CHAPTER 3

SOLVING PROBLEMS ANALYTICALLY AND CREATIVELY

Learning Objectives

1. Increase Proficiency in Analytical Problem Solving
2. Recognize Personal Conceptual Blocks
3. Enhance Creativity by Overcoming Conceptual Blocks
4. Foster Innovation Among Others

Resources for Teaching the Chapter

Problem solving is an inherent part of a manager’s job, and particularly during times of change, managers must be able to solve problems in ways that are either analytical or creative. Although analytical problem solving is applied more frequently, creative problem solving is especially critical during times of innovation and more generally for one’s career success. This chapter reviews skills and tools related to both.

The following sections provide resources to help instructors guide their students through the five-step Model for Developing Management Skills (See Table 2 in the Introduction of the textbook).

SKILL ASSESSMENT

Before reading the chapter, have students complete the Personal Inventory Assessment instruments in MyManagementLab™. Scores indicate the extent to which individuals have developed competency in the relevant skills and the extent to which they need to improve. Because this chapter focuses on students becoming more aware of their own styles and inclinations, the assessment instruments constitute the core learning material in the chapter.
Most of the text material explains the relevance of these instruments and provides research-based information about their association with management success.

**Problem Solving, Creativity, and Innovation Survey.** This survey is built around a core of questions from the Personal Assessment of Management Skills (PAMS) instrument contained in the Introduction chapter. The instrument contains three subscales: analytical problem solving (items 1 through 5), creative problem solving (items 6 through 15), and fostering innovation (items 16 through 22). You may want students to compare their scores with others in the class or in their small group on each section of the instrument. Some may be much stronger in one or two of the subscales than the others.

**Questions to Trigger Reflection and Discussion:**
- What types of problem-solving skills are most likely to facilitate the success of a top executive, financial analyst, brand manager, hospital administrator, strategic planning officer, accounting department head, and so on?
- Should the problem-solving skill profile change with different managerial positions? How about different managerial levels?
- Is there a basic level of analytical and creative problem-solving skills applicable to all positions?
- Describe the most-effective and the least-effective manager you have known. To what extent were they competent creative managers? To what extent were they analytical and systematic problem solvers? What about their problem-solving abilities?
- Can people be both good analytical problem solvers—systematic and thoughtful—and at the same time good creative problem solvers—unsystematic and random? How are the two approaches incompatible? How are they compatible?

**Discussion objective:** Help students explore their potential strengths and weaknesses related to problem-solving and creativity. Help them see that they can develop greater skills in problem-solving through practice and application.

**How Creative Are You?** This instrument measures personal creativity in general. The ability to be creative is not immutable, and students should not be discouraged if they score low. This instrument is used by a creativity consulting firm to assess creativity in the general population. The comparison scores are based on data from a large sample of Americans. Practicing the behavioral guidelines at the end of the Skill Learning section can increase these creative problem-solving skills.

**Questions to Trigger Reflection and Discussion:**
- Does a formal education program foster or dampen creativity?
- What kinds of experiences enhance your creative problem-solving abilities?
- How can one evaluate creativity?
- Is it desirable to be creative in order to succeed as a manager, or is it better to “play by the rules”?

**Discussion objective:** Help students explore their potential strengths and weaknesses related to creativity. Help them see that they can develop greater skills in creativity through practice and application.
Innovative Attitude Scale: This instrument assesses the extent to which individuals foster innovation in their work setting. Students who have not worked or managed in an organization should respond as they intend to behave. This instrument has been used in research on innovation, and high scores are significantly correlated with successful management (see Ettlie & O’Keefe, 1982).

Questions to Trigger Reflection and Discussion:
☐ Can one develop a more innovative attitude?
☐ How can someone demonstrate originality?
☐ How can one evaluate originality, particularly in work settings?

Discussion objective: Help students explore their potential strengths and weaknesses related to innovation at work. Help them see that they can develop greater skills in innovation through practice and application.

Creative Style Assessment. This instrument assesses one’s preferred creativity style against the four approaches described in this chapter. These styles show one’s inclination toward imagination, investment, improvement, and incubation. Each of these styles are associated with certain kinds of problems that an individual may be more inclined to solve creatively. Most people are unaware of how they use creativity and the material in the book will help one develop their competencies in creative problem solving.

Questions to Trigger Reflection and Discussion:
☐ How does one exhibit “imagination” in problem solving without appearing too odd, radical, or “out there” among co-workers or managers?
☐ How does one know whether a problem requires incremental improvement over major changes?
☐ What are the pros and cons of being a “first mover” in rapid and competitive problem solving situations?
☐ Can you describe situations where “two heads were better than one” when solving problems?

Discussion objective: Help students explore which of the four creativity styles they are most comfortable with. Encourage them to speculate about what types of problems their personal preference predisposes them to tackle.

Following is an pencil-and-paper survey instrument that doesn’t appear in the text, but which can foster student learning and discussion as a classroom activity:

Multiple Intelligences survey

Howard Gardner, in his book, Intelligence Reframed: Multiple Intelligences for the 21st Century (New York: Basic Books, 1999) suggests that human intelligence is not adequately captured by traditional I.Q. tests. Instead, Gardner suggests that there are at least eight different types of intelligence, including naturalist, visual / spatial, logical / mathematical, intrapersonal, interpersonal, bodily / kinesthetic, musical / rhythmic and verbal / linguistic intelligences. A very basic test of multiple intelligences follows.

Ask students to check each statement that applies to them, and then to count up the total number of statements checked in each box. The box with the most statements checked is likely to be a
stronger intelligence for that student. Point out to students that having one form of intelligence does not preclude having other forms of intelligence, but that people who are intelligent in non-traditional ways may not do well in school or test well. As students to compare their results on the multiple intelligences checklist with their scores on the other self-assessment tests they have taken so far – do they see any relationships forming?
**HOW ARE YOU INTELLIGENT?**

<table>
<thead>
<tr>
<th>NATURALIST</th>
<th>VISUAL/SPATIAL INTELLIGENCE</th>
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<tbody>
<tr>
<td>• I enjoy spending time in nature.</td>
<td>• I visualize clear pictures.</td>
</tr>
<tr>
<td>• I like to know classification of species.</td>
<td>• I think in pictures and images.</td>
</tr>
<tr>
<td>• I can hear animal and bird sounds clearly.</td>
<td>• I am sensitive to color.</td>
</tr>
<tr>
<td>• I see detail or specifics in flora and fauna.</td>
<td>• I can find my way around unfamiliar areas.</td>
</tr>
<tr>
<td>• I am happiest outdoors exploring the world.</td>
<td>• I draw and doodle.</td>
</tr>
<tr>
<td>• I like tending to plants and animals.</td>
<td>• I like illustrated books.</td>
</tr>
<tr>
<td>• I know the names of trees, plants, birds and animals.</td>
<td>• I easily read maps and charts.</td>
</tr>
<tr>
<td>• I enjoy camping, canoeing, and hiking.</td>
<td>• I enjoy jigsaw puzzles.</td>
</tr>
<tr>
<td></td>
<td>• I like slides, movies, and photographs.</td>
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<table>
<thead>
<tr>
<th>LOGICAL/MATHEMATICAL INTELLIGENCE</th>
<th>INTRAPERSONAL INTELLIGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• I compute math problems easily.</td>
<td>• I am aware of my inner feelings, strengths, and weaknesses.</td>
</tr>
<tr>
<td>• I enjoy math and using computers.</td>
<td>• I attend seminars to learn more about myself.</td>
</tr>
<tr>
<td>• I like strategy games.</td>
<td>• I consider myself a loner.</td>
</tr>
<tr>
<td>• I wonder how things work.</td>
<td>• I enjoy hobbies by myself.</td>
</tr>
<tr>
<td>• I like using logic to solve problems.</td>
<td>• I enjoy solitude.</td>
</tr>
<tr>
<td>• I reason things out.</td>
<td>• I have a deep sense of self-confidence.</td>
</tr>
<tr>
<td>• I like to use data in my work to measure, calculate, and analyze.</td>
<td>• I am motivated by independent study.</td>
</tr>
<tr>
<td></td>
<td>• I have intuitive ability.</td>
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<table>
<thead>
<tr>
<th>INTERPERSONAL INTELLIGENCE</th>
<th>BODILY/KINESTHETIC INTELLIGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• People look to me for advice.</td>
<td>• I process information using bodily sensations.</td>
</tr>
<tr>
<td>• I prefer team sports.</td>
<td>• I like to touch or be touched when talking.</td>
</tr>
<tr>
<td>• I have many close friends.</td>
<td>• I use hand gestures when speaking.</td>
</tr>
<tr>
<td>• I like working in groups.</td>
<td>• I like working with my hands on crafts/hobbies.</td>
</tr>
<tr>
<td>• I'm comfortable in a crowd.</td>
<td>• I think of myself as well coordinated.</td>
</tr>
<tr>
<td>• I have empathy for others.</td>
<td>• I learn by doing rather than watching.</td>
</tr>
<tr>
<td>• I can read situations and people.</td>
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<table>
<thead>
<tr>
<th>MUSICAL/RHYTHMIC INTELLIGENCE</th>
<th>VERBAL/LINGUISTIC INTELLIGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• I like to listen to musical selections on radio, computer, CDs.</td>
<td>• I like to tell jokes, tell stories or tales.</td>
</tr>
<tr>
<td>• I am sensitive to music and sounds in the environment.</td>
<td>• Books are important to me.</td>
</tr>
<tr>
<td>• I can remember melodies.</td>
<td>• I like to read.</td>
</tr>
<tr>
<td>• I listen to music when studying.</td>
<td>• I often listen to radio or tapes.</td>
</tr>
<tr>
<td>• I enjoy singing.</td>
<td>• I quote things I’ve read.</td>
</tr>
<tr>
<td>• I keep time to music.</td>
<td>• I like crosswords and word games.</td>
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SKILL LEARNING

Following is an outline of key concepts developed in the Skill Learning section of Chapter 3:

Problem Solving, Creativity, and Innovation

- **Problem solving** is an essential skill for effective management

Steps in Analytical Problem Solving

- The **analytical problem solving model** is a four step process:
  1. **Defining the Problem**: diagnosing a situation so that the focus is on the real problem, not just its symptoms
  2. **Generating Alternatives**: postponing the selection of any one solution until several alternatives have been proposed
  3. **Evaluating Alternatives**: carefully weighing the advantages and disadvantages of the proposed alternatives
  4. **Implementing the Solution**: Choosing one alternative and following through to enact it

Limitations of the Analytical Problem-Solving Model

- The model is not well-suited for problems when they are ambiguous, when alternatives are difficult to define, when information is unavailable, or when there is no clear standard

Impediments to Creative Problem Solving

- All of us develop **conceptual blocks** that prevent us from solving problems creatively

Multiple Approaches to Creativity

- There are four distinct **methods for creativity**
  1. **Imagination** refers to the creation of new ideas, breakthroughs, or radical approaches to solving problems.
  2. **Improvement** refers to the creation of incrementally better alternatives.
  3. **Investment** refers to the rapid pursuit of goal achievement and competitiveness.
  4. **Incubation** refers to an approach that is characterized by teamwork, involvement, and coordinating among individuals.

Conceptual Blocks

- There are four types of **conceptual blocks**:
  1. The **constancy** block refers to being wedded to one point of view and being unable to change perspectives.
     - One form of constancy is **vertical thinking**, which means ignoring alternative problem definitions and thus pursuing a narrow solution path.
     - Another form is **single thinking language**, where people use only words and verbal language to think about problems.
  2. The **commitment** block refers to an unwillingness to change perspectives once someone has taken a stance on a particular point of view.
     - One form of commitment is **stereotyping based on past experiences**, which means seeing current problems only as variations of past problems.
     - Another form is **ignoring commonalities**, which occurs when someone fails to identify similarities among disparate pieces of data.
  3. The **compression** block refers to looking too narrowly at a problem, defining it in a constricted way, or screening out relevant information.
     - One form of compression is **artificial constraints**, which means placing unnecessary boundaries around a problem.
     - Another form is **not separating figure from ground**, which means not constraining a problem sufficiently so that it can be solved.
4. The complacency block occurs as a result of fear, ignorance, insecurity, or mental laziness.
   - One form of complacency is noninquisitiveness, which is unwillingness to ask questions, gather information, or search for relevant data.
   - Another form is bias against thinking, which is a preference for taking action over engaging in thought and reflection.

**Conceptual Blockbusting**

- **Creative problem solving** involves four different stages:
  1. The **preparation** stage involves gathering information, defining the problem, generating alternatives, and evaluating all information.
  2. The **incubation** stage involves letting the mind work to combine unrelated elements.
  3. The **illumination** stage occurs when insights are recognized and a creative solution is articulated.
  4. The **verification** stage involves testing creative solutions for their practicality and validity.

**Methods for Improving Problem Definition**

- The first method for improving problem definition is **making the strange familiar and the familiar strange**.
  - Synectics is a technique employing analogies and metaphors to help people view a problem in terms of something else they know well.
- The second method is to **elaborate on the definition** by posing two alternative definitions of the problem, or by using a checklist to come up with alternative definitions.
- The third method is to **reverse the definition**, a process that involves turning the problem upside down, inside out, or back to front to gain new perspectives (also referred to as Janusian thinking).

**Ways to Generate More Alternatives**

- One can generate more alternatives by **deferring judgment**; for instance, brainstorming is a formal technique for fostering discussion that defers judgment.
- One can also **expand current alternatives** through techniques like subdivision, which involves dividing a problem into smaller parts.
- Another strategy is to **combine unrelated attributes** through techniques such as morphological synthesis or relational algorithms.

**Fostering Creativity in Others**

- Managers can foster creativity in others by **pulling people apart and putting people together**, meaning providing separate areas for people to develop new ideas and then putting them back together into teams and groups.
- Managers can also **monitor and prod**, meaning that they provide the resources needed for innovation and then hold people accountable for producing creative ideas.
- They can also **reward multiple roles**, such as idea champion, sponsor/mentor, orchestrator/facilitator, and rule breaker.

**SKILL ANALYSIS (CASES)**

*Following are resources to help instructors teach the three cases that appear in the text:*

**Coke versus Pepsi**
The case depicts the rigidity of thought and behavior that can occur when a group (or company) is faced with an external threat. The case depicts the linear thinking of Coca-Cola executives (i.e., “we have to do the same thing as our competitors, but do it better”), and its ultimate failure to revitalize the company.

As you discuss this case with students, encourage them to review each of the conceptual blocks and examine the role it might have played in discouraging Coca-Cola from conceptualizing the problem in a more creative or productive way. Encourage them to speculate about how executives might have reframed the problem, or analyzed it from a different angle. For instance, was the blind taste test the only way to evaluate the product and its competitors? Was there really a problem with the product, or was it problem of marketing or corporate image? How could Coca-Cola have “reversed the definition” of the problem to generate more creative solutions?

Consider the following points as you prepare to present this case.

1. Although the company found itself under an impending threat, executives could at least have paid some attention to “defining the problem.” They might have come up with an alternate problem definition to the one they embraced, which was “how do we fix our product.”

2. When circumstances create stress, decision-makers may succumb to threat rigidity and subvert the creative thinking process. Point out connections to Chapter 2.

3. Encourage students to think about ways that threat rigidity discourages creative thinking and flexible reaction in a corporate setting.

**Creativity at Apple**

One way to approach innovation in a company is an “integrator” model where the firm tries to create, develop, market, manufacture and sell the product itself. Another approach is the “orchestrator” model where some activities—say design—are kept in-house and other activities—say, manufacturing—is outsourced to a partner. Still another approach is the “licensor” model in which a company develops new products and then licenses them to other companies to reproduce and distribute (for example, Microsoft). Apple has chosen the integrator model and, consequently, is the sole source of all software, hardware, and peripherals. One of the other two models for innovation may help Apple expand its customer base and sales.

“Innovation doesn’t make money. Management makes money.” This is the watch cry of most consulting companies. Execution trumps the great ideas of the lone genius any day. Apple is good at generating ideas. It is good at turning creative ideas into innovative products. It is even good at getting those products to market. It is less capable at commercializing them to a mass market at low cost.

Apple cannot lose its capability at creative problem solving and innovation. That explains why the company has not followed the path of Commodore Computers or Wang, both of which were once among the largest computer companies in the world. The keys to overcoming conceptual blocks—lateral thinking, multiple thought languages, challenging stereotypes, identifying commonalities, separating figure from ground, avoiding artificial constraints, fostering inquisitiveness, and using right and left brain thinking—are all crucial for continued success.
Furthermore, techniques to enhance problem definitions and improve the generation of alternatives are also imperative for Apple’s success. However, Apple also needs to focus those activities more on business processes as well as on new product development. Innovative ways to save money, to cut costs, to distribute and market more widely and effectively, to capture market share, and so on must supplement Apple’s penchant for focusing too narrowly on product innovation.

Following are supplemental cases that do not appear in the textbook, but serve as a resource that instructors can use in class.

**Campus Life Problem: Solving Problems Creatively**

**Background.** A little over a year ago, the social life on this campus was very different from what it is today. At that time, alcohol flowed freely through the campus, to anyone, at any age, at any place or time. It was actually possible for someone to obtain free beer from a keg and drink as much as he or she wanted by going to a fraternity party. This is the way things had been for years, right or wrong. However, circumstances arose that forced many administrators and students to question the status quo and to wonder what steps needed to be taken.

**Situation.** Early last year, an alcohol study appeared on the front page of the student newspaper. The study stated that approximately 84 beers per month were consumed by fraternity members on campus. In contrast, only 30 beers per month were consumed by nonfraternity members. Furthermore, the statistics stated that sorority women drank more, on the average, than nonfraternity men. This study forced many on campus to consider possible changes in the alcohol policy.

Also about this time, another study related to alcohol appeared. Statistics showed that of all the rapes committed on campus, an overwhelming percentage of the offenders were under the influence of alcohol at the time of the attack. Alcohol was often involved on the part of the victim, as well. Soon, a connection was made between the percentage of rapes and the amount of alcohol consumption in fraternities. Sadly, around this time, a student fell from a fire escape to his death. This student had been drinking at a nearby bar and at an apartment party that evening. This incident triggered a great deal of concern in town.

**Concerns.** As this situation developed, many became concerned with their own liability as well as the safety of students. Fraternity members realized that they would be liable for any accident that could be traced to one of their parties. Not only would they be liable, but they also would be responsible for the drinking and actions of the individuals at their parties. At this time, several insurance companies began to place pressure on fraternities. Furthermore, the administration began to push for no keg parties. The Inter-Fraternity Council realized that something had to be done, but what?

**Questions to Trigger Reflection and Discussion:**

- What possible conceptual blocks might interfere with a creative decision?
- Which of the creative problem-solving techniques discussed in the chapter could be used in this case?

**Discussion objective:** Help students analyze how conceptual blocks might play a role in a situation relevant to their own lives. Challenge the students to explore applications of the problem-solving techniques in this scenario.
Following are descriptions of clips from feature films that instructors might use as further in-class skill analysis activities:

**Lorenzo’s Oil**

Augusto and Michaela Odone’s happy life is shattered when their vibrant young son, Lorenzo, is diagnosed with ALD, a disease in which a genetic problem in metabolism causes progressive neurological damage and, eventually, death. The Odones refuse to resign themselves to the hopeless prognosis given by Lorenzo’s physician, or to settle for the futilely slow pace of research on treatment for ALD. Despite their lack of medical training, they devote themselves to finding a cure for Lorenzo’s devastating disease.

**Clip (1:27:50–1:32:00).** Deirdre Murphy (Kathleen Wilhoite), a sister of Michaela Odone (Susan Sarandon), finds her brother-in-law (Nick Nolte) at a table in the library. Augusto is surrounded by pages copied from books and journals—and long chains of paperclips. He explains to Deirdre that he is using two types of paperclips to try to solve the biochemical paradox underlying ALD. The solution eludes him, and, exhausted, he succumbs to sleep. After having a vivid dream, Augusto awakens with the key to treating ALD.

**Questions to Trigger Reflection and Discussion:**

☐ Apply the four stages of the creative problem-solving process to the scenes you have just viewed.

☐ To what extent does Augusto Odone’s lack of formal medical education give him an advantage in understanding the biochemistry of ALD?

☐ What purpose do the paperclips serve in helping him solve his problem?

☐ Why is incubation essential to creative problem solving? Why is it difficult for some individuals to “wait” for their thoughts to percolate? What techniques would you recommend to help them develop skills to foster incubation?

**Discussion objective:** Help students explore how this film clip depicts the creative problem-solving process. Allow them to speculate about how the processes depicted in this clip might apply to their own lives.

**You’ve Got Mail**

New Yorkers Kathleen Kelly and Joe Fox have been conducting an Internet romance. Joe proposes that they meet in person—before discovering that Kathleen owns the bookshop about to be put out of business by the newest store in his family’s deep-discount mega-chain.

**Clip (0:25:00–0:26:15).** Thirty-something Joe Fox (Tom Hanks) brings a young girl and a younger boy into the bookshop Kathleen Kelly (Meg Ryan) owns and manages. Kathleen understandably, yet erroneously, assumes that Joe is the children’s father. She doubts the girl and boy when they tell her Joe is, respectively, their nephew and brother. Joe explains to Kathleen that the girl is his grandfather’s daughter and the boy, his father’s son.

**Questions to Trigger Reflection and Discussion:**

☐ Why does Kathleen assume that Joe is the children’s father? Why does she question that he is the girl’s nephew and the boy’s brother?
Which conceptual blocks are constraining Kathleen? How do these blocks curtail her problem definition?

Give an example of an analogous situation in which a conceptual block limited your problem definition. When did you recognize the impact of the block? How did you overcome it? How did you feel about having had the block? What will you do to avoid similar conceptual blocks?

**Discussion objective:** Help students explore how this film clip depicts the role of conceptual blocks in decision-making. Allow them to speculate about how the processes depicted in this clip might apply to their own lives.

**12 Angry Men**

12 jurors meet to determine the fate of a boy who is accused of killing his father. Over the course of an afternoon and evening, one of the twelve jurors (Henry Fonda) tries to convince the other eleven of the boy’s innocence.

Although “12 Angry Men” is a classic movie, used in many classes, students often respond favorably to seeing it again, especially if they are given specific discussion questions in advance. This movie can be used to examine group decision making processes (in which case it can be shown during a discussion of Chapter 3) or it can be used to examine team interactions (in which case it should with Chapter 9.)

**Questions to Trigger Reflection and Discussion:**

- According to the textbook, analytical problem solving consists of four steps: 1) defining the problem; 2) generating alternative solutions; 3) evaluating alternatives and selecting an appropriate one; 4) implementing and following up on the solution.

- What evidence do you see of the following conceptual blocks in the movie? 1) Vertical thinking; 2) Use of only one thinking language; 3) Stereotyping; 4) Ignoring commonalities; 5) Artificial constraints; 6) Not separating figure from ground; 7) Non-inquisitiveness; and 8) Bias against thinking.

- Groupthink is a problem that often troubles groups trying to make a decision. Which of the following signs of groupthink are evident in the film? 1) Illusion of invulnerability; 2) collective rationalization; 3) unquestioned morality; 4) negative stereotyping; 5) pressure to conform; 6) self-censorship; 7) illusion of unanimity; 8) mind guards.

- To what extent was the initial decision of the jury a function of groupthink? The final decision? Explain your answer.

- To what extent did the jury use the nominal group technique or the delphi technique to make their decision? Discuss the pros and cons of each technique in light of the decision that was being made.

**Discussion objective:** Challenge students to conduct a careful analysis of the decision-making processes throughout this film. There is far more material than you can reasonably discuss in a single class session. We have found that students are most energized by an open-ended discussion that allows them to elaborate on the connections they observed to course material.
SKILL PRACTICE (EXERCISES)

Following are resources to help instructors teach the three practice activities that appear in the text:

Moving Up in the Rankings and Keith Dunn and McGuffy’s Exercise

Purpose: To give students practice in applying the concepts of analytic and creative problem-solving to a real-life scenario.

Procedure: These exercises should be conducted in small groups, with an observer assigned to each group. The role of observer should be rotated so that one person is not always the feedback provider. The observer plays an important role: good observers give individual feedback to members as well as a description of the group’s problem-solving processes. The observer should use the Feedback Forms provided in the text. After each exercise is completed (that is, after Moving Up in the Rankings and Keith Dunn and McGuffy’s) the observer should be given at least 15 minutes to provide feedback on the group process and to each member. This feedback time is as important as the problem-solving time, so do not short-circuit it.

After students have been instructed to form small groups, explain their assignment (for both the Moving Up and the Keith Dunn case):

1. Do these practice exercises in two stages: (a) analytical problem solving, and (b) creative problem solving.

2. First, generate a single problem definition. Write it down so it is specific. This is important because people often tend to solve different problem from the original one they started out to solve.

3. Reach consensus in the group regarding the problem-definition statement.

4. Identify as quickly as possible some good alternative solutions to the problem. Pick your best three to share with the larger class.

5. Record the alternatives selected by the groups on a chalkboard or a flip chart.

6. Now get back in your groups and apply the creative problem-solving hints and techniques from the chapter. Generate five different definitions of the problem—different definitions, not just different ways to state the same definition.

7. Next, apply creative problem-solving hints and techniques to generate at least 10 alternative, new solutions. This may take more than 15 or 20 minutes if you use brainstorming, subdivision, forced connections, etc.

8. The photographs used as illustrations in the “Moving Up” case are taken from models of the Weatherhead School of Management building designed by Frank Gehry. One of the
authors of the text was heavily involved in the early stages of the building groundbreaking and construction—including raising money to pay for the structure. One of the key functions of the building is to bring recognition and visibility to the city of Cleveland, to Case Western Reserve University, and to the Weatherhead School of Management. The issue is how to actually use that building to achieve the objectives. Urge your students to go beyond the obvious and overly simplistic suggestions of “just expose it,” “increase marketing,” etc. This is only one element in the challenge described in the case study.

One way to do this is to ask different groups to apply different creative problem-solving techniques. Specifically, ask half the groups to focus on improving the problem definition and half to explore ways of generating more alternatives. For example, morphological forced connections can expand alternatives. Using this technique the problem statement could be something like: “Preserving books leads to overcrowding.” Alternatives should then be generated for each major element in that problem statement. For example, alternatives for “preserving” might be: shelving, storing, destroying, transforming, reducing. Alternatives for books might be tapes, videodisks, electronic media, microfilm. Alternatives for “leads to” might be: inhibits, engenders, encourages, discourages. Alternatives for “overcrowding” include: efficiency, automation, new facilities, better utilization.

The problem in the Keith Dunn and McGuffy’s case is just the opposite. It has so many potential problem statements and alternative solutions that the task will be to get students to focus on one single problem definition and to limit their alternatives to that one definition in the first stage. It will be easier for them to accomplish the second stage (creative problem solving) in this case than in the Moving Up case.

When students have generated their alternative solutions, make sure that you give observers time to provide feedback to the groups and to each individual.

Questions to Trigger Reflection and Discussion:

- How difficult was it to reach consensus on a problem statement?
- How quickly did the group select three good alternatives in stage 1?
- What creative problem-solving hints and techniques were most useful in each case?
- Which were less useful?
- Which can you use in other problems you face in your everyday life and/or as a manager?

Discussion objective: Challenge the students to use concepts from this chapter (e.g., the analytic and creative decision-making models) to describe the actors in these cases. Encourage them to draw upon their own experiences to describe times when they have seen similar dynamics.

Creative Problem-Solving Practice

Purpose: To get students to apply the creative and analytical skills described in the chapter (i.e. improving problem definition, overcoming conceptual blocks, etc.) and develop alternatives to the four problems presented in the exercise.

Procedure: Use the technique of brainstorming, in particular, to have groups come up with several (i.e. 40 or more) alternatives to the problem. Straightforward instructions are provided in the text to guide students through these practice exercises.
Following are supplemental activities that do not appear in the textbook, but serve as a resource that instructors can use in class.

**Synectics**

**Purpose:** To help students learn how to use the synectics tool as a way to foster more creative problem solving.

**Procedure:** Help students learn to apply the synectics technique by giving them a problem with which they can use the four different kinds of analogies. You will want to come up with your own problem, but if you are stuck for an idea you might try one of these: How can Americans become multilingual without disrupting the current educational system? How can we use the experience and know-how of people over the age of 65? What kind of a sport could be devised that could involve people 8 months old and 80 years old? What kind of a curriculum could be offered in a business school that would produce the best-prepared students?

**Brainstorming**

**Purpose:** To help students learn how to use the brainstorming tool as a way to foster more alternative generation.

**Procedure:** We have found it useful to assign students to participate in a brainstorming activity for at least 20 minutes. This may seem like a common activity, but students tend to evaluate alternatives as they are proposed and run out of ideas quickly. Make sure that they stick with the task for at least 20 minutes because after the initial flurry of ideas, the next set of ideas are often the most creative. If they discuss a problem they care about (i.e., that relates to their lives or their experience) they will gain more from the activity. Here again, the “debt problem” example described above can be useful to brainstorm causes or solutions. This is a memorable part of this chapter when the brainstorming assignment is viewed as real, not just a game.

**Running Out of Time**

**Purpose:** To help students appreciate the time constraints under which managers must solve major problems.

**Procedure:** Assign students to interview a manager they know well, asking the following questions about a major problem the manager very recently solved under pressure:

- How did the problem first come to your attention? Why do you consider it a major problem?
- How did you initially define the problem? Did your definition of the problem change as you learned more about it?
- What kind of pressure were you under to solve this problem? How did that affect the time you took to come up with a suitable solution or implement it?
- About how many possible solutions did you consider for this problem?
- What standard(s) did you use for selecting among the alternative solutions you considered (such as cost, timing, staffing, etc.)?
- What would you do differently to solve this problem if there were no time pressure?
Group students in teams of four to compare the results of their interviews and discuss the following questions, with a reporter summarizing the answers in a brief presentation:

- Was time a factor for many managers facing major problems?
- If so, how did it affect their problem definition, alternative generation, or evaluation of potential solutions?
- What would managers do differently to solve problems if they were not under time pressure?

What’s New?

Purpose: To help students search out new creative techniques, try one out, and report on the results.

Procedure: Assign students to use library or online sources for researching practical techniques for sparking creativity in problem solving. One online source is the Center of the Creative Universe Web site, which features articles about a variety of creative approaches (http://www.gocreate.com/Articles/index.htm). Students should select an article with at least one method not covered in Chapter 3.

Now have students:
1. Explain the technique in one paragraph. Is it (even distantly) related to any of the techniques in the chapter? If so, students should briefly discuss the similarities and differences. (For example, in “The Basics of Brainlining” article, the creativity technique builds on traditional brainstorming, with the twist that the brainstorming occurs online, sometimes with games to stimulate new ideas.)
2. Apply the technique to a problem they face at work, school, or home.
3. Summarize the problem and the results in a one-page report, indicating whether the creativity enhancement technique was effective and helpful in identifying a solution.

This exercise can be assigned for individual homework, followed by a class discussion of the most useful techniques and why they worked.

ACKS and BLOGS

Purpose: To help students analyze which problem-solving strategies they are most comfortable using, and which conceptual blocks they fall prey to.

Procedure: This exercise presents a problem that will require students to work in a group, preferably groups of five or six. One person should serve as an observer to record the methods used by the group and individuals within the group to solve the problem. The goal is to have the group solve the problem as quickly as possible.

Each group member will be given several items of information (listed following). Make enough copies of the items so that each group has a complete set. Make certain that only one item of information is on a single card or piece of paper. Each student should be given one item at a time until all the items are distributed to the group.

After the problem has been solved, have the observers report on the strategies used in the group and by individuals to solve the problem. Several different ones (e.g., multiple thinking languages,
making the strange familiar, subdividing, lateral thinking, separating figure from ground) will have been observable. Then discuss the following questions:

☐ Which problem-solving strategies did you feel most comfortable with?
☐ Which strategies were most effective?
☐ Which thinking languages did you use?
☐ What conceptual blocks needed to be overcome?
☐ How did you break your conceptual blocks?
ACKS and BLOGS

Directions to students. Pretend that ACKS and BLOGS represent a new way of measuring distance, and that CREPS, DATS, and FUMMS represent a new way of measuring time. A woman catches a train in Giz City and travels to Hakk City. She must travel through Jel City and Kyt City on her way. The task of your group is to determine how many DATS the entire trip took. Do not select a formal leader for your group. Work on the problem using whatever strategy you think will bring you the right answer the most quickly.

The following rules apply:

a. These items can be shared orally only, not written down and passed to other members of the group.

b. The group is finished when all members must have the answer.

Items of Information: ACKS AND BLOGS

(Put each sentence on a separate card or slip of paper)

How far is it from Giz City to Jel City?
It is four ACKS from Giz City to Jel City.

How far is it from Jel City to Kyp City?
It is eight ACKS from Jel City to Kyp City.

How far is it from Kyp City to Hakk City?
It is ten ACKS from Kyp City to Hakk City.

What is an ACK?
An ACK is ten BLOGS.

What is a BLOG?
A BLOG is a way of measuring distance.

How many BLOGS are there in a mile?
There are two BLOGS in a mile.

What is a CEPE?
A CEPE is ten DATS.

What is a DAT?
A DAT is five FUMMS.

What is a HJMIM?
A FUMM is a way of measuring time.

How many FUMMS are there in an hour?
There are two FUMMS in an hour.

How fast does the woman travel from Giz City to Jel City?
The woman travels from Giz City to Jel City at a rate of 24 ACKS per DAT.

How fast does the woman travel from Jel City to Kyp City?
The woman travels from Jel City to Kyp City at a rate of 30 ACKS per DAT.

How fast does the woman travel from Kyp City to Hakk City?
The woman travels from Kyp City to Hakk City at the rate of 30 ACKS per DAT.

What is a RAB?
A RAB is a way of measuring distance.

There are 50 RABS in an ACK.

It is 50 RABS from (Giz City to Hakk City.
**Answer:** The answer to the problem is 23/30 or .7666 DATS. That is, it takes .1666 DATS to travel from Giz City to Jel City, .2666 DATS to travel from Jel City to Kyp City, and .333 DATS to travel from Kyp City to Hakk City.

The system for answering the ACKS AND BLOGS problem is merely to do the math substituting the relevant words. The confusion comes in dealing with words and values that are not common (plus the fact that some of the information presented is irrelevant). Some students translate the problem into familiar times and distances (miles and hours), some draw pictures and work it out visually, and some remain in the new language to compute the answer. Some groups work as participative teams, others delegate all the information to a single person to do all the computations. No one right way exists to approach the problem, and one of the interesting learning points is to have students describe the approach they used to figure out the answer.

**Just Do It?**

**Purpose:** To help students focus on the importance and practical aspects of carefully implementing a creative solution. This exercise gives students a better appreciation for the steps managers must take after they’ve decided on an appropriate solution for a vexing problem.

**Procedure:** Divide students into teams of 3–6. Then follow these steps:

**Step 1:** Have each team select a problem and solution from the following list, so that at least two teams are working independently on one problem:
- Problem 1: An appliance manufacturer experiences 10% higher costs for raw materials, labor, and transportation.
  Solution 1: The manufacturer will implement a 10% increase in the price stores pay for its appliances.
- Problem 2: The number of high school seniors applying to a college drops by 10%.
  Solution 2: The college will implement a new online recruiting site to reach tech-savvy seniors.
- Problem 3: A new chain supermarket is siphoning sales from an existing independently owned grocery store.
  Solution 3: The independent store will implement a customer loyalty program, giving away free merchandise when shoppers spend a set amount over a set period.

**Step 2:** Ask the teams to assume the role of the management team that will implement the solution to the problem they have selected. First, tell students to list the steps they think they will need to take to implement the solution to their chosen problem. Next, ask them to write down their estimate of the time and cost needed for each step. Finally, ask them to specify how their organization will know that the solution was successfully implemented.

**Step 3:** Ask the teams that have worked on the same problem to compare their list of steps, time and money, and criteria for successful implementation.

**Questions to Trigger Reflection and Discussion:**
- What differences and similarities do teams see between their lists of steps for the same solution implementation?
- What differences and similarities do teams see between their estimates of time and money for each step?
What differences and similarities do teams see between their criteria for evaluating the success of implementation?

**Discussion objective:** Help the students to critically analyze how their team tackled the problem. Encourage frank evaluation of implementation, and help the students explore why some implementation strategies are more effective than others.

**Snowed Under**

**Purpose:** To help students apply both analytical and creative problem-solving techniques to an urgent and important real-world problem. Finding out what the airline actually did about the problem—and the unfortunate, highly publicized consequences of its solution—prompts students to reevaluate their alternatives and their standards for choosing a solution in light of the pressures businesses face every day in the course of satisfying customers and maintaining a good reputation.

**Procedure:**

**Step 1:** Form student teams of 4–8 to work on this case. Start by describing the following problem to students, without indicating that this is based on an actual situation.

You’re part of the management team for an airline hub in Detroit. One winter day, Detroit Metropolitan Airport is forced to close because of a blizzard. The runways are being plowed just enough to permit a few inbound planes to land from time to time, but no outbound flights can take off. In anticipation of the airport reopening, you have 30 flights carrying nearly 4,000 passengers waiting near the runways. As time goes on, however, you have no indication of when the airport will allow flights to depart. Your airline’s policies and practices call for putting passenger safety first, but they don’t cover this exact situation. What should you do?

**Step 2:** Ask the teams to define the problem, generate alternative solutions, and evaluate the options to select an appropriate solution, following the first three steps in analytical problem solving and using creative problem-solving techniques from the chapter.

**Step 3:** After 15 minutes, interrupt the teams by saying that you want to provide them with more information. At this point, the teams should be deep into the evaluation stage. Now tell the class that this case is based on a real situation:

Northwest Airlines actually faced this problem in 1999, when it left almost 4,000 passengers sitting on 30 planes for up to eight hours, waiting for the airport to reopen. During this period, the passengers had little or no food and water, and some onboard bathrooms stopped working. Pilots reported that fights broke out aboard some flights, and some passengers wanted to use the emergency exits to get off the planes. This situation received widespread media attention, and Northwest was criticized for its handling of the problem.

Now suggest that students use their knowledge of what really happened to take a fresh look at the alternatives they have generated and the standards they are using to evaluate those alternatives. Although they may have been considering standards such as safety, cost, and company convenience, they should also factor in customer satisfaction and public image.
Knowing about the solution Northwest chose, students may prefer to return to Step 2 of the problem-solving model to generate fresh, more creative alternatives.

**Step 4:** After another 10 minutes, ask each team to appoint a spokesperson who will present the team’s problem definition, indicate the team’s solution, and explain the reasoning behind the choice of solution. After all teams have reported, you may want to tell the class about the following alternative solutions, which have been suggested or were actually implemented that night:
- Other airlines brought their jets back to the gates so passengers could wait in the terminal.
- Some Northwest pilots asked that ground staff tow their planes back to the gates so passengers could get off there.
- Northwest might have towed its planes much closer to the gates and let the passengers off outside so they could walk through ground-level entrances into the terminal.
- Northwest might have put passengers on buses to bring them from the planes out on the runways back to the terminal.
- Northwest might have driven food, drink, videos, disposable diapers, and other supplies to the waiting planes on the runways.

**Questions to Trigger Reflection and Discussion:**
- What conceptual blocks may have contributed to the severity of this problem?
- Which techniques did teams find most useful for breaking through such conceptual blocks?
- Knowing what happened, what standards do you now consider most important for evaluating alternative solutions to this case—and why?

**Discussion objective:** Help students apply the idea of conceptual blocks to the case, and encourage them to explore techniques for breaking through those blocks. Encourage them to critically analyze their decisions and arguments as they completed the exercise.


**The Inheritance**

**Purpose:** To help students explore creative decision-making in a fun and whimsical case. The case challenges students to combine seemingly unrelated resources to produce a product or service in a manner that could conceivably turn a profit.

**Procedure:** Divide students into teams of 3-6 people. Equip each student with the instruction sheet included on the next page. If you do the exercise in class, give teams at least 30-40 minutes to come up with their business plans. (We usually don’t require teams to come up with a formal written plan, but instead ask them to sketch out their ideas on paper and be prepared to present them orally in class). Alternately, you might assign the teams to work on their plan outside of class.

After the teams have generated their plans, ask each team to take 2-3 minutes to explain their plan to the class. If you wish, you might select one plan as the most creative and present a small prize to the team.
Discussion Notes: In our experience, most teams come up with a plan to turn the land into an outdoor adventure area or ropes course. Some teams, however, come up with truly unique ideas that combine the resources in surprising ways. It’s useful to discuss why teams tend to converge around the same idea. For instance, you might point out that being in an organizational behavior might prime students to think about a ropes course. The discussion provides an opportunity to discuss how one’s immediate setting and current experiences can shape and constrain creative thinking.

Questions to Trigger Reflection and Discussion:

☐ What conceptual blocks did your team encounter as you worked on your business plan?
☐ Which techniques did teams find most useful for breaking through such conceptual blocks?
☐ What did the teams who produced unique ideas do to come up with novel business plans?

Discussion objective: Help students apply the idea of conceptual blocks to the case, and encourage them to explore techniques for breaking through those blocks. Encourage them to critically analyze their decisions and arguments as they completed the exercise.
The Inheritance

You are a group of siblings raised in a poor family. All of you are unemployed and have no remarkable skills or abilities. You have just been informed that your eccentric Aunt Gertie has died, leaving a will that bequeaths to you (as a group) a valuable, but unusual set of resources. The will stipulates that you must work together to establish a commercial venture using only the inherited resources (although you need not use all of them). The venture (which may consist of any product or service you can think of) must turn a profit within one year or your inheritance will be revoked.

Following is a detailed list of the resources Aunt Gertie left you:

1) **Land.** Aunt Gertie gave you a 1 sq. mile tract of land, half of which is forested and the other half grassland. The land is flat and aesthetically unremarkable. It includes a small stone quarry (with stone cutting equipment lying about in disarray), a 15-foot wide river, and a small landing strip. The land is located 5 miles from a sleepy town of 30,000 people called Lazydale. The nearest major city, Bigtown, is 70 miles away. Both are directly downriver.

2) **A Warehouse.** On the land is a massive warehouse divided into three equal-sized sections.
   - On the west end is a workshop housing 50 heavy-duty sewing machines. The machines have no resale value, but are in good condition and are excellent for heavy fabrics such as canvas. In the back of the workshop you find at least a ton of clean blue canvas, neatly stacked in large rolls.
   - In the middle section of the warehouse is an open workspace.
   - On the east end is another workshop housing saws, lathes, and other woodworking equipment.

3) **A Small Cargo Plane.** Aunt Gertie left you her small airplane, which has an empty storage area (7X12X7 feet). There is enough fuel in the plane to get you to Bigtown and back once.

4) **A Slush Fund.** Aunt Gertie left you $5,000 of discretionary cash. This is all you can spend on supplies!

5) **A Labor Budget.** Aunt Gertie left $500,000 earmarked for employee salaries. You may not use this money for any other purpose! After the first six months of operation, all salaries must come from revenues. The available labor in Lazydale includes only the following:

<table>
<thead>
<tr>
<th>Type of worker</th>
<th>Quantity Available</th>
<th>6-month salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unskilled laborers (mostly teenage part-time workers)</td>
<td>150</td>
<td>$10,000</td>
</tr>
<tr>
<td>Experienced managers/foremen</td>
<td>5</td>
<td>$40,000</td>
</tr>
<tr>
<td>Experienced sales personnel</td>
<td>10</td>
<td>$30,000</td>
</tr>
<tr>
<td>Various Professionals (doctors, educators, lawyers, entertainers, foresters, and scientists)</td>
<td>3-5 from each profession</td>
<td>$60,000</td>
</tr>
</tbody>
</table>

6) **Odds and Ends.** Aunt Gertie threw in some other interesting items:
   - A pickup truck
   - A bulldozer
   - A herd of 300 sheep
   - 10,000 feet of two-inch thick rope
   - 10,000 feet of electric wire
   - A 15X40 foot barge on the river
   - A ton of concrete mix, and a mixer
   - A large freezer filled with a ton of ice

**Your Task**

You and your siblings must develop a simple business plan for the next six months. You will present this plan to Aunt Gertie’s personal business advisor, who must approve it. The plan should answer the following questions:

- What product or service will you produce?
- How will you market and distribute the product/service?
- How will you use your resources to overcome logistics/feasibility problems?

The business advisor will evaluate your plan first and foremost on originality and creative use of available resources. The feasibility of the plan is of secondary, yet significant importance. Good luck!
SKILL APPLICATION

Suggested Activities

These exercises provide opportunities for students to extend the learning experience outside the classroom. Your selection of assignments should consider students’ ages, access to organizations, employment status, etc., as well as which aspects of the chapter you spent the most time discussing in class. The Skill Application assignment can balance the emphasis on various topics.

Assignment 3.11 encourages students to teach this skill to someone else. This is an enlightening experience that should be used as one of the assignments sometime during the course. Assignments 3.12–3.14 involve applying the creative problem-solving techniques to various problems—personal, group, organizational, or community.

Application Plan and Evaluation

One of the best ways to help students transfer their skill learning to a real-life setting is to have them create their own assignments. This application exercise is designed to help students identify the specific skills associated with the chapter that they want to improve. Urge students not to shortcut this exercise, but to complete each item on the form. That way they are forced to identify specific behaviors, a specific time frame, and specific reporting mechanisms that can help them actually implement a change in their skill behaviors outside the classroom environment.

Step 3.15: Students identify the specific skill(s) they want to improve. Being required to write it down often helps clarify it in ways that would not occur otherwise. It is not good enough to just state something general. The skill(s) should be written behaviorally, using the behavioral guidelines as a model—as well as a source of ideas.

Step 3.16: Students identify the circumstances in which the improvement efforts will occur. This focuses their attention on a particular problem or issue, a particular work situation, or a specific set of individuals. They should indicate when they will begin; otherwise it is easy to procrastinate.

Step 3.17: Students identify specific behaviors in which they will engage in order to improve their skill performance. Completing this step will require some analysis and time; it should not be done hurriedly or perfunctorily. This step essentially operationalizes the improvement activity into observable actions.

Step 3.18: Students identify specific outcomes that will indicate success. This is not easy for skills without a quantifiable outcome, but that is why this step is so important. Having students identify the ways they know they have improved in becoming more skillful will help them identify more clearly what they must do to improve. It is an important clarifying step. Appropriate outcomes might include increased satisfaction with a relationship or improved understanding. Students should be cautioned about using changes in another person’s behavior as the criteria for success. Instead, they should focus on outcomes they can control.

Steps 3.19 through 3.21: Students analyze, evaluate, and record their improvement efforts. We suggest a journal as the best mechanism for doing the recording. These steps not only foster
learning and self-understanding, they also can lead to a cycle of continuous improvement as ways are identified to enhance past performance.

We usually have students hand in at least some of these skill application analyses as part of their grade for the course. This reinforces the merit of immediate application, and lets you give them written feedback and encouragement. These experiences can also be incorporated into subsequent class discussions.

FOR FURTHER READING

After identifying three elements of creativity: (1) imaginative, flexible thinking; (2) expertise; and (3) intrinsic motivation, the author advises managers seeking to promote their employees’ creativity to focus on intrinsic motivation because it is the easiest to affect. Drawing from her extensive empirical research on the impact of managerial practices on creativity, she discusses six ways managers can provide a creativity-enhancing environment, by: (1) challenging employees, (2) giving employees autonomy over how they do their work, (3) allocating sufficient time and money, (4) carefully composing teams, (5) encouraging employees’ exploration and innovative efforts, and (6) establishing systems that support creativity.

Abstract: “Using 456 supervisor-employee dyads from four organizations, this study examined how employees use one proactive behavior, feedback seeking, as a strategy to enhance their creative performance. As hypothesized, employees’ cognitive style and perceived organizational support for creativity affected two patterns of feedback seeking: the propensity to inquire for feedback and the propensity to monitor the environment for indirect feedback. Feedback inquiry related to supervisor ratings of employee creative performance. These results highlight the importance of employees’ self-regulatory behaviors in the creative process and show that feedback seeking is not only a strategy that facilitates individual adaptation, but also a resource for achieving creative outcomes.”

Abstract: “Most people are born creative. But over time, a lot of us learn to stifle those impulses. We become warier of judgment, more cautious, more analytical. The world seems to divide into “creatives” and “noncreatives,” and too many people resign themselves to the latter category. And yet we know that creativity is essential to success in any discipline or industry. The good news, according to authors Tom Kelley and David Kelley of IDEO, is that we all can rediscover our creative confidence. The trick is to overcome the four big fears that hold most of us back: fear of the messy unknown, fear of judgment, fear of the first step, and fear of losing control. The authors use an approach based on the work of psychologist Albert Bandura in helping patients get over their snake phobias: You break challenges down into small steps and then build confidence by succeeding on one after
another. Creativity is something you practice, say the authors, not just a talent you are born with.”

The author discusses several techniques for creative problem solving, which she classifies into three categories: (1) paradigm-preserving techniques, which do not require problem solvers to change their perspectives of a situation; (2) paradigm-stretching techniques, which force problem-solvers to develop associations between unrelated stimuli; and (3) paradigm-breaking techniques, which fundamentally alter problem solvers’ view of a problem’s parameters. The author asserts that techniques requiring a shift in paradigm, when used properly, stimulate greater creative output. The author also evaluates these three classifications of techniques according to mode of expression used by problem solvers, use of imagination, potential for overcoming cognitive inertia, user (dis)comfort level, experience needed by a group of users, and need for skilled facilitation.

The author argues that imagination enhances strategic decision making, especially for managers facing environmental uncertainty. She explains that managers who use creative problem-solving techniques consider and reconfigure a greater variety of inputs, which affords them a broader and more insightful perspective of problems and increases their potential to generate more solutions. Indeed, her empirical research indicated that decision makers instructed to use imagination produced more creative and higher-quality solutions than did rational problem solvers. Furthermore, using an imaginative decision-making process especially led to high-quality solutions in situations involving environmental instability.

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