

# *Creative Technical Writing As Problem Solving*

By Bruce Closser and Joseph Warren

**A**fter three decades of careful analysis, writing teachers and researchers have concluded that the writing process typically involves three complex but identifiable stages: prewriting, drafting, and revising.<sup>1</sup> Although it has become traditional to discuss writing in these terms, some scholars have begun to see it from other perspectives, for example, as a problem-solving activity.<sup>2</sup>

Writers approach their task as a problem to be solved. They must deal with certain constraints such as defining a sense of purpose, the nature of the writing context, the intended audience, the persona they wish to convey, and their understanding of how to shape the text.

Although they use words and syntax in their work, technical writers produce reports, proposals, and memos by using procedures that are similar to the ones used by other creators or inventors. Let's look at the writing of technical documents as a creative problem-solving activity.

First, we will examine ordered strategies that creative individuals use to solve problems. Then we will outline the ways that writing parallels these

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stages, and analyze a technical writing task that illustrates the stages of the process.

### **Problem-Solving Strategies**

Except the severely mentally challenged, all humans exhibit creative problem-solving strategies. These divine sparks of creativity help us solve many daily problems.

Similar stages and processes are used by creative problem solvers. Consider the case of the Huntsville, Alabama, chapter of the National Space Society (HAL5) which, on May 11, 1997, successfully launched the first amateur rocket through the edge of the earth's atmosphere.<sup>3</sup>

HAL5's scientists faced a complex challenge: How could they design an in-

expensive rocket capable of escaping the earth's atmosphere? Like all creative problem solvers, they considered the task from all angles, considered their resources, made connections between what they knew about the physics of space travel and what resources they had, then devised and implemented an ingenious solution. They suspended a small rocket in a gondola beneath a high-altitude balloon, lifted it to the outer edges of the earth's atmosphere, and ignited it, sending it into space.

### **Four Strategies**

These amateur scientists followed four strategies that Goleman, Kaufman, and Ray associate with all creative operations: preparation, incubation, illumination, and transaction.<sup>4</sup>

During the preparation stage, problem solvers immerse themselves in the problem and seek to understand it as completely as possible. Whether through conversations, extensive reading and researching, or careful thinking, they engage in a process that Robert Sternberg, a Yale psychologist, calls "selective coding."<sup>5</sup> They approach their problems naively, suspicious of traditional solutions while being open to unusual or unique alternatives.

Creative problem solvers sort information, separating the important from the irrelevant. They let go of problems when solutions seem elusive, allowing time for the facts to incubate. Through a process of daydreaming, the unconscious mind examines the relevant materials and rearranges them in logical and often original combinations.

Creative problem solvers generally find solutions in intuitive ways. They learn to watch for the moment of illumination that occurs as the unconscious mind works through the problem. They do this by exploring the rich resources of the mind—making comparisons, forming analogies, juxtaposing elements, and looking at problems from various and unusual angles.

The problem is finally solved when it is translated, through hard work, into a practical solution, design, or document. The act of turning a creative solution into a practical reality is more recursive than linear. The creator doesn't

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proceed sequentially through the steps, but works by fits and starts, repeating various stages as necessary, until the problem is solved.

### **Writing as Creation**

Like the creative rocket launchers at HAL5, technical writers begin by responding to a challenging problem. For example, an airline may have inconvenienced a traveler, who decides to complain. The traveler (now writer) engages in the connective activity of gathering, analyzing, and synthesizing relevant information<sup>6</sup> within the constraints imposed by the context, the subject, the assignment, the reader, and the language.<sup>7</sup> To argue convincingly that the airline should give her a partial refund, each of these factors must be considered.

Just as the amateur scientists at HAL5 gathered as much information as possible about rocketry and the limitations of space travel, the above writer must carefully analyze the rhetorical constraints posed by the problem: What are her personal goals? How do these goals relate to the airline's concerns? Does she wish to appear angry, concerned, or frustrated? Does she wish to use formal or informal language?<sup>8</sup>

Creative problem solvers recognize that solutions are rarely obvious, but given sufficient time, they often serendipitously reveal themselves. The HAL5 scientists designed possible solutions, comparing them to what they knew about the limitations of space. From this knowledge emerged the solution.

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lar care the significance of the time Donald Murray, a well-known professional writer, devotes to incubation and discovery.<sup>9</sup> Accomplished writers like Murray allow time, once they have analyzed the writing task and produced a draft of their writing, for their ideas to incubate. They put the draft aside, return to it later, reread it, adding new wording and/or introducing evidence or arguments that have occurred to them.

### **The “Eureka” Moment**

All creators experience moments of illumination when a solution to the problem becomes apparent. A connection between elements of the problem, between pieces of information the creators have gathered, emerges in what Goldman, Kaufman, and Ray call a “eureka” moment.<sup>10</sup> The HAL5 scientists conceived the idea of lifting their rocket to the edges of space beneath a balloon; the writer rereads the letter and decides that a tone of anger will be less effective than one of disappointment over the airline’s performance and concern for its reputation.

Finally, for all creators and writers, the creative process must result in some product, service, or concept with practical value.<sup>11</sup> The HAL5 scientists’ work achieved significance only after the first successful launch on May 11, 1997, which made space exploration and science accessible to amateur scientists. The writer achieves success only when the document is completed. The writer’s intentions for the letter are relevant to his or her success; it may have been enough for one to express a sense of outrage, whereas another wants some sort of refund.

In all creative activities, and in writing particularly, problem solvers repeat the stages of the process<sup>12</sup> as new chal-

lenges emerge, gathering more information, pondering its significance, and looking for a moment of illumination when the solution clicks in his or her mind, then incorporating the information.<sup>13</sup>

### **Creative Writing Instruction**

To teach writing as a creative activity (as opposed to teaching creative writing, which is a separate issue), teachers must structure their assignments to encourage and accommodate the creative process. Consider a standard school writing assignment: “Where did you go on your summer vacation?” Simply assigning the topic does not tell students how to approach the task or what demands it places on them. Restructuring the assignment to

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specify a poster or a common technical document still focuses on travel and suggests more clearly how to begin.

Consider this suggested technical writing assignment: A school board approves the eighth graders’ request for a class trip, with certain stipulations: The trip may not be overnight; the eighth graders must raise the money themselves; it must have academic rather than simply amusement value; and all the class members must be actively involved in the planning.

The eighth-grade teacher decides to turn the problem into an interdisciplinary technical writing task, combining not only writing but also social studies, history, math, and science. She divides the students into small groups and tells each one to create a proposal from

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which the principal and the school board will select the most reasonably argued and best-written.

Using the stages of the creative process—preparation, incubation, illumination, and translation—the teacher designs the following writing assignment:

*Preparation:* First, she describes the task and helps the students gather relevant information. She asks the principal to present the requirements of the task. The students then write out or talk about task-related issues such as (1) what the school board or the principal would consider an academic experience, (2) what sort of trip would not require an overnight stay, and (3) what details needed to be decided—like raising money, finding chaperones, or arranging transportation. The students then analyze the audience that will approve their request. What do they know about the members of the school board and the principal? What sorts of concerns might these people have, considering the stipulations they placed on the trip?

*Incubation:* Once the class settles on

some basic elements of the project, they enter the incubation stage. To encourage this process, the teacher uses productive invention and planning activities to help students prepare to write their formal request.<sup>14</sup> To explore possible approaches, students discuss the following question: What form should our requests or presentations take—a series of letters or posters? Some sort of formal proposal? The class decides that each group will develop a poster that features their proposed destination, listing its points of interest.

The students discuss what sort of language to use, what facts to include, and how to format the posters. Armed with this information, each group selects a city or town within the travel radius and makes a written list of historical, educational, and amusement sites and activities in that community.

Students also investigate seasonal or special events, identify interesting businesses, locate museums and historical locations, and check the sites of parks and nature preserves. They also consider such issues as cost, transportation,

## ***Creative problem solvers generally find solutions in intuitive ways.***

and travel routes as part of the incubation process.

*Illumination:* The teacher actively aids the illumination process by having each group prepare in writing the material for their posters. The students discuss their completed drafts and receive suggestions for revision or improvement. They decide whether more information should be included and if any important elements have been forgotten.

The class discusses the various drafts, selects the best elements of each, and identifies missing elements. Each group then revises its draft and prepares a poster for presentation.

*Translation:* Each group gives the written draft for their poster a final

<p><b>ELEMENTARY LEVEL</b></p> <p><b>TECHNICAL WRITING TASK*</b></p> <p>In Bible class, you have been studying Christ's parables. Now, write a modern-day parable of your own.</p> <hr/> <p>* Thanks to Patricia Banks, a fifth/sixth-grade teacher at Ruth Murdoch Elementary School in Berrien Springs, Michigan, for sharing this assignment.</p>	<p><b>SECONDARY LEVEL</b></p> <p><b>TECHNICAL WRITING TASK</b></p> <p>Your school newspaper is running a column of suggestions for achieving academic success. This week's column examines the role of a schedule in helping students manage their time. Write a column on this subject. Be sure to answer this question: What role does a daily schedule play in helping students succeed in school?</p>	<p><b>COLLEGE LEVEL</b></p> <p><b>TECHNICAL WRITING TASK</b></p> <p>You are about to leave college and begin your job search. You have begun to think in a preliminary way about what sort of employment you want, where you might wish to work, and who might be some of your potential employers. Prepare a résumé as part of your job search strategies.</p>
<p><i>Preparation</i>—After your class reads and discusses several of Christ's parables, note the variety of spiritual lessons they teach and the range of common objects they contain, such as coins, sheep, wheat, and fish. Examine each parable's structure, including the formulaic beginnings ("The kingdom of heaven is like. . ."), story lines ("A sower went out to sow"), and interpretations ("The seed is the word of God. . .").</p>	<p><i>Preparation</i>—Identify the factors that influence how you spend your time on any given day or in any given week. What do you have to do on this day or during this week? Where are you supposed to be and when? Who is expecting you? How much time do you typically spend on each of the things you do in a day or week? Spend a week keeping a list of activities and the time they consume.</p>	<p><i>Preparation</i>—Identify regions of the country or world where you would enjoy living. What companies that you want to work for are located in this region? Who do you know in one or more of these companies? What do these companies do? What do you want to do in one or more of these companies? Why would one or more of these companies need you? Develop a file of answers to these questions.</p>
<p><i>Incubation</i>—Discuss Christ's parables and their present-day applications: The farmer who builds new barns could be a car collector who builds new garages for his prize antiques. With your classmates, make a list of objects from your daily life, i.e., games and toys, and discuss ways that these can teach spiritual lessons.</p>	<p><i>Incubation</i>—Analyze your use of time during one week. When do you get your best sleep? When do you get sleepy? When are your best study times? When are your meals most enjoyable? When are your best hours for physical work? When do you prefer to relax, be with friends, or enjoy a hobby? What is the best time for you to meditate and study God's Word?</p>	<p><i>Incubation</i>—Write an autobiography about your life and experiences. Use this to craft an image of yourself. Where have you worked? What are your professional skills? What is your alma mater? Who thinks well of you? What makes you unique? What awards have you received? What does all of this say about the sort of person you are?</p>
<p><i>Illumination</i>—Select a parable and rewrite it using objects from your daily life. Apply ideas that were generated during the incubation stage, and look for new applications. Read your draft to others in a small group. Make and receive suggestions for changes or improvements in the parables.</p>	<p><i>Illumination</i>—Based on the above, develop a schedule and follow it for a week. Allow specific times for sleeping, eating, exercising, studying, working, resting, and socializing. Keep notes on how well you stuck with your schedule and why you departed from it, with what results. Get feedback from others on their schedules.</p>	<p><i>Illumination</i>—Analyze sample professional and student résumés. Discuss important elements. Develop criteria for evaluating successful résumés. Write the elements of your own résumé. Lay out the parts in various formats until one shows you in your best light for the specific job. Print a draft of this résumé.</p>
<p><i>Translation</i>—Rewrite your parable, making changes as suggested by your group. Format the parable in biblical form by inserting chapter and verse numbers. Gather all the parables together into a class Bible. Work with your classmates to illustrate the parables.</p>	<p><i>Translation</i>—After keeping your schedule for one week, write the column to submit to the newspaper. Be sure to analyze the relationship between your academic success and your schedule of activities. Share your column with other students. Are ideas clearly stated? Are the mechanics smooth?</p>	<p><i>Translation</i>—When you have settled on a final draft of your résumé, share it with others. Role play interviews. Evaluate résumés. Make necessary changes. Do the finishing touches. Experiment with font sizes, lettering options, and highlighting features until the résumé has the "halo effect." Check for balance and white space. Print.</p>

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edit, asking the following questions:

Is the text mechanically sound?

Are sentences smooth?

Are words spelled and used correctly?

Are illustrations clearly chosen and displayed? Are tables and graphs easy to understand?

Is the poster attractively presented?

Finally, the students present their posters to the principal and the school board, and one proposal is approved for the class trip.

### Technical Writing Made Basic

Teaching technical writing as a creative, problem-solving activity takes much of the mystery out of the process. For too long, students and teachers alike have approached writing with a "some people have it" attitude. Students avoid technical writing because they think they can't do it, and teachers think they can't teach it because they lack the technical knowledge.

Teaching writing as a creative, problem-solving activity combines classroom instruction with students' innate creativity. When students write in order to solve a specific problem in which they have a vested interest, they will view the process with a relaxed enthusiasm, and use it in a variety of situations.

Ideally, we want our students to approach writing with the same curiosity they bring to play. "What's it like to ride on a sunbeam?" a child will ask. When Einstein asked the same question as an adult learner, his answers led to

important discoveries in the theory of relativity.<sup>15</sup> Your students may make similar discoveries through technical writing! ✍

*Dr. Bruce Closser is Associate Professor of English and Director of the University Writing Center at Andrews University in Berrien Springs, Michigan. Dr. Joseph Warren is an Associate Professor of English at Andrews University, a writing consultant, and founder of Educator Support Services.*

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10. Goleman, Kaufman, and Ray, pp. 28-30.

11. *Ibid.*, p. 23.

12. Perl.

13. *Ibid.*

14. Writers employ a variety of strategies to assist in planning how to approach a writing task. Writing teachers refer to these plans as invention strategies or heuristics. They include reading and researching, questioning, free-writing, journaling, brainstorming, and talking, to name a few. A excellent collection of these and other strategies is contained in a recent composition textbook by Elizabeth Cowan Needl (*Writing* [Glenview, IL: Scott, Foresman, and Company, 1986], rev. ed., pp. 17-65).

15. Goleman, Kaufman, and Ray, p. 51.