

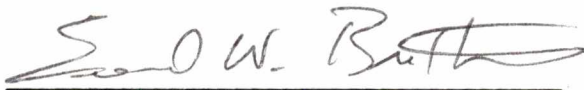
To the Graduate Council:

I am submitting herewith a thesis written by Patricia Steele Raible entitled "Using Visual Techniques to Teach Technical Writing." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in English.



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Vice Provost
and Dean of The Graduate School

USING VISUAL TECHNIQUES TO TEACH
TECHNICAL WRITING

A Thesis
Presented for the
Master of Arts
Degree
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Patricia S. Raible
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DEDICATION

This thesis is dedicated to my husband, Michael. Without his guidance, support, and love it would not have been possible. It is also dedicated to my children, Ashli, Amber, and Patrick for their patience and understanding.

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Reed Sanderlin, Communications Development Associates, Writing Manual.

National Council of Teachers of English, College English, page 180, Volume 45, 1983.

Bobbs-Merrill Educational Publishing, page 45 from The Technician as Writer; pages 15, 31 and 47 from Designing Technical Reports: Writing for Audience in Organizations.

Scott, Foresman & Company, page 96 from Technical Communication.

Houghton Mifflin Co., pages 187 and 198 from Technical Report Writing Today.

Heath, page 324 from Successful Writing at Work.

Wm. C. Brown Company, page 22 from Reporting Technical Information.

Holt, Rinehart and Winston, pages 5 and 6 from Technical Writing Process and Product.

Harcourt Brace Jovanovich, Inc., page 186 from The Elements of Technical Writing.

Tennessee Valley Authority, Training Department.

Mark Stevenson, Bennett & Pless, Inc.

Harper and Row, How to Write Plain English.

ABSTRACT

Teaching technical writing in the workplace requires the instructor to communicate ideas especially quickly and effectively, since working professionals are normally more demanding than college students who take technical writing courses. Working professionals understand the importance of writing in the "real world," and they understand that good writing can translate into promotions for them and profits for their company. Unfortunately, traditional teaching techniques do not always communicate ideas quickly and effectively.

While analyzing the traditional workshops, one variable, the visual, seemed particularly useful. The term visual for this paper, however, does not mean merely an illustration. Instead, visuals include charts, diagrams, or matrices that promote the use of the visual skills of the brain--visuals that allow people to gather information, to understand relationships, and to perceive movement from one idea to another.

First the current use of visuals in teaching technical writing was examined. Use of visuals was observed in a workshop setting, and it was determined that effective visuals aid memory, are necessary for understanding and are easy to apply to the workplace. Although only a few technical writing textbooks used visuals, those discovered were divided into visuals as graphics, visuals as examples, and visuals as symbols. In the latter category were the effective visuals--visuals

that show meaning easily, focus on function, state relevant propositions, and interpret relevant features. Using this criterion, suggestions were made for a visually designed technical writing workshop.

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INTRODUCTION

I was teaching a course in technical writing for a group of Tennessee Valley Authority safety engineers at Muscle Shoals, Alabama. One of the techniques I was using was free writing, a technique to help participants get started if they are having difficulty generating ideas for writing. The participants were trying to use the technique. Suddenly, a participant at the side of the room raised his hand. "I'm sorry," he said, "but I don't understand why you want us to do this. How will it help us?" I explained the purpose of free writing again. He reluctantly agreed to try it, but he was not very successful. The exercise had not made his writing assignment easier; it had made it more difficult and much more confusing. Later when we talked about our free writes, it became apparent that several of the other participants were also unsuccessful. Certainly, this was not the first time I was confronted by a confused individual during a technical writing workshop. But this time I began to wonder if the problem was a result of my explanation, or of the technique itself. Why did the technique work for some participants and not for others?

Background

When teaching technical writing in the workplace, the instructor must communicate ideas especially quickly and effectively. Professionals are more demanding than most college students. They require a course that will allow them to assimilate this information quickly

and to use it immediately in their jobs. Many of them already understand the importance of good writing. At least part of the reason some individuals attend in-house writing workshops is that they already know the writing they do for their jobs can translate into profits for their company. Often those who are reluctant to attend workshops have been disappointed in the past by a writing workshop that made little or no difference in their on-the-job performance. Professionals want instruction that will benefit them personally, instruction that will help them to write the energy report or proposal on which they are currently working. They want to learn skills that will not only mean profits for the company, but also bring promotions and pay raises for themselves.

Traditional teaching techniques, which are often difficult to understand and may seem to bear no relationship to on-the-job writing, do not satisfy many of these professionals. Teaching these people with techniques that are not successful produces a double bind: their writing problems remain, and a poor attitude may well have been created, even if there was no attitude problem about writing before such a workshop. If traditional techniques are not always effective in teaching technical writing, what other techniques might be effective? What techniques would help these professionals better understand difficult concepts and transfer them to their own writing?

Purpose

The purpose of this thesis is to examine one possible answer for more effective teaching of technical writing: visual techniques. The term visual techniques here does not simply mean illustrations.

Instead, it includes the charts, diagrams, or matrices that promote the use of the visual skills of the brain--visuals that allow people to gather information, to understand relationships, and to perceive movement from one idea to another.

Scientists are beginning to understand more and more about the importance of the visual aspects of the brain. Rudolph Arnheim, Professor Emeritus of the Psychology of Art at Harvard University, suggests that "all thinking takes place in the realm of images" (116). There is evidence to suggest imaginative or visual abilities may lead to a more productive way of thinking. The reason many people rely so heavily on verbal abilities, Arnheim believes, is because our educational system has stressed the development of these abilities and largely ignored visual thinking capabilities (v). Arthur Koestler believes an analogy, or what he terms "visual ideation," is necessary for all understanding. In The Act of Creation, he says that people must visually relate an unknown to something known in order to understand the unknown. They must, in fact, draw a picture in their minds (200). Popularizer Betty Edwards, in Drawing on the Right Side of the Brain, uses the split-brain theory in teaching art, stressing the use of visual patterns. Edwards shows amazing results by teaching those with seemingly little skill to concentrate on their visual skills (what she would call the right side of the brain). Scientists Michael Gazzaniga and Joseph E. LeDoux, while criticizing the split-brain theory, nonetheless agree that there is a visual component of thought which is very important to understanding.

To learn if visuals could be effective in teaching technical writing, it was important to first explore how visuals were already being integrated into the teaching of technical writing. An examination of textbooks and journal articles was conducted, revealing that the visual techniques that are effective share some common characteristics. Observations were made about the techniques that seemed to work best, including what they had in common and how they could be used effectively in teaching technical writing. To illustrate the criteria, some existing techniques were adapted and other techniques were created for various writing concepts. Reasons for using effective visuals, the criteria for designing those visuals, and the criteria for using these visuals are discussed in the final chapter. There are also suggestions about how to integrate these techniques into a technical writing course, and some possible implications of using visual techniques for teaching writing are also included.

Organization

The structure of this thesis reflects the process through which the use of visual techniques was researched and examined. Initially, traditional in-house technical writing workshops--the course contents, the instructors, the costs, and the current methods used to teach technical writing--were studied in order to determine specifically what types of visuals were already being used.

It soon became obvious that while all visuals do not have common elements, they can be grouped into three distinct categories. Specifically, visual techniques used in teaching technical writing can be classified as graphics (such as borders added to vary the monotony

of hundreds of pages of written words), examples (such as cover letters or abstracts, showing the form technical writing should take), and analogies (visuals that attempt to make visual connections for the reader between known and unknown material).

For example, Elizabeth Cowan begins the textbook Writing (which teaches basic writing concepts) with photographs of a log cabin under construction. Her text attempts to make a connection for students of writing between building a log cabin and writing an essay. She has created a visual analogy between something presumably known--the building of a shelter--and something presumably unknown--the process of writing. It is precisely this kind of visual, one that forms connections, that is most effective in teaching difficult concepts and in aiding the retention of information.

To observe use of visuals in actual practice, two abbreviated technical writing workshops, called "Writing for Decision Makers," were taught. One workshop used traditional techniques, and the other workshop used visual techniques. Except for the use of visual techniques in the second workshop, the workshops were as identical as possible. As in many writing workshops, the participants had a variety of backgrounds, but all were professionals and all wrote in their jobs. Many skills were taught, but three major concepts were stressed: writing as a process, defining the audience, and organizing the content. During the second workshop, visual techniques instead of traditional techniques were used to teach these concepts.

Because some type of "yardstick" was needed for comparison, writing samples were collected from participants before and after the

workshops, and an interview questionnaire was administered to each of the participants two weeks after the workshop. While the writing samples provided some general indications about an individual's improvement, the results were used as a basis for observation rather than statistical analysis. Typically, the results of the questionnaires tended to be more revealing, although also more subjective.

Based on the research, the workshops, and the observations, the final chapter attempts to answer these questions:

1. Why should we use visual techniques? Do they aid in the transfer of information and help people retain information?
2. What visuals are now being used to teach technical writing? What do the effective techniques have in common?
3. Do visual techniques seem to make a difference in "real world" situations?
4. How can visual techniques be integrated into a technical writing workshop?
5. What are the implications for using visuals in the teaching of technical writing?

CHAPTER I

IN-HOUSE WRITING PROGRAMS

In 1980 Sylvia Porter advised her readers that companies "single out communications skills . . . as their most important requirement" for business executives (Fine 12). A 1981 article in National Underwriting stressed the need for writing skills, saying "many top executives cannot turn out a clearly written, logically organized inter-office memo . . . and their style is slow and causes misunderstandings" (Maher 2). Unfortunately, many professionals do not enter the workplace with good writing skills. Freshman composition, the most extensive exposure to writing during undergraduate college years, has in the past taught writing in conjunction with literature. Professionals and current college students alike seem to feel this type of course rarely prepares them for the proposals, letters, or memos they face routinely as part of their work. In his article "Teaching Technical Writing: Resources and Strategies," John Walter said that the University of Texas at Austin has seen a startling increase in enrollment in both their technical writing classes and their sophomore-level expository writing course. Thus, students as well as professionals feel that effective writing is critical to the performance of their jobs and future careers (76). Employers and employees alike seem to favor one solution: the in-house writing program.

The Need for In-House Training in Writing

According to L. W. Denton in "In-House Training in Written Communication: A Status Report," the interest in in-house writing programs is "increasing at an unparalleled rate." Denton says companies spend billions of dollars annually for such programs, believing it will "cost them more not to train employees" (3).

Why? "Executives don't have the time--or the inclination--to unravel confusing proposals or poorly organized and presented material," said Deborah Dumaine in Write to the Top. Dumaine's company, Better Communications, teaches writing workshops to major companies such as Honeywell Incorporated and Wang Laboratories. She told her workshop participants it is not just their company that profits from good communications skills. She said that "good writing can distinguish your ideas, focus them for impact, and help you get the response you want from your colleagues." The major benefit is this: good writing can advance your career (xi).

Surveying the Companies

Denton's article on in-house writing was based on national research. Questionnaires were sent to 900 organizations, ranging in size from 50 to 100,000 employees, asking them to provide information on their in-house writing programs. Thirty-five percent of the organizations (each having between 5001 and 50,000 employees) responded. About 51 percent of those offered at least one in-house writing

program (5). While it is difficult to generalize, it seems the larger companies were more likely to have writing programs. However, Denton did find three major manufacturing corporations, employing more than 100,000 employees each, that offered no in-house programs in written communication (6).

Barbara Love, Supervisor of Training for the Tennessee Valley Authority's Office of Power in Chattanooga, Tennessee, coordinates the training needs for more than 27,000 employees. Love said in the past two years there has been a marked increase in interest in writing programs at TVA, although she admitted some of this interest may be because writing courses are more readily available now than in the past. The training division, when planning their courses approximately two years ago, identified writing as an area of need. So the division now routinely offers about five basic writing courses each year and provides a number of other writing courses when departments make special requests (Interview).

Denton said that all those who teach business and technical writing will attest to the "spectacular increases in enrollment over the last four or five years." He claimed this increase is partly due to the national concern for literacy. Whatever the reason, he believes we are entering a "Golden Age" for written communications. Richard Davis, head of the Department of Communications and Humanities at the Air Force Institute of Technology, agreed. In his article "Presenting Courses in Government and Industry," he told writing teachers they are "not just close to a gold mine . . . they're sitting on the mother lode" (74).

Surveying the Courses

Denton's survey indicated that the most common writing course was simply a course in general writing skills. He said this consists of units on basic principles, grammar, punctuation, word usage--sometimes set in a business or technical context. Technical report writing made up 20 percent of the total courses, business writing 19 percent of the total, and proposal writing 6 percent of the total (6). However, the needs and requests for technical writing courses are increasing, according to Davis. In a recent survey of needs at Wright-Patterson AFB, he noted that technical writing was the second most requested course of those suggested to potential users (67).

Tennessee is no different from the rest of the country in this increasing interest in technical writing. According to local professionals, there have been more requests for technical writing courses in the last three years than previously. Love said there were definitely more requests for technical writing courses at TVA than any other kind of writing--but she does not find this unusual because the Office of Power is primarily an engineering organization. Most of the writing courses TVA offers through their training manual are general writing courses rather than technical writing or proposal writing courses. However, the exercises in the general writing courses are still focused on the business and technical environment. Most of these courses are taught by outside consultants from the local universities (Interview).

Provident Life and Accident Co., a major insurance company based in Chattanooga, Tennessee, teaches all but a few of its writing courses in house. The in-house courses in letter writing are taught by someone in their training department. Presently, the company offers no technical writing courses.

George Morrison, the director of management training for Provident, said he is personally developing a writing course for business that is almost self-instructional. He said the course would require expert guidance, however, when the student turns in written work for critique. The course, called "Write on Target," is aimed first at good writing principles, then at the psychology of writing. The last part of the course, he says, deals with the form of technical reports or proposals (Interview).

Fred O'Hara, a private consultant in Oak Ridge, Tennessee, teaches only technical writing courses. Along with other concepts, his courses cover the basics (such as grammar and mechanics) because he believes they are so important to effective writing. His courses are developed individually for each client group, but since most of his clients are business and industry, O'Hara's focus is on technical reports and proposals--the type of writing his participants must do every day (Interview).

Lottie Applewhite, a technical publications editor at the Letterman Army Institute of Research at the Presidio of San Francisco, recommended a tutorial program in "An In-house Editorial-Tutorial Program for Developing Communications Skills." This program works particularly well for an Army medical research institute, she said,

because of time factors, Army requirements, and variety of individuals (5). Applewhite described the course as a one-to-one process that requires tutors to ask leading questions and gets researchers ultimately to recognize their own writing problems (6).

Assessing the Cost

The cost of in-house training varies with the type of course, the type of materials, the instructor, and the number of participants. The largest variable is the cost of instructors. If instructors are staff, the cost is likely to be much less than if the instructor is an outside consultant. Denton found that rates for consultants may be as much as \$110 per hour, with the average at \$30.14 per hour (11).

O'Hara charges \$85 per contact hour for technical writing courses (Interview), while Dr. Michael Keene, a professor at The University of Tennessee and a private consultant, bases his fee on the entire course, averaging about \$65 per contact hour. His most recent course used graduate students as "writing coaches," and each of these coaches earned about \$150 for the ten-week course (Interview). Although part of the fee determination for consultants is obviously based on education and experience, a good deal of the consideration is given to "what the market will bear."

Even within specific agencies, the instructor's fee may not be fixed. For example, agencies such as TVA seem to operate differently for each course. Love explained that for writing courses offered through their training brochure, the cost is fixed, with the instructor receiving \$45 per student. However, if a special course is developed

for a specific department, then the price paid for instruction can be negotiated. In these cases the remuneration largely depends on the budget, she said (Interview).

Denton found in his research that the average cost per employee for in-house training was \$78 per day, but costs varied widely from \$6 per day to \$250. Interestingly enough, many companies were not concerned about the cost of training in writing. Some companies did not put a price tag on the writing courses because they viewed them as cost savings (9).

The Development of In-House Writing Courses

In "Developing a Writing Course for State Employees: A Case Study," William J. Rothwell discussed the methods used by the Illinois Department of Personnel's Division of Employee Development to determine the writing needs of the state's 100,000 employees. The first method the department used was a survey of a small, relatively centralized state regulatory agency of 500 employees. The questionnaire administered to managers collected information on their interests in writing courses, the types of writing performed, and the audiences to which their employees wrote (109). From this survey the training department determined there was a high demand for writing courses (104).

Although a questionnaire may seem to be a tedious and time-consuming method of collecting information about writing needs, Rothwell concluded it was necessary because of the large number of potential participants and the limited literature on in-house programs. This type of survey only served as a starting point for trainers in

developing the courses. Rothwell admitted this approach does have some problems: the questionnaire tends to "measure attitudes rather than collecting more meaningful information on skills" (104). After the initial survey, the department decided a second interview questionnaire, also endorsed by top management, would provide more details for specific courses. This interview, which was also given to managers, provided data on employee attitudes about assignments, supervisors' expectations about writing, and the contexts in which assignments were made. From this questionnaire an experimental session was developed and taught, answering many of the remaining questions about developing a writing course for employees (105).

Unfortunately, not every organization can afford the time or money to do extensive research. Instead, these organizations must plan carefully with the help of experts to determine what best suits their needs and those of their employees.

Getting Management Support

Marlene Fine, who teaches courses in writing to corporate employees, said, "before we [instructors] agree to design and teach communication courses we should insist that management both know and support what we are teaching." She believes that if instructors do not receive this type of support, they will not be serving as teachers "but as tools of management, useful only because employee education is considered a 'perk,' not because we teach skills which will benefit employees on the job" (12).

Her concern is echoed by Henrietta Tichy, who has broad experience in teaching writing as an outside consultant. She said that it is very important for instructors to solicit full company cooperation, particularly in terms of "securing the goodwill of supervisors" (Walsh 142).

Donald Dickson, in "Planning for the In-House Writing Seminar," said he first determines who actually requested the course--management or employees--and changes his presentation accordingly. He not only suggested getting individual writing samples, but also setting up an interview with company managers, finding out as much as possible beforehand about the participants, the company, the needs, and the type of presentation that works for the particular organization (15).

Rothwell agreed that there is a need for pre-workshop research to determine the situation in which one will be asked to teach. However, he warned instructors that both personnel and management should understand that an in-house writing workshop cannot solve procedural or interpersonal problems and that these problems should be separated from the ones that can be solved (such as a lack of skills) (107).

Reed Sanderlin, a professor in the English Department at The University of Tennessee at Chattanooga and an outside consultant to companies such as Provident Life and Accident and the Tennessee Valley Authority, would even go a step further. To be effective, he believes one should let participants know what one plans to teach and what one is not going to teach, and he advised instructors "be realistic; don't promise what you can't deliver" (Interview).

Grouping Participants

Who are the participants? Depending on the course and the company, participants can be anyone from highly trained engineers and scientists to secretaries. Should an instructor try to teach such a diverse group? And what is the magic number of participants, especially if one is using hands-on exercises?

In his questionnaire Denton found that class size ranged from 3 to 30 people, with the average class size being 15.6 people (10). Richard Davis recommended 18 to 22 participants for most classes, saying if the class is much larger there is little chance for interaction, and the course tends to become more formal (69). Lee Garner, who teaches technical writing courses at Sandia National Laboratories in Albuquerque, New Mexico, said attendance at its workshops varies from 17 to 32. He said the key is making the course available to employees no matter how many sign up (9).

Rothwell said the trainers developing the course for the State of Illinois felt that a homogeneous group, organized by occupation and skill level, was best--but not always possible (106). O'Hara tries to insist that his groups be homogeneous. He related one experience (with a government agency) he labels as "horrifying" because the group was not at all what he anticipated. Instead of the small group of engineers he expected, he had nine engineers and nine secretaries. The problem was that each group had different interests. The secretaries were more interested in the mechanics and grammar of writing, elements

which they were required to correct. The engineers were more interested in learning to write procedures (Interview).

Dennis Walsh also found that the more congenial a group (i.e., if they liked working together), the more participants seemed to get from a workshop. Because the participants in one of his workshops were a close-knit group, they produced a better learning environment (150). Many political and follow-through problems were solved by integrating both the examiners and their supervisors into the group (140). On the other hand, Walsh also noted that in another of his three workshops a particularly difficult supervisor created poor morale and problems in attitude about the workshop (149).

Obviously, the best classes are those which participants attend voluntarily. But in at least 25 percent of the classes Denton surveyed, attendance was required (11). Barbara Love said required courses certainly happen within TVA, and when they do, she said, there is a difference in the attitude of the participants. The required course is difficult for both the instructor and the participants, she admitted (Interview).

Choosing Course Length

Most instructors agree that you cannot learn to write in one day. Some consultants believe this idea so strongly that they refuse to teach one-day workshops. Still, many in-house programs are set up as just that: one-day seminars. Some consultants argue that companies don't want employees tied up for six or eight weeks. These instructors believe that while they are not curing all writing problems in one day,

participants can be shown their specific weaknesses successfully within this short period. Which is best, or even which is the most common, is difficult to answer. Sanderlin believes "we've got to get over the feeling that a quick fix is the solution" to writing problems. Unfortunately, he said, "most in-house writing workshops are bandaids" (Interview).

Although a company might prefer the one-day routine, John Brockman said, "the process of writing development is too long and too important to be encapsulized in a quick painless course. If it is unavoidable to give a one-day workshop, the consultant's job is to demonstrate where the weaknesses (in writing) are, what can be done to correct them" (Walsh 140). Tichy said she shies away from these "one-day circuses in lieu of more responsible writing courses." In fact, she believes "a shorter course is of benefit only to highly educated employees who can then teach themselves" (Walsh 141).

While he has taught one-day workshops in the past, Fred O'Hara's most recent workshops were conducted over several weeks. He prefers the longer workshops since he works with participants as individually as possible. He needs time for feedback (Interview). Keene feels so strongly about the need for an extended class or workshop that he will no longer teach a one-day session. He said that he doesn't believe you can change someone's writing unless that person is writing extensively in a class or workshop. This is nearly impossible in the one-day situation (Interview).

Garner agreed with Keene on the need for intensive writing to produce a change in participants' writing. He said "redirecting

habits of a decade or more duration . . . demands opportunities for considerable 'space' between learning sessions." For this reason, courses at Sandia Laboratories run from nine to twelve weeks. The classes are held two times a week, for a total of about 48 class hours (8).

In his survey, Denton did not separate the short workshop from the longer course of several weeks. He found that the average number of contact hours for a course was 16.5 hours. The typical course met twice a week for two hours (10). Davis suggested a course length of 15 to 30 contact hours. His rationale for course length is this: if the course is under 15 hours, the instructor must severely limit what is covered, and if the course is over 30 hours, it "becomes a chore for the people in the class." Davis suggested two or three hour meetings, two or three times per week (69).

William J. Rothwell, in "Developing an In-house Training Curriculum," suggested developing a series of courses instead of just one--courses geared to each employee's level in the organizational hierarchy. This sequence would permit each course to focus on the writing requirements of a specific job. In addition, he recommended on-the-job tutorial help rather than the one-shot workshop (31).

Setting the Schedule

Some of the courses are taught at night, on the employees' time, but others are taught on the company's time. Courses taught on company time provide an additional incentive for attendance, according to Garner, who recommended that employees be paid for attending writing

workshops (9). John Brockman also advised instructors that some attendance and motivational problems can be easily solved by holding workshops or classes on company time. He concluded his point by saying "human nature loves to escape routines" (Walsh 140).

A recent course taught by Keene and coached by four of his graduate students involved ten weeks of classes, two days per week. The sessions were held at 4:30 p.m. on Mondays and Wednesdays, mostly because of logistics. The schedule, based on participants' needs, reflected the fact that all participants do not work in the same office. It was more convenient for the corporation and for the participants to hold classes near the end of the work day (Interview).

The Methods of Teaching

Dennis Walsh said he quickly discovered that teaching these adult professionals was not the same as teaching young college students. He found both their needs and their demands quite different.

Walsh said that first of all the instructor must know the types of writing that are part of the participant's job. Second, the instructor should establish a give-and-take atmosphere, one that is open and relaxed. Walsh said he can best describe the method used for the workshops he did for eligibility examiners as "mostly inductive pedagogy." He and his co-instructor observed participants' responses to materials and techniques, changing subsequent workshops accordingly.

Walsh commented that they were "highly aware of the need for careful pacing, and constantly tried to eliminate the distance between us and the participants, mostly by using first names as quickly as we

learned them and by employing as much humor as possible." Walsh admitted they were only "partly successful in eliminating the distrust we engendered by being academicians and writing specialists" (147).

Sanderlin agreed that much of a workshop's success depends on rapport with participants. He also tried to memorize names as quickly as possible, aiding his memory by having participants wear name tags and write a paragraph about themselves as an initial exercise. Sanderlin reviewed the paragraphs at lunch or some other time before the next session, hoping that they would help him get to know his participants better. He believes that the personal approach works much better with adults than a formal approach does (Interview).

Donald Dickson, in "Planning for the In-House Writing Seminar," stressed that the instructor must "adapt to his audience." He said this identifying of participants is the place to begin a workshop, just as writers would begin writing by defining their audience. But Dickson also warned that since workshop participants are not college students, an instructor has to establish credibility (15). These participants are professionals who "have definite ideas on how to write for their particular jobs. Be careful and be respectful as you modify ideas" (14). Sanderlin said he too has learned "adults can be very sensitive to criticism" (Interview).

Defining the Needs of the Adult Learner

Because of its very nature, technical writing is often taught in the workplace. Since we are talking about teaching technical writing to professionals, we must consider how these adults learn.

In The Adult Learner: A Neglected Species, Malcolm Knowles pointed out the difference between an adult learner and the typical college student. He said "as individuals mature their needs and capacity to be self-directed, to utilize experience in learning to identify readiness, and to organize learning about life probably increases" (43). Knowles observed that the adult is not willing to absorb everything an instructor gives him, to take it without question. The adult's life experiences cause him to be a different type of learner--one who learns by discovery. An adult's learning is problem-centered, while a child's learning is subject-centered and has a different time perspective. He said "the child's time perspective toward learning is one of postponed application." He gave himself as an example, saying what he learned in grade school had little to do with his functioning better as a preadolescent, but was learned to get into high school. Likewise, what he learned in high school was primarily to get into college, and what he learned in college was primarily to be able to get a job (47). A working adult views learning differently. He "comes into an educational activity largely because he is experiencing some inadequacy in coping with current life problems" said Knowles (48). Thus, he views education as something which must help him now, not in the future.

Knowles reiterated what Walsh and most instructors discover quickly when teaching in-house workshops: learning in the professional environment is really an exchange of knowledge between teacher and student. Knowles said that "in some of the best adult classes it is

sometimes difficult to discover who is learning most, the teacher or the students" (84).

Fred O'Hara agreed that teaching adults is different. He commented that "these people can see the value of writing, rewriting and refining. They know they can't be sloppy because it reflects on them. There is more motivation on the part of professionals." O'Hara also found that his courses are more of a shared experience, and often there was a questioning atmosphere about his "authority"--why he specifically was chosen to teach them. His approach is to take the focus off of himself and to make the workshop a shared experience, using peer activities. What participants will question coming from an instructor, he said, they will believe coming from a peer (Interview).

The Context of the Course

Walsh believes the key to success in teaching adults is getting them involved. In his workshops Walsh used questions to do that, questions that focused on the type of writing participants faced in the workplace. In his third and most successful workshop, Walsh began by asking questions--asking participants to define their writing problems. He let any "hard rules" concerning writing emerge from the discussions, making the course more of a "discovery" learning experience (152).

This is also the approach used by other instructors. O'Hara used his first session to talk about his participants' writing problems, to identify the kinds of writing on which they are working, and to determine what they would like to cover in the workshop. O'Hara believes that giving participants a chance to set the direction makes a

workshop more successful. He said many times they know what problems they have already, and any other problems can be determined by the instructor's examination of their writing samples (Interview).

Davis stressed the need for adult writing courses to be "as direct and practical as possible" (14). He advised instructors to focus on the type of problems participants faced daily, saying that as much as possible an instructor should provide "take-homeable, usable information" (73). One way to meet this challenge is to create exercises from participants' writing samples, or like Keene and O'Hara, to use the daily writing of each participant to work on specific skills. Keene lectured on a particular concept, then had workshop participants take a writing assignment they were currently working on and focus on that concept. Finally, those assignments are evaluated on a one-to-one basis with participants.

Teaching Writing Techniques

Another common approach to teaching technical writing is to teach concepts by using individual techniques for explanation or exercises as examples. Participants are generally shown a particular technique and then asked to apply the technique to a short piece of writing. Some of the exercises focus on repetition as a mode of learning.

Free Writing. Deborah Dumaine is one of many instructors who teaches writing as a process, separating writing tasks into topics such as getting started, positioning ideas, and writing drafts. Free writing is one method that she uses for getting started. This technique

asks participants to write on a given subject for three minutes, forgetting about conventions of spelling, grammar, and punctuation.

Momentum is an important part of the technique, so participants should not be interrupted and should not stop writing. Once the first free write is complete, participants are asked to complete two more. Then participants compare their free writes (30-31). (Figure 1, page 26, gives more detailed instructions about how to use the technique.)

A similar technique, called "speed writing," is used by Marlene Fine. Fine said this pre-writing skill shows participants "how to quickly get their ideas down on paper and then how to quickly edit those ideas to create a clear, coherent and concise piece of writing." In her process participants are asked to write as much as they can in a three-minute period on a given topic. Again, they are not to worry about spelling, punctuation, and other mechanics. Afterwards, they are asked to read their pieces aloud, and the entire class edits the writing (13).

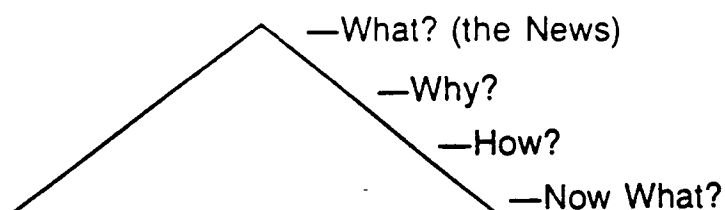
Organizing Pyramid. A technique used by Melba Murray, who teaches short courses in writing to employees of companies throughout the United States and Europe, helps participants to organize simple letters and reports. The technique divides the report into three parts: the main idea, the supporting material, and a statement indicating the action (what the reader should do or what attitude to adopt). The visual that accompanies this technique separates these parts into questions that are easily answered (see Figure 2, page 27).

1. **Get ready to concentrate.** Free-writing is a time for thinking about ideas. So before you start, you might want to have your secretary hold your calls or get an office mate to answer the telephone.
2. **Get your pen, paper, or typewriter ready.** These are your only tools.
3. **Now write for three minutes on your topic.** While you want to focus on your report or presentation, you can write anything you are thinking. If you are worried about remembering to pick up a loaf of bread, you can write this down too. Getting rid of extraneous thoughts will help you focus on the important ideas.
4. **Time yourself.** Use a watch, stopwatch or egg timer and time yourself three minutes for each free-write. Once you have completed the first free-write, go ahead and do the exercise again. You should complete at least two free-writes.
5. **Don't worry about grammar.** You don't want to be preoccupied with spelling, punctuation or even writing complete sentences. You can concern yourself with these items when you are editing.
6. **Don't stop writing.** When you're stuck for an idea, write a one-word descriptor over and over until the next idea comes. For example, if you are writing about the safety of the Tennessee Valley Authority's coal-fired plants, you might write the word "safety" over and over while you are waiting for the next idea to come. But don't stop writing; natural rhythm is important.
7. **Compare the first free-write with the second.** How are your free-writes alike? How are they different? If you've generated one idea several times, it is probably important.
8. **Circle all usable ideas.** Then make a list of your ideas, numbering them in order of importance. You might even take this list and make an outline.

Figure 1. Free Writing.

This is a description of the free-writing technique used by Deborah Dumaine in her workshops to help participants free ideas and get them on paper.

Taken from Deborah Dumaine, Writing to the Top: Writing for Corporate Success (New York: Random House, 1983):30-31.



1. Decide what the news really is, what your reader really wants to know or needs to know. Begin with that.
2. Next explain your news, what the reader will want to know about the "why."
3. Then explain "how," and what needs to be done next.

For a letter or memo the following three-part plan can be used:

Part I (paragraph I) — the main idea

Part II (the middle paragraphs) — supporting material

Part III (final paragraph) — statement indicating what the reader should do or what attitude to adopt.

Figure 2. Organizing Pyramid.

The organizing pyramid is used by Melba Murray, a teacher of short courses in writing, to help participants organize simple letters and reports.

Taken from Elizabeth Tebeaux, "Keeping Technical Writing Relevant," College English 45 (1983): 180.

Grammar. Whether instructors like it or not, most of the workshops include some review of grammar. While Davis does not feel that a teacher should stress what he terms "literary" English, meaning very formal English, he does believe the instructor should teach grammar and that participants should think of the instructor as the expert. Davis said he does a review in style, mechanics, and expression, using exercises to illustrate. He also talks about written communications and the importance of effective communication in writing (71).

Reed Sanderlin also believes it is important for participants to think of the instructor as the grammar expert. He said if someone makes a grammatical error, "you'd better correct it" (Interview). However, Sanderlin shies away from using the word "grammar" because he feels there is too much prejudice against the word. Instead, in his workshops he discusses grammar in the context of sentence editing. A typical grammar exercise used by Reed Sanderlin and published in his Writing Manual asked participants to correct a number of sentences, hoping that through repetition participants will begin to recognize grammar problems in their own writing (55). (See Figure 3, page 29.)

Wordiness. In business today it is common for words to obstruct the real meaning of communication. An exercise on wordiness also created by Sanderlin asked participants to write a word with a similar meaning as the phrase or long word in the underscored portions of given sentences. (See Figure 4, page 30.)

MODIFIERS

1. Moving to a drier climate, her asthma improved quickly.
2. After moving to Arizona, her health improved.
3. After eating our dinners, we noticed that it had started to rain.
4. We threw sand upon the fire, thus preventing it from spreading.
5. The fire having been extinguished, everyone went to sleep again.
6. Meeting him by chance on the street, he told me he had decided to quit school.
7. Being late, my entrance made a deep impression upon the class.
8. After asking my name, the professor repeated the next day's assignment.
9. Entering the North Gate, the new chapel stands out prominently.
10. Being too small for me to sit up in, I thought the new car was not worth its price.

Figure 3. Typical Grammar Exercise.

This grammar exercise in a workbook by Reed Sanderlin asks participants to identify words and phrases that modify.

Taken from Reed Sanderlin, Writing Manual (Chattanooga, TN: Communications Development Associates, 1982).

CONCISENESS

In the spaces in column 2 write a single word that has a similar meaning as the phrase or long word in the underscored portion of the sentence.

Column 2

- | | |
|--|-----------|
| He will make a decision <u>in the near future</u> . | 1. _____ |
| That article is not available <u>at this moment</u> . | 2. _____ |
| Will he be able to return my call <u>after a while</u> ? | 3. _____ |
| Please <u>send me your answer</u> today. | 4. _____ |
| Defective materials are replaced <u>with additional charge</u> . | 5. _____ |
| <u>At this point in time</u> what rewards can we expect? | 6. _____ |
| Summarize the investigation <u>in a very few words</u> . | 7. _____ |
| He almost never misses an opportunity to comment on the failings of others. | 8. _____ |
| <u>Endeavor</u> to improve your work performance. | 9. _____ |
| <u>In the event that</u> the report arrives early, please call me. | 10. _____ |
| I shall be glad to respond <u>at that time</u> . | 11. _____ |
| <u>Make inquiry from</u> the salesman about a refund. | 12. _____ |
| Will there be adequate railroad facilities if we build the plant <u>in that location</u> ? | 13. _____ |
| The maintenance branch orders frequently, but its orders are <u>not large</u> . | 14. _____ |
| Please make sure this practice <u>does not continue</u> . | 15. _____ |
| Orders are filled <u>in every instance</u> within twenty-four hours. | 16. _____ |
| <u>In this present situation today</u> the economic picture is bleak. | 17. _____ |
| The building should be built <u>in the neighborhood</u> of a main highway. | 18. _____ |
| We have a <u>manufacturing establishment</u> in Atlanta. | 19. _____ |
| We thought <u>in terms of</u> submitting a new proposal. | 20. _____ |

Figure 4. Typical Wordiness Exercise.

This wordiness exercise asks participants to find a single word that means the same thing as the phrases on the left.

Taken from Reed Sanderlin, Writing Manual (Chattanooga, TN: Communications Development Associations, 1982).

Organizing Classes or Workshops

Armen Khachaturian and Herman A. Estrin, in "Teaching In-house Technical Communications Courses," divided their eight-week course into four areas: "the writer and his responsibility to his reader; types of writing; word choice, usage, graphic aids, and style; and proficiency of writing." They also provided time for individual conferences and asked for individual writing samples before they began the course (42).

Fred O'Hara based his classes on three areas: the content of the written piece, the organization of the information, and the editing of the written piece. To some degree he talked about each of these areas, but sometimes he emphasized one over the others, depending on the group. O'Hara normally used the first class to establish a rapport with participants and to talk about the kinds of writing they must face daily. He asked participants to set up the schedule and to use their current writing projects in the workshops. O'Hara also had a one-to-one session with each of the participants, focusing on their specific weaknesses (Interview).

Keene described a writing course designed for an engineering company, which Keene said places a high value on the written word. He said this company understands that their primary product is written information and that good writing translates into dollars for them. This workshop for 13 engineers was a 10-week course, meeting twice a week. Keene used one day, Monday, to lecture on various topics such as the dollar value of information, the writing process, and the four levels of revision. On the second day participants brought three pages

of written work--again on their own projects. The writing was reviewed by the graduate student "coaches," and participants had a one-to-one session to discuss their work. Participants were then asked to make revisions and turn them in to the company secretary by Friday. Keene picked up these documents along with the previous draft, giving the writing a second review. The biggest value of this system, said Keene, is that participants write a lot and on their own projects. He believes you cannot improve writing unless you write. In fact, he believes in this system so strongly that he says this is probably the only way he will teach in-house technical writing workshops (Interview).

The Methods of Evaluation

Are the writing programs worth it? Most companies said they don't attempt to measure the returns of a writing course (Denton 9). Others try to measure the effectiveness of their courses by using evaluations, and sometimes consultants used evaluation forms to determine future course content. The Tennessee Valley Authority uses evaluation forms to determine the effectiveness of the course and the instructors. They want courses that will apply to the participant's work situation, and they use these evaluations to determine this.

Participants are asked to rate the knowledge of the subject gained, the adequacy of visual aids, the adequacy of learning guides, the opportunity for discussion, the practical value of the course, and the effectiveness of the presentation format. They are also asked to comment on how the course might influence their work habits. These evaluations are recorded and then sent to the instructors for review.

This evaluation is used for all courses, not just writing courses (Interview). (See Appendix, Figure A1, page 121 for a sample of TVA's evaluation form.)

Sometimes instructors ask participants to evaluate the course. But Fred O'Hara does not, feeling that the evaluation by the company is more objective. Keene asks participants to evaluate the course at mid-term and at the end. He, in turn, writes an evaluation and sends this to the company as follow up (Interview).

Denton's research showed that only 37 percent of the organizations with writing programs conducted any type of followup: usually this consisted of only reviewing writing samples with the employee after they completed the courses. Of the 37 percent of organizations conducting followup, 9 percent were not happy with the writing courses provided. These companies felt there had been little improvement, especially for the cost (12).

The problem with any evaluation of in-house writing is that it rarely measures what is learned. The course may measure the attitude of participants toward the content of the course, the instructor's approach, or the instructor himself. And, as O'Hara pointed out, if participants know the instructor will read the evaluations, how likely are they to be honest? But the real question is this: What determines the effectiveness of an in-house writing course? Is effectiveness measured by company sales? Is effectiveness measured by how well the company president feels employees are writing? Is effectiveness measured by how quickly, easily, or painlessly employees feel they can now write after an in-house workshop? Is effectiveness measured by

skills or understanding of concepts? The truth is that the in-house technical workshop is measured by all of these.

CHAPTER II

VISUAL THINKING AND THE TEACHING OF TECHNICAL WRITING

Since traditional technical writing workshops appear to be effective in teaching only some of the participants, instructors must continue to search for new methods. One possible method to consider is the use of techniques that employ visual thinking.

Defining Visual Thinking

Thinking visually does not mean thinking by using eyesight, although the eyes are certainly a tool. The term visual thinking means using the visual skills of the brain: perceiving spatial relationships, perceiving visual analogies.

Visual skills are used every day. Walking past a bakery a person may feel "hungry" for the hot, buttery rolls or cinnamon twists inside, even though that person may have just eaten a meal. He does not see the baked goods with his eyes, but the smell of yeast and cinnamon causes his brain to picture the treats. The image is usually strong enough to cause one to salivate at the thought.

Arthur Koestler in The Act of Creation said that everything we do involves visual thinking, but we do it so unconsciously that we never realize we are using visual skills. To illustrate the spectrum of thought from visual to verbal, Koestler used the spectrum of humour.

At the one extreme, he said, are the practical jokes and slapstick comedy. This type of humour is almost totally visual, so that even a child can "see the joke." At the other end, he explained, is the riddle--almost totally verbal and "a challenge to our wits" (89). One popularizer, Robert McKim, gave simple examples of visual thinking for his readers: he used the examples of someone trying to decide what clothes to wear, a football coach trying to decide on a new strategy, or a person in the middle of a dream (8). Visual thinking is, in fact, an everyday occurrence.

Visual Thinking as an Unconscious Process

Koestler also said that visual thinking is unconscious thinking, such as the thinking occurring in dreams. The inventor, the artist, and the dreamer all utilize the same skill. "The dream," he said, "associates by methods which are impermissible in the waking state--such as affinities of sound detached from meaning . . . It makes use of 'links,' which while awake, we 'would not dream' of using--except where dream-logic intrudes into humour, discovery and art" (179). Koestler stressed that even though the visual associations in dreams seem illogical or naive, many of them turn out to be of great value. They make us aware of new analogies, new combinations. Dreaming is a state of unconscious discovery (182).

Koestler even claimed that visual thinking was the key to discovery, and said in talking about such notables as Gutenberg, Kepler, and Darwin that "on the question of how the new synthesis comes into being, the evidence indicates that verbal thinking, and conscious

thinking in general, plays only a subordinate part in the decisive phase of the creative act" (208). Rudolf Arnheim strongly agreed. In his book Visual Thinking, he stated, "Truly productive thinking in whatever area of cognition takes place in the realm of (visual) imagery" (v.). But Koestler talked about a process that occurs unconsciously. Is it possible that--even as an unconscious process--visual thinking is an activity that can be learned?

Learning to Think Visually

Unfortunately, education rarely encourages visual thinking. McKim said there is a bias toward logical (verbal) thought processes. Rewards, he reminded, are given for proficiency in the three R's, which are verbal skills (4). Betty Edwards, who encourages learning to draw by learning to use visual abilities, said visual "brain functions are largely lost in our school system." After kindergarten or the first grade, very little encouragement is given for drawing or other visual exercises (37).

Arnheim was also concerned that our society seems to focus on one type of thinking. He said there is a lack of visual training in the arts and sciences and technology. He stressed that education must put more emphasis on the visual form, since "visual form is the principle medium of productive thinking" (295). Arnheim said that visual perception does not merely collect information with the eyes, but also "lays the groundwork of concept formation" (294).

Drawing as a Means of Thinking Visually

Arnheim did not, however, stress drawing copies of physical objects. He preferred that students take mental images and draw them as abstract representations of concepts. For example, one exercise asked students to take a concept such as "past" and draw a visual representation (120). This method taught students to realize there is no standard right or wrong, and that any "organized pattern is a carrier of meaning." These "exercises" suggested spontaneity and letting go; interestingly enough, Arnheim noted that rarely did anyone protest that these concepts could not be visually represented (297).

McKim also believes that one way to learn to think visually is to draw or sketch. Calling this exercise graphic ideation, he said it is exploratory and developmental. Graphic ideation allows you to sketch ideas, giving them birth, but also allowing them to evolve (122). It can even be a type of visual brainstorming, "utilizing seeing, imaging, and drawing in a cyclic feedback process" until an idea is fully conceived (124). To build spontaneity into this graphic ideation, McKim suggested use of materials that are direct, quick, and easy to use. He also stressed being relaxed, and giving your full attention to the problem at hand (38).

Kurt Hanks and Larry Bellison in Draw! A Visual Approach to Thinking, Learning and Communication also built on the idea of visual perception as productive thinking. They called drawing a "means to an end, a tool to help solve problems, create new ideas" (5). They gave as an example the drawings of Thomas Edison which show how through

his vision, his thinking, and his drawing, the idea of the electric light evolved (8).

Integrating Visual and Verbal Thinking

The brain has two ways of processing information: a logical or verbal mechanism and a visual or spatial mechanism. The two are complementary and seem to function best in tandem. Arnheim believes the cognitive process uses both the verbal and the visual mechanisms for thinking. He contended that cognition is an essential ingredient for perception, and they cannot be separated. Arnheim said that a person is truly well rounded when "he applies to everything he does the integrated whole of all his mental powers" (307).

The Split-Brain Theory

Where does visual thinking come from and how is it different from what scientists term verbal thinking? One theory proposes that since the left hemisphere of the brain controls the verbal motor skills, it follows that the right side of the brain controls the elusive visual component of thinking. This theory also states that the hemispheres are exclusive to those functions. What followed the general acceptance of this split-brain theory has been a virtual "feeding frenzy" by several popularizers of the right brain/left brain phenomenon, attributing everything from the bizarre to the ridiculous to those who possess control of their visual capabilities. McKim in Experiences in Visual Thinking said, "Individuals who have full access to their left hand (who are aware of their senses, open to their

feelings, in touch with their unconscious) inevitably experience more of everything--more pleasure, and also more pain" (24). Betty Edwards in Drawing on the Right Side of the Brain said, "Using the right hemisphere we understand metaphors, we dream, we create new combinations of ideas" (35).

The Integrated Brain Theory

Scientists Michael S. Gazzaniga and Joseph E. LeDoux in The Integrated Brain pleaded for a more rational interpretation. "We believe that these 'pop' versions of hemisphere function are in error, and a good deal of the business of this book (The Integrated Brain) is to reestablish a basic, sober, framework for considering studies on cerebral commissurotomy" (16). They preferred the view that while control of linguistic functions appears to be centered more often in the left hemisphere, there is no experimental verification that "each hemisphere in man has been separately endowed with a neural organization that is incompatible with the type of processing that occurs in the other half-brain" (72). Gazzaniga and LeDoux said visual and verbal thinking occur in both sides of the brain. While the left side may appear to control the linguistic function, they do not believe this is a specialization by this hemisphere. Prior to the second year, a child's brain is bilateral. Because linguistic skills require such a large area of the brain, they theorized that motor skills, which require an equally large area, postpone the "selection" of a hemisphere until the linguistic skills have developed (60).

Lateral Thinking

Edward de Bono in Lateral Thinking for Management used the terms lateral thinking and vertical thinking. While the terms do not mean exactly the same things as visual and verbal thinking, they are closely related. Vertical thinking is logical thinking in which predictable sequential steps are taken for problem solving. Lateral thinking attempts to solve problems by looking at the problem differently when the logical process seems to yield no solution. This process bears a striking resemblance to Koestler's "unconscious thinking." Koestler used the example of Gutenberg's integration of the concept of the grape press and the concept of the wax seal. Koestler said Gutenberg's invention was produced by unconscious thought, rather than by a logical process. De Bono would say Gutenberg used lateral thinking.

Whatever the label, de Bono was also suggesting that we use two different kinds of thinking. He said "In practice one uses lateral and vertical thinking in alternation . . . rarely does lateral thinking actually provide a solution by itself. Usually, it simply provides an approach or rescues someone who has been blocked by a particular idea" (13). This is why scientists such as Koestler recognize the potential for creativity in allowing our conscious and unconscious to interact.

Koestler would suggest that by taking a coffee break, by going for a walk, or even by playing a game of tennis, we are allowing time for the thinking about a problem. The solution often emerges easily. We wonder why we did not think of the solution earlier. During the period of incubation the unconscious process took over. "To sum up,

there is a two-way traffic between conscious and unconscious," said Koestler (181).

Koestler called this "unconscious ideation" (201). It is a way of looking at things differently, abandoning labels, and reclassifying things. This process allows new combinations, new alternatives, new discoveries. Koestler said that "the essence of discovery is that unlikely marriage of cabbages and kings--of previously unrelated frames of reference or universes of discourse--whose union will solve the previously unsolvable problem" (201).

Integrated thinking also aids memory. Arnheim said, "The most useful and common interaction between perception and memory takes place in the recognition of things seen. Visual knowledge acquired in the past helps not only in detecting the nature of an object or action appearing in the visual field. It also assigns the present object a place in the system of things, constituting our total view of the world" (90). Because of this connection, McKim speculated that the inability to remember could simply be the result of an inaccurate perception. "The more actively you perceive something," he said, "the more likely you will be able to reproduce it from memory" (16). He believed that people who don't really see things would have more difficulty recalling them, because "memory and seeing are mutually reinforcing" (95).

Koestler feels that words are essential for forming ideas, storing ideas in our memory, and for communicating those ideas to others. But he also warned that when relied on totally, "words can become snares, decoys, or strait-jackets" (176). Koestler was not

suggesting that we abandon verbal thinking, however. He simply did not want us to limit ourselves to verbal thinking. McKim described people who rely totally on verbal skills as tending to think in a "second-hand way: they skillfully manipulate symbols but rarely make full contact with their own primary resources" (25). Sometimes language will not work as the vehicle of thought; often the brain needs both images and words. "Rigidly adhering to one vehicle does tend to close doors," stressed McKim (5).

Investigating the Visuals Currently Used in Teaching Technical Writing

As technical writing instructors search for new and better ways to teach writing, they often find themselves using what are termed visual aids. Education courses stress the use of visual aids in teaching. Charles Stroh in "A Brief Primer on Vision and Human Perception" reminded us why: "Vision has a way of combining all the other senses." In fact, vision "registers some kinds of information as no other system can" (44).

Arnheim argued for a more conscious use of perceptual abstraction in teaching. Arnheim was not talking about visual aids, because he said what many people use for visual aids are just drawings--illustrations that do not produce favorable conditions for visual thinking. "The mere presentation by photography, drawing models, or live exhibition of things to be studied does not guarantee a thoughtful grasp of the subject." In his opinion, if a picture "fails to state propositions

perceptually, it is useless, incomprehensible, worse than no image at all" (308).

Visuals used in the teaching of technical writing can be placed into categories using Arnheim's classification of the function. A visual can be used as a sign, as a picture, or as a symbol. Arnheim felt that these categories were not mutually exclusive: in some cases a visual might be all three.

Signs: Visuals as Graphics

According to Arnheim, a visual image serves as a sign when it stands for "a particular content without reflecting its characteristics visually." He admits in a sense it is difficult for anything to be strictly a sign, because a portrayal slips in (308). However, visuals used as graphics seem to fit well into this category. These are visuals used primarily to attract the reader's attention.

In her article "Visual Presentation of Technical Information," Deborah C. Andrews said two of the reasons for using visuals were that "visuals enhance interest" (90) and that "visuals, like their verbal counterparts, serve an aesthetic purpose" (91). Most visuals that solely satisfy these two purposes are graphics. Visuals as graphics break the monotony of text. Using different colors of paper for different sections of text or using a border around an example are both visuals as graphics. Sometimes graphics are photographs. David Fear's text had photographs of technical writers in the workplace. The text The Technician as Writer had a set of "symbols" down the left hand side of the page (45). (See Figure 5, page 45.) In Technical Writing

δ ∇ $\therefore$ $*$ $\rightarrow$
 $\square$ V' $\rangle$ $\text{\textcircled{f}}$ $\text{\textcircled{z}}$
 Δ $\hbar$ cm^3 $\%$
 $\pm$ $\dot{\nabla}$ τ C_p $\odot$
 F_5 ∞ R $=$
 μg $\text{\textcircled{6}}$ Hu $\text{\textcircled{X}}$
 $\div$ Na_2 $\text{\textcircled{K}}$ λ
 Ψ $^{\circ}F$ $\text{\textcircled{R}}$ ∞ .

4 Designing the Basic Structure

4.1 Introduction

On a gray Monday morning, Len LaFara, manager of the sales division of a large company, looks dejectedly at the stacks of paper on his desk and slumps despairingly in his chair. How will he ever catch up?

His secretary, Ms. Ambrose, enters. "Here are the marketing reports you requested, Mr. LaFara." She drops them on his desk and leaves.

These reports will give Len the information necessary to make a vital decision before the afternoon meeting. He lifts a report and visibly shudders just at its weight. He reaches for his coffee.

Len slowly reads through the first five pages. His head starts to ache. "What a way to start the week," he mutters to himself. He turns a few more pages, then flips through several until he finds a heading, "Field Activities." The pain settles right behind his left eyeball. Even his master's degree in business management hasn't prepared him to cope with the statistical jargon, and who cares who was interviewed in Kankakee? What's the point of it all? His head throbs. He drops the report on the "to do later" pile and hopes there's nothing in it that would have helped him make a decision. He reaches for aspirin and the second report, in that order.

Len starts to read the second report and soon relaxes. He can even understand the first page. By the end of the page, he knows the company problem, the alternatives, and a possible solution. Len smiles contently, jots some ideas in the margin of the report, and puts it in his folder for that important conference in the afternoon. He will look good there. He notes the author of the report and

Figure 5. Visual as a Graphic/Page Design.

The scientific symbols down the left hand side of the page are not related to the text. This is a visual that the author hopes will attract the reader's attention.

Taken from Ingrid Brunner, J. C. Mathes and Dwight Stevenson, The Technician as Writer (Indianapolis, IN: Bobbs-Merrill Educational Publishing, 1980): 45.

by Charles Stratton, boxes and bullets are used to illustrate important points. This technique may be used for something as simple as a revision checklist or a list of illustrations (73).

Another textbook, Writing and Speaking in Business by Michael Spitzer, Michael Gamble, and Teri Kwal Gamble, had "springboards"--practice exercises--enclosed in a box, with a screened bar across the top. The information inside the springboards is an example, but the box and screened bar are visuals as graphics (97-98). Mathes and Stevenson's Designing Technical Reports contained a box used to illustrate the two basic structural components of a report and their functions. The visual actually isolates the information that has been listed and sets it apart from the remaining text (47). (See Figure 6, page 47.)

Pictures: Visuals as Examples

Arnheim distinguished visual images used as pictures from those used as signs by saying that pictures "render some relevant quality" of what is being portrayed (137). Visuals used as examples seem to fit best into this category, since they neither explain nor simply decorate the text. Visuals as examples are actual examples of writing or a writing situation used as visuals in textbooks or workshops. However, not all words that explain by example are visuals. These visuals are specifically set off in some way from the body of the text: by italicizing, by borders, or by screening in another color.

In Writing and Speaking in Business, Springboard 5-4 is entitled "memo problem prober." The exercise asked the reader to assume that

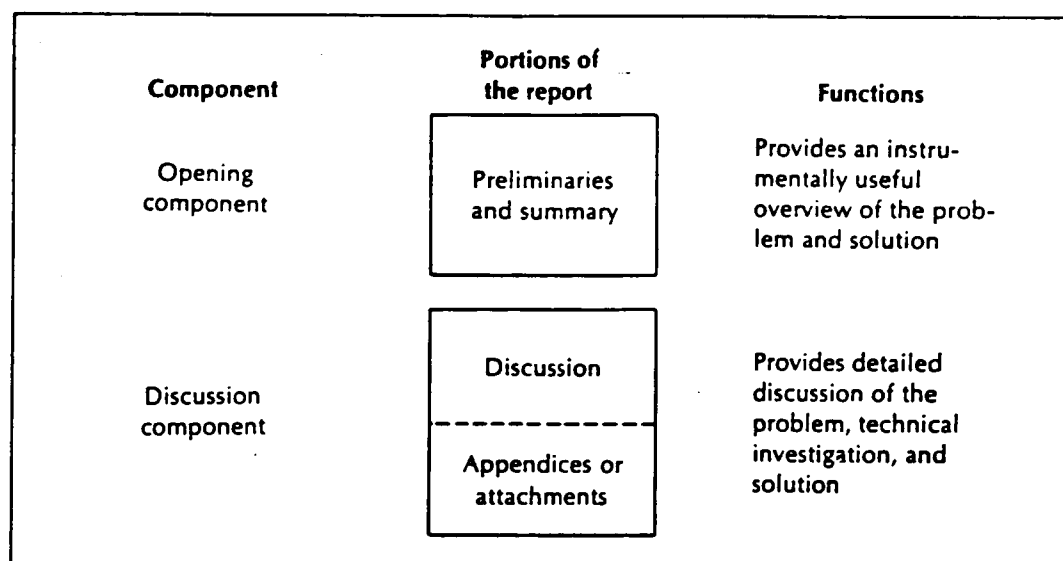


Figure 4-1. Two basic structural components of a report and their functions.

Figure 6. Visual as a Graphic/Information.

This visual isolates the information in the boxes, allowing the reader to quickly see the two basic structural components of a report.

Taken from J. C. Mathes and Dwight Stevenson, Designing Technical Reports: Writing for Audiences in Organizations (Indianapolis, IN: Bobbs-Merrill Educational Publishing, 1976): 47.

he or she is the executive in charge of a toothpick production plant. The reader is asked to read the excerpts also enclosed in the graphic and attempt to determine the main subject. The springboard serves a dual role as an example, since it also tells the student that these excerpts are ineffective. (See Figure 7, page 49.)

Reporting Technical Information by Kenneth W. Houp and Thomas E. Pearsall primarily used visuals as examples. This fifth edition is printed in two colors, using green to highlight the sections and a screening of that color as a background for the examples. Their examples included everything from a letter of transmittal to the pages of a complete short proposal. David Fear also used visuals as examples as well as graphics. He has shown the reader how a bar graph might look (96) or how a flow chart might look (101). (See Figure 8, page 50.)

In Technical Report Writing Today, Steven E. Pauley called his examples "models." Many of his examples were simply double spaced within the text, which tended to make them visually difficult to follow. Other "models" were those for title pages and abstracts (187, 189). (See Figures 9 and 10, pages 51 and 52.) On the other hand, Philip C. Kolin in Successful Writing at Work used his examples very effectively. In his section on the use of photographs, he gave examples of both good and bad photographs taken from different angles, emphasizing various aspects. He explained why each is good or bad (323, 324). He went far beyond providing the typical bar graph or flow chart and suggested that writers use cutaway drawings or exploded views instead (327). (See Figure 11, page 53.)

SPRINGBOARD 5-4

Memo Problem Prober

Assume that you are an executive in charge of a toothpick production plant. Either alone, or working with others, attempt to determine the main subject discussed in each of the following ineffective memo excerpts.

.

As I mentioned to you last week at the meeting—by the way, the cake you served was excellent—the price of wood for toothpicks—that reminds me, did we ever determine the amount of gas each driver is expected to purchase per day? Let's see now, where was I? Oh, yes—but by the way, how is your Father? Feeling better?

.

Before I get to the point, let me tell you that I saw a wonderful movie last night. My secretary just reminded me that we are to meet tomorrow afternoon to discuss the security problems on the second floor. Much lumber has been disappearing and we are losing 10 to 20 million toothpicks per week! Anyway, back to the main point of this message. . . .

.

I feel that you should understand the circumstances that led to Jim's firing. He was here twelve years. In the last few years he made a series of serious mistakes. When he first started he was punctual, but two years ago he began coming in late. Remember the fire on the third floor seven years ago? He failed to report it. Yesterday some people were hurt on a loose board on a step—but that's not the real reason. You see, three months ago he was on his way into the office when he was stopped by the police.

.

Let me try to describe the room to you. It has a twelve-foot ceiling and is partially light blue in color. On one wall—the brown one—is a large computer terminal. There are doors on another wall, and the floor is carpeted in thick pile. The doors swing out and the smaller window is stuck. Anyway, the air conditioner above the clock is . . . Oh my, I forgot to tell you the location of the twelve-foot clock. It's. . . .

.

How would you rewrite each memo segment so that its main purpose was made clear, and its organizational pattern was easily followed? What information would you emphasize? What information would you eliminate? What information would you add? Why?

Figure 7. Visual as Example/Problem Prober.

This visual asks the reader to assume a professional position and from that position make judgments about the subject matter of memos. This provides the reader with an example of writing that could come across their desk.

Taken from Michael Spitzer, Michael Gamble, and Teri Kwal Gamble *Writing and Speaking in Business* (New York: Random House, 1984):97-98.

Figure 5.4 Appliances Repaired in Three Shops, 1974

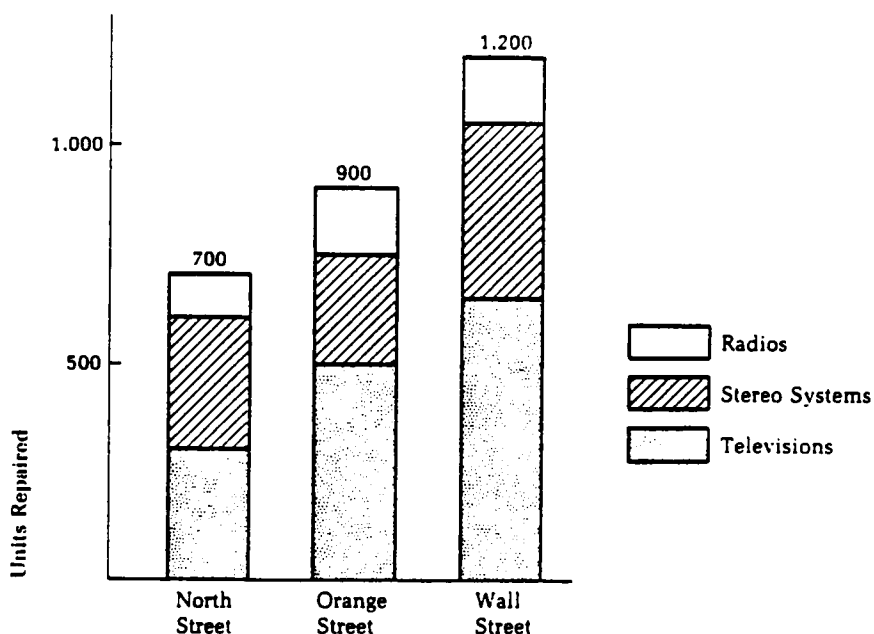


Figure 5.5 Distances from Muirfield Square to Six Competitive Shopping Areas



Figure 8. Visual as Example/Bar Graph.

David Fear shows students typical examples of bar graphs.

Taken from David Fear, Technical Communication (Glenview, IL: Scott, Foresman & Company, 1977): 96.

187 MODELS

PROPOSAL FOR
INSTALLATION OF A POWER GENERATOR

Prepared for
David J. Boliker
Manager of Manufacturing
Lansing Steel Company

By
Robert J. Smith
Acting Project Engineer

January 15, 1978

Figure 9. Visual as Example/Title Page.
This figure shows a typical title page for a proposal.
Taken from Steven Pauley, Technical Report Writing Today, 2nd.
ed. (Boston: Houghton Mifflin Co., 1979): 187.

ABSTRACT

The purpose of this report is to propose a back-up generating plant at the new Lansing facility.

The problems that might result from an electrical power failure at the plant involve both personnel and facilities. Employee injuries could result from moving about with no lighting in the plant, being trapped inside closed tanks, and being struck by items falling from cranes that are operated by vacuum lifts or battery magnets. The plant itself would be in danger of damage from surface-drainage water, fire, and the freezing of pipes and heaters.

A surplus generator is available from our Field Force Division and could be installed for approximately \$4060, including labor and material. It can be installed in the powerhouse's air-compressor room during the month of June, and its operation will require minimum training of personnel. The generator can meet all the plant's emergency requirements and do so very economically.

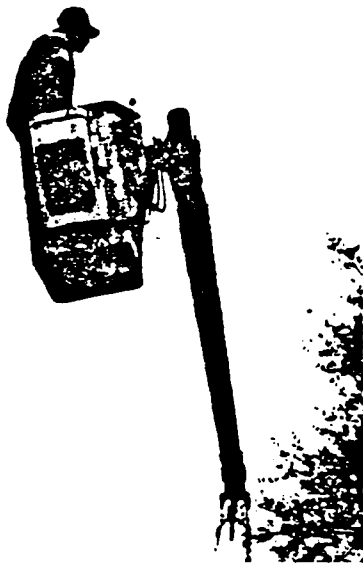
-iii-

Figure 10. Visual as Example/Abstract.

This figure is an example of an abstract written for a proposal

Taken from Steven Pauley, Technical Report Writing Today, 2nd. ed. (Boston: Houghton Mifflin Co., 1979): 189.

Fig. 10.22 A poor photograph—focus is on worker, but there is nothing else to identify person or work going on.



Photograph by David Longmire.

Fig. 10.23 A poor photograph—focus is on work going on, but there is nothing to indicate that worker is operating from a hydraulic truck.



Photograph by David Longmire

Figure 11. Visual as Example/Photographs.

These two photographs by Philip Kolin show the potential writer who wants to use photographs how to create a picture. Kolin said the problem with these photographs is that there is nothing to indicate what type of work is being done.

Taken from Philip C. Kolin, Successful Writing at Work (Lexington, MA: Heath, 1982): 324.

Symbols: Visuals as Analogies

The third kind of visual that Arnheim talked about was a symbol. This visual tends to be much less complex than the concept it represents. It creates graphic analogies which give shape and form to the concept it represents. Arnheim warned that care must still be taken in the selection of a symbol to represent a specific concept, since some symbols do not carry the same meaning for everyone (140).

Elizabeth Cowan in Writing said that writing is similar to building a cabin. At first it is tentative, exploratory and very enjoyable. The writer is gathering raw materials and collecting thoughts. The second stage, however, requires commitment. The writer must make specific plans and physically do the work. The work must be done and decisions must be made. The final stages of work are managing the details. The wood must be finished and polished, just as the writing must be edited and polished (xvii-xx). Cowan actually began the book with beautiful color photographs, showing the land before it was cleared, the foundation being laid, the roof being put on with aid of friends, the completed cabin in the snow, and the interior photographs showing the finishing touches that make this cabin the home of specific individuals (xvii-xxi). The symbol used both graphic and verbal information. By relating the building of a cabin to the act of writing, Cowan describes the concept of "writing as a process" very effectively and allows a beginning writer to draw a visual image of the process.

A flow chart in the textbook Writing Scientific Papers and Reports written by Paul Jones and revised by Michael Keene showed how

writing is a process and how it is recursive. The lines and arrows created movement between the writing stages then with the aid of verbal information related each stage is to another. (See Figure 12, page 56.)

Charles Stratton used the communications triangle as a visual. It is effective because it is shown as a series of three configurations based on three different types of writing. This three-stage triangle taught the importance of a focus on subject and reader in technical writing, showing the difference in focus among other types of writing (5, 6). Another symbol used by Stratton showed the reader how to convert a sentence from active to passive voice. The portion of the sentence to be moved has been circled and arrows indicated where to move it (398). (See Figures 13 and 14, pages 57 and 58.)

Finally, Joseph Alvarez in The Elements of Technical Writing used a flow chart to show the four types of "meaning words" and how each functioned. This visual could be used in an editing session to review basic sentence structure, since the visual showed what elements are necessary for a complete sentence and how each of the "meaning words" related to the others. (See Figure 15, page 59.)

The Effectiveness of Visuals as Teaching Tools

Arnheim concluded that it was not enough to pay "lip service" to the doctrine of visual aids. He said that a teacher who simply turned on a projector to keep students entertained for a few minutes was not teaching. That teacher, he contended, was not helping them to think visually or grasp a subject. He said that visual thinking calls

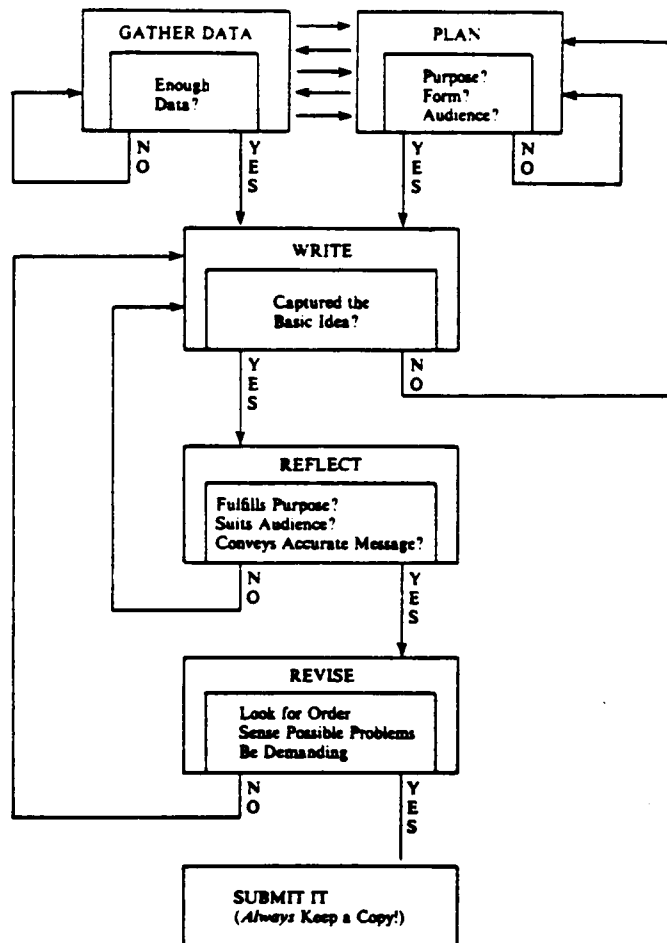


Figure 2.1. The process of writing. Flow chart is designed to indicate clearly the recursiveness among the various stages.

Figure 12. Visual as a Symbol/Process.

This flow chart becomes a symbol because it represents the concept writing as a process.

Taken from Paul W. Jones, and revised by Michael Keene, Reporting Technical Information, 5th ed. (Dubuque, IA: Wm. C. Brown Co., 1981): 22.

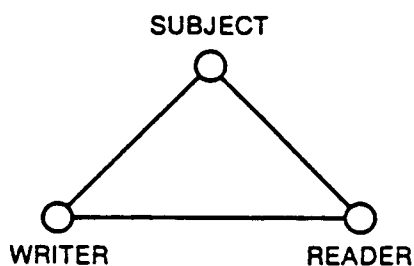


Figure 1-1 The Communication Triangle

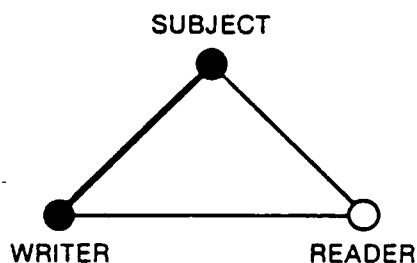


Figure 1-2 Creative Writing Focus

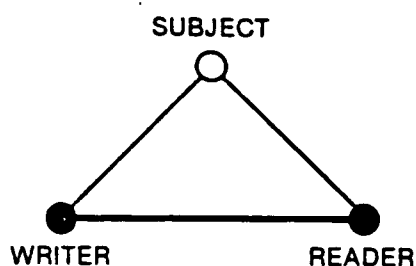


Figure 1-3 Expository Writing Focus

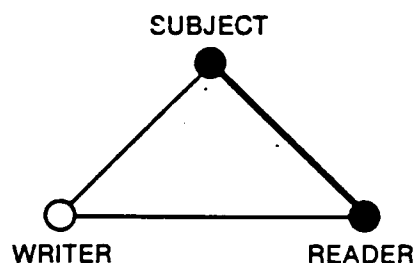


Figure 1-4 Technical Writing Focus

Figure 13. Visual as Symbol/Communications Triangle.

This symbol explains the writer's relationship to the subject and the reader in technical writing. By comparing the writer's role in other types of writing, the reader can fill in the patterns of the communications triangle.

Taken from Charles Stratton, Technical Writing; Process and Product (New York: Holt, Rinehart and Winston, 1984): 5-6.

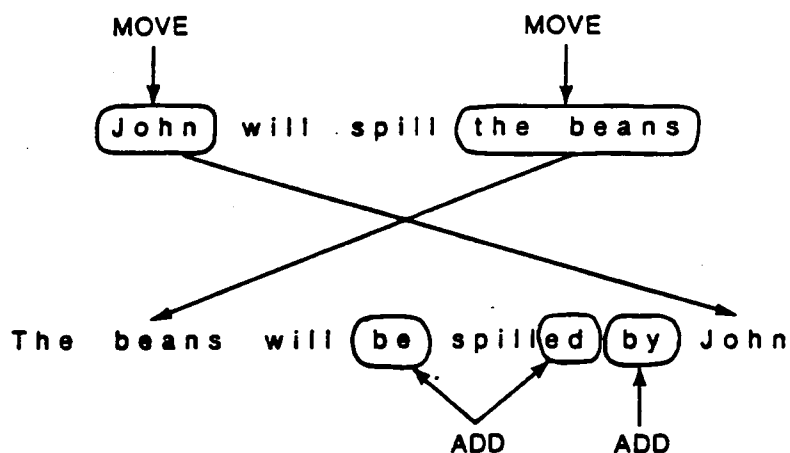


Figure 18-3 Converting from Active Voice to Passive Voice

Grammar for Engineers (and Others Who Don't Like Grammar)

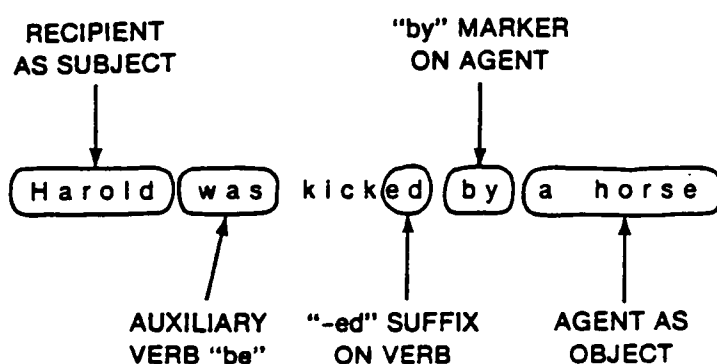


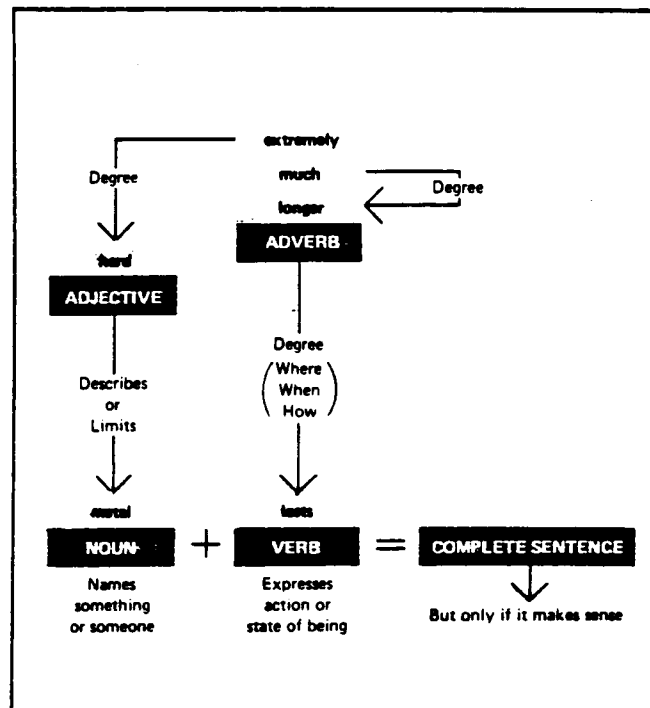
Figure 18-2 Characteristics of the Passive Voice

Figure 14. Visual as Symbol/Active and Passive Conversion.

Charles Stratton shows the reader how to convert from active to passive and the relationship between the words in a sentence that is passive.

Taken from Charles Stratton, Technical Writing: Process and Product (New York: Holt, Rinehart and Winston, 1984): 398.

FIGURE A-2.
THE RELATIONSHIPS
OF THE FOUR TYPES
OF MEANING WORDS
AND HOW EACH
ONE FUNCTIONS



Note that all the adverbs in Figure A-2—*longer*, *extremely*, and *much*—indicate degree in the sentence. However adverbs that modify verbs also can indicate place, time, and manner. For example, in the sentence “Goodman drove fast and arrived there early,” *fast*, *there*, and *early* are adverbs. *Fast* indicates how Goodman drove; *there* indicates where Goodman arrived; and *early* indicates when.

Similarly, the adjective *hard* in Figure A-2 describes the noun *metal*, but an adjective may also specify limits, as in the sentence “*Ten* houses were built this week.”

Figure 15. Visual as a Symbol/Meaning Words.

This visual shows the four types of meaning words.

Taken from Joseph Alvarez, The Elements of Technical Writing (New York: Harcourt Brace Jovanovich, Inc., 1980): 186.

"for the ability to see visual shapes as images of the patterns of forces that underlie our existence--the functioning of minds, of bodies or machines, the structure of societies or ideas" (315).

He further related that understanding took place "within the realm of the image itself." But he warned that this occurs "only if it is shaped in such a way to interpret the relevant features visually." Thus a visual aid should not be just a picture of an idea, but must be a symbol that "presents a set of propositions about the object" (309).

In "Visual Patterns: An Experiment with Technically Oriented Writers," Susan Feinberg found that the use of patterns that we would categorize as symbols or analogies was the most useful in teaching organizing concepts to students. Pre-instruction and post-instruction papers were graded holistically. With "just 3½ hours of instruction in the visual forms, 49 of the 97 students participating in the experiment received a higher score" (22). In "Visual Aids in Technical Writing" Dennis E. Minor said that visuals that are symbols or analogies--what he called "metaphorical language and mental images"-- may be the "keys to spurring the mind through the third way of thinking [the integration of visual and verbal thinking]; if so, they are not just important components of the reproduction of discovery but are important components of the discovery process itself" (88).

CHAPTER III

THE WORKSHOPS: OBSERVING VISUAL TECHNIQUES IN THE REAL WORLD

When I began this project, my experiences mirrored those reported by the authors in Chapter I. That is, I found several key elements in teaching effective writing workshops: participants must attend voluntarily, small groups with similar interests work best, and the best teaching techniques and exercises link writing concepts to the workplace.

Perhaps the most difficult and least successful workshop I have taught was in Muscle Shoals, Alabama, to a group of engineers in a safety division of the Tennessee Valley Authority. The participants had the poorest attitude toward writing I had encountered in a writing workshop. By the second session, I discovered the problem: attendance was not voluntary, and most participants seemed to feel the supervisor who had requested the workshop was the poorest writer among them, although he had elected not to come. Their conclusion was this: why learn to write better when it will be edited by a supervisor who knows less than I do about writing? Perhaps this problem would have surfaced in a preworkshop interview if I had been permitted to conduct one.

Common interest or knowledge is most important. In five business writing workshops I held for the Tennessee Valley Authority in 1983, management asked that everyone in the division attend these

courses. Initially, I asked participants be grouped by department, but because of vacation and illness, this was not always possible. Some of the writing exercises based on writing samples from one department meant little to a participant from another department. Participants want to use materials that they understand and that they use daily.

This was one reason in other workshops I attempted to create exercises from participants' writing samples. One exercise I used in a writing workshop for TVA's Office of Power employees was based on a referral letter. Normally a request for information from someone outside TVA requires a quick response from the Office of Power. TVA considers all these letters "top priority," and many times other tasks must stop to answer the referral. Using an actual referral letter and facts I had provided, participants were asked to write a letter in response. When completed, the letters were read aloud and discussed briefly, but not analyzed as good or bad writing. At the end of the course I asked participants to repeat the exercise. They were surprised at the dramatic results. But part of the reason for the significant changes was using materials that were familiar.

Thus, my experiences had already provided me with what can happen in an actual workshop. So, while I understood the importance of theory and new ideas, I also knew that unless those ideas work in a "real world" situation, the theory is of little value. For this reason I set up two basic technical writing workshops to observe the use of visual thinking theories--translated into what I termed visual techniques for the workshops. The workshops provided insight into how

these visual techniques might be more effective for teaching than many of the standard (verbal) teaching techniques.

The Workshop Participants and Schedule

The workshops were given on June 20 and June 27 in Chattanooga, Tennessee, at the Siskin Foundation on Vine Street. The workshops were conducted from 9 a.m. until 3 p.m. with a 15-minute break in the morning, a 10-minute break in the afternoon, and a 1-hour break for lunch. The only difference between the two workshops was my substitution in the second workshop on June 27 of three visual techniques to teach the creating and shaping stages of writing in place of the verbal techniques taught on June 20.

Six participants were registered for each workshop, but as in any "real world" situation, that number varied at the last minute. While I wanted a more homogeneous group of all design professionals, I was unable to find 12 such participants. Again, "real world" problems forced the workshops into less desirable conditions. Instead of grouping participants by job, I grouped participants by the type of writing they performed in the workplace. I gathered participants by sending letters of invitation to past clients and selected architectural firms, engineering firms, interior design firms, and accounting firms. These participants primarily wrote letter, memos, and reports. Only occasionally did anyone write a lengthy proposal. Participants had a variety of educational training and experience including engineering, personnel administration, accounting, early childhood education, and

public policy administration. However, they were all professionals, and all of them wrote in their present positions.

One requirement to attend the workshops was providing a writing sample prior to the workshop they attended and another sample two weeks after the workshop. These samples were used initially to plan the workshops. Since time was limited, I wanted to focus on basic concepts and on the problems of participants. The samples were also used later to check improvement. Their use will be discussed in Chapter IV.

Workshop 1: Traditional Teaching Techniques

Six participants registered for the first workshop, which I taught using only verbal techniques. However, only four people actually participated. These four were Tom Miller, an electrical engineer; Susan Murphey, an accountant; Eddie Long, a structural engineer; and Rita Trimble, a home economist by training who is an energy advisor in the residential program with the Tennessee Valley Authority.

Since a workshop operates on the "sharing" principle, it is important for participants to feel comfortable sharing with one another and sharing with the instructor. Therefore, during the first part of the workshop, I got acquainted with participants and allowed them to get to know each other. I also asked participants to talk a little about the kinds of writing they did in their work. Their writing included scripts, letters within their own organization, letters outside the organization, memos, specifications, procedures, proposals, and public information handouts.

Next we defined the problems participants felt they had with their writing. The problems they identified were primarily problems participants shared. For example, one common problem was voiced by an engineer in the group: "I don't like to write, but I have to write. And, I need to do it faster." An accountant, who writes almost exclusively informational letters to her clients, volunteered her problem: she said she can "go on and on forever, never seeming to know when or how to end." She said that she knows she should have ended the letter long ago, but she doesn't know how. She also recognized that she had trouble knowing how personal to be as a principal in a small firm. Another engineer said he often finds himself in situations where an opinion seems to be called for, but because of liability, he hesitated to give one. And finally, the TVA employee had the problem of writing for several audiences--specifically, writing letters for someone else to sign.

Writing Viewed as a Process

Part of the morning session was aimed at getting participants to view writing as a process--a process with distinct but overlapping stages. By viewing writing as a process, individuals can begin to overcome their fear of the "final product" that must appear on their boss's desk. When writing is viewed as a process, individuals realized they could concentrate on one phase of the process at the time. When one phase was completed, they felt successful and saw that final writing could be accomplished on time. Viewing writing as a process can also encourage individuals to get started on long projects earlier.

Individuals then tend to feel that free writing or listing to generate ideas is not useless, but rather a necessary stage that can help them get ideas on paper--something they can set aside and come back to, if necessary. During this session I also stressed that more time should be spent in planning, since studies indicate that when more time is spent planning, much less time is spent rewriting. As a result, much less time is spent on the whole product. (See Appendix, Figure A2, page 123 for an illustration of the overlapping writing process.)

The Importance of Audience

Participants were then encouraged to identify their audience--as a group or as a specific individual. The groups of individuals included electric power consumers, developers, contractors, and architects. The TVA employee identified her supervisor, and one of the engineers identified the firm's owner as an audience. In the latter case, participants wrote letters for these individuals to send to others.

The concept of audience was taught using the Communications Square, a visual aid with four sides labeled audience, purpose, message, and persona. There were two key points I wanted participants to understand: as writers they must adopt different personas with each audience, and as writers they must understand that their message may be different from their purpose. Both of these points are critical to writing effectively, and both points rely on thorough audience analysis. The communications square also includes lists of "representative" questions writers would ask about their audiences (Hairston 44-45). (See Appendix,

Figure A3, page 124 for the Communications Square taught in this workshop.) The questions asked writers to think about whether the audience is a group or a specific individual, to think about the background of their audience or audiences, to think about what is important to their audience, to think about their audience's familiarity with the subject, and to think about why they are writing and what they are trying to communicate. Many of the participants said they already asked many of these questions about their audience when they wrote. However, they had not been exposed to the idea of persona, and their facial expressions seemed to indicate that this idea might offer them a new way of approaching different audiences.

I asked participants to volunteer a current project so that we could analyze the audience. Since there were no volunteers, we analyzed a current project of mine--a newsletter for attorneys. The group discussed the kinds of audience that would possibly receive the newsletter: individuals, corporations, other attorneys, and potential clients. We talked about picturing each of these groups as specific individuals, trying to analyze the types of information they needed, would want, and could use. Finally, participants determined how this group as the writers of this newsletter could best present the information to communicate our message to these audiences.

Techniques for Getting Started

Once an audience has been identified and analyzed, ideas need to be generated. While one of the participants said he just starts writing, most wanted or needed to start with something like a list or

an outline. I introduced free writing, a technique for "getting started" and for generating ideas. To get participants to try the technique, I proposed this situation as a free writing exercise: their employer gave them only 20 minutes for lunch, and they wanted to write a memo requesting a longer lunch time. Participants were asked to use free writing to generate their ideas.

The Organizing Pyramid

The next exercise was aimed at helping people quickly organize their ideas, particularly for a short memo or letter. Called the organizing pyramid, this method is based on development by order of importance. The triangle or pyramid is a visual, symbolizing what happens when writers put their most important point first. Writers then develop that point with specific ideas and close by telling the readers what action to take or what attitude to adopt. I also reviewed other types of organizational techniques such as chronology, sequence, comparison, general to specific, and specific to general. We discussed when these organizational techniques could be used effectively. Since order of importance is one of the more frequently used methods of development in technical and professional writing, participants were asked to use this technique to write a short memo to their supervisor, explaining why flex time would benefit their company. These memos were read aloud, and participants were asked to comment on their organization. One of the engineers commented that this might help him organize his often wordy letters, and the accountant commented that this technique might help her with closures to client letters.

Rewriting and Editing

After lunch we looked at rewriting and editing. Because collected writing samples showed participants had a tendency to slip into what is termed "the official style," I used a short session to point out humorously why this is not good writing. The official style, as defined by Richard Lanham in Revising Business Prose, is vague, usually verbose writing. It is writing characterized by passive verbs and strings of prepositional phrases (81). This type of writing also contains misused words and overused words, adding to the length of a piece but not to its meaning or clarity. Samples from a government organization were read aloud, and when participants heard how this type of writing sounded from the examples, they were far more sensitive to the problem in their own writing. Participants were then asked to complete two exercises. In the first exercise, stressing misused words and verbose phrases, they were asked to rewrite five sentences for clarity. In the second exercise, participants were given an actual paragraph from a TVA letter and asked to circle everything they would change. This exercise not only gave participants a chance to recognize the official style, but also to point out other writing problems that needed to be identified in the editing stage (i.e., misspelled words, verb agreement). The TVA employee found this exercise to be fun and beneficial, perhaps because the letter was written within her own organization.

The next exercise reviewed the most common grammatical problems in their writing: dangling modifiers, parallelism, pronoun agreement,

use of commas, use of colons, use of dashes, and comparisons. I briefly reviewed what each of these terms meant using the sheet in their workshop packet (see Appendix, Figure A4, page 125). Then participants were asked to identify problems in 20 sentences and correct them. Because of time limitations about one-half of these sentences were done as a group. As in any workshop, participants partly determined by their interests and needs how much time was spent on a given exercise, and the exercise on wordiness lasted longer than I anticipated. Also, because these individuals seemed to be struggling with this exercise, I believe this was more beneficial than letting them continue to struggle alone. Working together seemed to allow participants to feel more comfortable. Not having reviewed grammar for several years, many of them were having problems completing the exercise. But when the exercise was done together and when they could see that other participants were having problems as well, they could laugh at themselves. None of them could identify a dangling modifier either. However, the sentences did point out the importance of grammar in making writing clear to their audiences.

Readability as a Barometer

The last exercise was designed to show participants how long sentences and multisyllable words keep writing from being clear or from being read with understanding. Using the Flesch readability formula, participants were asked to rate their own writing samples--the ones used to prepare the workshop. The Flesch formula, developed by Rudolph Flesch, is only one of many guides for determining the readability of

a given writing sample. This particular formula uses sentence length and the number of syllables per word in a given sample to determine reading difficulty. I stressed that this exercise was not a final statement about the readability of their writing, but simply a barometer--an interesting way of looking at their writing. We discussed what the readability scale meant and what participants might learn from a readability sample. (See Appendix, Figure A5, page 127 for the readability chart used in this workshop.)

At the conclusion of the workshop, I reviewed the writing problems we had identified at the beginning of the workshops. We discussed how we had addressed each problem in at least a limited way, pointing out that a short session such as this one could offer no "cures," but could identify weaknesses and offer some possible solutions.

Workshop 2: Visual Teaching Techniques

This workshop proved to be as much a "real world" situation as the first workshop, since there were again last minute attendance changes. Instead of the six participants that had registered, I had seven. TVA sent someone without my knowledge. But this problem of "more or less" participants happens frequently when teaching adults in the workplace, since their jobs must come first.

Participants in the second workshop included Linda Senduala, personnel director with The University of Tennessee at Chattanooga, whose educational background is psychology; Mark Stevenson, a structural engineer with a local consulting firm Bennett and Pless; Nancy Ligon, director of the child care center at The University of Tennessee at

Chattanooga and a teacher in the Department of Education; Carolyn Gilliam, director of the Chattanooga Urban League; Robert Phillips, a metallurgical engineer with TVA; and John Long and Terry Ezell, both in the residential program with TVA.

As in the first workshop, I began by getting the group to share ideas and to discuss the kinds of writing they do. Although most of the participants normally wrote only two or three different types of communication, there were many types of writing named: memos, letters, proposals, technical reports, analysis of materials, grants, progress reports, and procedures. When discussing writing problems, we found that even though some of the initial writing samples were well-written, participants felt they had serious problems getting to that point. They had to rewrite many times. Nancy Ligon immediately volunteered that she had problems "getting started." She said that she wanted to reduce the time it takes her to write a letter or a memo. One of the TVA employees had difficulty picturing the different levels of audience. Like the two participants in the first workshop, he wrote correspondence for other people to sign. Robert Phillips, who analyzes various metal structures and reports on their safety, said he is often in the position of telling someone "you screwed up" in a nonoffensive way. He felt the need to make his message clear, so the problem wouldn't occur again, but he also had to continue to work with these people.

When participants listed audiences, they identified more specific individuals than in the first workshop: the dean, parents, staff, other engineers, faculty, program coordinators, the chancellor, various city organizations, contractors, architects, manufacturer's

representatives, funding sources (boards), and purchasing (which they jokingly referred to as "god"). With such a wide range of audiences, it was easy to talk about the traditional way of viewing audience and then move into my first visual technique--the egocentric organizational chart.

The Egocentric Organizational Chart

The egocentric organizational chart shows the relationship between the writers and their audiences, particularly in terms of the writers' proximity to their audiences. Using a base chart and a specific situation (Ms. Senduala's own work situation), participants defined the audience for a memo about changes in health insurance. We identified the audience as current participants, nonparticipants who might be interested in the program, dependents of covered participants, and insurance carriers. Using a different color marker for each audience, we located where on the chart each of these audiences would be in proximity to this writer and showed how his or her location would affect the message this writer was sending. Then participants classified the audiences as primary, secondary, or immediate. Participants were reminded that an audience could be an immediate audience and also a primary or secondary audience. The primary audiences are those who make decisions based on the information in a report or proposal. The secondary audiences are those who are affected by the decisions, and the immediate audiences are those who route this report. Participants also traced the possible route of the memo through the organization. Many participants were surprised to find that the memo did not follow

the normal hierarchical route. The memo would not necessarily go to Ms. Senduala's supervisor, then to her supervisor. The egocentric organizational chart showed participants that the determination of audience is extremely critical in any successful writing. (See Figure 16, page 75, for the Egocentric Organizational Chart.)

The Brainstorm Outline

The second visual technique was used in the creating stage and was one method for getting started. Using a technique called the brainstorm outline, I asked participants to imagine they were allowed only 20 minutes for lunch (Dumaine 24). They wanted to write a memo to their supervisor explaining why they needed more time for lunch. The brainstorm outline works like this: the writer focuses on a central idea written at the center of a circle. Like free writing or the graphic ideation of McKim discussed in Chapter II, momentum is important here for getting the ideas onto paper. As main ideas are generated, they are written on lines radiating from the center circle like spokes of a wheel, and secondary ideas are branched off from these main spokes. And while similar ideas should be grouped, the grouping can be changed later. Once the ideas are grouped, they can also be numbered to assign priority. (See Figure 17, page 76 for the brainstorm outline.)

The Organizing Matrix

The third visual technique was an organizing matrix, requiring participants to determine the relationships between their specific audiences and the organizing principles we had already discussed. The organizing principles included in the matrix were chronology,

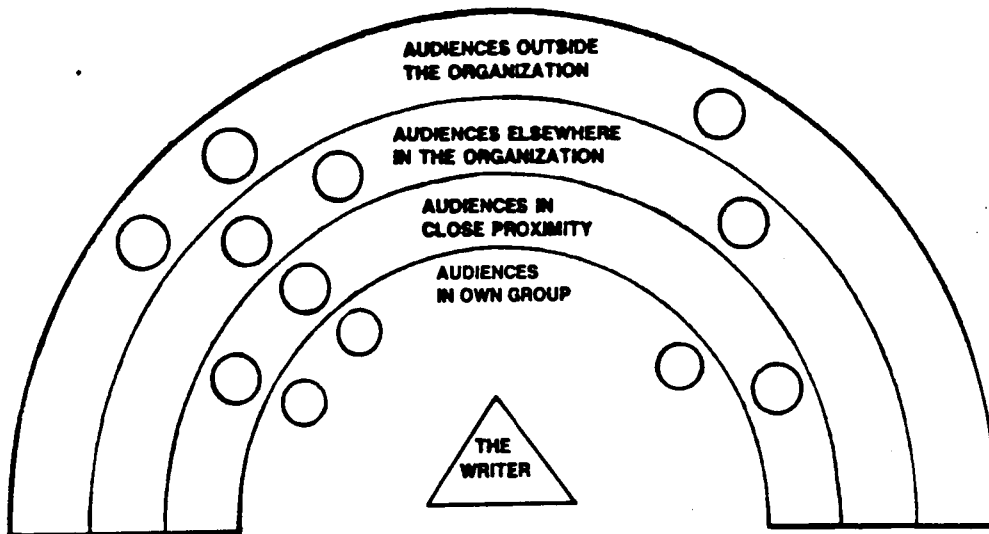


Figure 16. Egocentric Organizational Chart.

This chart shows the writers' relationships to their audiences within an organization.

Taken from J. C. Mathes and Dwight Stevenson, Designing Technical Reports: Writing for Audiences in Organizations (Indianapolis, IN: Bobbs-Merrill Educational Publishing, 1976): 17.

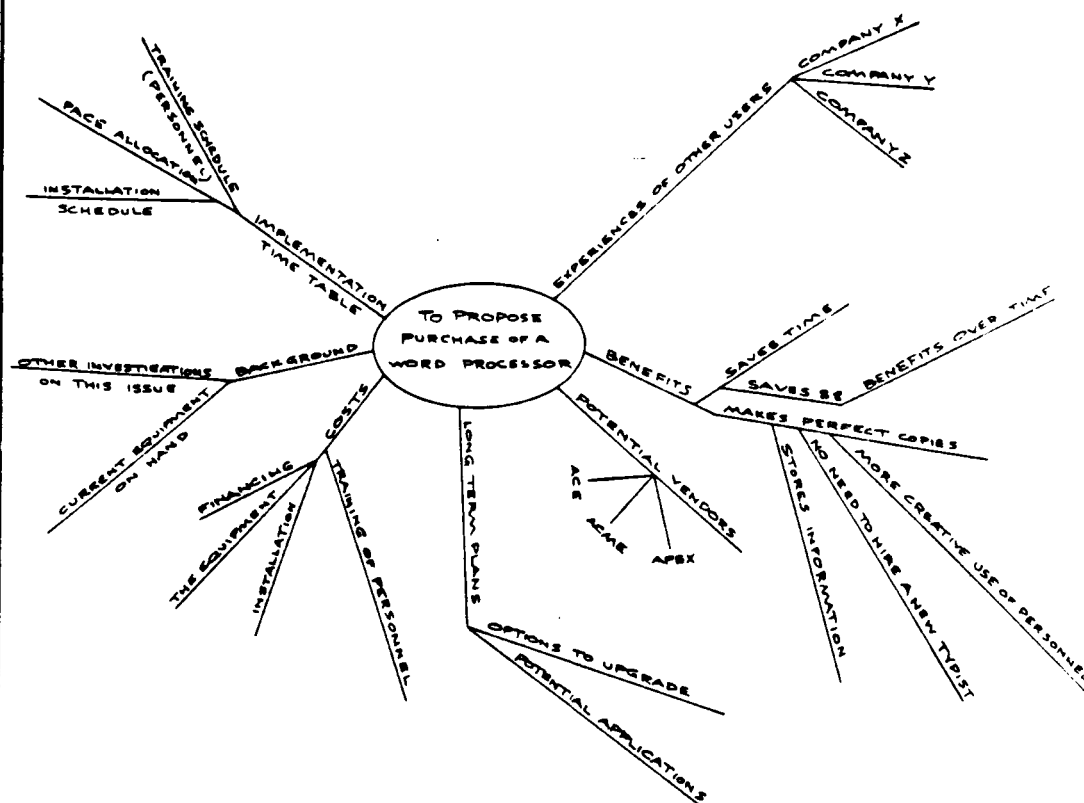


Figure 17. Brainstorm Outline.

The brainstorm outline is a creating technique that asks the writer to focus on his central goal, which is placed at the center of a circle. As main ideas are generated, they are written on lines radiating from the center circle like spokes of a wheel.

Taken from Deborah Dumaine, Write to the Top: Writing for Corporate Success (New York: Random House, 1983): 25.

sequence, general to specific, comparison, and order of importance. To complete the matrix, participants needed to fill in a purpose and an audience. This technique seemed to be difficult for participants to understand at first, perhaps because the matrix provides a very personalized assessment of audience and purpose in relation to the organizing technique for writing and in relation to an individual's specific job. The matrix required much thought and time to work effectively, and because it was nearly noon, participants seemed to want something they could complete in a hurry. However, the matrix's purpose and potential use seemed clear to participants when I used a specific example from our morning discussion and when I filled in the matrix on the flip chart. Participants told me during lunch that they realized the chart could be used not only to determine an organizational technique for the specific purposes of their writing, but also to determine what technique you would use with different audiences on a major proposal--since the purpose might be different with each audience. For example, most proposals address both primary audiences (those making the decision) and secondary audiences (those who carry out the decisions). This matrix would allow the writer to determine which organizing principle to use for the sections read by a specific primary audience and the principle to use for the sections read by secondary audiences. (See Figure 18, page 78 for the organizing matrix.)

Rewriting and Editing

The period after lunch was the same as that for the previous workshop. There was more participation by everyone in the session on

AUDIENCE ORGANIZING PRINCIPLE					
ORDER OF IMPORTANCE					
CHRONOLOGY					
COMPARISON					
GENERAL TO SPECIFIC SPECIFIC TO GENERAL					
SEQUENCE					

Figure 18. Organizing Matrix.

The organizing matrix helps determine the relationship between specific audiences, the purpose for writing, and the organizing principle.

eliminating jargon than in the morning sessions. Perhaps this was because at least two of the participants felt this was "their" problem. Again, they rewrote the sentences and circled the things they would change in the paragraph. Many of them went further with their editing, even cutting words and phrases that were unnecessary.

In reviewing their writing samples, I found that the session on grammar was needed by several participants. These participants were not deficient in grammar skills, but simply needed a review. Because we were short on time, we did the 20 sentences together as a group. This method also appeared to eliminate some individual fear about not being able to discover what was wrong in each case.

Readability

In the last segment, on readability, we again looked at the participants' own writing samples. Two of the TVA participants who had not given me samples rated a TVA memo which I provided for them. I wanted participants to use Flesch's formula, one of many methods for determining the reading ease of writing, as a barometer only. However, this is always an interesting exercise for participants. By rating someone else's memo, the TVA employees recognized some of the unclear phrasing that gave this piece a "difficult" rating. Other participants who scored their own writing seemed to have genuine concern that their writing had rated "fairly difficult." They expressed interest in more information about sentence length and flow. They wanted to know why long sentences create problems for the reader.

We ended the workshop by reviewing the writing problems we had identified in the morning and the methods for solving them. Again, I stressed to participants that this short workshop could only hope to identify the weaknesses in their writing. It was at best perhaps a diagnosis, not a cure. The workshops were not designed as models. Even though the second workshop employed what I believe are better teaching techniques, this second workshop was not intended to provide the model for teaching technical writing, but rather an opportunity to observe theory in practice.

CHAPTER IV

WORKSHOP RESULTS

Once the workshops were completed, I wanted to get as much feedback as possible about the verbal techniques I had used in both workshops and the visual techniques I had used in the second workshop. I felt that the easiest way to get the information was to use a personal interview questionnaire, talking with each participant individually approximately two weeks after the workshops.

As noted in the previous chapter, I also asked for writing samples prior to the workshop and another sample approximately two weeks after the workshops. I felt that the combination of writing samples and verbal comments would give me some information about the usefulness of specific teaching techniques. For example, if a participant's early writing sample indicated that he or she had difficulty organizing ideas, perhaps a later sample might show that this person had less of a problem once an organizing technique had been explained. However, a concept such as writing as a process could not be measured by samples. But verbal comments obtained from a questionnaire might tell me that thinking of writing as a process had alleviated some of their fears.

Realistically, I had not expected significant changes in writing samples, since I believe that significant changes occur only with writing practice, and a one-day seminar could not provide the

opportunity to write enough to bring about these changes. I did use the initial samples as a guide for preparing the workshops, and I used the final samples as a kind of barometer. Instead of significant change, I was looking for changes that would indicate a participant was aware of a problem and was attempting to correct it. For example, one participant, Mark Stevenson with Bennett and Pless, obviously tried to correct a problem with rambling, not getting to his main point. This problem was identified in his first writing sample, and his second sample had a note attached, asking if he had gotten to the point faster. (See Appendix, Figures A6 and A7, pages 128 and 130 for these samples.) Other factors also stood in the way of receiving "true samples." The TVA participants in particular were heavily edited by a supervisor, and despite my request for originals, they gave me samples reflecting this editing. As I expected, there were no dramatic changes in the writing samples. However, I was actually more interested in whether participants understood the techniques and the concepts and whether they applied them in the workplace. I felt that if they began applying the concepts and techniques to their writing, improvement would follow.

I did not have any expectations of the participants' answers, but I did hope they would be honest and was careful to phrase questions so that an answer would not rate me as an instructor. Instead, my questionnaire dealt with their feelings about writing, how they wrote the workshop exercises they found "helpful," and the techniques they felt they might use in the workplace. All of the comments in this chapter were taken from the interview questionnaire. (See Appendix, Figure A8, page 131 for a copy of the questionnaire.)

Workshop 1

Workshop 1 participants were interviewed during the week of July 5-July 10. Probably the most verbal participant in this workshop was Tom Miller, an engineer with March Adams and Associates. He has had very little training in writing and is perhaps typical of many engineers. He would rather rely on telephone conversations, computer calculations, or drawings than on written communication.

Communicating Through Writing

Mr. Miller does see the necessity of writing, but admitted that it is his "least frequent way of communicating." He said, "If I can't get a guy on the phone, then I'll write what I was going to say to him." Mr. Miller's views were, in fact, shared by the other three participants in this workshop. Susan Murphey, an accountant with James and Company, said she would rather telephone clients. She said she felt that she could accomplish more with a telephone conversation because clients ask questions when they don't understand. The other participants said the questioner's choice of words about writing attitude--dread--was perhaps harsh, but neither enjoyed writing, admitting they both wrote primarily because it was sometimes required on their jobs.

Picturing the Audience

All four participants thought about audience to some degree, but none of them felt an awareness of audience to be as important as the message, although the concept of focusing on the audience was specifically taught in the workshops to be equally important. Eddie Long, an

engineer with Bennett and Pless, said he had never thought of the clients he writes letters to as an audience; he just "thought of them as clients." He said he only pictures the audience as individuals if he knows them personally. Rita Trimble, a TVA marketing representative primarily concerned with low income programs, said she doesn't think of her audience as individuals, but when the audience is a group, she does "try to find the things they have in common."

Getting Started

Finding a way to start or to collect ideas did not seem to be a problem with any of these participants. However, Tom Miller admitted that before the workshop he simply "sat down and starting writing." But since the workshop he has tried using free writing. Other participants had already used techniques such as list-making or outlining prior to the workshop and told me they would continue to use them.

Putting Shape or Logic into Writing

Only one of the participants used a specific technique (such as the organizing pyramid) to put shape or logic into writing. Most said they tried to think about the message they wanted their audience to receive, but the normal "technique" was "put it down and change it." In other words, participants did a lot of rewriting. Several participants were aware that their audience might have a limited attention span because they knew their audience was busy. These participants said they try to put the important point at the beginning of the letter or report. In fact, Rita Trimble said she numbers her ideas before

she starts writing and then tries to form paragraphs of those ideas, putting the most important point first.

Communicating Through Language

When asked if they used a different kind of language with different people (i.e., boss and peers), two of the participants said they use the same language with everyone. Tom Miller said he worried more about using "proper English" with particular clients, but he felt his peers were less likely to be offended by incorrect grammar. Rita Trimble, who often composes letters for her superior to sign, said she tries to copy their style. She also pointed out a painful reality about trying to improve your writing style within a large organization: sometimes you are still required to "do it the TVA way."

Defining Good Writing

When participants were asked to define good writing and to identify the most important aspect of writing, all of them responded with some version of "getting the point across." Eddie Long said that he thought good writing was easy to understand and that the most important quality of writing was "clearly communicating your ideas." Interestingly enough, Tom Miller said he could detect good writing by the way it sounded, but he also admitted he relies heavily on the opinion of co-workers with his own writing, often asking them to read something before he sends it out.

Evaluating Specific Workshop Exercises

When asked to rate the most helpful workshop exercises and the least helpful workshop exercises, participants' answers seem to vary according to the specific weaknesses of the individual. Tom Miller found free writing to be the most helpful exercise because it "helped him get his ideas down." He liked being able to circle the ideas he wanted to use. I suspect he also preferred this exercise because it is close to the method he was already using to "get started"--just picking up the pen and starting to write. Since Mr. Miller was comfortable writing sentences and paragraphs, he liked free writing. This technique provided a more organized method than "just writing." This technique not only focused his ideas, but allowed him to develop some of them. He felt the exercises on grammar were the least helpful, although his samples showed grammar as an obvious weakness. He explained that he was too far removed from school to understand even some of the simplest elements. He felt, in fact, that he could use an entire refresher course on grammar alone.

Eddie Long felt that the organizing pyramid was the most helpful because he could apply this technique immediately. He also said the session on grammar was the least helpful. But Mr. Long said he is not really concerned with grammar, since he relies on a secretary to check this part of his writing.

Rita Trimble felt that the exercises on eliminating jargon and on grammar were the most helpful "because those are things you forget."

She felt that the least helpful exercise was free writing because "I couldn't do that in the office. It is not a technique I would use."

Susan Murphey also felt that the most helpful exercises were those on jargon. She said this was new information to her, and already she had begun to identify phrases she was using in her writing--phrases that are wordy and do not add meaning. She gave as an example the phrase "as you are aware." She said she had started a letter with that phrase a few days before this interview and immediately changed it. She commented that the hackneyed phrase was immediately obvious to her. Free writing was the least helpful exercise to Ms. Murphey. She said she did not feel this exercise would work for her "because I don't think in sentences."

All of the participants seemed to evaluate the techniques by one criteria--whether or not they could apply those techniques directly to their jobs. Effectiveness was translated in every case to mean applicability.

Assessing the Impact

The negative aspects of a one-day workshop have already been discussed in Chapter I. It is difficult to predict if participants will use concepts they are taught in a short workshop if they have little directed opportunity to try them. Most instructors agree that learning to write requires writing practice. Two of the participants, however, said they were now thinking more about their writing and were making a conscious effort to improve it. It is certainly likely that these participants will continue to try to make improvements in their

writing since all of the participants understood the importance of writing in their jobs and since they voluntarily attended the workshop. One participant said he even planned to attend another writing workshop.

The writing samples from these participants indicated some improvement with one or two individuals, but it seemed that the improvement was as much a result of individual motivation as it was an application of concepts learned in a short workshop. The majority of the participants did not see applications for the exercises in the workplace. Some said free writing was an interesting way to develop ideas, but few of them would allow the time for the technique to work. Perhaps the organizing pyramid was more applicable--something participants could use as model and copy. Yet this was a technique named by only one individual as being the most useful. The exercises named most frequently were those involving editing, an indication that most participants seem to view writing as primarily a rewriting exercise.

I concluded from this feedback that more emphasis must be put on concepts. While rewriting is certainly a significant part of writing, the planning or prewriting stages are just as critical, and traditional or verbal concepts for teaching audience or organizing are apparently not retained.

Workshop 2

Participants in second workshop, who were interviewed between July 10 and July 13, seemed to be more talkative. Participation in this workshop was greater, as was the feedback.

Communicating Through Writing

During the workshop it became apparent that on the whole this group had a slightly more positive attitude about writing than the previous group. In fact, two of the participants said they enjoyed writing as a method of communication. The TVA employees, however, seemed to be more cautious about their writing. They told me that their writing is edited and reviewed by several people, a practice that is not uncommon in large organizations. One TVA employee said in the followup interview that he didn't dread writing, but he was "uncomfortable about the politics involved." Apparently, his writing goes through several edits, and the changes he is asked to make often conflict. Another participant pointed out that writing has "become a necessary part of the workplace, and I have to do it often."

Picturing the Audience

Participants gave a variety of answers about picturing their audience. Two of the three TVA employees said they thought about the audience sometimes, but often they wrote to someone they didn't know. Therefore, they concentrated on the message. Mark Stevenson, an engineer with Bennett and Pless, said he thought about audience before the workshop, but not in as much detail as he has since the workshop. He said, for example, he always gave a contractor more background information about a project than he did an architect, but now he admitted he had a better understanding of the relationships among audience, purpose, and message. He said he now understands why it is more important to give that contractor more details.

Like some of the others, Carolyn Gilliam with the Chattanooga Urban League had always focused on her purpose prior to the workshop. However, "since I was at the workshop I think more about audience," she said. Both University of Tennessee at Chattanooga employees, Nancy Ligon and Linda Senduala, said they always thought about audience-- at least in terms of characteristics such as education and position.

Getting Started

Most of the participants got their ideas or assignments from the job tasks at hand. When the time came to put those ideas down, Carolyn Gilliam says she just let the ideas "run off the top of my head." She found a specific workshop technique, the brainstorm outline, very helpful and has already used this exercise in her writing. Linda Senduala used a type of free writing called looping that she learned in another writing workshop. The primary difference between looping and the free writing taught in the first workshop is that looping requires each free write to focus on a main point. This means that writers are both generating ideas and developing those ideas.

Mark Stevenson's ideas came from research. He was already using his own version of brainstorming--a listing technique where he put his ideas down and then numbered them in order of importance. Robert Phillips, a metallurgical engineer with TVA, also does a lot of research prior to writing. He said he had no technique for getting started before the workshop, but he had begun trying the brainstorm outline. John Long always tried to think about the most important point before he started writing, but the only way he arrived at any logic using

this method was by numerous rewritings. He said he has definitely begun to think about audience more and methods of organizing, but he had not had the opportunity to try any workshop techniques.

Putting Shape or Logic into Your Writing

Mr. Long was not the only TVA employee to put shape and logic into writing by "writing and rewriting." Terry Ezell also reads, edits, and rewrites several times. Mr. Phillips said he just uses chronology because it is "the TVA way." Linda Senduala, whose undergraduate training is in broadcast journalism, said she still uses the inverted pyramid style, putting the most important point first and the least important last. Ms. Gilliam uses what might be termed the reporter's formula (who, what, why, when, where and how) for gathering or generating information and assuring herself all the information is there.

Only one participant, Nancy Ligon, checked her writing in the final stage to determine its effectiveness for the audience. She said she looks at what she has written and makes sure that the first thing said is what the audience wants to hear. Ms. Ligon then gives the audience the facts or the background information, her own conclusions, and finally, summarizes what has been said. This is perhaps similar to the "tell them, and then tell them again" technique learned in high school public speaking.

Communicating Through Language

Five of the seven participants in this workshop said that they were aware of the language they use when writing to different individuals. One of the most interesting answers on how participants used

language came from Linda Senduala. She said she used "buzz words," defending this technique by saying it was necessary because of her audiences' various educational backgrounds. She stressed that they all want to hear "the language they know."

Most participants consciously used different language for an audience outside their organization or for people who they think have a different educational level. They wanted people to understand what they were saying and, therefore, tried to be conscious of their language. One TVA employee who rarely writes outside the organization said that in TVA the language never changes.

Evaluating Good Writing

When evaluating other people's writing, Carolyn Gilliam thought it is most important to understand what she's reading the first time she reads it. She felt that this was good writing. Clarity was important to all of the seven participants, though several of them phrased their answers differently:

Drawing a definite conclusion is the most important thing in writing.

Getting the point across effectively.

I want something (writing) that will make me visualize what they are saying.

Evaluating Workshop Exercises

Four participants found the organizational matrix the most helpful exercise in the workshop. Nancy Ligon said that the organizational matrix is the technique she will probably use the most. Once

I began making an analogy by using a hypothetical case of my own, Ms. Ligon understood how to use the matrix. She said the matrix helped her "understand relationships she hadn't seen before." Linda Senduala said she believes the matrix will help her "get organized," making her "look at what she's trying to accomplish," and helping her "target her material without unnecessary verbiage." Mark Stevenson thought the matrix would save him time once it was complete with all of his possible audiences and purposes. John Long believed the matrix would make him "think more about his focus and his audience."

The other three participants named the brainstorm outline as the most helpful. One participant also found the egocentric organizational chart, which dealt with the writers' relationships or proximities to their audiences, extremely helpful. Carolyn Gilliam said the egocentric chart "opened her mind totally." She said she has never thought about audience in terms of their relationship to her as a writer. Robert Williams called the brainstorm outline a "macrovision of what was happening," and Terry Ezell says the outline gave him a "picture of what you are doing" (when you write).

The participants in the second workshop indicated they felt all the techniques used were good, but one participant said he is not sure he could apply the egocentric organizational chart to TVA. Two participants needed clarification of the matrix, and one needed a clarification on the egocentric organizational chart. After this student completed the interview, I provided a two-minute clarification on the latter technique. This further explanation seemed to allow him to make the connections necessary to use the chart effectively.

Assessing the Impact

Several people suggested that one day is not enough time to cover thoroughly all the material I attempted to present. I explained both at the beginning of the workshop and the end of the workshop that I did not expect them to be able to write differently in one day. The workshop was at best, I explained, an attempt to help them identify their individual weaknesses and to give them some techniques to practice and use in the workplace. I stressed that only through practice could they become more effective writers.

I found the majority of the participants in this workshop extremely enthusiastic, and not just during the workshop. These participants were enthusiastic about the materials. They were eager to discuss concepts in relation to their workplace, and they were eager to apply the concepts themselves. They were somewhat less enthusiastic about the afternoon sessions, but again it is difficult to determine if this was because traditional or verbal techniques and exercises were used, or because they were simply tired. Nancy Ligon said affirmatively that she will use much of the workshop. She said she will certainly use the matrix, and "I will buy the book you recommended" (on overused and abused words).

I do believe, however, that one advantage of the visual techniques is that they are easily used and comprehended and therefore easily adapted to the workplace. Like a type of shorthand, visual techniques show multiple relationships. By using the egocentric organizational chart I was able to discuss not only the writer's relationship

to those in his audience, but also the sometimes indirect route his writing would follow. The chart also showed the necessity of writing reports and proposals at different levels, since the writing will obviously be read by both primary audiences (decision makers), and secondary audiences (those who will carry out the decision).

It is significant that in the evaluation by participants in the second workshop, the techniques and exercises named as the most useful were the visual techniques. In the first workshop, jargon exercises and grammar exercises were named.

Analysis of Samples

My analysis of individual samples did not show a great deal of difference in the writing samples taken before the workshop and those taken after the workshop. Unfortunately, participants were not as prompt or diligent about providing the "after" workshop samples. (The "before" sample was required for admission.) It has been my experience, however, that this situation is typical of a normal workshop.

It was also clear that some samples, particularly those submitted by TVA participants, had been edited prior to my receiving them. The one change that was obvious was in the writing samples submitted by one of the engineers: there was an attempt to put the most important point first.

As with any analysis, few conclusions can be drawn based on a limited sample. I believe that to draw meaningful conclusions from writing samples would require many more samples, samples that had not been edited, and samples that had been written over a longer period of time.

Even then, I am not sure conclusions could be validated, since evaluation of the sample content is subjective. So much of the process of technical writing occurs outside the final product that it is, at best, very difficult to tell if new techniques are being applied simply from samples.

Observation of the "Real World" Situation

There are a great number of variables to be considered in any workshop situation--even workshops such as these which were primarily set up to observe the use of visual techniques in teaching technical writing. Even the personalities of the participants can change the atmosphere of a particular workshop and its effectiveness. For example, only one participant in the first workshop volunteered information. The others seemed slightly reluctant to voice opinions or give information. I believe the participants in the second workshop were a particularly congenial group (and two of the participants knew each other), sharing ideas more readily than the first group. However, I also believe part of their enthusiasm was for the material. Otherwise, their enthusiasm would have faded rapidly (as I've experienced in other workshops) during the latter part of the workshop.

I believe that there was simply more happening at the second workshop. The discussion was not "this is interesting," which was the general attitude in the first workshop. Instead, the discussions focused on how the exercises related to their job situations. For example, once the egocentric organizational chart was explained, everyone seemed eager to apply the chart to his own organization.

The same was true of the matrix. Once the matrix was explained, participants immediately began asking questions about how their own audiences and purposes could fit into the matrix. One participant discovered she could even use it on a more limited basis with a large report she was writing that had several audiences. There seemed to be better acceptance of these visual techniques used in the morning sessions of the second workshop, both initially and during the discussions.

During the questionnaire interview, the second group was markedly more responsive. They seemed to remember the visual techniques and the exercises more readily, and their comments included words like "picture" and "see." All of their comments (except for one comment on the exercises on jargon) were directed at the visual techniques in the second workshop. The visual techniques seemed to stand up to the applicability test far more easily than the traditional, more verbal, techniques did. Most participants in the second workshop were using at least one technique regularly in their work.

CHAPTER V

USE OF VISUAL TECHNIQUES FOR
TEACHING TECHNICAL WRITING
TO PROFESSIONALS

Many different types of visuals are currently being used to teach technical writing, as explained in Chapter II. Both textbooks and instructors often use simple diagrams or photographs to capture participants' interest, or they show copies of manuscripts as examples.

Some of these visuals, such as the use of an overhead projector to compare examples of participants' work, are very effective as reinforcement for a concept that has already been learned. Initially, however, only the people who understand the concept benefit from the reinforcement. With this type of visual no learning occurs; the people who know the answers participate in giving them. Those who merely sense that one sentence sounds better than another one do not usually learn concepts from this type of exercise. Participants who have not learned the principles being taught are not likely to be able to apply them again to a different situation. However, properly designed visual techniques provide the workshop participants with the kind of information they need to make analogies and to begin to understand further applications of the principle involved.

Reasons to Use Visual Techniques

Not all visuals are useful in teaching technical writing. How, then, do we determine which visuals will work, and how do we design those visuals? Arnheim believes that "visual education must be based on the premise that every picture is a statement. The picture does not present the object itself, but a set of propositions about the object" (308). Visuals that are only illustrations are not effective in teaching or learning because they do not make analogies for learners, and thereby, they do not equip the individual to deal with a similar circumstance. Useful visuals or visual techniques structure participatory analogies for learners.

Visual Techniques Aid Memory

The June workshops (discussed in Chapters III and IV) provided an opportunity to observe the application of visual techniques in a "real world" situation. The frequency of discussion about the visual techniques in the post-workshop interviews indicated that those techniques were remembered easily. In fact, while some of the participants could not name a technique as being the most helpful, they still recalled its substance as "the one about audience or the one with the matrix." They remembered the technique by the relationship or movement that was pictured. Carolyn Gilliam, when talking about the brainstorm outline, never named the visual technique, but rather talked about "that thing with the circle in the middle and the ideas coming out from it like a wheel." She liked this technique because she could "picture

it in her mind"--and perhaps begin to picture her letter or report. Only in interviews after the second workshop did participants use the word see. In fact, as noted earlier, three out of four participants in the first workshop never mentioned the writing concepts that were taught. They noted that the most useful parts of the workshop for them were the exercises on jargon and on grammar. Perhaps this failure to mention writing concepts was because they could not remember the traditional teaching techniques that taught audience or organization.

B. Y. Auger of 3M's Visual Products Division said in an IEEE Transactions on Professional Communications article that we remember only 10 percent of what we hear, but if good visuals are used, that figure jumps to 50 percent. Auger was talking primarily about making presentations, not about teaching. However, when teaching adults, instructors use techniques similar to those of a presentation. Like Arnheim, Auger argued against "just showing pretty pictures to dress up a presentation." His fear was not just that these visuals are a waste of time, but that they may be interpreted incorrectly. He said, "Good visuals channel thinking, show comparisons, and show relationships" (124).

Visuals or Images Are Necessary for Understanding

Because applying symbols involves the visual and verbal abilities, both are necessary for communication. Without visuals, true understanding cannot occur according to Koestler, who believes that the visual analogies are the key ingredient to applying knowledge to new

situations. Visuals (and especially visual techniques which are at one sign, picture, and symbol) help us to make those analogies.

Traffic signs are an excellent example. No matter how many you see, the warning sign that simply has a curved arrow in the middle is difficult to interpret unless you are already familiar with the concept it represents. However, if a skidding car is added to this sign, it takes on new meaning. Almost anyone will make a visual analogy and understand the potential danger the sign represents.

Visuals Are Easier to Apply to the Workplace

While adult learners are more highly motivated, they also require a certain relevance to their particular careers and fairly immediate applicability to their work environments. Thus the instructor must find teaching techniques that not only allow adult learners to grasp major concepts, but also allow them to apply these concepts immediately to their writing. These learners do not want a book of principles they must constantly refer to. They expect methods that are practical and direct. In short, they expect a course that addresses their daily writing problems and needs. In their post-workshop interviews, all of the participants in both workshops talked about techniques and exercises they could use in their workplace, and they discarded those they could not use.

Technical writing courses will not be effective if cluttered with irrelevant or tedious exercises or lectures. Courses in which participants do not see the connection between the writing they do in their jobs and what the instructor is asking them to do will not be

successful. Properly designed visuals are one way to provide this applicability.

Criteria for Design and Use

The best advice to give an instructor designing visual techniques to be used in a technical writing workshop would be use visuals that are more than mere graphics. Only by using visuals that are signs, pictures, and symbols can instructors provide professionals with the proper tools.

Because the words or situations change, visuals that have direct application to the workplace must have several characteristics in common: they interpret significant features of the concept, they state relevant propositions about the concept, they are easy to understand and use, and they focus on function.

Interpret Relevant Features

Arnheim has forcefully argued for visuals that are more than just signs or graphics. He feels in order to be of value, a visual needs to interpret the relevant features of the concept (308). For instance, if the visual is being used to illustrate writing as a process, then it must picture all writing as a process of separate steps. If an example is used, then it must also include general terminology to enable the participant to apply the visual to another similar situation. If the visual works, it is easy to apply to other writing situations that may not have been discussed in the class or workshop.

State Relevant Propositions

Arnheim also stressed that good visuals are based on a set of propositions (309). In other words, a good visual also clarifies key relationships or makes connections that help learners understand the concept. A good visual for teaching writing as a process would show that the writing process is recursive, that each stage in the writing process is connected to another stage, and that often the stages will not be completed in sequence.

The flow chart designed by Dr. Michael Keene, showing writing as a process (discussed in Chapter II), is an example of a visual that does state these relevant propositions. This flow chart shows that writing has at least six distinct stages: gathering data, planning, writing, reflecting, revising and submitting. The flow chart not only connects the stages, showing how the writing process progresses, but the chart also shows that the writing process is recursive. The flow chart shows that the writers must sometimes go back and gather additional data even after they have begun writing. Or once they have reflected on what has been written, they may decide the message is inaccurate.

Show Meaning Easily

It is also critical that a good visual or visual technique be easy to understand. Studies have shown that unless people have the same background--the same education, similar experiences--they do not always understand a concept the same way. For example, primitive African natives shown photographs have been unable to understand what the

photographs were about, but simply looked at them as flat objects (Arnheim 309). Therefore, in designing visual techniques it is important that the instructor know something about the workshop participants. A visual technique cannot be effective unless it is meaningful and applicable to these participants. For example, because engineers already understand certain concepts, a flow chart describing a technical process would be easier for them to understand and use than it would be for accountants, although both groups are highly educated.

It is also important that a visual be fairly simple. If a visual technique is too complicated, professionals will not take the time to understand it or use it--no matter how well it depicts a given concept. A visual technique must be something workshop participants can grasp quickly.

Focus on Function

Arnheim has praised the inventor and artist Leonardo da Vinci because of his ability to draw analogies and parallels. This ability allowed him to see the functional value of many objects (313). Possibly this insight is what enabled him to invent so many devices. If instructors design visual techniques that focus on function, these techniques will not only help participants understand concepts, but also help them to apply those concepts to their writing in the workplace.

Also, if the instructor's approach to teaching a visual technique is verbal, it is unlikely that the technique will be effective. When teaching using visual techniques, instructors must demonstrate

rather than explain how the technique functions and how it will work for participants. For example, in Workshop 2 participants were able to understand the function of the writer in relation to the audience by using the egocentric organizational chart. But part of the reason this visual technique worked so well was that the technique was taught as a participative process, using one individual's personal situation. Starting with just the graphics of the chart, Linda Senduala, personnel director at UTC, was asked to identify her audiences for a given report or proposal. Once she had named these individuals, they were put into the diagram, showing how they related to the writer, Ms. Senduala. Then, using different colored markers for each type of audience, the participants categorized each audience as primary, secondary, or immediate. At still another level, a different marker was used to draw a dotted line to show the possible route of the report, showing that a report might not always follow a hierarchical route through an organization. This teaching method of allowing participants to fill in a pattern allows participants to place themselves in the picture.

Examples of Visual Techniques

The second workshop used three visual techniques borrowed and adapted from various texts. These techniques were successful in teaching several basic technical writing concepts. All three techniques also complied with the criteria discussed earlier; they interpreted relevant features, they stated relevant propositions, they were easy to understand and use, and they focused on function.

The Egocentric Organizational Chart

The Egocentric Organizational Chart was borrowed from Mathes and Stevenson's text Designing Technical Reports. Because audience is a basic and critical concept to any writing, but particularly to technical writing, this concept seemed to be especially important to teaching visual techniques. Actually, although their text addresses engineers, it is subtitled Writing for Audiences in Organizations. All of the people in my workshops must write for audiences in organizations. This chart seemed to be an excellent way to teach the importance of defining the audience and their needs early in the writing process. (See Figure 16, page 75.)

The Egocentric Chart interprets relevant features of audience, allowing participants to see their audience as a sequence of destinations for written communications not necessarily related to the sequence of power in the organization. Participants look at audiences in terms of their proximity to the writer, and the chart becomes very personal. Mathes and Stevenson pointed out that the chart's ultimate effectiveness is that writers see themselves from a functional rather than hierarchical perspective (16).

The chart is easy to use and easy to understand, partly because the chart is so personal. Participants must fill in the information about their own organization and about their own particular writing assignment. It is also graphically simple, using half circles and a triangle. This makes the chart easy for participants to draw themselves and to use later in their workplace. Because of the way

different audiences are grouped within the half circles, it is also easy to understand what is meant by an audience in close proximity to the writer or an audience outside the organization.

The method used to demonstrate this visual technique for use in the workplace was discussed earlier. But the visual itself also expressed function. Participants looked at this chart and located themselves in relation to their audiences. They could see that one audience was concerned with budgetary matters, another with research, and still another with production. They could understand, as well, the role they must play in writing this report or proposal--their critical input to the decision making process and to the carrying out of decisions within the organization.

Brainstorm Outline

The brainstorm outline was borrowed from Writing to the Top, a book by Deborah Dumaine for professionals who must write in their jobs. Dumaine puts the outline in the "getting started" section of her book. The technique is graphically very simple, and its simplicity clarifies the relevant features of this concept to generate ideas, to catalog ideas in ways that prove your point, and to focus on that main point. Graphically this technique shows that all of our ideas must serve our main point or goal. It shows writers that while there may be many secondary ideas, these ideas will all branch off from the main point. Because it requires only a few minutes of quiet concentration and only minimal writing, it is easy to use, even in the workplace. (See Figure 17, page 76.)

The Organizing Matrix

Because a matrix is an easy way to understand complex relationships, this form was used to design a visual technique that taught the concept of organizing ideas in technical writing. The relevant feature of this visual technique is that it shows that audience and purpose are interrelated with the organizing principle. Basically, the visual technique shows three things: (1) there are many ways to organize writing, (2) audience and purpose are equally important in technical writing, and (3) the most effective organizing principle is based on the writer's role, their relationship to the audience, the needs of the audience, and the purpose.

Because the matrix is fill-in-the-blanks and because it is a chart, it is easy for most professionals to understand. The chart is personalized because it depends upon the writers' role, their various audiences, and their purposes for writing. The matrix can be used with long reports that have multiple audiences to help writers focus correctly on each section, or the matrix can be used over a period of time, allowing the writer to look at the chart and determine what organizational principle to use for the same audience and the same purpose. The matrix is functional because it requires little writing, and it can be used over and over again with minor changes. (See Figure 18, page 78.)

Suggestions for the Design of a Visually Based Workshop

While I believe that visual techniques could be used as the basis for an entire 10-week or 12-week workshop, I will focus in this section on a visual technique for teaching technical writing as a process within a limited time frame. This technique shows writers the various technical and rhetorical stages of this type of writing and its recursive patterns. (See Figures 19, 20, and 21 on pages 110, 111, and 112.)

Like writing, any visual techniques should be adapted to a particular audience. This particular technique would be used for an audience of TVA engineers. This limitation does not mean that the same technique could not be used for other workshops, but rather that if the audiences' needs change, the technique should change accordingly. To show complex relationships, I have attempted to use simple graphics, such as circles and arrows. I believe that by keeping the pictorial portion of the visual simple, instructors allow participants to focus on relationships and movement. It is particularly important with this concept because technical writing, as other writing, is recursive.

It is also important that visual techniques be built in stages, allowing participants to fill in the patterns. Once they begin making analogies and connections, they can make a visual technique very personal. If this visual technique were taken a step further, participants might use a past writing project to see how it would fit in the various stages.

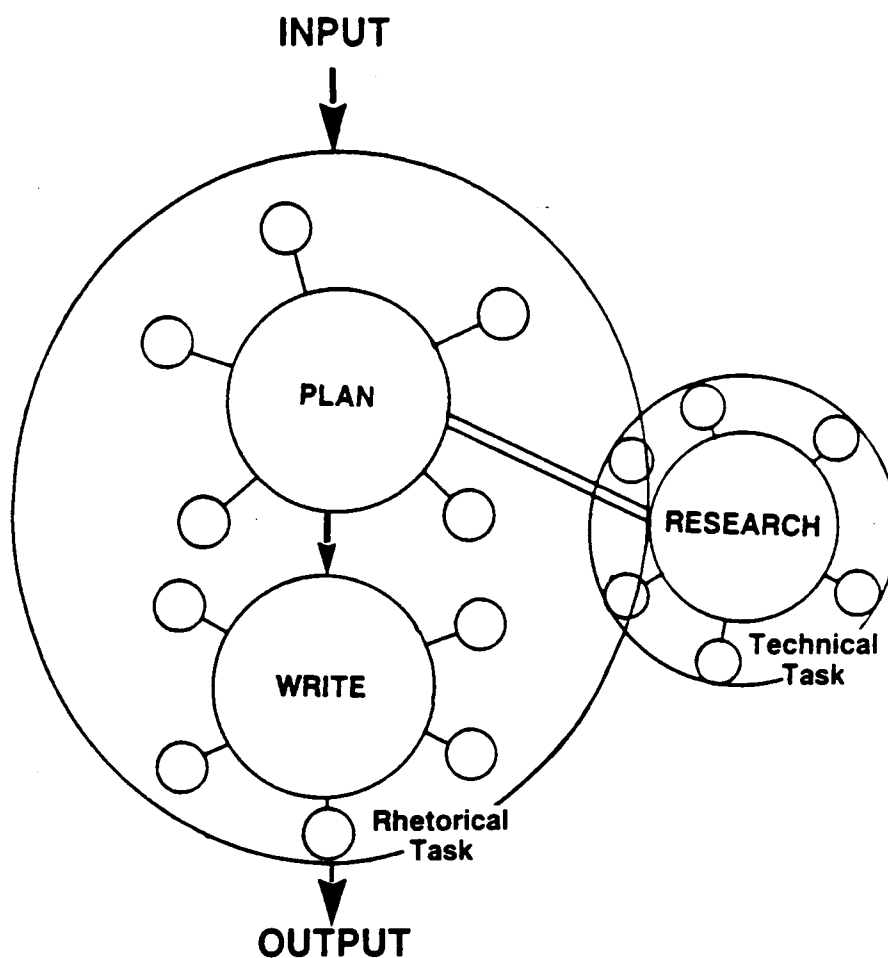


Figure 19. Rhetorical and Technical Tasks of Writing.

This is the first stage of a visual showing technical writing as a process. Stage one shows writers the two separate tasks to be accomplished: technical and rhetorical.

Adapted from J. C. Mathes and Dwight Stevenson, Designing Technical Reports: Writing for Audiences in Organizations (Indianapolis, IN: Bobbs-Merrill Education Publishing, 1976): 31.

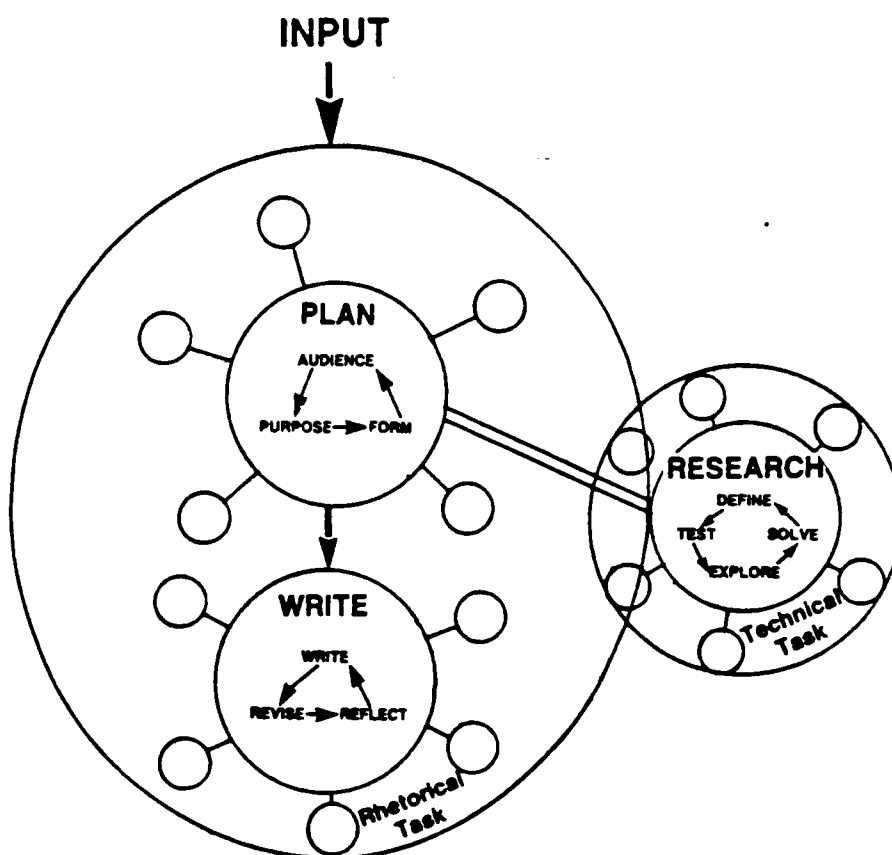


Figure 20. The "Inner" Recursive Stages of Writing.

The second stage of the visual shows writers that writing is divided into plan, research, and write and that each of those stages has a recursive process.

Adapted from Paul W. Jones, and revised by Michael Keene, Reporting Technical Information, 5th ed. (Dubuque, IA: Wm. C. Brown Company Publishers, 1981): 22.

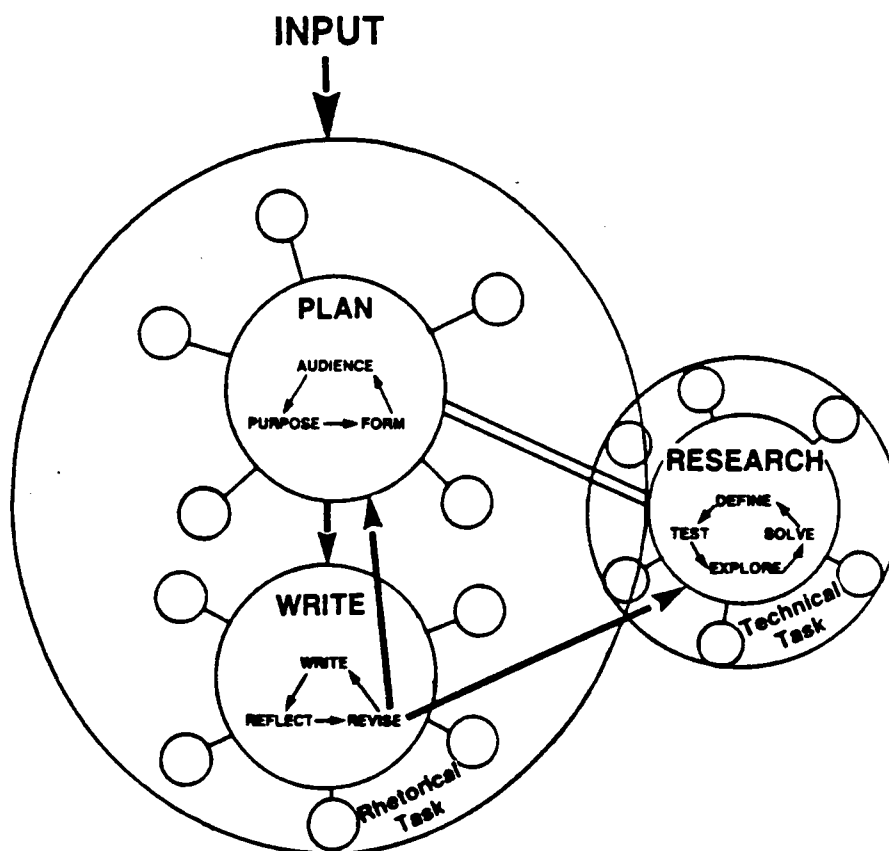


Figure 21. The "Outer" Recursive Stages of Writing.

This stage of the visual shows that writing is recursive at every point and that even though the writer has written a first draft, poor audience analysis may make the writer go back to the planning stage.

Adapted from Paul W. Jones, and revised by Michael Keene, Reporting Technical Information, 5th ed. (Dubuque, IA: Wm. C. Brown Company Publishers, 1981): 22.

The Implications

Short Term

1. What we know about visualization and the use of visual techniques in teaching suggests that they may be more effective in teaching technical writing than traditional methods because they aid in memory. As Gazzaniga and LeDoux have said, verbal recall is better when there is a visual image.

2. Visual techniques may also be more effective because they tend to fill in a pattern visually and are therefore participative.

3. Visual techniques may be more effective as learning tools because our culture is now oriented to visuals. What we must keep in mind here, however, is that not every visual is a good visual technique, but nevertheless, there are some positive culture biases toward information that is presented visually.

4. Since visual techniques tend to provide structures instead of specific words, they seem to be easier to apply and allow more latitude in the workplace than traditional techniques. A graphic technique such as the brainstorm outline imposes a structure and implies relationships.

Long Term

1. It is clear that everyone thinks visually at one time or another. I believe that visual techniques allow people to be more creative. Koestler says the only way to be creative is through visual techniques such as analogies or matrices. This concept explains why

when we put our brain into neutral and go for that long walk, we sometimes have our most creative ideas. By tapping our creativity, we may be tapping new abilities.

2. Because visual techniques are easy to use, they become "rules of thumb." Instructors may be able to accomplish a comprehensive overhaul of an individual's writing in less time and actually have it make long-term differences in their writing.

3. By using visual techniques, we may accomplish our goal of changing the professionals' attitude toward writing and changing their performance.

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APPENDIX

EVALUATION FORM OF THE TENNESSEE VALLEY AUTHORITY

Please complete this form and return it to 410 CST2-C. (We would appreciate you answering the questions completely and frankly).

Name of class _____ Name of instructor _____

Your division _____ Your schedule and grade _____

1. How do you feel about this class with regard to:

	<u>Very Satisfied</u>	<u>Somewhat Satisfied</u>	<u>Neutral</u>	<u>Somewhat Dissatisfied</u>	<u>Very Dissatisfied</u>
a. Knowledge of subject gained.	_____	_____	_____	_____	_____
b. Adequacy of visual aids	_____	_____	_____	_____	_____
c. Adequacy of learning guide	_____	_____	_____	_____	_____
d. Opportunity for discussion	_____	_____	_____	_____	_____
e. Practical value (for application on job)	_____	_____	_____	_____	_____
f. Effectiveness of presentation format	_____	_____	_____	_____	_____

Mention any expected difficulties in applying to the job.

2. By circling one number, rate your overall reaction to the:

a. Instructor: 10 9 8 7 6 5 4 3 2 1
 Excellent Good Average Fair Poor

b. Program Content: 10 9 8 7 6 5 4 3 2 1
 Excellent Good Average Fair Poor

3. What additional clarification would you need on this subject?

Figure A1. Evaluation Form of the Tennessee Valley Authority.

-2-

4. One of the most effective aspects of the class was:

5. As a result of the class, I plan to:

6. Were your objectives met? Yes ____ No ____

7. In what ways will the material from the workshop be useful to you in your work?

8. Would you recommend this class to others? Yes ____ No ____

RETURN TO: 410 CST2-C

Figure A1 (Continued)

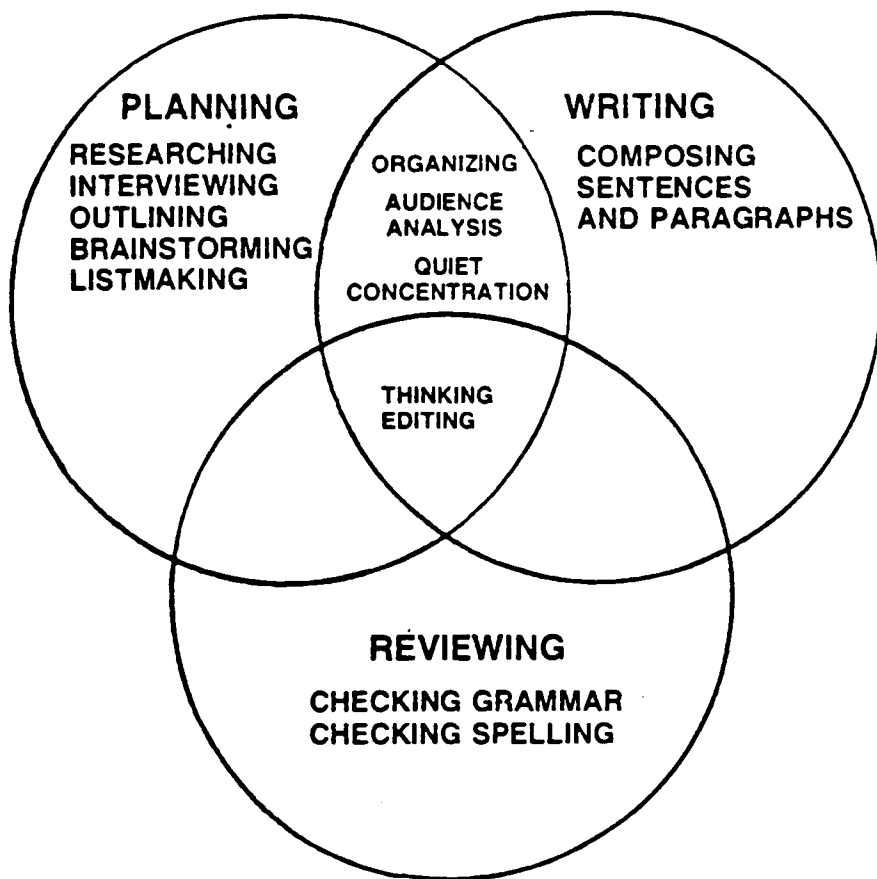
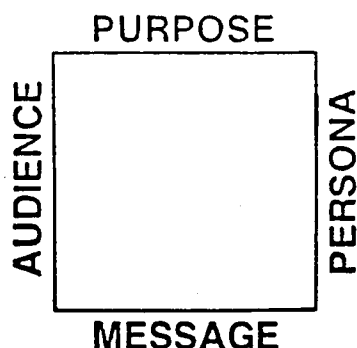


Figure A2. The Overlapping Writing Process.



Persona is a Latin word meaning actor's mask and is used here, rather than writer, to show that the effective writer adapts to the audience.

I. Who are my readers?

- A. Do I actually have two readers, one my broad audience, the other a specific person who acts as censor or judge and decides whether my writing gets to the intended audience?
- B. Am I writing for an audience other than the one I am addressing?
- C. What is the educational level of my audience?
- D. What is important to my audience?
- E. How busy are they?

II. What does my audience want?

- A. Do they want information, instruction, entertainment, or guidance?
- B. Do they need to read what I am writing?
- C. What will keep them reading?
- D. What will stop them from reading?

III. How much do they already know about the topic?

- A. Are they laymen or a specialized audience?
- B. How many examples do they need for understanding?
- C. How much detail do they need?

IV. Is my audience sympathetic or hostile or neutral toward my subject?

Figure A3. Communications Square.

Taken from Maxine C. Hairston, Successful Writing: A Rhetoric for Advanced Composition (New York: W. W. Norton & Co., 1981):44-45.

In each of the sentences below, find the problem and correct it.

1. Sounding amazingly like a human voice, she played the flute every day after work.
2. As Director of Communications, several pioneering ideas became realities.
3. Realizing that the undergraduate curriculum must be completely reevaluated in the next few weeks, proposals have suddenly appeared on the agenda that had received earlier discussion.
4. Her skills for the new job included researching, organization and writing of long reports.
5. His perspective employer required a resume and listing three references.
6. These advertisements persuade us that the corporation supports environmentalism but not to buy its frivolous products.
7. In order to analyze the structural properties of discourse, it is necessary to account for: the flow of semantic information in a paragraph, the devices used to achieve coherence, and the functional units in paragraphs such as topic sentences.
8. Susan was clearer than me about her choice for president.
9. If a person makes a mistake, they should admit it, and not hide the truth.
10. Our policies are different from Lang Realty.
11. My office is bigger than my boss.
12. Steven Marx who has a melodious voice is very effective on the telephone.
13. Anyone who has studied computer programming has an edge in today's job market.
14. One was promoted the other two quit.

Figure A4. Exercise on Common Grammatical Problems.

15. The managers had planned to discontinue that service however, an overwhelming customer demand persuaded them to retain it.
16. Four designers received top honors in the competition—but no one was there to accept the prizes.
17. Look what she has completed in only two years time.
18. Smith and Dawsons computer is the same model as Royal Regions.
19. When the lawyer concludes the opening statement from the floor may begin.
20. Women have always been underpaid they are only now beginning to do something about it.

Figure A4 (Continued)

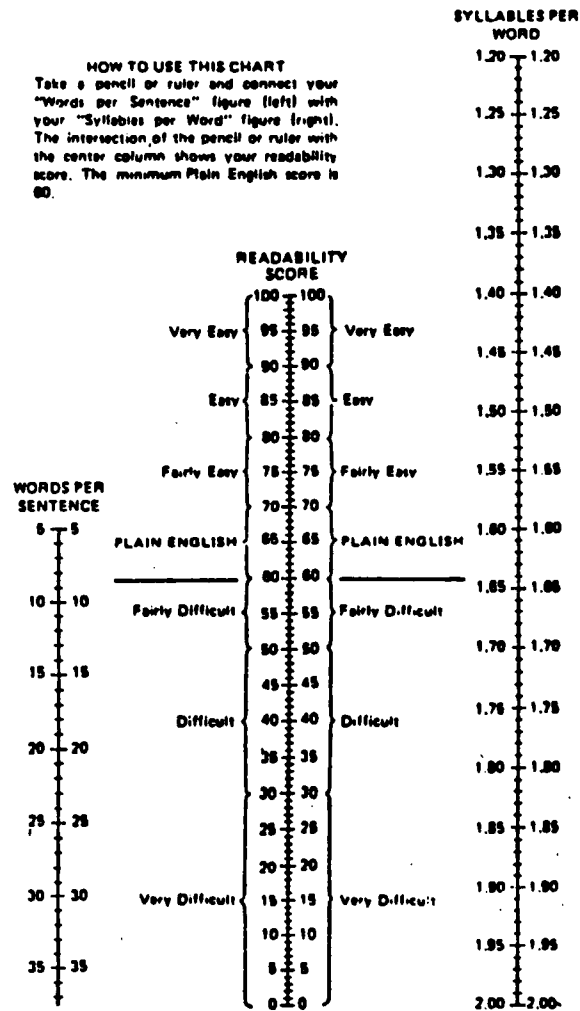
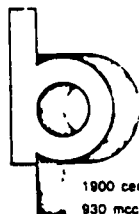


Figure A5. Readability Chart.

Taken from Rudolf Flesch, How to Write Plain English: A Book for Lawyers and Consumers (New York: Harper & Row, 1979):25.



bennett & pless, inc.
consulting structural engineers

1900 century place • suite 300 • atlanta, georgia 30345 • (404) 325-2000
 930 mcallie avenue • chattanooga, tennessee 37403 • (615) 756-7943

June 21, 1984

Parker Const. & Engineering Co.
 1600 Foust
 Chattanooga, TN. 37404

Attn: Butch Craft

RE: Airport Hanger
 Concrete Slab

Mr. Craft:

This letter is to verify our telephone conversation on June 20, 1984 concerning the design of an airport hanger concrete slab. The design establishes a minimum slab thickness and minimum slab reinforcing.

The information provided for the design consists of the following:

A jet weight of 22,000# is equally supported on three (3) pneumatic tires of 260 psi inflation.

Concrete is to be 3000 psi strength with grade 60 reinforcing.

Soil is to be of average subgrade strength with $k = 100$ pci.

The design procedure is based on a publication from the Portland Cement Association for the design of industrial concrete floors on grade. The factor of safety for the slab is set at 1.5.

The high tire pressure produces a small tire contact area, resulting in higher concrete stress. Such stress is best reduced to allowable limits by increasing slab thickness. In this case, a slab thickness of $7\frac{1}{2}$ " is required.

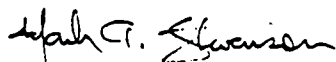
Figure A6. "Before" Workshop Writing Sample.

RE: Airport Hanger
Concrete Slab

Slab reinforcing is provided to control cracking. The amount of reinforcing steel provided is determined by the distance between free ends of the slab. (An isolation joint can count as a free end, but a control joint can not). In this case, for slab lengths of 82'-0 and 100'-0, #4 bars at 16" are recommended.

As designed, this slab should function well for the intended conditions. If you have further questions or desire further information please contact the Chattanooga office.

Sincerely,



Mark A. Stevenson

Figure A6. (Continued)



bennett & pless, inc.
consulting structural engineers

1900 century place • suite 300 • atlanta, georgia 30345 • (404) 325-2000
 930 mccallie avenue • chattanooga, tennessee 37403 • (615) 756-7943

June 28, 1984

Evans Associates, Arch.
 Suite 300 Arlen Building
 One Northgate Park
 Chattanooga, TN. 37415

Attn: Vernon Howard

RE: Columbiana Square
 Birmingham, AL.

Mr. Howard:

It has come to our attention that long slotted holes were called for on the beam splice plates of this job. For this connection to be acceptable, a plate washer must also be provided.

The AISC specification for structural joints using high strength bolts states that for long slotted holes in the outer ply, a plate washer or continuous bar at least 5/16" thick shall be used. This washer or bar is to have standard holes, be of structural grade material and completely cover the slots when installed.

Please feel free to contact our Chattanooga office if you have any questions.

Sincerely,

Mark A. Stevenson

cc: TSP

Figure A7. "After" Workshop Writing Sample.

Interview Questionnaire for Writing Workshops on Visual Techniques

1. How do you view the writing you do in your position? Do you dread writing or do you find it an easy way to communicate with your peers and others in your organization?
2. Do you ever think about who you are writing to? How do you picture this person or these people in your mind?
3. How do you get your ideas for writing?
4. How do you "get started?" Are there any specific techniques you use?
5. Once you have all of your ideas, how do you put shape or logic to your writing?
6. Do you think about the kind of language you use in communicating? In other words, do you write differently for your boss than you do for your peers? What's the difference?
7. What do you think is the most important thing in writing?
8. How do you know what is good writing or what is bad writing?
9. In the workshop you attended what was the most helpful exercise? How did it help you?
10. As a result of this workshop I plan to . . .

Figure A8. Interview Questionnaire for Writing Workshops on Visual Techniques.

VITA

Patricia Steele Raible was born in Columbia, South Carolina, on June 10, 1949, and attended public schools in South Carolina. She received a Bachelor of Arts degree in journalism from the University of South Carolina in 1970 and has spent the last 14 years as a writer and teacher of writing.

Currently she is owner of The Writing Co., Chattanooga, Tennessee, a firm providing consulting services in writing to a variety of business clients, and is also adjunct faculty at The University of Tennessee at Chattanooga. In December 1984 she received a Masters of Arts degree with a major in English, focusing in technical writing.

Ms. Raible is a member of Women in Communications, Inc., Society for Technical Communication, and the National Council of Teachers of English.