COMBINING INSTRUCTIONAL ANALYSIS TECHNIQUES

- Usually, there is a combination of subordinate skills from several domains for a goal that was classified as belonging to only 1 domain.

- For example: combination of intellectual skills and verbal information
  - when doing a hierarchical analysis it is not a wonder to identify knowledge that the learner should “know”. Just knowing something” is not an intellectual skill and therefore would not appear on an intellectual skills hierarchy.
  - However, it is vital for this knowledge, verbal information to appear as a part of the analysis of what must be learned to achieve the instructional goal.

- Therefore, Briggs and Wager (1981) suggest that verbal information can be shown in a box with a connecting line like this:
• This indicates that the verbal information in the right-hand box is used in support of the intellectual skill in the left-hand box. Box 1, 3 and 4 represent intellectual skills, while box 2 is verbal information.

• Sometimes, attitude goal with a psychomotor component might require subordinate intellectual skills and verbal information.

• The diagram might look like this:

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Diagram:

Psychometer component of the goal --> A (Attitude goal)

1 --> 2 --> 3

2.1 --> 2.2 --> 2.3 --> 2.4 --> 2.5

2.1.1, 2.1.2 --> 2.4.2

2.4.1 --> V
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• The diagram indicates that the primary goal is for learners to develop an attitude that will be demonstrated by the execution of some psychomotor behavior.
• The psychomotor skill is composed of 3 steps- 1, 2, and 3.
• Skill 2 have five steps, 2.1 through 2.5
• 2.1.1 and 2.1.2 are subordinate to step 2.1.
• The intellectual skill 2.4.2 requires verbal information 2.4.1 in order to support step 2.4.
**Instructional Analysis Diagrams**

- The diagramming procedures for doing an instructional analysis are:
  - classify your instructional goal and perform the goal analysis
  - select the appropriate technique(s) for identifying the subordinate skills.

<table>
<thead>
<tr>
<th>Type of Goal or Step</th>
<th>Type of Subordinate Skills Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual skill</td>
<td>Hierarchical*</td>
</tr>
<tr>
<td>Psychomotor skill</td>
<td>Hierarchical*</td>
</tr>
<tr>
<td>Verbal information</td>
<td>Cluster</td>
</tr>
<tr>
<td>Attitude</td>
<td>Hierarchical* and/or cluster</td>
</tr>
</tbody>
</table>

* Note that hierarchical analyses can contain sequences of procedural steps.

- As the designer proceeds with the analysis, the subordinate skills are visually displayed in diagrams.
- When diagrammed, any particular set of sub-skill required to reach a terminal objective can have a variety of structural appearances.

![Diagram 1](image1)

- Represent a goal analysis.
- No subordinate skills.
- One continuous line.

![Diagram 2](image2)

- Super-ordinate skills were placed above the skills on which they are dependent.
- The reader will automatically recognize the implied learning relationship of the sub-skills.
• Subsequent skills are depending on those preceding them.
• Subskill 1,2,3,4 are not necessarily performed in sequence

• If they were performed in sequence, then they would be the substeps of a superordinate skill.

• In addition, we noted that attitudinal goals can be indicated by the following:

  Motor or intellectual skill component of the goal  A  Attitude goal

  • Verbal information is indicated by connecting it to an intellectual skill via a line and a triangle containing the letter v.
**Entry Behaviors**

- The instructional analysis is also important because it helps the designer to identify exactly what learners will already have to know or able to do before they begin the instruction.

- These skills are referred to as entry behaviors.

- The procedure used to identify entry behaviors is directly related to the subordinate skills analysis process.

- Entry behaviors are so important because:
  - They are the building blocks for instruction.
  - Learners can begin to acquire the skills presented in the instruction.

- All the skills below the entry behaviors line are skills which the instructor assumes that the learners already have.

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**Instructional Analysis for Scale Reading Example**

Figure 4.5

- Interpret whole numbers
- Interpret decimal numbers to the nearest tenth units
- Interpret decimal numbers to the nearest hundredth units
- Identify a designated point on a hundredth-unit scale in decimal form to the nearest hundredth
- Divide a scale marked only in whole units into tenths
- Identify a designated point on a tenth-unit scale to the nearest tenth
- Identify a designated point on a whole-number scale to the nearest whole number
- Divide distance between two points into ten equal parts
- Divide a scale marked only in tenths into hundredths
- Estimate to the nearest ± .01 a designated point on a scale marked only in tenths units
- Given a scale marked off in tenths, and asked to identify the location of designated points on the scale to the nearest hundredths, read the scale in decimal form by estimating between 2 tenth divisions to the nearest hundredth and report the reading to within ±.01 units
The Tentativeness of Entry Behaviors

- The entry line sometimes is uncertain. The dotted line might drawn too high or too low.
- The dotted line is drawn too high:
  - suggest that learners already have mastered most of the skills.
  - instructional materials lose their effectiveness.
- The dotted line is drawn too low:
  - presume the learners have few or none of the skills required to achieve the instructional materials
  - developing unnecessary instructional materials
  - wasting the learners time to study skills they have already mastered.
- If specific content being taught, the instructor will find a group of learners with a right entry behavior for the instruction.
- On the other hand, if the purpose is to teach a specific group of learners, the instruction must be modified to fit in with the right entry behaviors of the learners.

HIERARCHICAL APPROACH
- the hierarchical approach is used to analyze individual steps in the goal analysis that are classified as intellectual or psychomotor skills.

- How to build the hierarchical analysis.

Hypothetical Hierarchical Analysis of a Step from a Problem-Solving Goal
Figure 4.1
1. A ‘rule’ serves as the immediate subordinate skill required to learn a particular problem-solving skill.
2. Box 2 represents one step in performing the goal.
3. After the rule has been identified (box 2.4), the designer then asks, “What must the student know how to do in order to learn the rule?”
4. The answer is that the student must learn two concepts, which are represented in box 2.2 and 2.3.
5. When asked, “What must the student know how to do to learn the concept in box 2.2?”, the answer is nothing so no additional skills are listed.
6. For box 2.3, the question results in the identification of a relevant discrimination, which is shown in box 2.1.

- This hierarchy of skills is helpful to the designer because it can be used to suggest the type of specific subordinate skills that will be required to support any particular step in the goal.

**PROCEDURAL ANALYSIS**

- One or more steps in the goal analysis will be found to contain an additional set of mental or physical steps.
- When this is the case, one simply lists out the skills in the same step-by-step manner as was done for the original goal analysis.

- In the above diagram, step 1 through 5 is the original steps in the goal analysis.
- Step 2.1 is subordinate to step 2 as in any typical hierarchical relationship.
- Steps 4.1, 4.2 and 4.3 are subskills of step 4 in that they detail the 3 additional procedural steps of which step 4 is composed.
- step 4.2.1 is subordinate to step 4.2 in a normal hierarchical relationship.

**CLUSTER ANALYSIS**
- the most meaningful analysis of a verbal information goal is to identify the major categories of information that are implied by the goal.
- In diagramming a cluster analysis.
  - use the hierarchical technique with the goal at the top and each major cluster as a subskill.
  - Then, clearly labeled it as a verbal information cluster analysis and not a hierarchy.
  - you can also use an outline format and simply list each of the clusters.

**SUBORDINATE SKILLS ANALYSIS TECHNIQUE FOR ATTITUDE GOALS**
- the purpose of the goal is to get the learner to choose to do either a psychomotor or an intellectual skill.
- The first half of the analysis for an attitudinal goal requires hierarchical analysis techniques.
- The second part of the analysis is usually verbal information.
- The verbal information may either be analyzed using a separate cluster analysis or it may be integrated, as verbal information, into the basic hierarchical analysis that was done for the first half of the analysis.
- The verbal information constitutes the persuasive part of the attitude shaping, along with modeling and reinforcement and it should be included as an integral part of the instructional analysis.

This connecting line shows that the motor or intellectual skill is supporting the attitudinal goal.