

MODULE 3: PART 3.6

Reading: *Stating Your Objective*Excerpt from *The Skillful Teacher: Building Your Teaching Skills*

By Jon Saphier and Robert Gower

It is easy to lose track of where you're going if you don't think or write objectives in terms of student mastery. A teacher can get tied to materials and activities, and have students involved and liking their classes, but be achieving uncertain, erratic, and unpredictable results. Student involvement and enjoyment of school are important goals, but they do not by themselves make for effective teaching and learning.

Madeline Hunter, former director of the UCLA Lab elementary school, used to tell a story that illuminates how fuzzy thinking about objectives can dilute learning. She finds a kindergarten teacher holding her head amid a room that's a mess of paper and glue. There are mimeographed turkeys all around on which children have been pasting squares of colored tissue paper to make Thanksgiving collages. Madeline asks what's been going on. "Well, it was an art experience for the kids," is the reply. The exchange then continued:

Madeline: Why did you go to the trouble of mimeographing the turkeys? Why not just give them a piece of paper and the tissue and let them be creative, express themselves?

Teacher: It really wasn't that. It was really a lesson in eye-hand coordination.

Madeline: Well, then why didn't you have them outline the turkey? You can't tell whether they stayed within the line or not when they've got them pasted all over the turkey.

Teacher: Well, it really wasn't that. It was a lesson in conservation.

Madeline: Conservation!

Teacher: Yes. The kids have really been very wasteful of paste. So I was trying to teach them to put just a tiny piece of paste on.

Madeline: Then why didn't you give them a piece of paste, or a paper of paste, and see how much of their turkey they could finish before they ran out of paste? You can't tell if there's a cup of paste under some of these turkeys.

Teacher: Oh, for cryin' out loud, can't kids just have fun?

Madeline: Sure, they can have fun. What do your kids like to do?

Teacher: The thing they like to do best is just chase out on the school grounds.

Madeline: Why didn't you take the last half-hour and go around, supervise them while they chased, and you wouldn't have this mess to clean up (Hunter, 1977).

Five Kinds of Teacher Thinking

There are five kinds of thinking relevant to lesson planning. Each of the five has an important place in planning, but if any one becomes an exclusive mind-set, the instruction that results can have significant gaps for students. In the sections that follow, we profile these five kinds of thinking.

COVERAGE THINKING

One kind of thinking during lesson planning is what content or skill is to be addressed or "covered" in the lesson (an event in history, Impressionism, converting fractions to decimals, the preterite tense, dribbling a basketball, the biography of a particular writer, two-part harmonies, and so on) When a teacher is thinking about coverage, she is thinking in terms of her part in the lesson. She is going to present, describe, explain, demonstrate, or cover identified information, events, procedures, or processes. As central as this concern is to any lesson, there is a danger when our

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planning stops here or when we think of what we are covering as the objective of the lesson (“My objective tomorrow is to cover the material on gas attacks in World War I.”). This outlook will negatively influence the quality of the teaching and consequently the learning that takes place. A teacher who confuses coverage with objectives focuses on getting through everything without thinking about student learning. What becomes important is covering the agenda and presenting the information within the time frame of the lesson. When the agenda is covered the lesson is done. The teacher has taken the information out of her head and put it “out there.” She is not necessarily doing it in a way that is guided by what is in the students’ heads before she starts. And she doesn’t know if it passed through the nether regions of “out there” into students’ heads when the lesson is over. When planning is driven by coverage thinking alone, we tend to do minimal – or superficial – checking for understanding, less intellectual exploration, and less integration with other learning. Instruction tends toward recitation.

ACTIVITY THINKING

Another consideration in designing lessons is thinking about what activities we want students to do: researching information on a Web site, answering questions, watching a film, building a model, solving problems, conducting an experiment, discussing a reading, and so forth. The focus shifts now from what the teacher will do to how students will participate in the lesson. Once again, this is a very important aspect of lesson design: what will students do to take in information, process it, and internalize it? This becomes a liability only if the focus rests on activities alone – students being busy – without examining the activities in light of an important learning outcome or weighing decisions about what activities students will do in terms of how well each activity supports achievement of an intended lesson objective. Without such a focus, it is possible that an activity is not teaching what should be taught or that the activity can be completed without students’ learning anything.

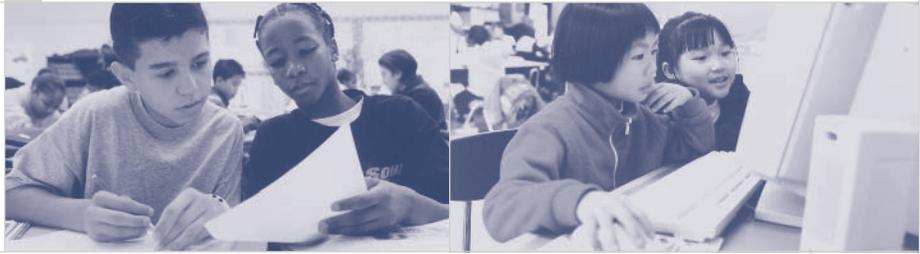
“Write a story,” for example, may be the activity for after lunch in a primary grade room. To get the children involved (make the activity more fun, more attractive, more motivating), the teacher has textured wallpaper pieces they can use to

make covers for their “books” and is going to help them bind their books. The quality of stories ranges from complete plots with beginnings, middles, and ends to random pictures with no text at all. While binding each book, the teacher asks the children about their stories: some make comments; some don’t. The teacher is focusing on the binding and keeping the flow of students moving. An observer in the class sees no evidence that there is any particular feature the teacher is looking for in the stories. She is making an effort to be positive about some aspect of each child’s work, but appears to be looking for nothing in particular. The real goal is just that the students produce stories of any quality and make books to put them in. This is activity thinking in isolation from other important planning concerns. The teacher might not have intended that, but no other conclusion is supportable.

When teachers’ prime planning concern is about activities, they miss opportunities to underline the critical learnings, make connections between learnings for students, and check and evaluate student learning. A teacher thinking in terms of activities is concerned more with what students are doing rather than on what they are learning. Sometimes this confusion shows up in assessment. Criteria for success might focus more on the visual appeal or mechanics of the product versus the content substance that indicates achievement of important learning outcomes.

INVOLVEMENT THINKING

Another important concern in lesson planning is to get all students engaged in the learning experience. This can be accomplished in many ways: by using examples that are relevant to students (a lesson on the court system for eighth graders that features a case of police shutting down a party: kids are arrested for transporting beer even though they did not actually drink it); by causing movement, interaction, and exchange of opinion among students; by presenting discrepant events that arouse curiosity. When a teacher plans how information will be presented or activities are shaped and varied to accommodate a variety of learning styles, differing levels of background knowledge, or degrees of readiness, we see the most complex level of this aspect of planning and the effects show up in the



classroom. There is strategic consideration about how to present and have students process information in a variety of modalities, whether students should do activities individually, in pairs, in small groups, or as a whole class; there is often choice and variety available to students. We see evidence of this kind of thinking when teachers design differentiated learning experiences for students. The idea is to make the learning inviting and accessible to all students, provided, that is, that all of the concerns and decisions about student engagement are in relation to a particular learning outcome for the lesson.

Here again, if student involvement or engagement becomes the dominant concern without being considered in light of a clear learning objective, things will look very different. When a teacher says, “My objective tomorrow is to get all students to react personally – say what they’d do if they invented a horrible weapon. Would they turn it over to the government?” he is confusing involvement thinking with objectives. There is no learning outcome implied; success will be measured by whether or not students participated, rather than by what new learning has occurred or is in evidence.

Or consider the following scenario of a teacher talking about a lesson: “My students love to do word searches, so I make up one with their spelling words in it, and they do it for seatwork. They really have fun with them. They really got into that word search today!” But when we ask how it helped students learn to spell the words the answer is, “I’m not sure. I assigned it because I thought they’d like to do it, and they do.” As it turns out, there is no evidence that word searches improve students’ ability to spell the words they find. It may improve their ability to scan complex data fields for visual information; some may develop systematic searching strategies for finding the words more efficiently. But this was not the objective, and students who learn systematic search are learning it at random and incidentally, not through any deliberate approach.

Studies of teacher planning (conducted by having teachers think aloud) have shown that activity thinking and involvement thinking have tended to dominate planning. Planning lessons that are engaging for students is important; it is a good thing to do. But student engagement is not enough for learning. They

have to be engaged with activities that are carefully designed to lead to desired learnings.

Secondary teachers sometimes report that when they plan for students to be actively involved in learning experiences they encounter initial resistance: some students would rather sit back and be passive than be held accountable to actively participate. Perhaps some of the resistance is a reaction to experiences they’ve had in the past where learning experiences were poorly designed or managed. Perhaps it also says something about what they have become accustomed to expecting: that the teacher is the one who does most of the work! If that is their misconception, it is time to teach them otherwise and to show them through well-designed learning experiences that their active participation is the only way they will be the ones learning. And similar to the case we made earlier, this means thoughtfulness about how to structure and monitor activities and ensuring that we function as facilitators keeping students on track with the learning outcomes. If we think of a learning experience as a journey students will take, then coverage, activity, and involvement thinking are like planning the details of the trip: the routes to take, stops along the way, possible alternate routes, what transportation to use, how to make it interesting, and so on. But the next two kinds of thinking – determining and articulating the objectives or student learning outcomes – are of the highest order of importance in lesson design. To continue the previous metaphor, the objectives identify the destination of the trip. Hence, they need to be determined before decisions are made about what to cover, what activities students will do, and how things will be designed to maximize student involvement.

MASTERY OBJECTIVES THINKING

If the objective is mastery of the spelling words, then the teacher will do something that should increase the likelihood that the students will spell the words correctly: perhaps quiz each other in pairs and then make a list of the words they missed and go through a practice routine of seeing, saying, writing in the air, and retesting, over a ten-minute period. Then clearly there is a mastery objective at work for the students.



Perhaps a teacher says, “My objective for tomorrow is for students to be able to distinguish between rational, amoral, and moral reasons for political decisions from the list of positions we will generate in class.” If he focuses on student learning, there will be lots of checking to see what students know, perceive, or can do. When the goal is mastery, timetables are flexible, and what’s important is that students learn well, even if less material is covered. When teachers plan with a focus on mastery objectives they ask themselves certain questions: (1) “What exactly do I want students to know and be able to do when this lesson is over?” (2) “How will I know they have learned it, that is, what will I take as evidence the objective has been met?” Thus, thinking clearly about objectives also means thinking about assessment and how to gather the data that will enable us to determine where student learning is in relation to the targeted objective.

Two major issues to consider in identifying the mastery objectives for a lesson are as follows:

- Is the objective precisely worded so that the learning targets are clear to both teacher and students?
- Are the objectives appropriate, that is, aligned with the district or grade level curriculum standards?

We address the alignment issue later in the chapter.

When it comes to the language of an objective we have identified several attributes that ensure a focus on student learning. All mastery objectives start with the learner as the subject: “Students will be able to ...” or other language to that effect (for example, “Participants will demonstrate that they can ...”). Then comes the all-important verb. It has to be an action verb that can be observed – for example, “*explain* in their own words,” “*make* a model that displays ...,” “*list* the evidence that supports,” “*describe* the attributes of ...,” “*compare and contrast* the elements of ...”

Verbs that are about unobservable processes cannot stand by themselves in a statement of a mastery objective. Such verbs are *understand*, *appreciate*, *witness*, and *see*, for example. You can, of course, use these verbs if you then go on to say how the students will show that they know or understand.

You know it’s a good objective if you can answer this:

- What is each student going to walk away with inside his or her head that wasn’t there before, that is, something the student can understand and explain or something he or she can do as a skill?
- How will I know the students can do this?

Our colleague Mary Sterling suggests the following sentence structure for framing objectives: “Students will demonstrate an understanding of ... [know] by ... [able to do]” Teachers in her courses practice framing their objectives in this form. Then they ask one another: Is the “able to do” deep enough and strong enough to convince you that they know? In pairs, Sterling asks teachers to exchange their statements and single-underline the “know” and double-underline the “able to do” parts.

The next phase of making a clear objective is identifying the criteria for success for evaluating whether the student work meets the objective.

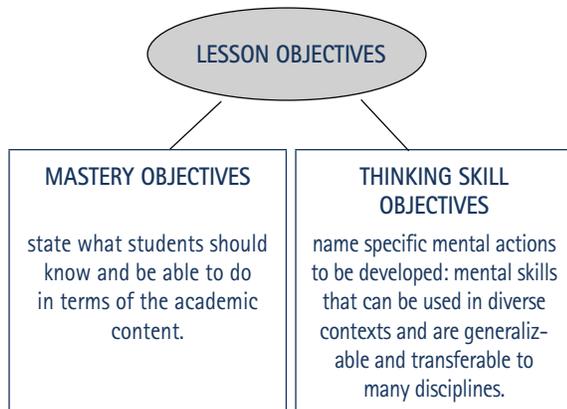
The more precise and mastery oriented teachers are, the more time they spend thinking about how they will assess student mastery. The more time they think about that, the clearer they get on the criteria for a student product that would meet the standard of mastery they want. That is, clear thinking about objectives must precede developing a student task whose product will signal mastery. The development of that task or product, in turn, invites listing the criteria and level of performance on each criterion a student has to meet to reach the objective. (See Exhibit 16.2 for criteria for success.)

For example, say you want your students to be able to explain how the checks and balances built into the U.S. Constitution work. That’s a mastery objective but without criteria. The criteria for meeting that objective are that they could describe a situation in which each branch has checks on others. That’s six examples they have to come up with: how the executive exerts checks on the legislative; executive on judicial; legislative on executive; legislative on judicial; judicial on executive; judicial on legislative.

Or perhaps your mastery objective is that students can explain the variables that influence the rate of evaporation for



EXHIBIT 16.1. LESSON OBJECTIVES

**Mastery and thinking objectives should be appropriate:**

- Linked to the agreed-on curricular standards (national, state, local)
- Worth knowing
- Matched to the students: challenging and attainable
- Able to be assessed

The language of a mastery objective:

- Is specific in terms of curricular knowledge: declarative or procedural
- Names an active performance (observable behavior) that demonstrates mastery
- voids using mental action words that do not inform students about what they will have to do to demonstrate mastery, such as:

– understand	– learn	– be familiar with
– know	– recognize that	– have a grasp of
– see that	– appreciate that	– recognize significance of
- Begins with "Students (or you) will be able to..." indicating development of capacity vs. completion of an activity
- Includes strong clues about assessment
- May include a level of performance or be accompanied by criteria for success
- Is "kid friendly"

A thinking skill objective:

- Names a specific mental action verb
- Is "kid friendly"

a liquid. What criteria would you use to assess they met that objective? There are three variables involved in how fast liquid evaporates: surface area, air velocity, and temperature (air pressure might be included also as a variable for more advanced students). So one criterion is that they include all three in their explanation. A second criterion is that they know the correct relation of each variable to evaporation: the bigger the surface area, the quicker the evaporation; the warmer the temperature, the quicker the evaporation; and the faster the air velocity, the quicker the evaporation. They have to address each of the three variables and describe the relation of each to evaporation. How well do they have to do so for it to count as mastery? It is to answer this question that rubrics are developed (Chapter Nineteen, "Assessment").

This way of thinking goes directly from the objective to the creation of the assessment, and all before designing the actual experiences or selecting the materials to use in the lesson. This is the new model of curriculum design described in the previous chapter.

THE MATCH BETWEEN STATED, LIVED, AND WORTHY OBJECTIVES

So far we have said there are the four kinds of thinking in lesson planning: mastery, involvement, activity, and coverage. They are not mutually exclusive and tend to be cumulative. A teacher planning in terms of student learning has to consider activities, involvement, and what will be covered. But the acid test for clear objectives thinking is that these three are aligned in service of the mastery objective.

This is an interesting lens to use in reviewing classroom events. Inquiring into the nature of thinking about objectives will often help solve puzzles about why certain pieces of teaching are going awry or not fully living up to their promise.

Sometimes the objective as stated (and written on the board) does not match the objective in action, that is, the objective that the activities appear to be aiming for. And it could be that neither one exploits the full potential of what could or should be the objective, that is, a worthy objective.



One of us recently visited a freshman world history class with a high school principal. Before class the teacher explained that her objective was for students to see how Napoleon's invasions and conquests spawned nationalism as a strong force in European countries that had previously been socially and politically fragmented. This was because the people united against a common enemy (Napoleon) and saw themselves as having common cause.

During the first part of the class, the teacher gave a lively lecture about Napoleon's big military mistakes and students appeared highly engaged. At the teacher's direction students were copying into their notebooks the main points she was putting on the board. At the conclusion of the lecture, students were assigned to triads to locate information in the text about Napoleon's big mistakes.

Reflecting later on what actually took place in that class it was difficult to determine how the activities of the day matched either the objective she had stated in our earlier conversation or what she had written on the board ("Students will understand the impact of Napoleon's reign on Europe.") Because Napoleon's reign had many different effects on Europe, it was even unclear from the board what specific effect she wanted students to "understand."

Her presentation, the notes students took, and the small group activity focused entirely on Napoleon's big military mistakes. There was no mention of nationalism in the lecture or the activities. Although the text addresses the whole issue of Napoleon's impact on Nationalism in several of the countries he invaded, students were directed to research his mistakes, thus missing the bigger picture or more important objective.

Later during the class while students were working in triads, we questioned individual students about the meaning of nationalism. Threequarters of them couldn't explain it.

We think this vignette highlights two important points:

1. When objectives are unclear or not fully formulated in the teacher's mind, both teacher and students may work hard but miss the point. The intended learning may be lost.

EXHIBIT 16.2. CRITERIA FOR SUCCESS

Definition

Criteria for success are the qualities that must be present for performance and products to meet the standards and be deemed successful. "What are the criteria?" means:

- "What should we look for in examining students' products or performances to know if they were successful?"
- "What attributes should we use to judge the effectiveness of the product or performance?"
- "What counts?"

A list of criteria (and exemplars) enable students to assess their current performances in light of the target performance. Criteria for success do not state what the teacher will do. They do not state what the student will do. Criteria for success name or describe the characteristics of the product performance, so the subject of the criteria should be the product or performance.

Examples of some criteria for products

1. The lab report

- lists all the steps for the process of _____
- explains your observations
- explains your conclusions about the relationship between _____
- uses technical terms correctly

2. Your learning log

- summarizes the major events in the chapter
- identifies the central conflict and progress toward its resolution
- includes your own reflections on the decision that the protagonist is making in her attempt to deal with and solve her problem

Examples of some criteria for a performance

1. Your oral presentation

- clearly states your position on the topic
- presents the arguments supporting your position
- supports all arguments with reason and evidence
- responds to arguments opposing your position
- is accompanied by visuals (e.g., charts, overheads, chalkboard, handouts)
- is loud enough for everyone in the room to hear easily
- may be spoken with notes but not read
- is fluent in delivery and confident in tone (which means you practiced!)

2. Your sharing of your independent reading tells

- the title and author of your book
- the most interesting part so far
- at least one vocabulary word that is new or interesting to you
- a prediction of what will happen next



TABLE 16.1. STATED OBJECTIVES, LIVED OBJECTIVES, AND WORTHY OBJECTIVES

Stated Objective	Lived Objective	Actual Experience	Worthy Objectives
<i>(What's posted on the board or written in lesson plan. It might even be what the teacher tells the students the objective is.)</i>	<i>(Objectives that are being addressed through the activities the students are participating in)</i>	<i>(What the students are actually doing)</i>	<i>(Learning targets that would benefit the students most)</i>
<ul style="list-style-type: none"> Students will understand the impact of Napoleon's reign on Europe. 	<ul style="list-style-type: none"> Students will be able to name Napoleon's three big mistakes. 	<ul style="list-style-type: none"> Students will listen to presentation on Napoleon's big mistakes and copy the teacher's board notes into their notebooks. 	<ul style="list-style-type: none"> Students will be able to explain what nationalism is and how it shows up in the modern world. Students will be able to explain how Napoleon's foreign invasions stimulated nationalism in every country he touched. Students will be able to explain how Napoleon's arrogance led to suffering and death for millions and also led to his downfall. Students will be able to organize main ideas and subordinate ideas they extract from the text into Cornell style notes. Students will be able to use three conventions in textbooks (section titles, color cues, and sidebars) to guide their reading.

2. A lesson like this and the available material in the text could serve many worthy objectives if the teacher dug deeply into the material as part of the planning process.

Given what was in the text and what other learning needs these students revealed, including not knowing what nationalism was to begin with, a number of other objectives could have been worthwhile choices (see Table 16.1). Because there was not any checking for understanding going on, the only verifiable accomplishment, if we are really honest about it, was to get the students to copy her notes off the board.

GENERIC THINKING OBJECTIVES

A fifth kind of thinking about objectives is practiced by teachers who, in addition to aiming to teach concepts, information, and skills, wish to develop particular thinking skills in students at the same time.

Let's go back to the word search. Suppose you want students to learn something about systematic search as a strategy. That's

the kind of skill we use to look through a collection of nuts and bolts for a particular size, or scan a map for Maple Street and know only that it's somewhere on the page.

A teacher who wants students to learn strategies for systematic search would certainly talk about how different children were going about looking for the words: comparing approaches and strategies, giving names to the different strategies, listing them on the board, asking students where else they could use these strategies or what other kinds of tasks would be good places to try them out (transfer), and so forth. This teacher has a generic thinking objective: an objective to develop a thinking skill apart from any particular content knowledge.

Consider a seventh-grade social studies class working on a chapter about bedouins of the Arabian desert. There's a lot of information in the chapter— facts and concepts galore. But their teacher wants them to learn more than facts. She wants them to learn about hierarchical relationships—not just relationships in bedouin life, but the nature of hierarchical relationships in



general, how to find them and represent them. So she adds something to the assignment, asking them to identify key terms from the chapter and make a diagram that shows their relationships to one another. Now something more is required. Figure 16.1 shows two diagrams that students might draw.

Note the different kinds of thinking behind these two diagrams. The first has terms arranged subordinately according to size. The Murrah is one of many tribes. Each tribe (Murrah included) is composed of clans of about twenty-five families, and each clan is headed by a sheik. Each family is organized around a patriarch and inhabits a “house of hair” (a bedouin dwelling) with a harem. Then the relationships shift to category groupings.

The second diagram shows relationships that are random and nonlinear. The diagram seems to have been created by free association rather than consistent application of some particular kind of logic.

Now students compare their diagrams in small groups and explain the kind of relationships their connecting lines represent. They talk to each other about their thinking and later in a total class discussion will develop in particular what hierarchical or subordinated relationships mean using their examples. The teacher will use those words (*hierarchical, subordinated*) because the objective for this and for the upcoming series of lessons is that they become able to do that kind of thinking, whether it’s around bedouins, sports, or computer programming. The objective here goes beyond mastery of content, though it includes that. It aims to develop a particular thinking skill.

There are literally dozens of thinking skills that may be targeted and taught simultaneously with and through academic content. But it takes consciousness and intentionality to ensure that improving students’ thinking capacity or skills is the focus of a learning experience. When we bring this lens to lesson design we ask ourselves, “What thinking skill or processes could I teach or reinforce in this lesson and how might I engineer activities and assignments so that that kind of thinking will be an instructional focal point?” (Table 16.2 describes a wide range of such thinking skills taken from a taxonomy created by Deb Burns.)

FIGURE 16.1. DIAGRAMS FOR LEARNING ABOUT HIERARCHICAL RELATIONSHIPS

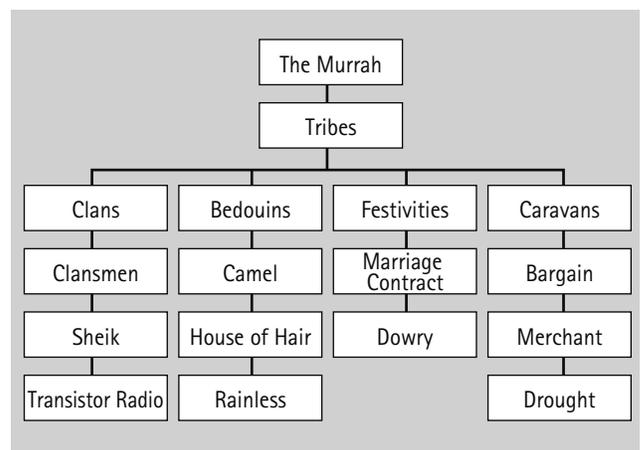
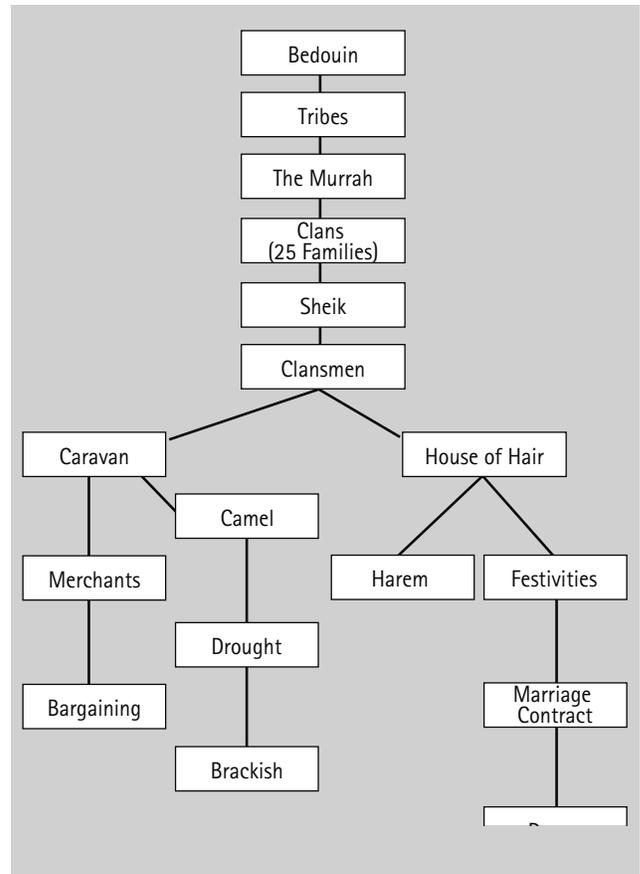




TABLE 16.2. TAXONOMY OF THINKING SKILLS

ANALYTICAL REASONING SKILLS**Identifying Characteristics**

The ability to identify the numerous, distinct, specific, and relevant details that distinguish a specific idea, object, or event; the ability to generate a "rich" description

Recognizing Attributes

The ability to assign a name or label to the general or common features and factors within a set of data

Making an Observation

The ability to use purpose setting to select relevant attributes, tools, or procedures to guide a data gathering experience

Discriminating Between Same and Different

The ability to discern and make fine distinctions between the characteristics of various objects, ideas, or events

Comparing and Contrasting

The ability to use purpose setting and common attributes to identify commonalities and discrepancies across numerous sets of information

Categorizing

The ability to group similar objects or items according to previously established, essential attributes or characteristics

Classifying

The ability to use purpose setting and relevant attributes to sort, organize, and group information

Criteria Setting

The ability to identify and quantify the most useful standards that can be used to evaluate item or items for their worth

Ranking, Prioritizing, and Sequencing

The ability to place items or events in a hierarchical order according to a quantifiable value

Seeing Relationships

The ability to compare ideas or events to identify the regularity between two or more attributes in a relationship that yield a reliable or a repeated scheme

Predicting

The ability to use pattern recognition, comparing, contrasting, and identifying, and anticipate likely events in the future

Determining Cause and Effect

The ability to identify the varied and most powerful reasons for, or results of, a given event or previous action

Making Analogies

The ability to identify a relationship between two familiar items or events, and similar items or events in a novel situation for the purpose of problem solving or creative productivity

ORGANIZATIONAL THINKING SKILLS**Memory**

The ability to readily bring from long-term memory relevant, stored facts and information

Summarizing

The ability to give a brief review of essential information that has been read, heard, or observed

Metacognition

The ability to consciously monitor, describe, and reflect on one's own thinking process

Goal Setting

The ability to identify the most desirable end state of a problem situation

Formulating Questions

The ability to develop relevant inquiries that will provide needed information to solve a given problem

Developing Hypotheses

The ability to use prior observations to develop a possible explanation for the apparent relationship between two or more variables

Generalizing

The ability to use repeated, controlled, and accurate observations to develop a rule, principle or formula that explains a number of related situations

Problem Solving

The ability to define and describe a problem, to identify the ideal outcome, and to select and test possible strategies and solutions, revising and evaluating as necessary

Decision Making

The ability to use appropriate criteria to select the best alternative in a given situation after careful consideration of the facts, possibilities, consequences, and one's personal values

Planning

The ability to develop a detailed and sequenced program of action to achieve an end

CRITICAL THINKING SKILLS**Inductive Thinking**

The ability to draw an inferential conclusion on the basis of repeated observations that yielded promising, consistent, but incomplete data

Deductive Thinking

The ability to draw a logical conclusion in which the premises were related and supported the argument under discussion

Determining Reality and Fantasy

The ability to distinguish between information that is fanciful and imaginative and information that is true to life and derived from the real world

Source: Reprinted with permission from Burns, D. E. (1993). *A Six Phase Model for the Teaching of Thinking Skills*. National Research Center on the Gifted and Talented. University of Connecticut.



TABLE 16.2. TAXONOMY OF THINKING SKILLS *(continued)*

Determining Benefits and Drawbacks

The ability to weigh the advantages and disadvantages of a given idea or action

Identifying value statements

The ability to recognize statements within an argument that reflect appraisals of worth that cannot be documented through objective means

Identifying point of view

The ability to recognize the various individuals or groups that may have differing sets of observations or priorities that influence their perspective on a given argument

Determining bias

The ability to distinguish between statements in an argument that can be proven and those statements that reflect personal beliefs or judgments

Determining the accuracy of presented information

The ability to verify the authenticity and precision of the evidence presented in an argument

Judging essential and incidental evidence

The ability to categorize information within an argument into useful and less useful categories

Determining relevance

The ability to distinguish between points in an argument that are related to the topic under consideration and those points that are distractions and not related

Identifying missing information

The ability to identify the information that is needed to evaluate the strength of an argument; information that may have been purposefully omitted from related data sources

Judging the credibility of a source

The ability to judge a source of information within an argument as believable, reliable, valid, and worthy to be considered

Determining warranted and unwarranted claims

The ability to distinguish between claims that can be proved and those that cannot be proved

Recognizing assumptions

The ability to discriminate between information that is commonly accepted as true and information that is assumed true without any proof of evidence

Recognizing fallacies

The ability to recognize errors in conclusions drawn from deductive or inductive reasoning that is used to support an argument

Detecting inconsistencies in an argument

The ability to identify contradictions or incompatibilities within an argument

Identifying ambiguity

The ability to identify words or phrases within an argument that have two or more possible meanings so as to be unclear, indefinite, vague, and subject to personal interpretation

Identifying exaggeration

The ability to identify words or phrases within an argument that overstate, magnify, or overemphasize beyond what is accepted as fact

Determining the strength of an argument

The ability to identify the theme, reasons, and evidence used to support an argument or proposal

CREATIVITY SKILLS

Fluency

The ability to generate numerous ideas or alternatives to solve a problem that requires a novel solution

Flexibility

The ability to generate a wide variety of ideas or alternatives to solve a problem that requires a novel solution

Originality

The ability to generate novel, unique, and rare ideas or alternatives to solve a problem that requires an innovative solution

Elaboration

The ability to generate a large number of minute details or descriptions that explain a specific and novel solution to a problem

Imagery

The ability to visualize a situation or an object and to mentally manipulate various alternatives for solving a problem related to the object or situation without benefit of models, props, or physical objects

SCAMPER modification techniques

The ability to use a checklist (substitute, combine, adapt, modify or minify, put to new use, eliminate, reverse, rearrange) of techniques to guide a comprehensive search for appropriate strategies to modify and improve a product by altering one or more components of the original product

Attribute listing

The ability to identify appropriate improvements to a press or project by systematically considering modifications of the various attributes of the original product

Random input

The ability to see a relationship between an apparently irrelevant word or phrase, selected at random, and a potential and creative solution for a given problem

Brainstorming

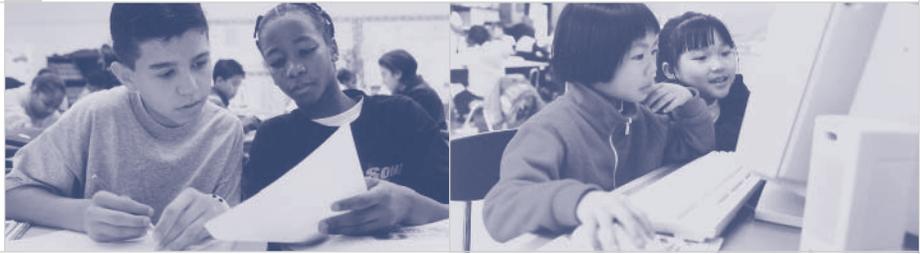
The ability to work with a group of other people to withhold judgment while identifying various innovative and numerous alternatives for solving a given problem

Creative problem solving

The ability to use a multiple step process to identify, research, and plan to solve a subproblem that requires a novel but relevant solution in order to remedy or alter a problem situation

Synectics

The ability to identify an analogous situation to a given problem set and to use that relationship to identify a solution to the problem at hand



Distinguishing Thinking Skill Objectives and Mastery Objectives

There is an important distinction between thinking skill objectives and mastery objectives. They are both, to be sure, a form of mastery. In the latter, the goal is for students to master knowledge (for example, be able to explain the causes of the Civil War) and operational skills (for example, write with good grammar; solve three-step word problems; locate points on the globe with latitude and longitude). In the case of thinking skill objectives, the goal is for students to master a generic form of thinking skill, like comparison and contrast, or understanding one's assumptions, or defining the real problem before listing solutions. Put another way, the goal is for students to learn or get better at a particular mental process and be able to transfer it to material other than today's content.

Let's say that your geography lesson today includes being able to list the attributes of an estuary: (1) fan-shaped land formation, (2) at the mouth of a river, (3) containing sedimentary deposits, and (4) filled with brackish water. But more generally, aside from today's geography lesson, you want your students to know that many concepts have a set of attributes that define them, and all the attributes need to be present for the concept to be the concept. You want them to be able to analyze the attributes of an item. That's a generic thinking skill. An example would be to use the attributes of representative democracy to analyze which of two countries, both of which appear to have elections, are really democracies (for example, compare Iraq in 2007 with Israel).

Merely giving assignments whose fulfillment calls for certain thinking skills is not teaching the thinking skill, just as round-robin reading, which calls for students to perform reading, is not necessarily teaching them anything about how to get better at reading (Duffy, Roehler, and Rockliffe, 1986).

For example, asking students to compare and contrast the motives of the North and the South at the beginning of the Civil War does not teach students anything about the act of comparing and contrasting two things if they do not already know how to do that.

Almost everything teachers ask students to do requires them to think in some way. But only when they are deliberately and explicitly teaching a particular kind of thinking skill that can be named can we say that there is a thinking skill objective. If you want your students to learn thinking skill X, you may repeatedly give them tasks that call for it, that is, do a task that requires the thinking skill to complete it correctly. But you may not have clarity about what it takes to get them there, and you may not have the true commitment to go the extra step of teaching the thinking skill explicitly.

When teaching a particular thinking skill is a real objective, we advise naming the thinking skill, teaching it, coaching it, and arranging for the children to get feedback on how they're doing with it—all this in addition to having them practice it. If a teacher has a thinking skill objective for children (rather than just an assignment or a task that calls for thinking), the teacher should:

1. Name the skill.
2. Deal explicitly with how to do it (for example, model aloud with the steps or have students share strategies for doing it).
3. Highlight steps.
4. Give tips and coaching pointers.
5. Have students practice with feedback.
6. Evaluate how the students are doing with the thinking skill.

Unfortunately, we usually see only step 6. That's not teaching a thinking skill; that's testing for it and hoping the students will learn the skill from the test or the task.

Table 16.3 summarizes the five kinds of thinking about objectives described so far and Figure 16.2 shows them in a graphic relationship.

The explicit teaching of thinking skills has a marvelous literature of its own. Tishman, Perkins, and Jay (1995) describe school structures and practices that support the explicit teaching of thinking skills. In fact, they are interested in fostering



TABLE 16.3. FIVE KINDS OF THINKING ABOUT OBJECTIVES

Name	Language Used	The Purpose
Generic thinking skills: student centered – centered on ways that children function intellectually	"Diagram the relationship between keys terms describing bedouin life."	For students to express or develop a certain kind of thinking skill
Mastery of academic knowledge or skills: Student centered – centered on what children will learn in the way of new information or skills	"Be able to describe to each other the principal causes of World War I" "Measure distance using scale on the map."	For students to know or be able to do something specific
Involvement: Student centered – on how children will react	"After giving a dramatic reading of the story, I'll solicit their opinions and get them involved in a discussion."	For students to be visibly involved – at least to participate actively and at best to be excited and have fun
Activity: Student centered – on what children will do	"They'll look at the filmstrip, then make a map of the South, then answer the questions at the end of the chapter."	For students to finish certain tasks
Coverage: Teacher centered – on what the teacher will do, what agenda to get through	"First I'll discuss the heat of reaction; then I'll go over endothermic reactions, entropy, enthalpy, and then review valences."	To mention or get students to mention ideas

schools where thinking dispositions such as openmindedness, strategic spirit, and inquisitiveness are core values of the institution. Similar positions are taken by Barell (2003) and Costa and Kallick in their excellent "Habits of Mind" series (2000). Teachers and leaders who want these things for their children have an overarching objective for what a school should be. An objective to teach an individual thinking skill like comparison and contrast is well nourished when an entire school decides to make developing minds a core value.

NESTED THINKING BEHIND OBJECTIVES

No one can teach a thinking skill objective without having some content for the students to apply it to, so a teacher who is teaching to a thinking objective almost always has a mastery-of-knowledge or skills objective too. That is why the thinking circle in the diagram in Figure 16.2 includes the "mastery of knowledge and skills" circle. But the reverse is not necessarily

true: A teacher can be teaching for mastery of knowledge without necessarily aiming to teach a particular thinking skill.

Similarly, the way in which the other circles in Figure 16.2 are nested shows the overlapping relationship of different kinds of teacher cognition during planning. For example, one can think "coverage" without having any activities for the students to do, but there cannot be activities without having some content the students are dealing with. To give another example, a teacher can have activities without any clear notion of what she wants students to learn. But she cannot have a true mastery objective without having both something for the students to do (activity) and some content on which to do it. Thus, the mastery of knowledge and skills circle contains the other two.

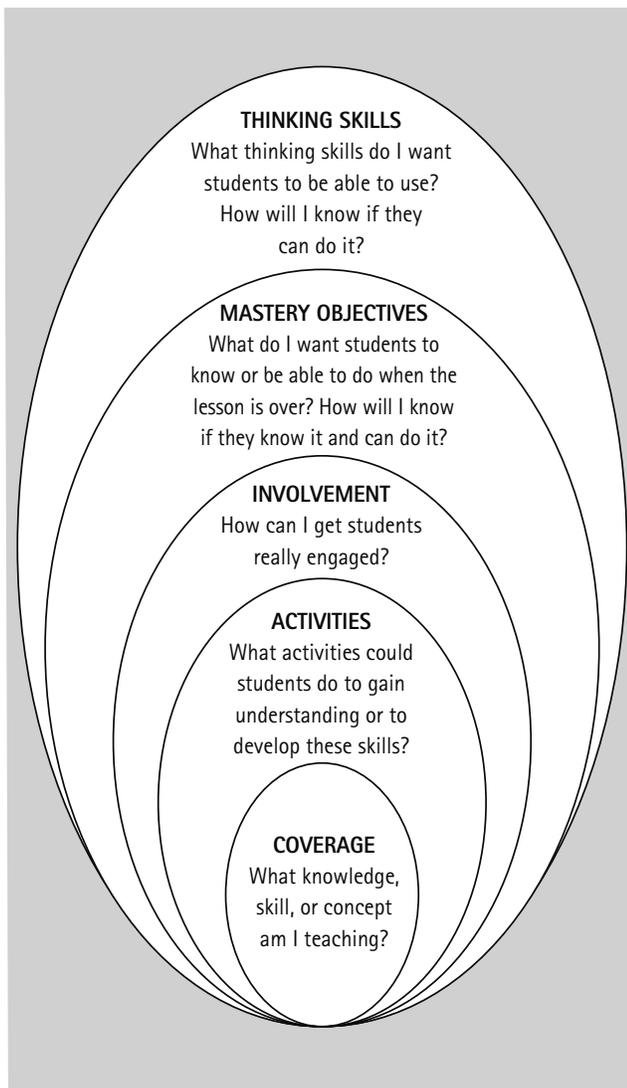
TEACHER THINKING AND LESSON PLANNING

We have made the case that there are pitfalls when coverage, activity, or involvement thinking dominates planning. Since the



FIGURE 16.2. NESTED THINKING BEHIND OBJECTIVES

Thinking Behind Objectives



real goal of coverage thinking is to get through material, such teaching is predictably characterized by more teacher talk, more lecture, and less checking for understanding.

Activity thinking tends to produce classes where students are often busy, sometimes working in groups. There may be good record-keeping systems on student completion of tasks and assignments, but activity thinking, when it dominates, tends to produce classes where students are clear on neither what is to be learned nor the criteria for quality work.

Involvement thinking adds higher energy and more fun, but classes may look essentially the same as those that are activity based.

In previous chapters, we have presented repertoires and argued that all behaviors in a repertoire can be good if they are an appropriate match to the student, situation, or curriculum. The repertoire argument needs to be modified, however, to be valid for the five kinds of thinking about objectives. Activity thinking or coverage thinking is not good enough if one never gets as far as mastery thinking in preparing for lessons.

On the other hand, fully developed planners—teachers who have clear images of what they want students to know and be able to do—still have to identify content for coverage. They still have to invent or find activities that could logically lead students to master the intended learnings. Good planners, in fact, ask the key questions involved in all five kinds of thinking in Figure 16.2, but they start by answering the mastery question thoroughly: “What do I want students to know or be able to do? How will I know they know it or can do it?”

Teachers who are logical, linear, and analytical like to start with a statement of the mastery objective and proceed deliberately to develop assessment criteria and criterion tasks. Then they identify activities and materials that fit in with this objective.

Many of us have “neat” activities or materials we love to use or think will be highly engaging for students. But this is a dicey place to start the planning process, because there is a tendency to warp the objective to fit the activity we love. There may be



a need to give up certain engaging activities we are attached to if they do not directly help students learn something they are supposed to be learning.

Each of us in teaching, in looking back at a class we taught or observed, ought to be able to infer a clear statement of what students were supposed to be able to do at the end. And that something needs to be part of the curriculum to which our school or district is committed.

A clear objective creates an image of what a student will know or be able to do when the instruction is over: a picture in your mind, a sentence of inner speech you say to yourself, or a written statement. What's important is that the image is framed from the students' point of view. The objective is a clear picture that the teacher has of desired student performance, which then becomes a clear picture for the students too.

We would argue that all objectives can be framed as a clear image of student performance— even objectives pertaining to attitude or appreciation. Second, we argue that objectives that are not thought through in this way typically wind up with coverage thinking, activity thinking, or involvement thinking, and all three of these are weaker than mastery thinking. Third, we argue that mastery thinking improves teaching by leading teachers to do more goal stating with students, more checking, more feedback according to criteria, better record keeping, and more diagnosis of individual student needs.

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