

Express the Problem or Issue

Imagine that a certain kind of question would help you produce many and varied kinds of solutions to problems. Imagine, too, that other questions would enable you to cut through confusion and get to the heart of controversial issues and that knowing those questions would make you a more confident and successful thinker.

The good news is that such questions do exist. This chapter identifies them and shows you how to use them.

This stage in the creative process is the one most often neglected. The reason is not that people decide to be stubborn and to proceed without having identified the best expression of the problem or issue. Rather, it is that they are convinced that the problem is self-evident and that it would be a waste of their valuable time to consider alternative ways of formulating it.

Such thinking is wrong. Like our first impressions of people, our initial perspectives on problems and issues are likely to be limited or superficial. We see no more than what we have been conditioned to see, and stereotyped notions block clear vision and crowd out imagination. Most important, all this happens without any alarms sounding, so we never realize it is occurring.

You can avoid this narrowness of perspective by developing the habit of expressing every problem or issue in as many different ways as you can. Before discussing the most effective forms of expression, we will note how to distinguish between problems and issues.

DISTINGUISHING PROBLEMS FROM ISSUES

As noted earlier, problems and issues differ in some respects. A problem is a situation that we regard as unacceptable; an issue is a matter about which intelligent, informed people disagree to some extent. Solving problems therefore means *deciding what action will change the situation for the best*, whereas resolving issues means *deciding what belief or viewpoint is the most reasonable*.

Whenever you are uncertain whether to treat a particular challenge as a problem or an issue, apply this test: Ask whether the matter involved tends to arouse partisan feelings and to divide informed, intelligent people. If it does not, treat it as a problem. If it does, treat it as an issue. Here are some sample problems: a student trying to study in a noisy dormitory, a child frightened by the prospect of being admitted to the hospital, a businesswoman dealing with subtle sexual harassment from her boss. And here are some sample issues: a public school teacher leading students in prayer in a public school classroom, a member of Congress proposing a cut in Social Security benefits for the elderly, an anthropologist stating that human beings are by nature violent.

Each of the situations in the first group is properly considered a problem because there is nothing about the situation itself that is likely to divide informed, intelligent people. Of course, someone, somewhere, might conceivably take an unusual view of a situation—for example, challenging the right of a student to a quiet dorm atmosphere—but that is likely to be a remote possibility. However, each of the situations in the second group is likely to provoke considerable disagreement because each involves *a matter that is itself controversial*.

EXPRESSING PROBLEMS

Both problems and issues are best expressed as questions, but the form of the question is different for each. The form most effective in expressing problems is the “How can . . . ?” form. Let’s consider an actual case and see how this form applies. Some years ago, almost 7000 public schools around the country closed their doors because of declining enrollments, budget cuts, and inflation.¹ Here are the various ways school officials might have expressed this problem.

- How can school enrollments be increased?
- How can school budgets be reduced?
- How can the impact of inflation on education be lessened?
- How can school buildings best be used after the schools are closed?
- How can the unused space in school buildings be used to generate income so the school will not have to be closed?
- How can school buildings be used in evenings and on weekends to generate income?
- How can the empty buildings be used after the schools are shut down?
- How can the unemployed teachers be used after the schools are closed?

Let's consider another problem, the drug problem, arguably the greatest social challenge of our time. Here are just a few of the many ways this problem can be expressed.

- How can people be taught to shun drugs?
- How can people be discouraged from dealing in drugs?
- How can celebrities be persuaded to use their influence to combat drug use?
- How can the media assist in the anti-drug effort?
- How can individual citizens support the federal government's anti-drug program?
- How can law enforcement agencies be made immune to corruption by drug lords?
- How can the support of drug-producing countries be enlisted?
- How can crops of drug-producing plants be spotted and destroyed before harvest?

There is room for disagreement about which expression of a problem is best. But there can be no disagreement that we are in a better position to make that decision, and to produce a creative solution, if we take the time to identify and consider all of the questions, because *each question opens a different avenue of thought*. The kinds of solutions for teaching people to shun drugs are very different from those for destroying drug crops.

EXPRESSING ISSUES

The question forms most effective in expressing issues are the "Is . . . ?" "Does . . . ?" or "Should . . . ?" forms. Using such questions, in the sense we are considering here, does not mean asking for simple facts. Rather, it means probing the central elements of dispute. To determine these elements, just note the main points each side uses in its arguments, and turn them into questions.

For example, in the abortion issue, the pro-life side argues that the fetus is a human being and therefore should be entitled to the protection of the law. The pro-choice side argues that a woman's body is hers alone and therefore she alone should have the right to decide the fate of her fetus. Thus, your expression of the issue would be:

Is the fetus a human being?

Does the fetus deserve the protection of the law?

Is a woman's body hers alone?

Should a woman have the right to decide the fate of her fetus?

In the issue of capital punishment, the pro side argues that when a person has been convicted of a capital crime, the government has the right to decide whether he or she should live or die. The anti side argues that capital punishment

constitutes cruel and unusual treatment and is therefore a violation of a person's constitutional rights. Thus, your expression of this issue would be:

Does the government have the right to decide whether someone convicted of a capital crime will live or die?

Is capital punishment cruel and unusual treatment?

Does capital punishment violate a person's constitutional rights?

The main points in an argument will be either directly expressed or at least clearly implied. They may, of course, be more numerous than those in the preceding examples.

The fact that "How can . . . ?" questions are the best kind for expressing problems and "Is . . . ?" "Does . . . ?" or "Should . . . ?" questions are best for expressing issues does not mean that other kinds of questions are without value. It means only that they have a different purpose than to focus a challenge. Questions that demand information—such as "Who?" "What?" "When?" and "Where?"—are useful in the investigating stage.* And questions that analyze—such as "Why?" and "How?"—are useful in the evaluation and refinement of ideas.

WHEN PROBLEMS BECOME ISSUES

It is possible to create a controversial issue where none existed. The way we express the problem (or, at a later stage, the specific solution we choose) may provoke serious objection. Consider, for example, the last expression of the drug problem: "How can crops of drug-producing plants be spotted and destroyed before harvest?" Even people strongly committed to the war on drugs might respond as follows: "Most of the plants used for drugs could be used for other purposes. It is morally wrong to destroy such plants, especially if they are found in foreign countries on the lands of poor farmers."

Concerned about the high number of dropouts in West Virginia high schools (a problem in other states as well), officials devised an ingenious way to keep students in school: taking away the driver's licenses of students aged 16 to 18 who miss classes. The school notified the Department of Motor Vehicles, which sent a letter telling the offender to return to school or surrender his or her license.² This solution, however, was controversial. Some people argued that it violated the rights of students or that it transferred jurisdiction over minors from the parents to an agency of the government.

Good thinkers are sensitive to the implications of both their questions and their assertions. Whenever your questions or assertions create an issue, address it immediately. In the case of destroying drug plants, that would mean

*When the subject is noncontroversial, questions such as "Is . . . ?" and "Does . . . ?" are also in this category.

someone thought to redefine the problem as “How can the wheels be made to grip the track more securely?” was the flanged wheel invented.³

The tendency to limit the lines of thought that are considered is one of the reasons that breakthrough ideas take years, even centuries, to develop. The development of modern periodontal surgery is a case in point. Before the idea of recording human history was invented, some toothless, elderly person may have wondered, “How can I prepare food to make it edible without teeth?” Having asked the question, he or she may have hit upon the idea of pounding food with a rock to grind it into powder or paste. Later, history tells us, the ancient Etruscans asked, “How will we chew our food after our teeth have fallen out?” and proceeded to invent false teeth. But thousands of years passed before some dentist thought to ask, “How can we restore the gums to good health and make loose teeth more secure in the underlying bone?” and thereafter invented periodontal surgery. Undoubtedly, some creative person is at this very moment asking, “How can people’s gums be permanently protected from disease?”

Keeping more than one line of thought open is especially urgent when dealing with issues. The human drive to make sense of things (a healthy drive, we should acknowledge) will often lead you to take sides too quickly in disputes. And once you have taken a side, ever afterward you are burdened with a powerful temptation to ignore all arguments and all evidence for the other side—indeed, to ignore the very questions that intellectual honesty requires you to ask.

For example, a strict creationist, who believes that the earth is only a few thousand years old, will tend to avoid pondering the question “Is it likely that scientific techniques for dating rocks and other materials are as inaccurate as my belief would suggest?” Similarly, a strict evolutionist, who attributes all that exists to strictly material causes, will tend to avoid pondering the question “Is it possible that a Supreme Being created the evolutionary process by which all things come into existence?” Surely both would be better thinkers for asking the questions they tend to ignore.

Keeping many lines of thought open when you address problems and issues can enable you to produce ideas that are ahead of your time and to avoid narrow-mindedness.

A SAMPLE PROBLEM

A situation that occurred some time ago in a college town illustrates the approach discussed here. Jean, a middle-aged woman, returned to college after many years to complete her degree. She was living off campus, in an apartment house. Directly below her apartment lived a young woman who played her stereo loud enough to reach Vladivostok with a favorable wind. At least it seemed that way to Jean. The sound and the woman’s rudeness infuriated her. She pondered the problem and came up with the following expressions of it:

How can I persuade her to turn it down?

How can I compel her to turn it down?

How can I frighten her into moving?

How can I escape the noise?

How can I bother her as much as she bothers me?

Deciding that the first expression of the problem was the best, Jean investigated how she might approach the woman. She tried to recall similarly difficult situations in the past that she had experienced or heard others tell about. Then she brainstormed the possible approaches she might take. After producing a generous number of ideas, she chose the best one, went to the woman, and tried it. It failed; the music continued to blare.

Disappointed, Jean looked at her list of expressions again and decided, probably because of her anger, that *compelling* might succeed where persuasion hadn't. She investigated again, produced ideas again, then selected and carried out not one, but two of them: reporting the matter to the apartment house's owner and registering a complaint with the police. The result was disheartening. The owner made a feeble appeal to the woman and the police gave her a halfhearted warning. After a day or two of quiet, the music blared again.

Now Jean decided her last expression of the problem was the best of the remaining ones. She gleefully listed dozens of hateful ideas for *bothering* the woman (including boring a hole in the floor and pouring water on the stereo). Then the insight came to her. An athletic woman, Jean loved to play tennis and jog. Why not use exercise as a weapon? So she did. She bought herself a jump rope and every morning, promptly at 4:00 A.M., she jumped rope in her bedroom—right over the sleeping woman's head. Wham, whump, thump. How sweet was revenge.

What happened next proved Jean's idea to be even more creative than she had realized. In a few days, the woman knocked on Jean's door and explained sheepishly that Jean's jumping was keeping her awake. Jean seized the opportunity and said, "I'll tell you what: I'll stop jumping rope if you'll turn the stereo down." The woman agreed, and the problem was solved.

A SAMPLE ISSUE

The following situation illustrates how the expression of an issue would differ from that of a problem.*

You read a newspaper story explaining that a national chain of convenience stores has decided no longer to sell magazines with a sexual emphasis. The chain's decision, the story says, reflects increasing public objection to all forms of pornography. You decide to address the challenge implicit in this subject.

*Because an adequate treatment of the issue illustrated here would demand greater space than is available, the discussion, unlike that of the sample problem, is limited to the expression of the issue.

Your first step is to decide whether the subject should be considered a problem or an issue. Because pornography divides informed, intelligent people—some regarding it as harmless and others as harmful—you decide it is an issue. Next, you consider the essential elements of dispute found in the pro and con arguments concerning pornography. Those who believe pornography is harmless often argue that (1) countries that take a liberal approach to the dissemination of pornography have no higher incidence of sex crimes than the United States, (2) looking at pornography provides a healthy release for sexual tension, and (3) the right of free speech applies to pornographers. On the other hand, those who believe pornography is harmful often argue that (4) it promotes a distorted view of sexuality and a negative view of women, and (5) it encourages irresponsible, immoral sexual behavior, including sadomasochism and sex between children and adults.

This consideration of the elements of dispute would lead you to the following expressions of the issue (the numbers correspond):

1. Is the incidence of sex crimes lower in countries that take a liberal approach to pornography?
2. Does looking at pornography provide a healthy release for sexual tension? In everyone? In certain people? Does the answer depend on the kind of pornography viewed?
3. Is the right of free speech applicable to pornographers?
4. Does pornography promote a distorted view of sexuality? A negative view of women? Does it do so for some people but not others? Is age a factor here?
5. Does all pornography encourage irresponsible, immoral sexual behavior, including sadomasochism and sex between children and adults? Does some pornography encourage these?

Careful exploration of these questions would prepare you to address the more general expression of the issue: Should the sale and distribution of pornography be in any way restricted?

WARM-UP EXERCISES

- 7.1. A hunter sees a squirrel on the trunk of a tall tree. The hunter approaches quietly, but the squirrel hears him and scampers to the other side of the tree. The hunter follows the squirrel around the tree, but the squirrel is very clever: It keeps moving at just the right pace to be on the side of the tree opposite the hunter. Around and around they move that way, on into the night. The question is: Does the hunter ever go around the squirrel? Explain your answer.

- 7.2. Is it possible for you to think of a city or a country that you have never been to? Explain your answer thoroughly.
- 7.3. Read the following dialogue carefully. Then state what you think Kenneth should say next to ensure that Karl will have no reasonable comeback.

KENNETH: Every circle has an inside and an outside.

KARL: I'll bet you can't prove that statement.

KENNETH: Sure, I can . . .

KARL: Remember, you said *every* circle. That's what you have got to prove.

APPLICATIONS

Note: Do each of the following applications (7.1 to 7.8) in this manner: First, express the problem or issue, using the guidelines explained in this chapter. Then investigate, as necessary, and produce as many ideas as you can to solve or resolve it. (Record all your thoughts as they occur to you, and be prepared to submit them to your instructor.) Finally, state which of your ideas you believe is best, and briefly explain why.

- 7.1. A Los Angeles woman and her husband were convicted of prostitution charges in an unusual case. The couple admitted accepting money from men for sexual favors, but they claimed that the sex acts were part of a religious ritual rather than prostitution. The husband testified he had a revelation from God to revive a 5000-year-old Egyptian religion. In his church, he explained, men's sins are absolved by having sex with the priestess, his wife.⁴
- 7.2. James Cook, president of the Thomas Alva Edison Foundation, noted that the number of patent applications in the United States had declined steadily and that a large number of the applications filed came from foreigners. He believed that the main reason for the apparent lack of interest in invention here was the poor image technology enjoyed, particularly among young people. He cited a UN study of the understanding level and appreciation of technology among the people of 19 industrialized countries. Japan scored first, the United States last.⁵
- 7.3. Rocco is the manager of a movie theater. In recent years a number of competitors have cut into his business, and cable television, on-demand and video rental services like Netflix have reduced the number of moviegoers still further. Rocco desperately needs to get more people to patronize his theater, particularly since he has begun to hear the owners talk of closing it and dismissing him if box office receipts don't improve.

- 7.4. Many authorities agree that one of the important reasons for the high divorce rate in this country is the naively romantic view of love many people have when they enter marriage.
- 7.5. Gail has always slept well, but lately, she has been waking up at about 3 A.M. and having trouble getting back to sleep.
- 7.6. For over a century, the United States has been the richest most powerful country in the world. Some Americans are ashamed of this status, seeing it as proof of our forbears having taken advantage of other countries. Others believe it is a testament to American ingenuity and accomplishment in which we should take pride. Which side is right? Does the United States deserve credit or blame? Research this issue, consider the evidence, and explain your conclusion and the thinking that led you to it. Be sure to anticipate and respond to possible objections to your view.
- 7.7. “Judicial activism” refers to the philosophy under which judges not just interpret the law—in particular, the Constitution—but also, in effect, *revise* it. Supporters of such activism claim that the law—in particular, the Constitution—is a living entity that must be revised to fit new circumstances and insights. Opponents argue that the legislature alone should legislate and the courts should only decide whether a law is constitutional. Research both sides of this issue, keeping in mind the principle explained in Chapter 2: *If you don’t understand both (or all) sides of an issue, you don’t understand the issue.* Then decide which view is more reasonable and explain your reasoning.
- 7.8. In recent years the idea of monetary profit has become controversial. Some people maintain that achieving financial success implies that one has taken advantage of others. (This notion was reinforced by President Barack Obama’s July 13, 2012, remark: “If you’ve got a business—you didn’t build that. Somebody else made that happen.”) This thinking leads many to conclude that financial profit should be heavily taxed. But others claim that such thinking is wrong. In their view, financially successful people should be appreciated because they create jobs and wealth for others. For that very reason, they argue, successful people should be taxed no more highly than others. Research this issue and decide which position is most reasonable.
- 7.9. Select three entries from the lists you developed in response to Applications 6.1 and 6.3. Decide whether each of those entries represents a problem or an issue, and express it, following the guidelines in this chapter.

CHAPTER

8

Investigate the Problem or Issue

It would be convenient if every problem or issue came in a kit containing all the information necessary to solve it. Unfortunately, that is seldom the case—we've got to search out the facts for ourselves.

In this chapter you'll learn numerous sources of information and how to use them efficiently and imaginatively. You'll also learn how to conduct your own research whenever possible.

It may seem strange to learn that investigation is a creative stage. You may think of it as a dull, plodding effort involving very little thinking of any kind, let alone creative thinking. In part, that is right. The way many people actually carry out their investigation involves little or no thinking—which is why their investigation is so often unproductive.

Investigation, as we define it, means more than routinely getting the same information as everyone else. It means getting information others overlook by searching in ways and places that never occur to the uncreative. It means using our resourcefulness and originality, being imaginative in our search.

Not every problem you encounter requires significant investigation. If, for instance, you decide to go beyond grumbling and kicking your gym locker when the string in your sweatpants slips out, you can apply the creative process without using the investigative stage at all. You can identify the problem in a number of ways—"How can I insert the string again easily?" "How can I avoid having it slip out again in the future?" "How can I eliminate the need for a string?"—and then go directly to the third stage of the creative process: producing as many solutions to the problem as you can.

In many other cases, however, the investigative stage is a crucial step in the process. The scientists who developed the creative surgical procedure in response

to periodontal disease first had to investigate the nature of the disease—that is, its cause, its progress from initial infection to tooth loss, and the various technological methods, medical tools, and approaches available to be used. In the case of unwanted graffiti, the invention of Graffiti Gobbler depended on (1) a knowledge of what techniques had been unsuccessfully tried and (2) a basic understanding of chemistry. “Inspiration,” wrote Louis Pasteur, “is the impact of a fact on a well-prepared mind.” The investigation stage provides the mental preparation.

Investigation is especially important in complex or controversial issues. In such matters, unless you know all the relevant facts, including the various viewpoints involved and the different lines of reasoning people follow, you are not likely to make sound judgments and develop workable solutions. A. E. Mander makes the point vividly:

The fewer the facts [one] possesses, the simpler the problem seems to him. If we know only a dozen facts, it is not difficult to find a theory to fit them. But suppose there are five hundred thousand other facts known—but not known to us! Of what value then is our poor little theory which has been designed to fit, and which perhaps fits, only about a dozen of the five hundred thousand known facts!¹

Sometimes a single fact can make a significant difference, as in a study of multiple personality disorders that revealed that 97 percent of the victims had been abused as children.²

The point is not that you should feel daunted by difficult problems and issues and give up—that would certainly not help you to become a better thinker. It is that you should appreciate the importance of being thorough in your investigations and refusing to rush in, like the proverbial fool, where angels fear to tread.

WHAT TO LOOK FOR

Broadly speaking, the information necessary to solve problems or resolve issues consists of facts and informed opinions. Following are the most common sources of information.

Eyewitness Testimony

Such testimony is usually associated with the courtroom but in the more general sense it consists of any observation recounted by the person who made it. A report of what transpired at a committee meeting by someone who was present constitutes eyewitness testimony, as does the statement of someone who witnessed an automobile accident.

Eyewitness testimony is commonly thought to be highly reliable, but that is a misconception. Research has shown that perception can be clouded by a number of factors, including time of day, atmospheric conditions, emotional state,

and degree of alertness. In addition, memories change over time, as Elizabeth Loftus explains:

The “drawers” holding our memories are obviously extremely crowded and densely packed. They are also constantly being emptied out, scattered about, and then stuffed back into place. . . . As new bits of information are added into long-term memory, the old memories are removed, replaced, crumpled up, or shoved into corners. Little details are added, confusing or extraneous facts are deleted, and a coherent construction of the facts is gradually created that may bear little resemblance to the original event.³

Because eyewitness testimony may or may not be accurate, you should not accept it at face value. Instead, wherever possible, try to verify it.

Unpublished Report

This kind of information sometimes reflects real knowledge and sometimes merely hearsay. If you are familiar with the game “Rumor,”* you know that the more a story is told, the greater the likelihood of it being changed, often dramatically. Unpublished reports abound in e-mail. Even if you have only a few correspondents, you may receive a number of these reports every day. Sometimes they take the form of a warning to do or avoid doing something lest harm befall you or your computer. Often they are false. Therefore, it is prudent to verify the accuracy of unpublished reports before accepting them or repeating them.

Published Report

This kind of information is found in books, magazines, professional journals, radio and television broadcasts, such reference works as encyclopedias, almanacs, and dictionaries, and on the Internet. When the information is documented in a footnote or endnote, as it sometimes is, you can check the original source for verification. If documentation is not provided, you should consider whether the author’s and/or publisher’s reputation for reliability is solid enough for you to trust the information. (Remember, too, that even trustworthy people can make mistakes.)

Expert Opinion

Expert opinion is generally much more trustworthy than most other sources of information because experts are better acquainted with the complexities of their subjects than laypeople and better able to distinguish typical incidents and events from nontypical ones. However, the knowledge explosion has made it more difficult to stay abreast of the developments even in a single area of a discipline, let alone an entire discipline. Thus, a person can be world renowned in one special area of his or her discipline yet uninformed about other areas. Before accepting

*This game is played with a group of people. It begins with one person whispering a statement to the person next to him or her. That person then whispers the statement to the next person, and so on around the room. When the last person whispers it to the person who originated it, that final version is compared with the original statement.

expert opinion, it is best to (1) be sure the person is qualified in the *specific* area in question and (2) check to see whether or not the expert's view is shared by other experts. And never confuse celebrity with expertise.

Experiment

An experiment is a controlled procedure undertaken to test the validity of a hypothesis, a statement that predicts or explains phenomena or behavior. The researcher begins the experiment by formulating one or more hypotheses. Next, the researcher decides what behavior characteristics can be measured, rated, or scored; these characteristics are known as *variables*. Finally, the researcher constructs and conducts the experiment and analyzes the resulting data.

There are two broad categories of experiment: the laboratory experiment and the field experiment. The laboratory experiment has the advantage of controlled conditions, which permit more accurate determinations of cause and effect. However, it has the disadvantage of the experimenter unintentionally influencing the outcome. The results of a laboratory experiment can be trusted if it has been replicated by other researchers; the conclusions of a field experiment can be trusted if they have been independently confirmed.

In one well-known psychological experiment, Haney, Banks, and Zimbardo tested the hypothesis that the roles people choose or are assigned strongly influence the way they behave. The researchers had college students volunteer (for pay) to take part in a six-day "prison" experiment in the basement of a university building. Some students were randomly assigned to be "prisoners" and others were assigned to be "guards." In a relatively short time, the "prisoners" developed one or more emotional symptoms, including depression, helplessness, apathy, anger, and panic. The "guards" quickly adopted the characteristics common to prison workers. Some were kind and fair, but others were cruel and abusive, even when the "prisoners" gave them no reason to be so. When the experiment ended, all the "prisoners" were relieved, but most of the "guards" were disappointed: They had found their position of power enjoyable and were reluctant to relinquish it.⁴

In another well-known experiment, Solomon Asch tested the hypothesis that people will contradict their own perceptions and judgments if they are under group pressure to conform. Asch's experiment was quite simple. One by one, eight students were shown a sheet of paper containing a 10-inch line and three other lines marked A, B, and C. They were then asked which of the three other lines matched the 10-inch line. The correct answer was A, the other lines being obviously shorter or longer. Unknown to the eighth student, all the students who answered before had been secretly directed to choose line B. By the time the eighth student answered, the pressure to conform was strong. Predictably, a majority of students yielded to the pressure and gave the wrong answer.⁵ In this experiment, as in the previous one, the researcher's hypothesis was validated.

Statistics

The term *statistics* refers, in the broadest sense, to quantified information. Used more narrowly, it means information obtained by accounting for every individual in a group. Examples of statistical information are the voting records of

members of Congress, the patterns of immigration over the last 50 years, and the comparative incomes of various racial and ethnic groups. When carefully collected and honestly presented, statistical information is very reliable. In considering any statistical information, determine the completeness and currency of the data as well as the reputation of the statistician.

Survey

Like statistics, a survey produces quantified information. However, a survey is done with a *representative sample* of a group rather than with the entire group. A survey identifies the opinions, beliefs, or behaviors of a particular group of people, the technical name for which is a *population*. If the population is small enough, all members may be surveyed. However, if the population is too large, a more limited number, or *sample*, is surveyed. The sample must be representative of the total population, and to ensure that this is the case, researchers are required to take a systematic approach, selecting, for example, every tenth or twentieth or one-hundredth name on a list of members of the population. The actual survey may be mailed (or otherwise delivered) and self-administered, or it may be conducted in person or by telephone. Survey questions are typically fill-in or multiple-choice type and designed to identify the subject's feelings, thoughts, or behaviors concerning the issue being investigated. For the survey to be valid, all questions must be clear, unambiguous, and free of bias.

Observational Study

As the name implies, this approach consists of closely examining an event or activity as it is taking place, for the purpose of understanding it and, in some cases, finding ways to improve it. The researcher may be either a participant or a bystander. In the latter role, his or her physical presence is not necessarily required; a videotape of the activity might suffice. For example, an executive charged with improving a company's customer service department might spend a week or so performing that job or, instead, arrange to videotape customer service staff interacting with customers. (The staff would, of course, be informed that they were being taped.) From this study, the executive would learn the kinds of situations customer service representatives are required to deal with, the variation in the time necessary to complete transactions, the difficulties and frustrations that accompany the job, and the relative effectiveness of the strategies employed to achieve customer satisfaction.

The conclusions reached by formal observation are generally reliable if (a) they were of sufficient duration to ensure that the group's behavior was not unusual, (b) the observer did not influence the group's behavior by his or her presence, and (c) the conclusions are not overgeneralized beyond the group observed to other groups that might be different.

Research Review

As the term implies, a research review draws together and compares the results of a number, often dozens or hundreds, of individual studies. Because it can reveal broad areas of agreement and disagreement among researchers, it is among the

most valuable and reliable kinds of information, provided that it does not omit any relevant research.

Your Personal Experience

This is often the most vivid information because you know it intimately and have greater confidence in it. Unfortunately, that confidence could lead you to assume that an experience is typical when it might not be and to end your investigation prematurely. The best approach is to combine your personal experience with the other information rather than use it as a substitute.

In consulting your personal experience, keep in mind that it may be more substantial and more relevant than you realize. This is especially so if, like many people, you regard every subject, and every aspect within a subject, as neatly and permanently separated from every other one. In that case, you might never dream of finding a scientific insight in a poem or a clue to an ethical problem in a math book. Yet many of the most creative insights come from just such unexpected places.

The forklift, for example, which makes it possible to move the heaviest objects effortlessly, was first conceived of when the inventor was standing in a bakery. He noticed how the doughnuts were lifted out of the oven on steel “fingers” and thought, “Why shouldn’t that same idea work in the warehouse?”⁶ Similarly, the idea of the printing press first occurred to Johannes Gutenberg while he was watching a winepress operating. He had long pondered how to achieve quicker book production; the established method was to carve words laboriously on blocks and then to rub paper against them. The winepress suggested the idea of transferring an image to paper by pressing an inked lead seal against it.⁷

What connection is there between a secretary’s desk and an operating room? Or between the dolphins at Florida’s Ocean World and the education of children with Down syndrome? “No connection at all,” most people would say. And yet creative people have seen a very valuable connection. Surgeons are now using staples in place of sutures to save time and blood loss. And David Nathanson, a professor of psychology at Florida International University, has demonstrated that young people with Down syndrome learn to speak more quickly and remember words longer when they spend time in pools with trained dolphins. He got the idea for the experiment when he noticed that these children, who couldn’t sit still and pay attention to a teacher, would play with a puppy for a quarter of an hour. Speculating on how this interest in animals could best be used in teaching, he decided to use dolphins.⁸

In addition to searching for connections among ideas you encounter now, you can also search for connections you overlooked in past experiences and observations. You surely have thousands of experiences classified under only one heading that could be classified under several. For example, you may have gone swimming as a child, got a little too far from shore, struggled, panicked, and almost drowned, until a friend saved you. That experience and the circumstances surrounding it are probably etched in your mind as *narrow escape from drowning*. But think of the other possible classifications: *effects of fear on performance*,

importance of children's obedience to parents, role of personal sacrifice in friendship. By seeing more connections between past experiences and observations, you multiply your store of useful information.

The Experiences of People You Know

Other people's experiences can be as valuable to you as your own. To tap your friends' experiences, ask them questions that stimulate their thinking and assist them in remembering. Let's say your problem is how to overcome your fear of heights. You could ask a friend, "Have you ever been afraid of high places?" but that wouldn't be the best way to phrase the question. Any of your friend's fears might give you helpful information, so your first question should be broader. And you should be ready with subsequent questions to direct your friend's recall in ways that seem helpful to you. Here's how you might proceed:

YOU: Have you ever had a nagging fear you wanted to overcome?

FRIEND: I don't know . . . I guess so. Hmmm . . . [Trying to remember something specific]

YOU: [Stimulating recall] I mean, like a fear of being closed in; or dogs; or high places.

FRIEND: Yeah, when I was about 12. I can remember being terrified of the dogs on my paper route.

YOU: Tell me about it. How did you feel?

Later in the conversation, you would ask how the fear began and, more important, how your friend coped with and overcame it. You'd also ask whether he or she ever received any advice from others that proved helpful or knows any books and articles that speak to the question of overcoming fear. You might even share your fear with your friend and ask for a reaction.

Any time you try to draw on other people's experience in this way, keep two points in mind. First, some people are more helpful than others. You'll always do better asking a good thinker rather than a poor thinker or an open, talkative person rather than a shy, secretive one. Second, successful questioning depends not only on your ability to ask the right question at the right time but also on your willingness to listen at other times, to open yourself to the person's experience and not let other thoughts (even analytical ones) intrude.

It is also a good idea not to rely solely on your memory. Instead, get in the habit of taking notes. In most cases, this is better done soon after the conversation rather than during it because the people could be distracted if you write while they speak.

USING THE LIBRARY

Perhaps you think of the library as a gathering place for dull people, a place of little use to anyone who is lively and creative. That is a mistaken view. In