knowledge.
• Until then it is only “for school purposes.”

What must be done for content to become more than information to be learned?

• Start by thinking about content as it will relate to student’s prior knowledge -- something that is of concern to the student.
• Make it meaningful to them.
  • Builds on their prior knowledge so that the effect of the new information makes for deeper understanding.
Learning content and becoming knowledgeable are separate activities.

- It is the “learned” content that is the real curriculum content.
- Does passing tests equal understanding knowledge?

Content vs Process

What is process?
- Process is the operations that handle and create knowledge
  - “Knowledge” that is remembered and has meaning to the learner.
- Process exits in an infinite variety of shapes and forms.
- Is knowledge a “tool” or an end it itself?

Processes that help the acquisition, use, and communication of knowledge deserve much more consideration than they have received in the past.

- Processes even become content when we study them.
  - Think about speech and grammar.
Scope?

Scope is the...

- Breadth and depth of the curriculum.
- It refers to the range of content represented, and the depth of treatment.

The problem...

- Lots of content to draw from.
- And most of it can be studied in great detail.
- The curriculum developer has to make a decision what the curriculum will include.
What content can be found in a scope?

- **Common content**
  - General knowledge shared by all within a social group (a society, a workforce, a company).

- **Special content**
  - Content experienced by only a portion of the learners within the society (vocational education within a school, artillery gunnery within the army).

What is sequence?

- The order in which content is presented.
  - What criteria should determine the order of succession of the materials on instruction?
  - What follows what and why?
  - What is the most desirable time for learners to acquire certain content?

Ways to develop sequence.

- Simple to complex (biology, chemistry, Grammar)
- Whole to part (geography)
- Prerequisite Learnings (geometry, physics)
- Chronology (history)
- Combination

- Must always consider prerequisite knowledge requirements
Goal of Curriculum Developers

- To select the content that is most effective and efficient in bringing about the realization of curriculum aims and goals.

Do we need to teach all that we do?

Criteria for selecting content

- Significance
- Utility
- Interest
- Human Development
Foundations and Content

- Cohesion
  - How well do the various elements of the content work together to accomplish the goals and aims of the curriculum.
  - Does the sequence and structure make sense?

Other Factors That Affect the Determination of Curriculum Content

- Resources (time, dollars, equipment available.)
- Internal and external pressures
- Federal, state, and local requirements
- Grade or development level at which content will be provided.

Content Determination Strategies

- Subjective
- Objective
- Philosophical Base
- Introspection
- Functional Approach
- Task Analysis
- DACUM Process
- Cognitive Task Analysis
The DACUM Process

Duties          Tasks

DACUM: Developing a Curriculum

- Results in an occupational analysis
  - what tasks compose the job
  - what equipment and tools are used
  - what skills, aptitudes, and attitudes are characteristic

The DACUM -- It is:

- A process of questioning expert workers in a specific occupation to determine the responsibilities, tools, and conditions of their job
- Results in an occupational task list
A DACUM -- Main Players

- A panel of experts identifies tasks using either wall charts or reviewing a preliminary task list.
  - Expert workers can describe their jobs better than anyone else.

WALL CHARTS/ CARDS

<table>
<thead>
<tr>
<th>Duties</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

A DACUM -- Administrators

- Facilitator helps panel of workers to come to consensus.
- Facilitator gathers other related information from panel as time allows.
- Recorder keeps record of written tasks and other information.
A DACUM: The Participants

- Coordinator (Plans-Manages)
- Facilitator (Guides)
- Recorder (Writes)
- Panelists (Describes)

A DACUM: The Panel

- 8-12 persons
- 6-10 front line expert workers
- 2 immediate supervisors
- Workers form various size firms
- Workers currently in the job
  - Not new workers

A DACUM: Panelists

- Generally poor choices:
  - Teachers/Faculty Members
  - Managers
  - Human Relations Managers
  - Trainers/Training Managers
- They get their say later
Task Analysis

- Always start with the information you get in a Job Analysis.
- Then you do a **Task Listing**
  - This is a list of all the tasks a worker does on the job
- And then you do a **Task Detailing**
  - A list of steps a worker does to perform each task.

Performing the Task Analysis

- Begin with the Job Description
  - A general description of what a person does on the job.
- Do the Task Listing
  - Listing all the tasks a person does on the job
- Do the Task Detailing
  - Listing the steps a person goes through when forming a task. Sometimes called the *performance steps*.
Task Listing

- First list **ALL** the tasks that might be included in the job.
  - While you can list many, a well-designed training course requires a thorough analysis.
  - You will need to talk with individuals now working at the job, or watch them actually doing the job.
  - This helps you avoid a serious trap... loading the course with irrelevant content.

Doing the Task Listing . . .

- Talk with people who **actually do the job**.
- Talk to the supervisor who will tell you what it ought to be.
- Use your judgment as to which tasks are **reasonable** to include in your list based on probability of need.

Doing the Task Listing

The Questions:

- What important things do you do?
- What do you do first thing?
- What do you do next?
- What do you do last thing each day?
- What do you do once a week, month, year?
- What do you do for customers? suppliers?
- Look at this list. Are there other things you do? Or things others in your job do?
Task Listing Example 1
Job: Service Station Mechanic-attendant

1. Replace spark plugs.
2. Adjust and bleed brakes.
3. Replace wheel cylinders.
4. Inspect and flush radiators.
5. Test antifreeze.
6. Repair tube or tubeless tires.
7. Retake tires.
8. Lubricate vehicles.
10. Replace air cleaners.
11. Clean or replace gas filters.
12. Wash and wax autos.
14. Replace oil filters.
15. Check oil, brake fluid, power steering, other fluids.
16. Washer windshields, replaces blades.
17. Fill gas tanks, radiators.
18. Maintain daily records of sales, inventory changes.
19. Order supplies.
20. Open and close station.

Listing the Tasks

**Note:**
- Task statements begin with an active verb.
  - Clean or replace spark plugs.
  - Adjust and bleed brakes.
  - Replace wheel cylinders.
  - Inspect and flush radiators.
  - Test antifreeze.

Task Detailing

**Note:**
- The second step in the task analysis is:
  - list each of the steps involved in performing each of the tasks in terms of what is done, rather than in terms of what must be known.
  - The performance steps should also begin with an active verb.
Task Analysis

Service Station Attendant

1. Clean or replace spark plugs.
2. Adjust and bleed brakes.
3. Replace wheel cylinders.
4. Inspect and flush radiators.
5. Test antifreeze.
6. Repair tube or tubeless tires.
8. Lubricate vehicles.
10. Replace air cleaners.
11. Clean or replace gas filters.
12. Wash and wax autos.

Task Detail

Clean or replace spark plugs
1. Note the plug location relative to the cylinder.
2. Remove all spark plugs.
3. Identify the type of plugs.
4. Decide whether to adjust or replace plugs.
5. Clean plugs, if necessary.
6. Replace spark plugs in engine.
7. Connect ignition wires to appropriate plugs.
8. Check for performance.
9. Clean tools and equipment.

Again, Task Analysis

- First, start with Job Analysis, review it for content -- verify it.
- Then list **ALL** the tasks required to do the job or perform the skill (Task Listing).
- Then list the steps for each task (Task Detailing).

In the end . . .

- You have one list of all the tasks performed on the job (A Task Listing).
- You have a Task Detail Sheet for each task on the task listing.
Cognitive Task Analysis

- For tasks with a high cognitive component
  - decision making
  - problem solving
  - judgments

- A traditional task analysis may fail to identify those cognitive skills required to perform a given task or job.

- A cognitive task analysis is performed to identify and to describe the cognitive components of a task.
A Variety of Methodologies are Available

- to represent and define the various knowledge structures needed to perform a task or job.
- There are three knowledge structures:
  - declarative, procedural and strategic

Declarative Knowledge

- Tells us why things work the way they do, or that the object or thing has a particular name or location.
- It includes information about the concepts and elements in the domain and the relationships between them.

Declarative Knowledge

- The type of knowledge found at this level include
  - facts
  - principles
  - rules of science
  - concepts
  - "Knowing the rules of good database design" is one example.
  - Another is "knows the names, location, and prices of all the SKUs in inventory."
Methods for eliciting declarative knowledge:

- Card Sorting - (like a DACUM)
  - Obtain sets of concepts that broadly cover the domain (derived from glossary, texts, or gleaned from tutorial talk), then transfers each concept onto a card.
  - Subject matter experts then sort the cards into common groups or functions according to similarity.
  - The SMEs then create the sorting criteria.
  - The groups are regrouped until eventually a hierarchy is formed.

- Data Flow Modeling -
  - An expert is interviewed.
  - Draw a data flow diagram using data gathered from interview.
  - Expert verifies diagram.

Procedural Knowledge

- Tells us how to perform a given task.
- Contains the discrete steps or actions to be taken and the available alternatives to perform a given task.
  - With practice, procedural knowledge becomes an automatic process. It allows us to perform a task without conscious awareness.
  - This automatically allows us to perform more than one complex task at a given time. A couple of examples would be “create a v-ditch using a motored grader” or “type a letter at 95 words per minute.”
Methods for eliciting procedural knowledge:

- Interviewing - Several variations. Some are:
  - working backwards through the problem
  - drawing a concept map
  - showing an expert photographs depicting system in a number of states and asking questions
  - expert describes procedure to interviewer and then the interviewer teaches it back to the expert.

Concept Maps

Expert Pictures

The Bowline Knot
Another method for eliciting procedural knowledge:

- Discourse Analysis (observation) - An expert helps an user while a researcher records the process.
  - The transcript is then analyzed for tasks and elements. The data is then converted into a taxonomy.

Strategic Knowledge

- is comprised of information that is the basis of problem solving, such as
  - action plans to meet specific goals
  - knowledge of the context in which procedures should be implemented
  - actions to be taken if a proposed solution fails
  - how to respond if necessary information is absent.
- An example of this would be a production plant manager who formulates a plan to meet the needs of a greatly increased forecast.

Methods for eliciting strategic knowledge:

- Critical Decision Method (Interview) first method
  - Interview the expert to identify non-routine events that challenged her expertise and events which expertise made a significant difference.
  - Construct a timeline of events and key points are further probed.
- Critical Decision Method (Interview) second method -
  - Perform a semi-structured interview to gather type of information for perceptual cues, judgment details, and decision strategy details that are not generally captured with traditional reporting methods.
The Cognitive Task Analysis

- Looks at not only what the worker does
- But also looks at:
  - the knowledge,
  - thought processes,
  - mental aspects of goal attainment at work
- In the end you have a list of tasks a person must know and be able to do -- A Task List.

So what now?

Content

- Select and arrange content.
  - Should achieve aims, goals, and objectives.
  - Transmit important and desirable knowledge of the culture.
  - Achieved through learning activities.
Assignment

- Text, Chapter 6
- Annotation no. 4 (Green)
- Foundations Due -- July 2nd
  - Also Next Phase of OTED 885 due