What We Know about Expertise in Professional Communication

Karen Schriver

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Citation:

Schriver, K. (2012). What we know about expertise in professional communication. In V. W. Berninger (Ed.), *Past, present, and future contributions of cognitive writing research to cognitive psychology* (pp. 275-312). New York, NY: Psychology Press.

Contact Information: KSA Communication Design and Research, Inc. 33 Potomac Street Oakmont, Pennsylvania 15139 USA 412.828.8791 kschriver@earthlink.net Past, Present, and Future Contributions of Cognitive Writing Research to Cognitive Psychology

Edited by Virginia Wise Berninger

This book honors three pioneers who helped create and sustain research on the cognitive processes of writing—John R. Hayes, Michel Fayol, and Pietro Boscolo—and a pioneer in the social constructivist tradition of writing research— Charles Bazerman. All are leaders in creating a global network of writing researchers across many disciplines and countries in which cognitive psychologists participate.

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What We Know About Expertise in Professional Communication

KAREN SCHRIVER

P sychology has a rich tradition of studying the nature of expertise—a tradition that began with laboratory studies of skilled chess players (Charness, 1976; Chase & Simon, 1973) and continues with studies of professionals such as composers, painters (Hayes, 1985, 1989a), musicians (Lehmann & Ericsson, 1997), ocean navigators (Hutchins, 1995), and airline pilots (Schreiber et al., 2009). But with a few exceptions (Beaufort, 2000; Carter, 1990; Kellogg, 2006, 2008), studies of people who write and design¹ for a living are absent from this corpus. Research on professional communication can contribute to the study of expertise by expanding conceptions of the constructive activities that people engage in on the path toward literate expertise (Scardamalia & Bereiter, 1991). An understanding of professional communication can help us to see not only the cognitive aspects of advanced literate practices, but also the social and motivational factors that underlie the development of expertise in situated environments.

Professional communication encompasses the range of advanced writing and visual design activity in workplace settings. Surveys of adults in the workplace suggest that professionals spend on average 24% of their workweek writing (Kirtz & Reep, 1990; Mabrito, 1997; McMullen & Wellman, 1990; Reave, 2004; Tenopir & King, 2004). According to the U.S. Bureau of Labor Statistics, careers in technical communication are predicted to grow 18% from 2008 to 2018, or faster than the average of all occupations (U.S. Department of Labor, 2010). Whether adults communicate professionally as part of their jobs or work as full-time professional communicators, advanced skills in writing, speaking, and

¹ By "design," I refer to the constellation of choices that must be orchestrated in order to make content visually engaging, functional, legible, and rhetorically effective—from considerations of graphics, illustrations, typography, spatial arrangement, and data visualizations to visual cues such as size, position, contrast, color, grouping, or use of negative space.

visual design play an important—even crucial—role in the workplace. Even so, many preprofessional academic programs (e.g., in education, engineering, business, architecture, and medicine) include minimal, if any, education in professional communication skills. This is unfortunate because expert instruction in professional communication could help such preprofessional programs attend to aspects of learning, knowledge construction, and socialization that they might not otherwise consider (Russell, 2007). Moreover, it could help students develop the communication abilities they need in order to effect change in the workplace and the professions they serve.

This chapter reviews the literature concerning expertise in professional communication. There is much to say about developing high levels of skill in writing and visual design; here, I integrate what we know about two central questions relevant to developing expertise:

- 1. What are the challenges of professional writing and visual design in the workplace?
- 2. What knowledge underlies the development of high levels of skill in professional writing and visual design?

In addressing these questions I will argue that research on professional communication has the capacity to provide an interesting and unique window on our understanding of the nature of written and visual communication. I begin with a characterization of the challenges of professional communication, focusing on what makes writing and visual design in the workplace so difficult. Then I examine the knowledge that undergirds professional communication activity. In doing so, I elucidate some components of writing models (Hayes, 1996; Hayes & Flower, 1980) that have been largely unexplored, particularly the dynamic relationships that occur within *task environments* as individuals or teams carry out their work, especially relations between the *social environment* (the audience and collaborators) and the *physical environment* (the text-so-far and the composing medium). The chapter ends with some characteristics of high-achieving professional communicators.

WHAT IS PROFESSIONAL COMMUNICATION?

Definition

Professional communication is an umbrella term for the creative activities that adults engage in as they compose purpose-driven communications on the job. These communications take many forms—for example, reports, proposals, instructions, presentations, multimedia, Web pages—and may be displayed in a variety of media, with an increasing emphasis on Web-based presentations. To make such communications both visually engaging and rhetorically effective involves the careful integration of writing and visual design, calling on the professional to make sophisticated judgments about issues such as form, content, style, arrangement, graphics, illustrations, color, typography, and spatial display.

Cognitive Structures and Relational Networks

Although professional communication activity is often construed as merely concerned with producing work-a-day artifacts for organizations, as though the resulting artifacts were the ultimate goal, professional communication activity is actually situated in a much broader social practice; that is, *the practice of creating cognitive structures and relational networks among people through shared content (using words, pictures, sounds, or symbols).* For example, well-written and well-designed artifacts can promote comprehension of ideas in science, education, and technology, enabling people to build coherent representations of complex content, such as understanding nanotechnology or macroeconomic theory.

Mental Models

Additionally, professionally designed artifacts such as diagrams and maps can help people form accurate mental models of complex systems. For example, the redesign of the London Underground (subway) map—an icon of good information design—regularizes the appearance of subways routes to make them easy to follow by preserving some but not all geographic features. If users had to rely only on a geographically accurate map (Figure 12.1 shows a portion), they could easily be confused when trying to sort out a sensible route across the city. But Harry Beck's redesign (Figure 12.2 shows a portion) creates a more readable and understandable model of the city (for more examples, see Futrelle, 2004).

Purposes

As these examples illustrate, the cognitive and relational networks that professional communicators build are directed toward purposes such as educating, persuading, clarifying, sharing, or collaborating. In a real sense, professional communicators aim to design relationships between organizations, writers, designers, and



Figure 12.1 Excerpt from a geographically accurate map of the London Underground.



Figure 12.2 Excerpt from the redesigned London Underground map.

their constituent stakeholders (e.g., a hospital's wellness clinic and patients who have diabetes). As such, communicators construct the public face of organizations through words, images, and symbols. In designing these networks, professional communicators must be extremely knowledgeable about the social and semiotic resources they can draw on and of ways to orchestrate them.

WHO ARE PROFESSIONAL COMMUNICATORS?

Writing as a Profession Versus as a Work Tool

The field of professional communication encompasses two broad groups of working professionals. The first group centers around the literate activities of people *who write or design for a living*. This group is composed of over 100,000 people in the United States and hundreds of thousands of people around the world. It consists of information designers, journalists, editors, technical communicators, science writers, business writers, grant writers, public relations officers, communication designers, magazine writers, screenwriters, and nonfiction authors. The second group of professionals includes people who do not consider themselves as writers or designers, but *who write or design professionally as part of their work*. Again, this is also a very large group, including teachers, graduate students, professors, lawyers, researchers, scientists, politicians, architects, museum curators, engineers, doctors, nurses, computer scientists, and managers.

Professional communicators who write or design for a living typically work full time or as part-time freelancers on behalf of companies, governments, or nonprofit organizations. Although professional communicators sometimes work alone, more often they work in teams. By contrast, those who write or design as part of their professional activity tend to generate communications on an as-needed basis. For example, they may work alone or with a team on a grant proposal, a journal article, or a legal brief.

Evaluation of Professional Communication

Unlike domains in which the criteria for evaluating outstanding performance lie solely in the judgments of other experts, the quality of professional communications is judged partly by peers or domain experts, but primarily by how well the artifact(s) meets the needs of stakeholders (i.e., intended readers, users, citizens, audiences, managers, or clients). Over the past few decades, professionals have employed a variety of reader-focused evaluation methods to learn about what people think and feel as they engage with their writing and design (Schriver, 1989a). By directly collecting feedback from their intended stakeholders, professionals can acquire valuable local knowledge to underpin the cognitive and relational networks they hope to create. In doing so, they also learn that thinking about their stakeholders involves much more than projecting writer- or designer-centric representations of what people need; that is, representations created solely by the reflections of individual writers, designers, or interdisciplinary teams.

Taking stakeholders' needs seriously involves actively interacting with the range of people who may find the artifact of value—from intermediate audiences such as managers to end users such as readers of e-books. It means considering stakeholders' positive and negative evaluations in reflecting on and rerepresenting ideas for content, design, or media. And because so many of today's communications artifacts are displayed on the Web, professionals can more easily invite stakeholders to comment on their artifacts, encouraging them, for example, to participate in discussion lists, to blog or to tweet about them, or to tag them on social networks for perusal by others. In this way, serendipitous networks may be created among people designing and interpreting communications, with the roles of author and audience sometimes reversing.

Need for Experts in Professional Communication and Plain Writing

Professional communicators vary considerably—ranging from novice to expert—in how well they are able to compose artifacts that build cognitive and relational networks. As readers, we have all encountered professional communications that failed us as readers, from incomprehensible tax forms to mystifying medical information. Although we may not think about it, all of those experiences were designed by wellmeaning individuals or teams. The problem of poorly designed professional communications is so severe that countries are beginning to pass *plain language* laws. Such laws have been enacted in Australia, Canada, Mexico, New Zealand, Portugal, South Africa, Sweden, the European Union, and most recently, in the United States.² In fact, on October 13, 2010, President Barack Obama signed into law H.R. 946, the Plain Writing Act of 2010. It requires the federal government to write all new publications, forms, and publicly distributed documents in a "clear, concise, and well-organized"

² For more information on plain language initiatives in the United States and around the world, consult the Web sites for these groups: the Center for Plain Language, a nonprofit dedicated to advocating for plain language in business and government: http://centerforplainlanguage.org; Plain, advocates who work in U.S. government agencies: http://www.plainlanguage.gov; and Clarity, an international group focused on clear legal language: http://www.clarity-international.net.

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manner (Plain Writing Act of 2010, p. 1). That so many public communications from around the world disenfranchise citizens who need to use them underscores the social value of and pressing need for experts in professional communication.

Individual Differences

My work as a professor and as a consultant to organizations has given me the opportunity to be immersed in the workplace activities of professional communicators for many years. I have observed large individual differences among professionals in the workplace. Many are excellent, but many are only mediocre in professional communication. We need to characterize these differences in order to build pedagogies to help novices become more expert.

Rhetorical Goals

Whether one writes and designs for a living or as part of one's role in another career, one's professional communication activity involves the intentional design of visual and verbal artifacts for stakeholders, who bring their own purposes for engaging with the content. The rhetorical goals for communicating professionally are typically a mix of persuading, informing, explaining, or instructing. The resulting artifacts help people do things with content—understand ideas, make decisions, carry out procedures, or appreciate the value of ideas, products, or services.

To become an expert in creating rhetorically effective communications requires the development of sophisticated general knowledge about writing and visual design as well as extensive domain-specific local knowledge for carrying out writing and design activity (Carter, 1990). Experts must be able to think through complex communication challenges, while at the same time act on their thinking by employing practical knowledge and strategies for solving problems of writing and visual design. Put differently, professionals must respond creatively to ill-structured problems of design, what some have called "wicked problems" (Buchanan, 1992, p. 5; Simon, 1996, p. 129.). Throughout the processes of planning, designing, and evaluating their work, professionals must anticipate how their stakeholders may respond to their solutions, adapting their writing and design activities to people's evolving needs and expectations. Although it is difficult to specify precisely how expert communicators carry out these high-wire rhetorical acts of interpretation, anticipation, production, and reflection, the existing literature offers a number of clues that shed light on the nature of expert performance.

Evolving Knowledge About Professional Communication

What we know about professional communication derives from a variety of theoretical orientations, such as cognitive theory, rhetorical theory, situated learning theory, and activity theory. An integrative view of the field needs to take a methodologically pluralistic rhetorical stance in order to bring together the sometimes theoretically incompatible research that sheds light on the nature of expertise. I turn now to the literature that uncovers the challenges of professional communication in the workplace and the knowledge that underlies developing high levels of skill in writing and visual design.

WHAT ARE THE CHALLENGES OF PROFESSIONAL WRITING AND VISUAL DESIGN IN THE WORKPLACE?

Professional writers and visual designers, like communicators in academic settings, need to draw on both subject-matter knowledge and rhetorical savvy. They need to decide what to say, how much to say, and how to say it. Expert communicators strive to provide the "right" content at an appropriate level of detail in the most suitable media for the audience. And much like students in academic settings, professional communicators often struggle with issues of content. On the one hand, professionals may feel compelled to say everything they know about a subject—an adult version of "knowledge telling" (Bereiter & Scardamalia, 1982). On the other hand, writers may assume that most stakeholders for their communication already know the basics of the subject matter, and in an interest of politeness and not wanting to be insulting, may inadvertently befuddle their readers by generating content that is overly abstruse or technical.

Either way, when writers or designers focus on displaying their mastery of the subject matter, the readers may not be provided with the content they want or need. Research suggests that experienced communicators learn to self-regulate the presentation of their subject matter knowledge in service of rhetorical goals (Ackerman, 1991; Hillocks, 1986).

Although there are many parallels between communication in classroom settings and workplace settings, there are three aspects of professional communication activity that make it quite unlike most classroom experiences in writing or visual design:

- 1. The need to orchestrate writing knowledge and strategy with visual design knowledge and strategy
- 2. The need to engage multiple stakeholders with a given body of content
- 3. The need to negotiate the social, political, and cultural landscapes of the workplace

ORCHESTRATING WRITING KNOWLEDGE AND STRATEGY WITH VISUAL DESIGN KNOWLEDGE AND STRATEGY

Professional communicators are skilled in integrating messages, both visually and verbally, placing emphasis on the visual display of the content (e.g., layout, figure or ground organization, grouping) and on good writing that is clear, concise, and functional. When the visual display of the message skillfully reveals the structure of the content, the design is more likely to afford stakeholders with multiple ways

of engaging with the content—searching, skimming, comprehending, learning, or analyzing.

Because professional communicators recognize that stakeholders come to their messages with different purposes, they design with an eye toward flexible access of the content—expecting that sometimes stakeholders will seek to extract the gist or main point, while at other times stakeholders may seek to comprehend the content.

To be effective in designing for stakeholders' on-the-fly purposes, professional communicators need to coordinate their subject-matter knowledge with their rhetorical knowledge. They must possess both declarative and procedural knowledge of writing and visual design, being able to move from diagnosing rhetorical problems to solving them (Flower, Hayes, Carey, Schriver, & Stratman, 1986). In diagnosing visual or verbal problems of design, professionals rely on highly accomplished reading strategies for assessing the quality of the text produced so far (Quinlan & Alamargot, 2007). Professionals not only monitor their own comprehension in solving text problems, but they also strive to anticipate stakeholders' likely reading processes (Schriver, 2010). Professional communicators employ these representations as they make choices in deciding what content to keep, what to delete, what to say verbally, and what to say visually.

Design Decisions

These communication design decisions involve a host of *writing issues* such as content selection, logic, modularization, coherence, style, voice, and persona. They also involve *visual design issues* such as format, hierarchy, shape, emphasis, contrast, typography, and legibility. (For an extended treatment of writing and designing professional communications, see Schriver, 1997; for analysis of how people read online and the ways in which the quality of their engagement is mediated by the quality of writing and visual design, see Schriver, 2010.) Whether designing for print media or for the Web, professionals need to orchestrate their knowledge and strategies for design—integrating visual and verbal content into a single coherent artifact. Experts draw on their in-depth knowledge and strategies in turning their plans and intentions into wellformed artifacts (Flower, 1989; Flower & Hayes, 1984; Flower, Schriver, Haas, Carey, & Hayes, 1992; Witte, 1987).

ENGAGING MULTIPLE STAKEHOLDERS WITH A GIVEN BODY OF CONTENT

Multiple Audiences

One of the hallmarks of writing professionally is the ability to shape the same content for different audiences, for example, for people with or without disciplinary expertise in the subject matter. Early views of professional communication tended to construe the audience as rather one dimensional, as either expert or novice. But as Holland, Charrow, and Wright (1988) pointed out more than two decades ago, there is rarely a single constituency for the work of professional communicators. More typically, there are a variety of stakeholders, audiences, critics, bosses, clients, and colleagues whose expectations need to be met. Shaping content in ways that can engage multiple stakeholders is a complex act of composing and visual design, particularly when different groups have different expectations for the same body of content. For example, professional communicators designing Web-based instructional content may attempt to reduce information overload while simultaneously maintaining the attention of multiple stakeholders by employing design strategies such as *progressive disclosure* (Lidwell, Holden, & Butler, 2003). In this strategy, communicators structure the content into layers in order to modularize and sequence it over a number of screens, segmenting abstract from concrete, easy from difficult, and basic from complex.

Gap Between Thinking About an Audience and Taking Action

Professional communicators must be sensitive both to the means of discovering stakeholders' diverse needs and to considering options for presenting content. Although "audience analysis and user-centered design" have long been cornerstones of educational programs in professional communication, students often have difficulty moving from thinking about the audience to acting on their needs (Blakeslee, 2010), especially when multiple audiences are involved (Albers, 2003; Spilka, 1990). My own research indicates that when professional communication students engage in extensive practice in learning about how people interpret text and graphics, they can develop mental models of how readers may interact with their content (Schriver, 1992a), models that can help them adapt their writing and design to the stakeholders and situation at hand. In order to close the gap between thinking about the audience and taking action, students can profit from extensive practice in observing people's moment-by-moment interpretations of text and graphics.

NEGOTIATING THE SOCIAL AND CULTURAL LANDSCAPES OF THE WORKPLACE

Persuasion Expertise

Developing expertise in professional communication requires exceptional capabilities in writing, visual design, and stakeholder analysis. But as important as these communication abilities are, they are not enough. Professional communicators work in organizations in which goals, priorities, stakeholders, funding, and deadlines for their work shift according to local political, cultural, and economic forces. Shifting constraints make writing and designing in organizations rhetorically challenging and calls on communicators to develop keen negotiation skills. Professionals must not only be able to solve problems of writing and visual design, but also to argue cogently (in writing and orally) for their plans and solutions, articulating why a particular communication problem should be solved in ways they envision. Put differently, they need to be able to persuade others in the workplace of the value of their contributory expertise (Henry, 1998). Managers, for example, may believe

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that "anyone who can speak a language can also write well," or "anyone who can use page layout software can design skillfully," dismissing the expertise of professional communicators as obvious and uninteresting.

Constraints and Challenges

Although communication designers view their task as a goal-oriented activity in which they imagine effective communication solutions for their stakeholders, the organizations in which they work often make it difficult to act on the behalf of those people who will use the artifact. As Hovde (2000) pointed out, sometimes organizations will not allow professional communicators to gain access to their stakeholders, believing that direct contact with the audience is unnecessary. As a type of problem-solving activity in the real world, professional communication is constrained by ambiguous missions and changing local circumstance—writing and design in the wild. Although writing and visual design of any sort are complex constraint-satisfaction and representational tasks (Visser, 2006), professional communication seems to emphasize constraint-driven design because it routinely takes place in rather volatile organizational contexts. Alamargot and Chanquoy (2001) observed that until researchers have a better understanding of the nature of constraints on writing processes, it will be difficult to model the development of expertise.

Effectiveness Within Constraints

Despite the significant constraint-based nature of workplace communication design, expert professionals often exert profound influence on how communications are created and disseminated. But to be effective, professionals must learn to anticipate workplace constraints and thrive within them. In so doing, over time they become skilled at reading the embodied and material landscapes of the workplace, gradually understanding the implicit and explicit rules for "getting things done" (Beaufort, 2000; Haas & Witte, 2001; Henry, 2000; Winsor, 1996). Professional communicators learn how the artifacts they create interface with larger systems of organizational activity (Russell, 1997), learning to use the material resources, communication tools, and representational technologies within an environment in order to collaborate and "work the system" (Bazerman, 1988; Spinuzzi, 2003; Wegner, 2004; Winsor, 2001). Research clearly suggests that to become expert in professional communication one must excel in negotiating the social, political, and cultural landscapes of workplace environments.

As we have seen, it takes exceptional sensitivity, metacognitive awareness, and knowledge in order to be able to create communications while contending with these sorts of issues. The existing literature indicates that the acquisition of professional communication expertise cannot be reduced to a set of neatly isolated and easily teachable skills. Rather, we must account for a dynamic and mutually constitutive constellation of forces and processes that enable (and sometimes disable) the development of expertise. In the next section, I explore the knowledge that professional communicators need to acquire on the road to expertise.

WHAT KNOWLEDGE UNDERLIES THE DEVELOPMENT OF HIGH LEVELS OF SKILL IN PROFESSIONAL WRITING AND VISUAL DESIGN?

To understand how professional communicators develop their expertise, it is useful to identify the knowledge that underlies skilled writing and visual design activity. To address this issue, I first characterize the types of rhetorical and social knowledge that communicators must develop. Then I detail some components of writing models (Hayes, 1996; Hayes & Flower, 1980) that have been largely unexplored, particularly the interactive relationships that occur within *task environments* as individuals or teams carry out their work, especially relations between the *social environment* (the audience and collaborators) and the *physical environment* (the text so far and the composing medium). By considering the dynamic forces that mediate the production of professional communication artifacts, we can better see how cognitive and relational networks of shared content are developed.

Rhetorical Knowledge

Perhaps the most important aspect of a professional communicator's growth is the development of rhetorical knowledge, that is, knowledge of the ways that stakeholders may engage with the writing and visual design. A key aspect of rhetorical knowledge is the ability to anticipate how the intended stakeholders (i.e., readers, users, audiences, or viewers) may think or feel about the content, a concern for both cognitive and emotional responses to the message and its presentation (Schriver, 1997). As Kellogg (2008) pointed out, professional communicators must hold a representation of the reader in memory and apply it as they craft what to say and how to say it.

After considerable experience in observing how readers actually respond to text and graphics—for example, through practice in usability testing professional communicators may develop an image of readers that can become a working mental model, providing them with cues about what readers want and expect (Schriver, 1992b). But these working mental models that guide reader-focused writing and visual design are difficult to develop, even with explicit instruction in doing so.

For example, I compared more traditional methods of teaching audience analysis used in the professional writing classroom (e.g., audience-analysis heuristics, role playing, peer response, checklists) with a method I called protocol-aided audience modeling (PAM), a method that teaches students to analyze the transcripts of think-aloud protocols of readers at work (Schriver, 1997). Writers in my study took part in 10 lessons in PAM, which entailed reading and evaluating 10 poorly written and badly designed two-page excerpts from computer manuals intended for novice users. After reading one of the lessons, students then detected and diagnosed readers' likely difficulties with the content. Next, I provided students with a thinkaloud protocol from a novice struggling to understand the text, followed by asking students to again revisit the text and identify the nature of the problems, this time with the help of the reader. I found that students did not show signs of improvement until lessons five or six. But this immersion in reader response gradually did significantly broaden their view of what to focus on during revision. Early in the training (roughly lessons one to four), writers tended to focus on rule-governed problems at the sentence level rather than on more thorny problems of comprehension and usability at the whole-text level. Gradually—from lessons 5 through 10—novice designers changed their view of what to focus on. By the end of the 10 lessons students directed their attention not only to problems of *commission* (problems created for readers by what the text said or by how visuals were displayed) but also to problems of *omission* (problems created by what was missing visually or verbally).

Students in experimental classes (unlike those in classes using traditional methods) expanded their view of how to improve the content: from editing microlevel issues (such as diction or phrasing) to revising whole-text issues (such as organization and structure). Moreover, students were able to transfer their knowledge of audience from instructional texts (manuals) to expository science texts (articles in *Newsweek* magazine). Several students who participated in the PAM method reported that after going through the training they could no longer read their drafts without hearing "readers in their heads" saying, "I'm confused! What do you mean by that?" The PAM method helped novice professional writers to acquire a model of the reader and a critical awareness for developing their expertise.

Friess (2008) studied the workplace practices of 20 novice designers who had taken a course in user-centered design. Designers took the course and then worked on a task for a client who expected them to carry out detailed investigations of what users needed and to employ that rhetorical knowledge to derive an evidence-based solution. However, even with a semester-long course intended to help these novice designers develop skill in collecting evidence and advocating for users, 40% of the time students supported their decisions with vague opinions and hypothetical stories that were not grounded in evidence-based rhetorical knowledge, but were merely idiosyncratic designer-centric claims about what they thought would work.

Making Assumptions About Stakeholders' Reading Processes

Expert professional writers assume there will be inexpert reading strategies brought to bear in consuming their texts. Unlike expert readers who read to understand by making deliberate use of the linguistic context to monitor their comprehension text structure, lexical repetitions, topic sentences, transitional signals, and other metadiscursive cues (Crismore, 1989)—less-skilled readers tend to interpret individual text elements immediately without necessarily considering how they fit together, without asking themselves whether they are understanding the main point, and without reflecting on how the message speaks to what they already know (Summers & Summers, 2005).

Because most professional communication is intended for reading on the job, professional communicators must anticipate readers who are in a hurry and who are likely to bring inexpert reading strategies to the task, even if they are subject-matter experts. Online readers are often multitasking, which leads them to abandon the reading process they would employ in leisurely situations (Redish, 2007). Instead, online readers are likely to adopt a strategy in which they follow their best guess about where to begin, then follow the "scent of information"—drawing on relevant macrolevel semantic cues such as menu items, links, labels, and headings (Pirolli & Card, 1999). This means that if the artifact does not provide good macrolevel cues, readers will likely miss key parts of the content or simply abandon the text.

Torrance (2007) suggested that "successful text must incorporate sophisticated structures for maintaining both cohesion and coherence if readers are to experience sentence-to-sentence flow and gain a global understanding of the writer's message" (p. 1). Although this suggestion is an excellent description of an academic writer's task, it is less of a priority for professional writers who need to focus on the macrostructure as much if not more than the microstructure.

THE ROLE OF EXPERIENCE IN PROFESSIONAL COMMUNICATION

Experience and Expertise

Since the 1970s psychologists have been interested in the nature of skill acquisition, in how long experts spend learning about their field, and in the nature of the effort required to excel. Chase and Simon (1973) were curious about just how much effort was required to become a chess master. They found that experts practiced for roughly a decade before reaching the grand master level. Simon and Chase (1973) argue that there is no such thing as instant expertise; "it requires about a decade of intense preoccupation ... perhaps 10,000 to 50,000 hours staring at chess positions" (p. 402). Becoming an expert "takes time—years—to build the thousands of chunks needed for ... building up recognition memory for many familiar chess patterns" (p. 403).

Their finding led researchers to study world-class musicians and painters (Hayes, 1985, 1989a). Parallel to Chase and Simon's findings, Hayes found that composers such as Mozart did not begin to produce world-class works until about 10 years into their careers. Although some composers and painters did produce good work early in their careers, very few produced world-class work until they had been working intensively for nearly a decade. Similarly, Wishbow (1988) studied the biographies of 66 poets whose poems were part of the literary canon found in the *Norton Anthology of Poetry*. She found that in 83% of the cases, poets whose works appeared in the anthology were composed 10 or more years into their careers. These findings suggest that extensive experience in one's domain is absolutely crucial to developing expertise, but as I will discuss next, investing a great deal of time may not always produce outstanding performance.

Cultivating Expertise

A common assumption about expertise is that the more experience one accumulates in a given field, the more expert one becomes; thus, experience cultivates expertise. In workplace settings, this translates into "the longer you are on the job, the better you get." But research on expertise tells a different story. An intriguing observation made by Bereiter and Scardamalia (1993) is that experience *does not* necessarily lead to expertise. They concluded that although most people who are experts have extensive experience in their field(s), not all people with extensive experience are experts. In fact, people with years of experience may operate at roughly the same level as those with minimal experience.

Experience Necessary but Not Sufficient

My ongoing research into the nature of expertise in information design supports the contention that experience is necessary but insufficient to acquire expertise. On the one hand, information designers who work a long time in the same organization may get better, much better, and even exceptionally so. On the other hand, information designers might perform at roughly the same level of competence as when they started and merely repeat that level of performance again and again.

In fact, some seasoned professionals may not be much better than new graduates of academic programs in professional communication. Regrettably many workplaces for writers and designers do not provide the conditions that encourage employees to innovate and do their best work. Because the field is relatively new and often misunderstood, many workplaces fail to nurture information design expertise. Many experienced professionals who write or design for a living work on familiar sets of problems (often the same genres for the same audiences for years on end). The tendency is to address these common challenges with well-rehearsed routines. Many work environments reward their employees for being quick in learning new software and using those tools to carry out well-practiced routines rather than for working at the edge of their competence. Put differently, many workplaces fail to support the development of expertise, which can lead writers and designers to experience burn out, frustration, or complacency.

This sort of problem led Bereiter and Scardamalia (1993) to coin the term *expe*rienced nonexperts (p. 11) to describe people with extensive experience who tend to employ routine solutions to problems that call for novel approaches. Experienced nonexperts tend to embrace familiar and often conventional approaches to problem solving and rarely modify what worked the previous time. Although using a status quo strategy may be efficient for producing text quickly (and may please the boss or gatekeepers), it rarely leads to an optimal design for stakeholders.

Competing Hypotheses About the Nature of Expertise

If experience is not the whole story, then what is it that distinguishes the expert from the experienced nonexpert? Two competing hypotheses profile how people get better at what they do. The first, the *individual talent hypothesis*, asserts that people are born with gifts, genius, talent, or creativity that predispose them to greatness in their field (Winner, 1996). This hypothesis aligns with the romantic tradition, which assumes that writing and visual design are mysterious and cannot be taught explicitly (Young, 1980). Romantic assumptions about the nature of expertise may play out in writing and design classrooms in the form of "critique" sessions, in which students are encouraged to find their inner voice and to derive their personal standards for evaluating what good is. Such models of teaching promote a disabling designer-centric view of professional communication activity (Frascara, 1995).

A second competing conception of expertise is the *deliberate practice hypothesis*, which asserts that people need not be born with special gifts; rather, individuals must work hard—very hard—on developing knowledge, skills, and sensitivities in their domain. In short, it is not enough to simply practice or gain experience in one's chosen field, one must practice aspects of the field one has not yet mastered with the intention to improve.

THE ROLE OF DELIBERATE PRACTICE IN DEVELOPING EXPERTISE

Deliberate Practice

According to Ericsson, Krampe, and Tesch-Römer (1993), a key feature of deliberate practice is that one consciously seeks to work at the edge of one's current competence. Ericsson and his colleagues asserted that to become an expert requires considerable intrinsic motivation to engage with hard tasks in one's domain and, particularly, to sustain one's interest over the long haul (about a decade). In order to move to the "next level" in one's domain, the "expert-in-training" must both practice at the edge of his or her mastery and focus on the appropriate next level within reach.

As they work on developing their knowledge and skill, experts-in-training grow more sensitive to monitoring their own progress—figuring out what they do well and not so well. In many domains, deliberate practice involves high levels of repetition in order to achieve mastery, a fact that leads many experts-in-training to quit. A different and quite important aspect of deliberate practice is that people need external feedback about their performance. Studies show that a mentor's critical eye can help experts-in-training to see their shortcomings and recognize where they need to focus their practice next.

The studies of deliberate practice across many domains show that experts work intensively on developing their knowledge, skills, and perceptions before being able to perform at the top of their field. For example, Ericsson et al. (1993) asked the question, "How long do musicians practice en route to becoming expert?" (p. 379). They studied four groups of expert violinists: (1) the best experts, (2) the good experts, (3) professionals (people who perform in bands or orchestras), and (4) the least accomplished experts.

Researchers found that by the time musicians reached the age of 20 the "best experts" and the "good experts" had practiced more than the "professionals" and the "least accomplished experts." The two best groups of violinists practiced close to 10,000 hours, professionals about 8,000 hours, and the least accomplished experts about 5,000 hours. These results give credence to the old adage "practice makes perfect," which could be better said, "deliberate practice makes perfect."

As Anderson (2009) pointed out, all of the evidence indicates that genius is 90% perspiration and 10% inspiration (p. 263).

How Deliberate Practice Leads to Expertise

The results of many studies of experts suggest that one of the most important things experts acquire as a result of deliberate practice is *extensive pattern knowl-edge about their domain*. Chess is a game that demands considerable complex thinking, and like information design, it involves a great deal of visual and perceptual processing.

That humans are remarkably good at pattern recognition has implications for many fields of endeavor. In a study of how expert radiologists interpret chest X-rays, researchers showed 10 expert radiologists a series of 10 normal and 10 abnormal chest X-ray films in two viewing conditions: (1) 200 ms, and (2) an unlimited viewing time (Kundel & Nodine, 1975). Researchers found that experts could detect and name 70% of the abnormalities in the films in the 200-ms condition. Their performance improved to 97% when they could view the radiographs for an unlimited time. The researchers suggested that experts' visual search begins with a global scan that classifies the content they are looking at, detects gross deviations from normal patterns, and organizes subsequent checking to examine ambiguities in more detail.

How Expertise Acquired Depends on the Field

Research suggests that expertise develops differently, depending on the individual, the discipline, and the context. Some people get better at what they do largely by working alone; others immerse themselves in teamwork en route to gaining expertise. Perhaps more people engage in both individual effort and teamwork as they develop in their field. For example, concert pianists tend to develop their expertise as they practice in relative isolation (Sosniak, 1985, 1990). But pianists also usually practice under the guidance of a mentor who provides feedback about how to improve (Sosniak, 1990). The mentor provides one-on-one critical guidance designed to encourage developing musicians to persist in their training and to push the pianists to the next level (Howe & Davidson, 1993). Other professionals, such as commanders in the military, develop their expertise as they work in groups. Reflecting on the diverse feedback from colleagues helps them to make changes in how they perform (Fletcher, 2009).

Research also reminds us that "what constitutes expertise" is socially constructed, with criteria shifting depending on who is doing the evaluating. For example, academics who teach poetry tend to bring different criteria to bear in evaluating the skill of a poet than people outside of the academy who enjoy reading poetry. People in different settings bring their own values to bear in judging what counts. This makes the assessment of expertise a rather slippery enterprise because the definition of an expert for any given field may change from context to context (see the anthology by Ericsson, Charness, Feltovich, & Hoffman, 2006, which brings together the work on expertise from 15 domains).

WHAT MIGHT DELIBERATE PRACTICE DO FOR PROFESSIONAL COMMUNICATORS?

Taken together the research shows that sustained practice in working at the edge of one's ability gives experts sophisticated knowledge of their domain, rich schematic knowledge of typical problems in their domain, and keen perceptual skills that enable experts to recognize and judge meaningful patterns in their domain (Ericsson, 1996, 2009; Ericsson et al., 1993). Over time experts develop the ability to draw on more patterns, larger patterns, and patterns within patterns. They also learn useful strategies and procedures for working in their domain (Chase & Ericsson, 1982).

It seems reasonable to believe that deliberate practice would also provide such benefits for professional communicators, and that they would acquire deep interconnected knowledge of visual and verbal language patterns and structures. We can hypothesize that experts might display marked ability in recognizing visual or verbal patterns when they evaluate poorly designed communications, patterns that novices may not notice. These patterns would range from macrolevel visual and verbal concerns (e.g., logic and layout) to microlevel concerns (e.g., sentence style and typographic choice). In fact, information designers likely acquire many more patterns than the 100,000 required in skilled chess, particularly given that chess is a game played in a limited space (an 8-by-8 board) with a limited set of pieces and a small set of rules. The game of professional communication is played in a much larger space. The following is a list of a few of the patterns that professional communicators might acquire along their road to expertise:

- Linguistic (active vs. passive voice, simple vs. complex structures)
- Structural (hierarchy, inductive, deductive, problem solution, narrative, expository)
- Genre (procedures, advice, reviews, reports, forms, diagrams, animations)
- Spatial (position, size, weight, saturation, shape, contrast, juxtaposition)
- Graphic (grouping, size, repetition, alignment, proximity, position, color)
- Typographic (type families, style, size, weight, position, contrast, spacing)

Information designers gain rhetorical flexibility in employing these patterns while designing print or online communications, learning to detect when patterns are effective and diagnosing when they are not (Schriver, 2009). Expert information designers gain skill in replicating patterns that work and repairing patterns that do not; and they develop particular facility in rerepresenting and combining patterns in skilled ways. When professional communicators revise, the text produced so far serves as a catalyst, which triggers visual and verbal associations from the designer's long-term memory and enables creative responses to practical problems of communication. To do so requires enormous sensitivity not only to language patterns but also to the audiences for whom the visual and verbal patterns are intended to shape meaning (Sadoski & Paivio, 2001; Schriver & Hayes, 2009).

We can hypothesize then that experts' knowledge of visual and verbal language, along with their understanding of stakeholders' likely expectations for content, will make them more effective than novices at fundamental skills in professional communication, such as the following:

- Empathizing with stakeholder's cognitive and emotional responses to content
- Considering optional paths toward generating prototypes or revisions
- Distinguishing among visual or verbal features of artifacts that align with stakeholders' needs and those that do not
- · Diagnosing problems of text design or integration of word and image
- Taking textual action to solve problems of poor writing or visual design

CONTEXTUAL KNOWLEDGE

As I emphasized previously, an important part of professionals' abilities lies in the development of contextual knowledge about how to make an impact within a given workplace. To be effective, professionals need to acquire sophisticated knowledge about the social networks and structures of the workplace (Beaufort, 2008). Winsor (1998) found that professionals who worked in a for-profit organization learned how to take action and make their contributions visible within the social structure of the workplace, recognizing how to negotiate the social system of the organization.

As professional communicators develop their contextual knowledge, they learn to "read" the "information ecology"—the complex interconnections among people, activities, tools, values, and practices that distinguish one context from the next (Nardi & O'Day, 1999). Acquiring deep local knowledge about the typical patterns of decision making within the organizational context becomes integral in carrying out knowledge work that coworkers and other insiders will view as constructive. Figure 12.3 depicts my view of the interactive relationships among three important processes in professional communication:

- Constructing content (generating ideas for visual and verbal artifacts)
- Connecting content to stakeholders (shaping artifacts rhetorically to build cognitive structures and relational networks)
- Contextualizing design activity (making design activity visible and valued within the context of ongoing organizational activity)



Figure 12.3 Three interactive processes in professional communication.

In my experience in working with professional communicators, I have observed, not surprisingly, that practitioners vary considerably in how well they negotiate the rhetorical space of constructing, connecting, and contextualizing. For example, they may have outstanding abilities in constructing texts, but may not be very skilled in knowing how to assess visual and verbal design, and completely unaware of the need to contextualize their work. They may be very good at analyzing readers' needs, but lack advanced skills in writing and visual design, making the resulting artifact well intended, but poorly executed. They may be rhetorically savvy in contextualizing their work, but unable to design artifacts that actually help people build cognitive structures or relational networks. Or they may be very skilled in all three processes: constructing, connecting, and contextualizing.

These interactive processes illustrate Winsor's (2001) contention that workplace design is firmly embedded in a social web, and that to participate in systems of distributed cognition, professionals need more than rhetorical and subject-matter knowledge. Professional communicators must be creative in negotiating the constellation of factors that shape and are shaped by literacy practices within organizational contexts.

CONSTELLATION OF FACTORS SHAPING COMMUNICATION WITHIN ORGANIZATIONAL CONTEXTS

Planning Ideas

Kellogg (2006) reminded us that professional writing is at once "a thinking task, a language task, and a memory task. A professional communicator can hold multiple representations in mind while adeptly juggling the basic processes of planning ideas, generating sentences, and reviewing how well the process is going" (p. 389). For example, Schumacher, Scott, Klare, Cronin, and Lambert (1989) studied journalists as they planned and composed news stories. They reported that experienced journalists imagined the structure of what they wanted to say, held that structure in mind as they went to a telephone, and then dictated the story over the phone without ever writing down or typing their plan. Similarly, Flower et al. (1992) found that expert writers created more goals than did novices; they also integrated those goals for themselves and maintained an eye on those goals, monitoring their progress during acts of planning. Haas (1996) observed that writers using a computer to write planned less than when using pen and paper, reminding us that technology mediates processes of writing and design.

Generating Content

In reviewing the research on how writers move from "idea to text," Hayes (2009) examined the bursts of words writers produce as they compose. He described a study that compared the burst length of freshmen and graduate student writers. More experienced writers (graduate students) were found to have generated twice as many words per burst (10 to 12) compared with less-experienced writers (5 to 6 words for freshmen). In other words, the increased number of words per burst

meant that experienced writers could retrieve words more quickly, could form complete phrases faster, and could shape complex grammatical structures from memory more rapidly.

McCutchen, Covill, Hoyne, and Mildes (1994) found that skilled writers were faster and more accurate than less-skilled writers in accessing the words they wanted to say. Skilled writers were also better able to access representations of the text structure and to use story grammars or genre schemata as they composed.

According to McCutchen (2010), here lies a paradox: If adult experienced writers are faster at accessing what they propose to say and can also monitor how audiences might react to their content—prompting them to revise, for example, the syntax, semantics, or tone—then why do experienced writers seem to take longer to write, even the first sentence of a simple narrative (Scardamalia & Bereiter, 1991)? That expert writers may take longer and work harder to accomplish quality work runs counter to previous research on expertise in other domains, which suggests that as individuals or teams gain experience in their domain, they tend to speed up and employ their processes for doing their work more efficiently and with less conscious effort (Ericsson, 2009).

Torrance (2007) hypothesized that the extra time expert writers spend in constructing good content is related to their use of more complex and more sophisticated writing processes. As Scardamalia and Bereiter (1991) noted, experienced writers typically bring to mind a great deal of information as they plan what to say, including content they often toss out later. In fact, transcripts of think-aloud protocols of experienced writers show that they propose much more content than they actually commit to (McCutchen, 2010). Indeed, experienced writers tend to entertain more optional content, generate more revisions, take longer to write, and exert more effort than inexperienced writers (Scardamalia & Bereiter, 1991).

Although novices' speed can be attributed to their propensity to write down the first thing that comes to mind, experienced writers construct more elaborate mental representations of the communication problem at hand. We can hypothesize that for experienced communicators on the job, those more complex processes are related mainly to two difficult aspects of professional communication, discussed earlier: (1) thinking about the multiple audiences for their work and imagining content they might expect, and (2) managing the social and pragmatic constraints of the workplace.

Evaluating Content

Experienced communicators recognize the importance of evaluating their work with the intended stakeholders for the artifact. Although professionals strive to tailor their artifacts to meet stakeholders' cognitive and affective needs, they also recognize the difficulty in meeting those needs without actually talking with stakeholders. Indeed, the field of professional communication has for a long time recognized that the best way to assess an artifact is through reader-focused testing rather than by employing methods such as expert reviews, readability formulas, or focus groups (Schriver, 1989a). Usability testing of professional communication artifacts is now commonplace in many forward-thinking organizations. But even today, expert professionals still need to be able to make persuasive arguments about why assessment is valuable. Some experts in professional communication are also developing sophisticated skills in managing usability testing and evaluation efforts within organizations—framing the right questions, choosing appropriate methodologies, managing tests, analyzing results, sharing the results, and moving from analysis to subsequent revision.

Monitoring Text Production and Revising

Although skilled professional writers may take longer to accomplish their work (this observation needs further empirical testing), their final products are typically measurably better in quality from the perspective of readers (Schriver, 1993a). Skilled writers are better able to revise their texts for meaning, taking a top-down approach to text revision, improving the quality of the macrostructure before attending to editing the microstructure (Schriver, 1989b). Experienced professionals' ability to monitor their revision activity and to reflect on the quality of their writing or visual design is related to how they define revision. Experienced writers differ from inexperienced writers in that they see revision as a whole-text task that requires evaluating the text, extracting its gist, and comparing that meaning to the text produced so far, asking how well the text realizes the goals and intentions for readers (Hayes, Flower, Schriver, Stratman, & Carey, 1987).

DRAWING ON SUBJECT-MATTER KNOWLEDGE: HELP AND A HINDRANCE

Possessing subject-matter knowledge without rhetorical and cultural knowledge can inhibit professional communicators from accomplishing their goals. Indeed, people's everyday experience with instructions for cell phones, letters from lawyers, or explanations from engineers suggests that subject-matter knowledge can be a hindrance as much as a help. A central problem for many subject-matter experts lies in being able to take the perspective of people who do not share that knowledge.

Research suggests that when students acquire disciplinary knowledge, that knowledge may sometimes act as a blinder to recognizing the needs of people who do not possess that disciplinary knowledge. As mentioned earlier, one of the hallmarks of writing professionally is the ability to shape the content for different audiences, for example, for people with disciplinary expertise or people without such knowledge. Paradoxically, as students gain more sophistication in the subject matter of their field of study, they may experience more difficulty with making what they know clear for novice audiences. Learning to imagine the audience is a challenging rhetorical task for many college-aged writers and does not get easier when they enter the workplace (Smart & Brown, 2002)

Hayes (1989b) found that when college-aged writers read poorly written texts about topics they already knew well, those writers found it difficult to anticipate the comprehension problems that readers without knowledge of the subject matter might experience. Similarly, undergraduate engineering students had difficulty predicting a lay audience's ability to understand words that were part of their field's everyday vernacular (Hayes & Bajzek, 2008).

Although acquiring sophisticated subject-matter knowledge is requisite for expert-to-expert communication in any discipline, there are usually many other audiences the professional communicator must reach. For example, in his advice to scientists and researchers trying to reach broader audiences, Meredith (2010) pointed out that to have the most impact, researchers must disseminate their work beyond their network of peers to potential collaborators in other disciplines, administrators, funding agencies, private donors, prospective students, legislators, and the general public.

Not surprisingly, evidence suggests that professional communication is difficult for college-aged writers and may remain so as they make the transition to the workplace (Beaufort, 1999; Smart & Brown, 2002). For example, in a study of the professional communication skills of undergraduate bioengineers, my colleague and I studied how students' creation of technical reports, scientific posters, and oral presentations evolved from their sophomore to senior year (Schriver & Hayes, 2009). We found that early in students' coursework, bioengineers at the sophomore level necessarily focused on acquiring in-depth knowledge about their discipline. They tended to "tell their knowledge" to their professor rather than transform what they knew to a general audience or another specialized audience. Later in their coursework (by senior year), students broadened the audiences for whom they created their technical reports, scientific posters, and oral presentations. They moved from producing artifacts that were clearly oriented to the "teacher as audience" to creating artifacts shaped explicitly for people outside their field-stakeholders such as venture capitalists who could fund their research. But the transition from knowledge telling to knowledge transforming did not come easily nor did it come smoothly.

SETTING GOALS

On the one hand, organizational goals may be as simple as providing stakeholders with "accurate and helpful information" about a product or service. In this case, the professional communicator might be asked to design clear procedural information about a piece of software. A relational network might develop if stakeholders act on the procedures, have a good experience, think better of the organization, and possibly refer others to the organization. On the other hand, organizational goals for the artifact may be more complex, such as providing patients with usable information about understanding medical tests. In this case, the communicator might be challenged to invent novel visual displays for depicting the results of medical tests (e.g., decision aids about how to lower cholesterol; see Leckart, 2010, for some excellent examples).

As these examples show, professional communication tasks differ markedly in the complexity of the artifacts and in their intended rhetorical scope and temporal impact. Professional communication artifacts can be used to organize people's activity over brief periods of time (e.g., the time it takes to read a manual or inspect a Web page) or over much larger reaches of time and space (e.g., the time it takes to change a parent's thinking about the role of diet on health and the impact of parental behavior on family health). Put differently, the goals that professional communicators set for their communications may have short- or long-term motives (Russell, 1997).

RECOGNIZING RHETORICAL OPPORTUNITIES

From a rhetorical perspective, the idea of *kairos* or timing (from the Greek meaning the right or opportune moment to say or do the appropriate thing) is very important to professional communication activity. Experts in professional communication face the rhetorical demand of needing to recognize the "right time" for a particular message, a sensitivity that reminds us that expertise is much more than a collection of technical skills. As Kinneavy (2002) put it, kairos was the basis for an art of rhetoric, in which discerning the right time for a rhetorical act was crucial. Professional communicators both create these kairotic moments and seize rhetorical opportunities as they arise.

Sometimes professional communicators create their own kairos by imparting a topic with such saliency that relational networks can be built as a result of people experiencing the artifact. For example, since 1978—when communications designer Burkey Belser created the "Energy Guide label" to help consumers easily identify energy-efficient products—consumers have been able to use the Energy Guide label to make comparisons about energy savings when they bought household products (like a refrigerator). Multiplied by millions of refrigerators, the energy savings have been enormous, and companies with the best energy-savings models have built loyal customer networks that continue to grow (for a discussion, see Emerson, 2005).

Other times professional communicators build rhetorical relationships with potential stakeholders by generating a novel design in response to a kairotic moment. For example, in 2000 after the U.S. Bush versus Gore election and the Florida "butterfly ballot" fiasco—in which many voters made incorrect choices because of poor ballot design—the idea of socially conscious design gained prominence in writing and visual design circles. This consciousness prompted communication design firms to develop capabilities in ballot design and laid the groundwork for igniting the Design for Democracy Movement (Lausen, 2007).

REPRESENTING PROFESSIONAL COMMUNICATION TASKS

As we can see, the goals that organizations, individual designers, or collaborative teams set for themselves and the kairos—the rhetorical opportunities that are present or discovered in a particular situation—will influence the professional communicator's representation of the task as well as their motivation for the task. From a cognitive perspective a communicator's *task definition* (or *task representation*) is fundamental in setting in motion strategies for writing and visual design as well as for prompting the communicator to access relevant prior knowledge for generating a plan, producing an artifact, and judging its relative success (Hayes et al., 1987; Wallace & Hayes, 1991).

Previous accounts of the cognitive processes in writing focused mainly on modeling writers in academic settings, environments in which the goals for writing tasks were typically established by teachers or researchers. By contrast, the representations of professional communication tasks are set by interactions among individual writers or designers, design teams, and organizations sponsoring or requesting the work.

Task representations are constrained by opportunities and limitations posed by the genre, the media available, and the material and political conditions of the rhetorical situation. For example, an individual professional communicator might set a goal to write a scientific exposé on global warming for the print version of *National Geographic* magazine. Because she wants to reduce the risk of having the article rejected due to excessive length, she might define her task as "write a tight, compelling article in no more than three pages including images." But in talking with the magazine's editor, she may learn that if the editor likes the print version, she or he will invite her to expand the story for the Web-based version of the magazine.

Being immersed in the rhetorical situation causes the professional to modify her representation of the task and to view the smaller task in relation to the larger task. The professional communicator's rerepresentation raises her evaluative standards for what would make for an effective short article and changes her view of the whole task, altering her notion of what is possible. In this way, situated knowledge and motives for writing and visual design interact and serve a heuristic function, influencing how designers represent opportunities and the shape of their communication activity (Bazerman & Russell, 2002).

When organizations establish the goals for a task, they vary a lot in terms of their specificity. For example, the task can be quite constrained (e.g., create a stepby-step diagram to help immigrants understand the process of becoming a citizen; use a brochure format; do not use color). Organizations may also frame the task in a rather open-ended fashion (e.g., develop a communication system for helping new home buyers to understand the intricacies of financing a mortgage; design with an eye toward adding to the system other types of financial documents such as credit card agreements; create both print and Web versions). In the latter example, the professional has considerably more latitude in how the task can be represented.

In either case, professional communicators strive to define their task in ways that will allow them to shape artifacts so they adhere to their preferred representations of what to do. Put differently, experts in design are concerned with how things might be or ought to be (Simon, 1996).

THE TASK ENVIRONMENT OF PROFESSIONAL COMMUNICATION

Because the nature of professional communication is not yet well researched and its rhetorical exigencies have received little attention, it is not surprising that current

models do not adequately capture the cognitive and rhetorical activity of professional communication, but they do provide important points of departure, particularly the influential models proposed by Hayes and his colleagues (Chenoweth & Hayes, 2001; Hayes, 1996; Hayes & Flower, 1980; Hayes et al., 1987).

In particular, Hayes's 1996 model of composing (shown in Figure 12.4) portrayed some of the characteristics of individuals as they engage in skilled writing. The *task environment* locates the social, cultural, and material resources for professional



Figure 12.4 Interactive features of cognitive processes in writing (Hayes, 1996). Used with permission of the author.

communication activity. The model illustrates the reciprocal and mutually constitutive relations among the social environment, the physical environment, and the writer's motivation, memory, and cognitive processes. By task environment Hayes refers to everything outside the writer's skin—the complex interactive systems of activity that shape the process and are shaped by the process.

The task environment of the workplace is parallel to classroom settings in that both the cultural context and the people who work there—peers, collaborators, and superiors—exert direct and indirect influence on the design processes. Moreover, both classroom and workplace settings are sites of highly intense collaborative activity, often mediated by advanced computing technologies. But workplace task environments are different from classroom settings in several important ways, including the following:

- Procedures for providing feedback
- · How individuals or teams develop a sense of agency in their environment
- Support for writing and visual design processes
- · Processes of planning, revising, and collaborating

Differences in Feedback

Educators in professional communication pride themselves on providing helpful and useful feedback on student writing and design. However, the feedback that professional communicators in the workplace receive is considerably less supportive, and it often comes as a shock to students entering the workforce to find that colleagues and superiors may be more concerned with critiquing what's wrong with their writing or design than with discussing how to improve it.

Researchers investigating teacher-feedback practices in college-level design classes found that although design studios emphasized the "critique," teachers rarely gave substantive negative feedback and tended to socialize students to assume egalitarian relationships and autonomous decision making (Dannels & Martin, 2008). When academics idealize the professional workplace, they may complicate students' ability to respond constructively to negative feedback.

Differences in Agency

In modern student-centered classrooms, learners are encouraged to develop their personal sense of agency in various ways; for example, by asking challenging questions, by defending their ideas during collaborative activities, by taking a critical rhetorical stance, or by deliberately changing the focus of class discussion in productive ways. But in the workplace, these strategies that work well in inclusive classroom settings may be viewed as annoying, insubordinate, or presumptuous. As Spilka (1993) pointed out, professional communication students often need specific instruction in analyzing the social situation at work and in using strategies for social accommodation.

Agency in organizations is not a personal attribute or a property of teams that can be deployed; rather, it is an interactive accomplishment that is constructed in real time as professionals work together with other professionals, mediated by their culture's artifacts and technologies (see Engeström, 1992). Expertise in professional communication calls on keen social skills and extensive local knowledge in order to cultivate one's agency and authority. If writers and designers are to be heard in workplace cultures organized primarily around the activities of scientists, engineers, and technology experts, they need to position themselves as central rather than as peripheral to an organization's key activities, seizing rhetorical opportunities for moment-by-moment agency. They need to read the task environment in order to learn the social norms, values, and practices for getting things done (Smart & Brown, 2002). In this way they will develop expert practices for contextualizing their work, recognizing conditions and opportunities in the local situation that may enable agency, either individually or as a team. As discussed earlier, the key for professional communicators lies in perceiving the moment (kairos) to exert their agency so they have the best chance of making a long-term impact.

Differences in Supporting Writing and Visual Design Processes

Although most writing and visual design classrooms support an optimal design process—from planning to evaluation—many corporate environments fail to understand what professional writers and information designers do and treat them more as wordsmiths and data decorators than as rhetorical problem solvers (Flower, 1989). This problem of professional identity that I described over a decade ago (Schriver, 1997) still persists and influences design processes in negative ways. A professional writing student from Carnegie Mellon University reported to me in her internship report, "my boss at IBM Boca Raton told me that planning a writing task is a waste of time; he wants me to get writing fast and stop fooling around." Comments such as these remind us that workplaces may not provide the resources for supporting an expert design process, forcing writers and designers to focus on efficiency of production over communication quality.

Because workplaces differ markedly in how they conceive of writing and design processes, professional communicators must be skilled in recognizing the characteristics of the process that can impede the creation of well-designed artifacts. They must be able to audit how design activity takes place in the local situation, considering the range of tools and practices that mediate design work—policies, methods, informal protocols, sign-offs, technologies, and reward structures. Moreover, experts must be able to persuasively argue for the cultural and material benefits of producing high-quality professional communications, especially for the long-term benefits of building cognitive structures and relational networks for stakeholders.

Differences in Planning

Students in writing and design classrooms typically begin their planning with metacognitive reflection on the best way to proceed for a design project. By contrast, professional communicators in the workplace often engage in preplanning by conducting interviews with subject-matter experts. In making the transition to the workplace, professional communication students may find the process of planning to be stressful because it is often very difficult to gain access to subject-matter

experts, such as computer scientists or lawyers, whose understanding of the content they need in order to get started. Planning in the workplace demands refined skills in asking questions that will elicit the content professionals need to work with. Professionals need to reflect on their subject-matter knowledge, gauging the distance between what they know and what they need to know.

Like the plans of student writers or designers, professionals' plans usually take the form of words, images, diagrams, or sketches (Flower & Hayes, 1984; Witte, 1987). But unlike academic environments, where the plan is usually a response to a well-designed assignment, the professional's plan is more of a social negotiation among team members in response to an ill-defined problem. Professionals require keen planning skills not only to ensure the quality of their own projects, but also for contextualizing their work within the larger activities of the organization.

Differences in Revision

When students revise in classroom settings, revision is usually an activity carried out by writers or designers working on their own writing and visual design. Their efforts are guided by the assignment and by their own goals. In contrast, the workplace calls for revising texts written or visualized by other people in order to achieve goals that have been determined by negotiating with others in the organization. It is common in workplace settings for many individuals to have authority over artifacts created—demanding rewrites, revisualizations, or complete overhauls of writing and visual design. One writer in the U.S. Internal Revenue Service told me that as many as 28 people had authority to edit what he had written. To be effective, professional communicators must have strategies for evaluating, consolidating, and taking action on the contradictory feedback they will likely receive.

There is also a difference in what motivates revision in the classroom and the workplace. In the classroom, the assignment and students' personal goals shape their objectives for revision. In the workplace, revision is typically initiated when the organization recognizes a gap between the communications they have and those they need, often prompted by negative feedback from internal or external stakeholders (e.g., managers, sales representatives, users, readers). Revision in the workplace involves iterative redesign until stakeholders' needs are met or until the artifact is approved for publication. In forward-thinking organizations, professionals evaluate the quality of their artifacts through methods such as preference tests, comprehension tests, or usability tests, leaning on stakeholders' cognitive and affective constructions of the content to guide revision of the text so far.

Differences in Collaboration

In many writing and visual design classrooms, collaborative activities focus on joint projects among students in the same class who share similar goals for the task to be accomplished. In contrast, workplace collaboration is characterized by cross-disciplinary efforts in distributed work environments (separated by time, space, geography, allegiances, subject-matter expertise, or sense of mission; for a discussion, see Spinuzzi, 2007). In workplace collaboration, team members from different fields may hold radically different goals for the problem to be solved, requiring participants to engage in substantial negotiation, coordination, and conflict resolution (Burnett, 1991). For example, in an effort to introduce college students to workplace issues of collaboration, Wojahn, Dyke, Riley, Hensel, and Brown (2001) studied students who majored in engineering and technical communication as they worked together on client-based projects. They found that engineering and technical communication students experienced difficulty in collaborating because the engineering students tended to privilege their own discipline and view the task of communicating technically as a mere "add on." They also found that technical communication students were unable to articulate persuasively to engineers the value of their discipline and what they added to the project. Unlike students in a writing or design class, professional communicators often find themselves needing to make clear to their interdisciplinary collaborators the usefulness of the expertise they bring to solving problems. In doing so experienced professional communicators invent and reveal their own disciplinary identity as they engage in multidisciplinary activity.

In the classroom, students typically work face to face and in groups, mediated by technologies such as computer-based discussion lists or intranets. In the workplace, professionals may never meet their collaborators in person. Instead, most of their work may be carried out in ad hoc teams who operate remotely through electronic means (e.g., e-mails, conference calls, video chats, and intranet communications). Often separated by discipline, location, and time, these fluid group ensembles must not only build communication products, they must also coordinate their decision-making activities in ways that allow them to achieve their rhetorical goals. Part of the social burden of distributed environments is that professional communicators must coordinate two goals simultaneously. First, they must articulate their ideas for solving the problem at hand in a persuasive way, bringing to bear their knowledge of writing and visual design, and when possible, by identifying empirical research or best practices to support their ideas (Schriver & Gordon, 2010). Second, professional communicators often need to establish their credibility, ethos, and work ethic with their collaborators.

Put differently, they need to construct for their collaborators a positive image of their professional identity. Paretti, McNair, and Holloway-Attaway (2007), for example, provided a case study of U.S. and Swedish engineering and digital media students who collaborated on a design project. They found that although students were very experienced in using digital technologies for their personal work, students did not do very well in using these technologies to construct and mediate their professional identity in distributed work environments. For example, engineering students paid little attention to thinking about creating positive social interactions with their distant collaborators. Students failed to consider how productive patterns of collaboration might have enhanced their problem solving. Paretti and her colleagues contend that teachers of professional communication need to devise pedagogies for teaching collaborative strategies for interacting effectively in distributed environments.

These differences between classroom and workplace task environments illustrate how communication practices in different contexts are uniquely mediated by social influences and material practices. These differences also make clear that to understand and nurture expertise in professional communication, we need detailed empirical studies of the dynamics of workplace task environments. We need to examine the interactions between individual expertise and distributed expertise. Such studies would provide a basis for developing pedagogies for educating young professionals to be more effective in the workplace.

CHARACTERISTICS OF EXPERT PROFESSIONAL COMMUNICATORS

Taken together, the literature suggests a number of typical characteristics of highachieving professional communicators:

- 1. Possess rich schematic and tacit knowledge about genres, stakeholders, processes, symbols, and tools—knowledge that guides engagement with others and that influences their symbolic-analytic production of text.
- 2. Able to read the context and scope out social resources, noticing opportunities that can enable them to exert change.
- 3. Can coordinate their representations of personal knowledge, text produced so far, stakeholders' needs, and context as they design. Able to fuse disparate items of content into a coherent whole.
- 4. Are visually and verbally fluent, able to draw on a large repertory of semiotic resources (words, images, sounds, numbers). Comfortable with displacing one form (e.g., text) with another (e.g., visual). Not invested in one form or another, but on what meets the needs of stakeholders, their situation, and the available media.
- 5. Articulate *what* they know and the *why* of their choices in particular rhetorical situations.
- 6. Reflective on their knowledge and able to devise tactics for learning what they need to know. Are metacognitively aware of what they need to know and have strategies for getting that knowledge.
- 7. Possess rich rhetorical memories about the people they have designed for—readers, audiences, stakeholders, communities, or users.
- 8. Rhetorically perceptive of opportunities to build knowledge and to advance personal innovation and organizational agendas through formal and informal social networks within organizations.
- 9. Expect their work will be circulated and repurposed (Swarts, 2010) in various lengths, formats, and media—for example, circulated as an extended report and as report highlights in modular format; presented as a print publication and displayed on the Web; or deployed on high-definition television and reformatted on the fly for display on cellular technologies. Embrace the dynamics of content reuse in organizational settings and anticipate the resemiotization (Iedema, 2003) of their work (i.e., textual artifacts may change in meaning as they shift from context to context), traversing local genre ecologies (e.g., report to instructions to brochure).
- 10. Recognize that communication artifacts are often recontextualized in unpredictable ways (e.g., a slogan written for a public service campaign

such as "plain language is a civil right" may become a tagline for a Web site devoted to advocacy for plain language). Each time a text is reused, it becomes divorced from the social context that produced it (Mehan, 1993). Professionals are not invested in single meaning with a singular purpose.

- 11. Can juggle multiple organizational constraints (deadlines or lack of funding) and multiple representations of the content (what the boss wants, what the client needs, and what the author thinks is best) and still maintain a focus on the stakeholders' needs.
- 12. Acquire rich patterned knowledge of visual, verbal, and typographic text features. Skilled in selecting what to say, in deciding how to say it, and in combining visual and verbal resources.
- 13. Recognize that the texts and artifacts they create can influence how others perceive their abilities, positioning them positively or negatively for future work.
- 14. Adaptive to complexity in the workplace; can interpret what they need to know on the fly.
- 15. Strategic in building alliances with others who may help them to achieve long-term goals for design processes and products.

CONCLUSION

In this chapter I explored two questions about developing expertise in professional communication:

- What are the challenges of professional writing and visual design in the workplace?
- What knowledge underlies the development of high levels of skill in professional writing and visual design?

In addressing the first question, I characterized three challenges that make professional communication unique:

- The need to orchestrate writing knowledge and strategy with visual design knowledge and strategy
- The need to engage multiple stakeholders with a given body of content
- The need to negotiate the social, political and cultural landscapes of the workplace

This review shows clearly that addressing these challenges is difficult for anyone who writes or designs in the workplace and that skilled performance requires much more than being able to create well-written or elegantly designed artifacts. To be effective the artifacts must actually achieve their goals for stakeholders, helping them to build appropriate cognitive structures and useful relational networks. As I have shown, the rhetorical stakes are high for designing either paper-based or Webbased artifacts, as stakeholders for professional communications are an impatient

lot, tending to skim and scan more often than reading for understanding—making it difficult to gain stakeholders' attention and keep it.

The second part of the chapter examined the knowledge that underlies high levels of skill in professional communication, knowledge that may distinguish experts from novices, and experts from experienced nonexperts. Existing literature suggests that experts in professional communication need not only advanced abilities in writing and visual design, but also extensive rhetorical, social, and cultural knowledge.

This chapter also contributes to our understanding of the ways in which workplace task environments differ from classroom settings:

- Procedures for providing feedback
- How individuals or teams develop a sense of agency in their environment
- Support for writing and visual design processes
- Processes of planning, revising, and collaborating

My analysis identified some of the unique features of writing and visual design in professional settings, underscoring the need for the development of new pedagogies that could ease students' transition from school to work, pedagogies that could help them more easily negotiate the fluid and often volatile context of the workplace, and provide them with strategies for developing a sense of agency in order to be more rhetorically effective.

As researchers better understand the nature of writing and visual design ability, the knowledge needed to excel, and the ecologies of workplace task environments, the field will be better positioned to suggest a path toward developing and nurturing expertise in professional communication, both in the classroom and in the world of work.

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