ABSTRACT

INGRAM, LAURA W. An Analysis of the Problem of Writing Skill Transference and Its Implications for Professional Writing Instructors. (Under the direction of Chris M. Anson).

In recent years, both businesses and students have reported a lack of student preparation for writing in the workplace. Many studies have been conducted to examine the transference of skills between settings. However, researchers have found that the differences between the academic and workplace environments complicate the issue of transfer for writers making the transition from college to career, and for professional writing instructors hoping to the make the transition easier for their students.

In order to better understand the differences in academic and workplace contexts, this thesis critically examines the research conducted in skill transfer over the past two decades. It explores topics like expertise, situated learning, and activity theory from the perspectives of both cognitive science and composition to provide a comprehensive view of the problem of writing skill transfer and thus present pedagogical strategies that might improve transfer of writing skills from college to the workplace. Instructional methods like cognitive apprenticeships that use scaffolding techniques to move students gradually from general writing knowledge to more context-specific writing knowledge may help facilitate a smoother transition from academic writing to workplace writing, thereby minimizing the need for on-the-job training.

AN ANALYSIS OF THE PROBLEM OF WRITING SKILL TRANSFERENCE AND ITS IMPLICATIONS FOR PROFESSIONAL WRITING INSTRUCTORS

By
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DEDICATION

To my best friend and husband, Rob,

for his never-ending supply of patience, love, and encouragement

and for having the biggest heart of anyone I know.

May we have many more decades together.

BIOGRAPHY

Laura Williams Ingram was born in 1975 and grew up in Angier, North Carolina. She now resides in Garner, North Carolina with her husband, Rob. As an undergraduate, she attended North Carolina State University as a Teaching Fellows scholar and graduated Cum Laude with a Bachelor of Arts in English in 1997. She returned to complete her Master of Arts in English with a concentration in Rhetoric and Composition in the fall of 2003. While completing her graduate study, she worked as a tutor for NCSU's Writing and Speaking Tutorial Services. Upon receiving her Master's degree, she hopes to teach post-secondary composition and eventually publish her first book of poetry.

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INTRODUCTION

Writing skills are needed in nearly every aspect of life. As a result, writers are constantly making transitions—transitions from one course to another, from high school to college, and from college to the workplace. It is assumed that writing instruction provides students not only with knowledge that is valuable for its own sake, but with the skills necessary for effective performance on various types of writing tasks that may be encountered in the future. On some level there is an expectation that the writing skills students acquire will be useful to them beyond their immediate function in a particular class. There is an expectation that, ideally, the skills learned in writing courses will transfer to other courses, that the writing skills acquired in high school will transfer to college, and that the writing skills acquired in college will transfer to the workplace.

The transition that writers make from college to the workplace has received particular attention. A study conducted on the campus of North Carolina State University in 1996 revealed that students are not aware of how important writing is on the job and are not prepared for the types of writing that they will be required to do (Miller, Larsen, and Gaitens v, 1). Students tend to believe that the writing skills they acquire throughout their college education will somehow prepare them for what lies ahead in their professions. However, this is not always the case; academic writing[1] does not always provide the skills necessary for effective performance on workplace writing tasks.

Professional writing courses, however, are designed specifically to help prepare students for workplace writing. These courses include centralized courses like writing in a particular discipline (such as science or business) and capstone courses that provide writing practice in a

[1] For the purposes of this thesis, the term "academic writing" is used to mean any writing produced within the context of a school setting, rather than to suggest any specific form of writing that is scholarly and research-based.

particular field (such as social work) and are generally taken in the second half of students' undergraduate coursework as part of their major; these courses attempt to provide students with valuable experience in communicating in the workplace and producing documents similar to those they might encounter as they enter their professions. Professional writing courses are certainly a step in the right direction in preparing students for the writing they may be expected to produce as professionals in their fields, but there is evidence that a problem still exists. Is it realistic to assume that these writing courses can help students produce effective and appropriate professional documents as they move into the workplace? Can the writing skills acquired in these courses actually transfer to workplace writing tasks?

An article written in a 2004 edition of *The New York Times* entitled "i need help writing a esay" examines the growing problem of employees who cannot meet the writing demands of their professions. These employees are otherwise successful people, but their lack of writing skills has become an annoying and costly problem for businesses and corporations across the country. These companies that rely so heavily on effective written inter- and intra-office communication have to train employees to write effectively on the job (Dillon A23). With the existence of professional writing courses in many post-secondary curricula, one might expect that the problem would be alleviated. However, articles like Dillon's lead us to a different conclusion; businesses continue to report that new employees are unprepared for workplace writing. Are professional writing programs the solution? If so, is the structure of these courses the problem? Or is the issue more complicated?

Many studies have been conducted over the past twenty years examining the transition between college and the workplace, and more specifically the transference of writing skills from one environment to the other. Many of these studies have found that school and work are two

completely different settings and that this creates two completely different contexts in which to write. Both environments constitute different social, political, and cultural contexts that vary by situation. These contexts affect the writing done in each setting. For example, academic writing is produced for the instructor, and its goal is primarily to demonstrate knowledge and skills, while workplace writing is for multiple audiences, ranging from broad, public audiences to highly specific internal audiences, and is often more action-oriented. If the two settings are so different, how can the skills taught in one environment possibly transfer to the other? To what extent can a professional writing curriculum prepare a student for writing on the job?

Since research began on the process of skill transference, many scholars (e.g., Lave, Wenger, Brown, Collins, Duguid, etc.) have found that the problem lies in the nature of learning itself. Learning is situational. Patrick Dias, Aviva Freedman, Peter Medway, and Anthony Paré suggest that "writing is not a single clearly definable skill acquired once and for all; [it] is shaped fundamentally by its sociocultural context" (4). Writing has many diverse functions, from mere communication to skill demonstration to argument, "each with its own complex political and social dimensions" (4). For this reason, many of the writing skills learned within the context of one setting do not easily transfer to the other, simply because the settings are governed by completely different audiences and purposes and result in different genres, styles, and formats. As the research of Aviva Freedman, Christine Adam, and Graham Smart has shown, even writing classes that attempt to simulate the work environment for each writing assignment cannot completely prepare students to function within the social and political discourse of every workplace setting. After all, each office, company, or business has its own context that its employees must understand and use as a guide for the writing done in that environment.

Academic institutions certainly have their own contexts and appropriate discourses that function within those contexts.

It is natural to assume that one of the purposes of academic writing is to, as Dias et al. suggest, "enabl[e] students, through discourse production, to learn to use language, 'to do things with words,' in ways valorized in specific disciplines" (47). However, according to Dias et al., the grading and ranking of students within institutions creates a unique and more complicated environment. The instructor and his/her expectations control the type of writing produced within the classroom, but regardless of the type of writing assigned, it is produced with the understanding that it will somehow factor into the students' success or failure in the particular class and the institution as a whole. Two of the main functions of the writing done in the classroom are to practice and improve communication skills and to demonstrate those skills based on the instructors' guidance and expectations—even if that writing is done for the explicit purpose of workplace preparation.

On the other hand, as Jean Ann Lutz suggests, once students become employees they are immersed in what she calls the "corporate culture" of the business or organization that hired them (113). New employees must become socialized into that corporate culture—initiated into the "values, the patterns of thought, beliefs, feelings, attitudes, behaviors, products, and publications that result from the experiences and common goals shared by people working in the same organization" (114). Writing is a fundamental part of this process, since it is the means through which employees participate in the company, through which outsiders learn about the company, and through which the corporate culture is solidified (114).

According to Lutz, once workers are hired they bring with them different types of knowledge: knowledge of their respective fields and knowledge of the particular discourses

associated with their fields (118-119). But the one thing they cannot bring is the knowledge of the corporate cultures of different businesses and organizations. Before employees can become productive members of an organization, and more importantly write effectively within that organization, they must become immersed in the corporate culture of the workplace. They must learn how to interact with co-workers and managers in a way that promotes and solidifies that company's values and beliefs. The culture of the organization may not only influence what types of documents are produced, but also how they are organized, what they say, and how they say it (119).

Despite the differences that exist between academic and workplace settings, institutions of higher learning still play a part in preparing students for professional life. Professional writing courses exist within those institutions to prepare students for workplace writing. Even though each workplace has its own unique history, goals, power structure, etc. which cannot be known until one becomes immersed in it, it seems overly pessimistic to assume that efforts made to prepare writers for workplace tasks are wasted. The workplace environment *is* unique to each field, and even to each company or agency within that field, and there *are* certain rules, whether spoken or unspoken, that govern the types of writing that are appropriate within each setting. These unique characteristics of workplace settings complicate the issue of designing professional writing curriculums; however, professional writing instruction is not a useless endeavor in preparing students for writing on the job. After all, professional writing programs may be the best strategy we have for providing students valuable experience with workplace writing tasks. But if writing effectively in the workplace means having appropriate knowledge of the context of that environment, then what skills and strategies can be taught in the professional writing classroom

that might transfer across settings? Is this knowledge of corporate culture what is needed to write effectively on the job, or are there more generic skills that might transfer to the workplace?

With these questions in mind, this thesis examines the subject of writing skill transference by reviewing the research done on the topic over the past fifteen to twenty years to present pedagogical considerations that could potentially increase the possibility of transference from professional writing courses to the workplace. While transfer seems to be attainable with the appropriate instructional methods in place, it does not always occur, particularly from college to the workplace. Although we might expect that professional writing courses that are designed to prepare students for writing on the job should be able to facilitate the transition of writing skills from school to work, the writing skills practiced in one may not transfer seamlessly to the other because of the vast differences between the two contexts. Social learning theories like situated cognition and activity theory explain this lack of transfer by proposing that learning is essentially tied to its situation and that learning to write in academic settings will not translate into effective performance in workplace settings.

On the other hand, research in cognition suggests that it is possible to learn by abstraction *and* by immersion in a social context and that writing performance requires both general and context-bound skills. However, if the classroom cannot always provide adequate instruction in the context-specific skills, then cognitive apprenticeship and scaffolding models of instruction may help to solve the problem. These models place knowledge on a continuum from general to specific; they use the general skills that students already have to help them move along the continuum in the direction of expert performance in a particular context.

Chapter One provides an overview of the research presented in this thesis and defines several key terms that are fundamental to understanding transference. It also introduces the

concept of situated learning which complicates the issue of transference for professional writing instruction. Chapter Two examines research on skill transference, analyzing the learning processes involved in acquiring new skills and transferring those skills to new situations. Using the information provided in Chapter Two as a foundation, Chapter Three proceeds with a review of the literature on writing skill transference, applying the principles of general skill transference to the process of writing. After reviewing existing literature on skill transference in general and writing skill transference in particular, the thesis concludes with a final chapter on the implications of the research for professional writing instructors in preparing students for effective workplace writing.

CHAPTER ONE

What is transfer of learning and why is it a problem? Defining key terms

As David N. Perkins and Gavriel Salomon explain in "Transfer of Learning," in order for students to say that they have learned skills, they must be able to demonstrate those skills later—the skills learned previously must be transferred to new situations where they can be demonstrated (sec. 1). Mary L. Gick and Keith J. Holyoak suggest that we generally understand that "learning . . . occurs when the 'same' task is repeated" while transfer involves two seemingly different tasks (10), yet upon closer examination, we can see that each learning situation has its own unique context which makes each demonstration of the acquired skill a new and different experience. Because of this, there are situations in which one learns but is not able to demonstrate what he/she has learned—for example, a student who does well on a grammar test but cannot correct grammar in daily life. In situations like this, what is not present is transfer (Perkins and Salomon, "Transfer" sec. 1). The student has *learned* the words in one context but cannot implement them in another. Transfer requires learning, but learning does not guarantee transfer. That is essentially the dilemma with which this thesis is concerned—why the skills learned in professional writing courses do not always transfer to the workplace. Consequently, in order to understand more fully how transfer works—and more importantly, why it often does not occur—it may be helpful to further define the term "transfer" by explaining the key terms associated with it before proceeding.

Defining Transfer

According to the International Encyclopedia of Education, "transfer occurs when learning in one context enhances or undermines a related performance in another context" (Perkins and

Salomon, abstract). As Perkins and Salomon describe, transference can be either **positive** or **negative**—"positive transfer occurs when learning in one context improves performance in some other context . . . . Negative transfer occurs when learning in one context impacts negatively on performance in another" (sec. 1). For example, a student who speaks Spanish and later studies French may experience positive transfer; because the two languages are related in many ways, the previous knowledge of Spanish may actually enhance the study of French. However, while learning French the differences in pronunciation and syntax between the two languages may produce obstacles that hinder the acquisition of the new language and result in negative transfer (sec. 1).

The International Encyclopedia of Education also describes two types of transference between contexts—**near transfer** and **far transfer**. In order for near transfer to occur, there must be "closely related contexts and performances" (sec. 1); for example, students who have practiced word problems in their homework assignments experience near transfer when they are taking a test that is made up primarily of word problems similar to those they have studied. On the other hand, far transfer occurs between "rather different contexts and performances" according to Perkins and Salomon; far transfer might occur when "a chess player . . . appl[ies] basic strategic principles such as 'take control of the center' to investment practices, politics, or military campaigns" (sec. 1).

There are also two cognitive processes by which transference can take place. As Perkins and Salomon describe in "Transfer of Learning," when transfer occurs by means of stimulating previously rehearsed actions with conditions similar to those in the previous learning context it is called **low road** (or **reflexive**) **transfer** (sec. 5). According to Perkins and Salomon, learning to read is a perfect example of low road transfer; "instruction in reading normally involves

extensive practice with diverse materials to the point of considerable automaticity. Moreover, when students face occasions of reading outside of school the printed page provides a blatant stimulus to evoke reading skills" (sec. 6). **High road** (or **mindful**) transfer, on the other hand, "involves deliberate effortful abstraction and a search for connections" between contexts (abstract). For example, a history teacher who asks students to examine current events in light of past events to help them ask questions and form connections is encouraging high road transfer (sec. 6).

Putting these concepts into simple, easily definable terms may make the issue of transfer seem less complicated and problematic than it really is. In fact, quite often, transfer of learning does not occur, as Perkins and Salomon suggest in "The Science and Art of Transfer"; learners acquire skills in one context and are not successful in forming connections to other contexts where those skills would be useful. And if transfer does not frequently occur, then it poses serious problems for educators. If teachers aim to facilitate the acquisition of writing skills that when learned can be applied to new situations in other classrooms and outside the classroom, then transfer must occur as often as possible.

In response to these basic goals, Perkins and Salomon have set forth three theories that may help us better understand the notion of transfer. The first theory described is the "Bo Peep Theory." Those who unconsciously espouse this theory assume that transfer happens automatically—that if you "leave them alone, . . . they'll come home/wagging their tails behind them" ("Bo Peep Theory" Science and Art). Teachers present information with the expectation that what is taught will be effortlessly transferred to other classrooms and to the world outside of school. The problem with this theory is that it is essentially unrealistic; imparting knowledge does not ensure the ability to apply that knowledge.

The second theory presented is known as the "Lost Sheep Theory." According to this theory, knowledge is highly context-specific, and the expectation that transfer may occur is simply naïve. Learners are, in fact, "lost sheep" with little or no hope of making connections between acquired knowledge and new contexts. The goal of "Lost Sheep" theorists would be to tailor classrooms to facilitate the acquisition of specialized skills that are useful in achieving very specific goals ("Lost Sheep Theory" Science and Art). If we buy into this theory, however, what we may be left with is essentially a vocational curriculum that produces workers rather than learners.

The third theory, the "Good Shepherd Theory," was put forth by Perkins and Salomon themselves in response to the other two. According to this theory, both mindful and reflexive transfer are possible, but the occurrence of each depends on whether or not teachers are "good shepherds"—whether or not the learning environment activates the mechanisms necessary for transfer ("Good Shepherd Theory" Science and Art). Therefore, an educational system that provides opportunities for both types of transfer is ideal—and possible.

Conditions of Transfer

As Perkins and Salomon suggest in their "Good Shepherd Theory," instruction must activate the mechanisms necessary for transfer. One of these mechanisms is called **hugging**. Hugging is necessary for reflexive transfer to occur. "The general idea of hugging is to make the learning situation *more like* the situations to which transfer is desired. . . [so that] the automatic reflexive triggering of response will frequently occur" (Perkins and Salomon, "Hugging" Science and Art). According to Perkins and Salomon, role-playing is a good example of hugging; in role-

playing scenarios, learners' active participation provides them with skills that may be useful in handling a similar situation.

However, in order for mindful transfer to occur, Perkins and Salomon suggest using **bridging**. Bridging is a way for teachers to assist students in connecting (or "bridging") the skills learned in one context to a new one. Using analogies is one way of bridging two seemingly unrelated contexts to provide an opportunity for mindful abstraction. As Perkins and Salomon describe, a biology teacher who asks students to think of things in their everyday lives that function in much the same way as the human circulatory system is using analogy to help the students understand how the circulatory system works on a level that goes beyond the biology classroom. Students may provide analogies such as plumbing circulating water throughout a home, or electrical circuits that transmit current ("Bridging" Science and Art).

Adaptive Expertise

With these definitions of transfer in place, it may be said that successful transfer, then, relies on what is known as "adaptive expertise." "Experts have acquired extensive knowledge that affects what they notice and how they organize, represent, and interpret information in their environment" which "affects their abilities to remember, reason, and solve problems" (Bransford, Brown, and Cocking 31). Expertise, then, can be seen as a combination of reflexive and mindful transfer: the ability to match new situations to previous experiences combined with the ability to abstract general problem-solving skills from previous experiences to apply in new situations (Beaufort 180). Experts are able not only to recognize similar situations and apply the appropriate skills but also to examine new situations to determine which strategy must be used to find a solution to a given problem. Research has suggested that situations are "perceived and

understood differently, depending on the knowledge that a person brings to the situation" (Bransford, Brown, and Cocking 32). Experts are, therefore, more likely to recognize significant patterns of information than novices because their knowledge is organized by strategies that direct their thinking in multiple situations, rather than by separate lists of facts that are relevant to individual situations (33, 36). That is not to say that experts merely possess general problem-solving skills that apply to a variety of situations (48); it is, in fact, more correct to say that experts have "conditionalized" knowledge that includes information about the contexts in which a particular skill may be useful (43).

However, simply being an expert is only part of the equation. Experts must be able to adapt to new situations. John D. Bransford, Ann L. Brown, and Rodney R. Cocking provide an example of this by contrasting two Japanese sushi experts, one of whom must strictly follow a recipe and the other who is able to incorporate a certain amount of individual creativity into cooking (45). The second chef is a perfect example of adaptive expertise. He is more able to adapt his skills to meet the demands of the situation. One of the main differences between experts and adaptive experts is metacognitive ability. Adaptive experts do not simply learn a skill and apply it over and over again; they are aware of their own level of ability and continually strive to improve it (48). Adaptive experts possess not only the knowledge of skills and their applications (as experts do), but they are also able to see connections and relationships between ideas and understand the appropriateness of a particular problem-solving strategy under a given set of circumstances; and, perhaps most importantly, they have an awareness of their own cognitive processes that guides them through the act of learning. In other words, they possess a combination of declarative, procedural, theoretical, conditional, and strategic knowledge, which Robert E. Haskell suggests is essential for transfer.

Situated Learning

Theories of situated learning, however, complicate the issue of transfer. If learning is inevitably bound to the context in which it occurs, to what extent is it reasonable to expect transfer, even if instruction includes the conditions that Perkins and Salomon have recommended? Jean Lave and Etienne Wenger explored the concept of situated learning in depth and focused on what they call "legitimate peripheral participation." They defined legitimate peripheral participation as the process through which "learners inevitably participate in communities of practitioners [in which] mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community" (29). They examined the concept of apprenticeship in different places around the world and discovered that by analyzing the apprenticeships from the perspective of legitimate peripheral participation, they could more fully understand the process through which the apprentices became fully-functioning participants of the social practices of their respective trades. This theory of situated learning, for them, is a way of connecting the sometimes mutually exclusive goals of learning for its own sake and learning as part of social practice (34). For Lave and Wenger, learning is situated in social practice, and "legitimate peripheral participation is proposed as a descriptor of engagement in social practice that entails learning as an integral constituent" (35).

It seems that the concept of situated learning excludes the possibility of transfer since, according to Lave and Wenger, all learning is bound to the social context in which it occurs. If learning is socially situated and cannot be separated from its context, and if the contexts of school and work are independent and unique, then mere transfer seems an unrealistic goal for instructors. If the writing skills learned in the classroom are inherently bound up in the academic

context, then it seems the only way to write successfully in the workplace, according to Lave and Wenger, would be to relearn writing skills in the workplace context.

Despite the claims of Lave and Wenger that learning is inseparable from its situation, there is evidence that their assertions, and the assertions of other supporters of situated learning, are somewhat overstated. As John R. Anderson, Lynne M. Reder, and Herbert A. Simon argue, theories of situated learning focus excessively on the social context of learning and propose that knowledge is essentially context-bound and does not transfer to other situations. These theories suggest that abstract instruction is impractical, and that in order for instruction to be useful it must be carried out in social contexts—that learning to write on the job requires immersion in the workplace environment. Anderson, Reder, and Simon explain that while these theories may provide a potentially useful perspective on learning and education, they do not reflect many of the things that cognitive research has proven. We know that transfer does occur, and we know that not all instruction must be done in social contexts in order for students to learn valuable skills. We know that learning *can* be context-bound, but it does not necessarily have to be.

Despite what situated cognition suggests, we know that students can learn both abstractly and through social interaction. We know that knowledge consists of both context-specific skills and abstract, general skills. As Gick and Holyoak argue, general and specific knowledge work together and "should be viewed as complementary rather than competing processes" (11). As Perkins and Salomon propose in "Transfer of Learning," the importance of context-specific knowledge in situated learning does not necessarily negate the importance of more general knowledge that, when combined with context-specific knowledge, may foster transfer (sec. 3).

If we take a comprehensive view of learning and understand the writer as being both an individual and a participant in a social situation, and if we understand writing performance as a

combination of context-specific and general skills, then how do we prepare writers for the workplace? We know that school and work are different social contexts, but as Perkins and Salomon suggest bridging and hugging techniques are necessary to facilitate transfer. These techniques attempt to facilitate transfer by either making the learning context more like the context in which transfer is desired (hugging) or by helping students make connections between the learning situation and the transfer situation (bridging). Still, searching for connections between course assignments and workplace tasks and simulating workplace writing in the classroom may not help students fully understand the "corporate culture" that Lutz described. This "corporate culture" may create a gap between the two contexts that can only be overcome through experience within the workplace context.

Can professional writing courses provide students with adequate, transferable knowledge of effective workplace communication, or is it simply unrealistic to expect these courses to offer anything more than general strategies that may or may not improve students' performances in the workplace? If professional writing courses *can* provide students with valuable experience in producing workplace documents, then how do we teach these courses to maximize the benefits? With these questions in mind, Chapter Two will examine several significant studies conducted over the past two decades that have contributed to the current state of knowledge on the problem of skill transfer to better understand what these studies may offer in terms of a professional writing pedagogy that may facilitate transfer.

CHAPTER TWO

What do we know about skill transfer?

There have been many theories posited over the past two decades about what transfer is and how it works. It is assumed that transfer does, in fact, occur (at least sometimes); otherwise, we would approach each new learning situation with a blank slate. Certainly in the real world we encounter situations that we are ill-equipped to handle because of a lack of knowledge about that particular context—situations in which we must learn a new skill or adapt to a new set of expectations (for example, graduating from college to begin a career) (Gick and Holyoak 9). However, if we did not believe in the possibility of transfer, regardless of what skills we had learned in the past, each new problem we encountered would be one that we were not able to solve.

Certainly in the professional writing classroom the idea of transfer is important. After all, professional writing courses are usually designed for the purpose of preparing students for workplace writing tasks. Instructors understand that the assignments they present to students are aimed, at least in part, at providing valuable experience in creating effective business documents—experience that will aid students in transitioning from college to career. However, there is much controversy over whether or not transfer is a realistic goal for instruction. Over the past twenty to thirty years, there have been many studies that have approached the topic of learning transfer in the hopes of coming to some sort of consensus about the possibility of transfer and how transfer functions in the process of learning.

About fifty years ago, a scholar named George Pólya hypothesized that finding solutions to mathematical problems relied more on general problem-solving skills than formal training in mathematics. Also, Allen Newell and Herbert Simon conducted research on artificial

intelligence by designing and implementing a computer program that would allow the computer to play chess. Because they were able to input general strategies into the computer to generate successful chess-playing, they concluded that it was general problem-solving abilities that accounted for intellectual knowledge ("Cognitive Skills" 17). The work of Pólya and Newell and Simon has provided the foundation for more recent transfer studies; many scholars since that time have agreed with their findings, but there have also been many studies that have provided contradictory results. According to Perkins and Salomon, many of these opposing studies can be divided into three groups: expertise, weak methods, and transfer ("Cognitive Skills" 18).

Expertise

Studies in expertise examined the knowledge of chess players to determine what sets of skills experts possess and how they utilize those skills to solve problems. These studies on the topic of expertise found that there are two types of experts: what Haskell calls "routine experts" and "adaptive experts." Routine experts are those who possess a rather small base of context-specific knowledge, and adaptive experts are those whose expertise depends on an extensive local knowledge of patterns within a domain, near automatic recognition of situations where those patterns are relevant, and "forward reasoning" that moves from pattern recognition to an appropriate solution by applying the patterns ("Cognitive Skills" 18; Haskell 107).

This "adaptive expertise" that Haskell describes can be seen as the level of performance that writers need in order to function effectively in the workplace. And according to articles like Dillon's (see Introduction) it is the level of writing performance that many workers are missing. Research in expertise suggests that, in order to be successful on the job, writers need an extensive

knowledge base *and* the adaptability to recognize appropriate situations for applying what they know.

Gick and Holyoak also examined research in expertise to study transfer. They saw that many previous studies concluded that transfer primarily occurs between tasks that are very similar. These studies fueled the debate that local knowledge was more important than general knowledge in increasing the likelihood for transfer. Gick and Holyoak, however, did not view local and general knowledge as competing forces in the transfer process (11). Instead, they blamed the previous studies' lack of evidence for transfer on the brief time span of the research conducted and the inability of researchers to account for the details of the original learning situation (13). They argued that since the researchers examined only the transfer situation and had an incomplete understanding of what was originally learned, and since the studies ignored the possibility that transfer might occur at a later time if it does not happen immediately, the lack of transfer resulting from these studies was not conclusive (41).

Using these weaknesses of previous studies, Gick and Holyoak analyzed the components of tasks and concluded that they are made up of both structural and surface features. The structural features are those "that are either causally or functionally related in outcome or goal attainment," and those that are not are considered surface features; similarity in features, both structural and surface, increases the likelihood that two tasks will be viewed as similar (16). They provide an example of this by setting up the problem of drought in Oklahoma and California. How similar the two contexts appear is based on one's prior knowledge; if both states have drought, based on our knowledge of drought conditions we might expect that if one state suffers crop damage then the other will, too. Drought is the common structural feature of the two scenarios; simply put, if the two states experience similar conditions then we might conclude that

they may experience similar results. Because the two contexts share common structural features, we might predict that they would share common results as well. In other words, Gick and Holyoak concluded that perceived similarity, both structural and surface, affects whether or not the learner will attempt to transfer information, while definite structural similarity between the two contexts determines the direction of transfer (whether it will be positive or negative) (18).

For Gick and Holyoak, transfer depends very much on what was learned originally and how that information is organized in memory. They suggest that knowledge stored in memory has two parts—content and format. Content is what the knowledge represents and how it can be applied; format is how that knowledge is encoded and stored in the brain (13). Similarly, Larry W. Brooks and Donald F. Dansereau have argued that how easily one accesses the information necessary for transfer depends on what has been stored (content) and how it has been stored (format). They pointed out that the content and organization of a subject's knowledge base is the primary negotiator between what was learned previously and transfer performance (122-123).

Based on the conclusions of Gick and Holyoak and Brooks and Dansereau, experts must not only have an extensive knowledge base, but the knowledge must also be organized in a way that makes information easily accessible. Thus, expert writing performance in the workplace concerns more than knowing how to write well; it also requires being able to select quickly and easily the strategy that may be needed to perform a particular writing task. Pedagogically speaking, it may not be enough to teach the writing skills that may be needed in the workplace; it may also be important to present material in a way that helps students organize information for future access.

Weak Methods

The weak methods argument arose from research in artificial intelligence and showed that general strategies were inadequate for those subjects who were new to a particular situation. According to Perkins and Salomon, "when new to a domain, all a computer or human could do was deploy weak methods that turned out weak results"; therefore, many AI researchers began to use research on expertise to address the inadequacy of general strategies in solving problems ("Cognitive Skills" 18). Similarly, Haskell argues that an extensive foundation of prior knowledge is essential for problem-solving in a variety of situations. He suggests that computer programming studies like Newell and Simon's have misled us because they rely too heavily on procedural or "how-to" knowledge and do not adequately consider the other four types of knowledge (as mentioned in Chapter One) which he believes are necessary for transfer. He argues that focusing too much on general strategies is dangerous because it can lead to what he calls "runaway" transfers; without the acquisition and utilization of all five types of knowledge, one does not have the knowledge base to prevent application of inaccurate information—for example, a child who applies the label of "fish" to a whale (102). According to Haskell, having more knowledge increases the chances of forming connections and relationships between concepts; simply put, "the more we know, the better" (106).

However, Haskell does argue that the quantity of knowledge is not enough. After all, many so-called experts possess large amounts of specific knowledge, but they at times become so rigid in their thinking that they cannot adapt to new situations (98). This adaptability is the second part of Haskell's transfer equation; it is the quality of the knowledge one has—the way the knowledge is organized so that one can sort and access the information necessary to solve a variety of problems.

These "weak methods" of previous AI research can also be used to describe the performance of novice workers. As students move into their professions after graduating from college, oftentimes they have only basic, general skills to assist them as they attempt unfamiliar workplace writing tasks; as Perkins and Salomon have explained, they possess "weak methods" for solving problems and they end up with "weak results." General knowledge is certainly better than the absence of knowledge, but it is simply not a strong enough foundation to ease the transition from school to work.

Transfer

Studies in transfer concluded that thinking relies heavily on "context-bound" local knowledge which may not be relevant to other situations. Sylvia Scribner and Michael Cole, for example, conducted a study of the Vai people and examined their acquisition and use of a written language that was not taught in school. Their results actually opposed evidence of transfer (Perkins and Salomon, "Cognitive Skills" 19).

In their study, Scribner and Cole found that since the uses of the Vai written language were limited, particularly when compared to language practices in Western society, that the skills necessary to use the language were limited as a result. The language was highly specialized; it was used only to accomplish a few specific tasks in a limited range of situations (258). Because the Vai language was used only within a highly-specific context, there was little opportunity for "varied practice" (Salomon and Perkins 131). This lack of varied practice is primarily responsible for the lack of transfer that resulted from the Vai study. Transfer requires the practice of a skill using multiple examples in a variety of contexts until it becomes automatic and adaptable (Salomon and Perkins 120, 121; Haskell 26-27). This is particularly important in cases

of low-road transfer where the characteristics of the transfer situation must closely resemble those of the original learning situation so as to activate a near automatic response (Salomon and Perkins 120). This lack of practice is primarily responsible for the lack of positive transfer results in so many transfer studies. Because the material attempted in the original learning situation was not adequately practiced, and therefore was not sufficiently mastered, transfer simply could not and did not take place (Haskell 173).

However, the key ingredient necessary for practice to be meaningful is the variety of practice situations. New skills must be practiced again and again in a variety of situations, and such practice must be done with an understanding of its purpose in the learning process, for subjects to acquire the level of expertise to apply these new skills in new situations, especially in those situations that do not mirror the context of the original learning situation (Haskell 177). If the focus were merely on repetitive practice without the introduction of varied contexts, then students would only be able to transfer the new skills in situations that were near exact replicas of the original learning situation; and when novel situations were encountered, then negative transfer would result (179). Because learning can be "context bound," practice in various contexts leads to a greater possibility of transfer; the more situations encountered when practicing a skill, the more likely that a later situation would trigger previous experiences and promote transfer (Salomon and Perkins 120).

The negative results received from past transfer studies pointed to local knowledge as the primary basis for skills and a general lack of ability to "decontextualize" and apply those skills to a variety of situations. However, Perkins and Salomon proposed that the negative results point to an entirely different conclusion ("Cognitive Skills" 21). After all, we know that "when faced with novel situations, people routinely try to apply knowledge, skills, and specific strategies from

other, more familiar domains" (22). They examined one particular study in which graduate students learned statistical principles by practicing them repeatedly so that they could examine how the principles worked and find ways to apply them. They also looked at a study that found evidence that children can learn metacognitive reading skills from a computer program and apply the skills much later in composition exercises (22). Contrary to previous findings, these studies suggest that transfer does occur; however, it does not occur under all conditions.

Most studies that found negative transfer results did not recognize the connection between transfer and the conditions necessary to make it happen (Salomon and Perkins 119). For example, Scribner and Cole's study of the Vai language did not account for the condition of varied practice, as mentioned above. Because the language skills were practiced within a narrow range of similar situations, the Vai were not given the opportunity to practice using the language in a variety of contexts, thereby limiting the chance for transferability (Salomon and Perkins 131). When general strategies are taught along with metacognitive skills and instruction involves students' exposure to various potential applications of the strategies, transfer often occurs. If instructional settings provide the proper conditions such as "cueing, practicing, generating abstract rules, socially developing explanations and principles, conjuring up analogies," then general skills from one context can transfer to another (Perkins and Salomon, "Cognitive Skills" 22). Another reason that many of the studies on transfer have offered little evidence of its occurrence is because, according to Salomon and Perkins, they have failed to recognize that there are different types of transfer—low road and high road (114-115).

Lave proposed another interesting suggestion about the inability of many previous studies to find evidence of transfer. In 1978, she began researching the everyday math skills used by people in the supermarket. She called her study the Adult Math Project. First, she got to know

her subjects to understand their educational backgrounds and professional experiences (47). Then, the subjects completed a standardized, multiple-choice test measuring general math skills such as weights and measures and ratios—skills which might be similar to those required in grocery shopping (52).

In comparing the results across the two contexts, Lave found that the participants did much better on the problem-solving tasks at the supermarket than they did on the multiple-choice test. In analyzing the differences in performances in the two settings, Lave found that the type of arithmetic done while grocery shopping was "qualitatively different" from the type required on the test (63). She concluded that the problem-solving done in both the laboratory and in the supermarket was shaped by the context in which it occurred. The increased pressure of the laboratory setting negatively affected the subjects' test performances, while the supermarket provided a more relaxed environment which positively influenced the subjects' performances in solving real-world problems. Therefore, it was not necessarily the ability or inability of the subjects to transfer cognitive strategies that resulted in such obvious differences in performance across the two settings. She argued that the different settings promoted different types of actions from the people within them—that "thought (embodied and enacted) is situated in socially and culturally structured time and space" (171).

Lave, in looking at the connections between situations and activities, realized that most theories have tended to "ignore the embodied, inescapably 'located' nature of activity in time-space" (148). According to Lave, whose research is based on Lev Vygotsky's theory of learning as a social process, the "functionalist" perspective of these previous theories relies on the rather two-dimensional view of the mind as a toolbox—knowledge is the set of tools available, and when faced with a particular task, the appropriate tool is taken out and used to perform the task

and then returned to the toolbox; the tools, despite being used again and again, are stored in the toolbox, unaltered and unharmed. The only two scenarios possible with such a theory are the use of special tools for each new situation (local knowledge) or the use of a few multi-function tools for a larger number of situations (general knowledge) (24), which Lave argues is far too limiting because it focuses solely on the use of the tools rather than on the situations in which their use is deemed appropriate. These functionalist theories do not work because they completely ignore the "situatedness" of activity within a context. As Vygotsky suggested in Mind in Society, learning comes from social interaction; it is inherently "situated" in social contexts. For him, and for Lave, learning is primarily a social activity. It occurs socially through the interactions of learner and teacher.

Lave and Wenger further examined this idea of situated learning by analyzing five studies of apprenticeship around the world: Mayan midwives in Mexico, Vai and Gola tailors in Liberia, U.S. Navy quartermasters, U.S. butchers, and members of Alcoholics Anonymous. They wanted to examine the context of learning in each situation to determine how these people learn the skills necessary to participate in their fields. They found that practice rather than instruction was fundamental to learning (85).

Lave and Wenger also agreed that practice with new skills must be situated within a sociocultural context for learning to be meaningful (100). They called this view of learning "legitimate peripheral participation." Through legitimate peripheral participation, the apprentices were able to participate as newcomers in the community they wished to join in order to acquire the skills necessary to achieve full participation. Lave and Wenger argued that the process of learning cannot be understood without taking into account the social activities that shape it. After all, learning is not about memorizing facts and duplicating performances in an isolated

classroom; it necessarily requires active participation in a social community (97). The apprenticeship studies illustrate how instruction should focus on learning rather than teaching. A learning-based curriculum, like the apprenticeships, works because it focuses on the organization of the community in which learning takes place; it understands that context is key. On the other hand, a teaching-based curriculum does not work because it is filtered through the instructor and his/her "external view of what knowledge is about" (97); it ignores the "situatedness" of the learning process.

John G. Borkowski and Nithi Muthukrishna drew upon previous research in apprenticeships and theories of problem-based learning to suggest that a learning-based curriculum is one in which both methodologies are incorporated. They argued that "teaching [that] is directed at a limited array of content materials, and assessment instruments [that] mirror only isolated bits of knowledge . . . instill limited knowledge and only rudimentary cognitive skills that remain inert outside the classroom and testing contexts" (Borkowski and Muthukrishna 284). It is not enough for students to know how to solve a problem theoretically; they must also be able to implement the steps necessary to obtain the solution (Haskell 178).

By using learning-based curricula, schools, therefore, would become communities of learners that focus on "intentional learning"—learning that is "purposeful, effortful, self-regulated, and active" (Borkowski and Muthukrishna 288). In these cognitive apprenticeships, teachers, rather than merely presenting problems and examples of solutions, would be responsible for modeling and practicing the strategies necessary to find solutions (284). Consequently, the relationship between teachers and students would be more horizontally-oriented as opposed to the more vertical structure of traditional classrooms. Students would be encouraged "to engage in argumentation and reflection as they use, refine, and enlarge their

existing knowledge states in order to understand and evaluate new or alternative points of view"—to interact socially and engage in dialogue to help them understand and adopt the goals and beliefs necessary to participate in the community of learners (Borkowski and Muthukrishna 285, 289).

Educational models like the one suggested by Borkowski and Muthukrishna attempt to reconcile the theories of situated learning and individual psychology by modifying apprenticeships to put more focus on the individual in the learning process than other models offered by proponents of situated learning. According to David Kirshner and James A. Whitson, by examining the two perspectives collectively and viewing cognition as a process that occurs both within the individual and within the sphere of social activity, we may be better able to understand the intricate and complex nature of learning. As Kirshner and Whitson argue, "We are engaged not just as individuals, but as *socii* [emphasis in original], and we are engaged in the worlds of each other and of ourselves and of things that surround us in concrete social and material situations" (2). The problem with theories of situated learning is that they do not adequately consider the importance of the individual in the learning process; they tend to focus more on learning as an essentially social activity. In emphasizing one perspective over the other, these theories necessarily inhibit the exploration of more comprehensive approaches that may be more valuable (2).

This chapter has examined the inadequacies of early transfer research and presented emerging research that outlines the conditions necessary for optimizing the likelihood of skill transfer, and it has examined the argument that learning must be situated in order to be meaningful. It has also looked at arguments that suggest that learning must be analyzed from more than one perspective if we are to truly understand it. The problem, however, lies in finding

a way to reconcile two theories of learning that seem to be completely at odds with each other. According to Perkins and Salomon, varied practice is the essential ingredient for transfer because practice in a variety of contexts increases the likelihood that the transfer situation will be familiar. For Haskell, transfer requires a certain level of expertise—learning as much as possible to increase the chance that subjects will possess the skill needed to solve an unfamiliar problem, and organizing acquired skills in a way that makes them easily accessible. But as Lave and Wenger suggest, learning is inherently situated. It seems logical to assume that transfer does occur, at least sometimes, but this research seems to point to two competing pedagogical theories—one that suggests that with adequate instruction students may acquire the skills necessary for transfer and another that suggests that transfer is impractical since learning is essentially woven into the context in which it occurs.

Perkins and Salomon's varied practice, Haskell's expertise, and Lave and Wenger's situated learning make the issue of transfer problematic. Providing practice in a variety of contexts is difficult for instructors since the classroom is clearly only one context. Regardless of the type of assignment, the academic context still places limits on the amount of variety that is possible for practicing skills. Theories of expertise and situated learning complicate transfer; theories of expertise rely on extensive local knowledge bases for effective task performance, while situated learning requires participation in a social context for the acquisition of skills necessary to perform effectively within that domain. Neither of these ideas allows much hope for professional writing instruction. If learning is tied to the context in which it occurs and effective performance requires extensive local knowledge of that context, then transfer seems unrealistic, and implementing the conditions necessary to make it happen seems useless. If students can only learn to write effective workplace documents after they become employees of a particular

organization, then professional writing courses have little value. However, if businesses are reluctant to invest the extra time and money necessary to train employees on the job, then colleges must consider providing some level of experience with workplace writing so that employees have at least a foundation of knowledge on which to build as they enter the job market. It is far too limiting to assume that the only way to learn to write professionally is by complete immersion in the workplace context.

However, as Perkins and Salomon and Gick and Holyoak propose, the need for local, context-specific knowledge in performing certain tasks does not mean that general, transferable knowledge is unimportant. They see learning as the process of acquiring and applying both general skills that transcend the boundaries of context and localized skills that are context-bound. But how can we reconcile the two into a workable pedagogy? Is there a professional writing methodology that can facilitate the transfer of writing skills to the workplace?

In an attempt to answer these questions, Chapter Three will look at the problem of writing skill transfer, particularly the transfer of writing skills from academic settings to workplace settings. It will examine much of the research over the past two decades that has been conducted on the transfer of writing skills to determine how transfer works in performing unfamiliar writing tasks, what role context plays in the transfer process, and perhaps most importantly, whether transfer of writing skills from school to work is a realistic expectation and, if so, the instructional conditions necessary to facilitate it.

CHAPTER THREE

What does research on transfer mean for professional writing?

Even though many colleges and universities require students to take courses in professional writing that are related to their major courses of study, companies continue to complain that new employees are costing them time and money by not being able to perform the types of writing tasks their jobs demand (Beaufort 3). As more and more students move throughout the college curriculum and find themselves struggling to write effectively, and as more and more of those students move into the working world and find themselves unprepared for the types of writing necessary to be successful, the question "How do professional writing courses figure into the equation?" arises. Is lack of transfer the problem, or is the problem much more complicated? With these questions in mind, many scholars have examined the context of academic writing in comparison with workplace writing to see if the differences are significant enough to inhibit transfer.

David Russell, for example, used Aleksei Leontyev's theories of human activity to examine the context of writing instruction as an activity system. Activity systems consist of subjects (ones performing tasks), objects (tasks), and tools (means of accomplishing tasks). For instance, if a child (subject) wants a toy that is out of reach (object), then the child may try any of several methods to get to the toy. These methods are the tools used to accomplish the goal of reaching the toy. The tools vary based on the task they need to perform, much like wrenches or screwdrivers "vary in their design and use depending on the work to be done with them," but regardless of the tool(s) used to accomplish the task, the object remains the same (Russell 53-54).

Similarly, Patrick Dias looked at the three levels of analysis set forth by Leontyev to explain what goes on within a particular context: the levels of activities, action, and operations.

Activities exist in relation to the motives (objects) that drive them; they are defined by the subject's intentions (16-17). For example, driving may be seen as work or play depending on the motive of the driver—whether he is driving a taxi to earn a living or taking a recreational drive down a scenic highway. Actions are the tasks performed by subjects to accomplish particular goals. Driving the taxi is the action undertaken by the cab driver to earn a salary. Actions can function within different activities; for instance, the action of driving can function as both a work activity and a recreational activity, depending on the goal the subject wants to accomplish. On the other hand, the activity of work can be undertaken through any number of actions—driving a cab, programming a computer, preparing a meal, etc.—just as recreational activity may be realized through actions such as hiking, watching a movie, reading a magazine, etc. (17). Dias defined operations as "the *conditions* under which the action is carried out and the *means* by which it is carried out [emphasis in original]"—the habitual responses to particular conditions present in a situation, like deciding whether to walk or drive to work depending on the weather (18).

These activity systems that Russell and Dias describe are inherently dependent upon human social interaction. According to Russell, we do not merely "learn to write," nor do we learn outside of human activity and then re-enter the activity system to apply our new skills. We learn to use language through our experiences within the activity systems that use language as a tool to accomplish its goals. The writing skills observed and practiced in the social arena become internalized into a person's knowledge base and emerge in their own actions within the activity systems in which they participate (56). Russell's argument is similar to that of Lave and Wenger; both concluded that learning is inextricably tied to the situation in which it occurs and that learning does not occur outside of social interaction. The apprentices that Lave and Wenger

studied acquired full participation in their respective trades by observing and practicing the actions of experts until they became competent enough to work independently in their fields. They learned through participation in the activity systems of their respective trades. But if businesses expect a certain level of preparation in their new employees, then the findings of Lave and Wenger make professional writing pedagogy problematic. How can professional writing courses prepare students for workplace writing if effective performance depends on context-specific skills that may only be learned through immersion in a particular workplace context?

After all, according to activity theory, writing must be viewed as a situated activity that is "integrally bound up with the contexts within which it occurs . . . in the sense that context is more than just the container or surround, the place or situation or conditions within which writing occurs" (Dias 14). Context must be understood as the force that "define[s] the goals and direction of writing, the very character, process, and constitution of writing" (15). The writer and the text do not exist independently of the context; they are inherently woven into it.

The problem with these theories, however, is that they are rather limiting because they suggest that all knowledge is inherently bound to a particular context. While there may be particular skills that have little value outside of the social context in which they are practiced, there are skills that can be acquired without immersion in a context. Anderson, Reder, and Simon provide an example of a tax accountant who must learn two important skills: how to use a calculator and how to interact effectively with clients. Learning to use a calculator does not require any sort of social interaction with clients in order to be effective. In fact, learning to use the calculator while immersed in social interaction with clients may actually hinder the learning process. Also, once the accountant learns how to use the calculator, that skill is not bound to the

context in which it was learned (the accounting office); it may easily transfer to other situations (9). Learning is not always situational.

On the other hand, activity theory does provide valuable insight into how writing functions within contexts. As Russell demonstrated, there are different tools that can be used to carry out different actions within activity systems. This difference in tools depending on the goal of the activity system can be seen as genre in activity systems that use written communication as operations or tools to accomplish their objectives. Genres, then, are the means by which a particular communicative goal is accomplished within an activity system; according to Miller's conception of genres, they are the "typified rhetorical responses to situations that are socially interpreted or constructed as recurrent or similar" (Freedman, Adam, and Smart 196; Miller 151). Regardless of whether the activity system is a professional writing classroom or a corporation, genre is the operation used to accomplish a writing task.

Perhaps what this research means for professional writing instruction is that learning how genre functions in the activity system in which one is immersed—whether that system is school or work—can be a powerful skill. Genres differ based on the audience and the purpose of the writing task. Therefore, understanding which genres are better suited for which tasks and why certain genres are better for certain tasks is a skill that might transfer from the classroom to the workplace. Certainly, as Lutz has suggested (see Introduction), there are aspects of an organization's culture and values that cannot be learned or understood in a classroom setting. Business settings are socially unique when compared to classrooms; school and work are completely different activity systems, and the genres used within them function differently as a result. But understanding these differences might go a long way in improving writing performance on the job.

In response to this concern about the differences between school and work as sites for composing, Freedman, Adam, and Smart studied professional writing courses that attempted to simulate the writing situations that might be encountered on the job to see if these courses were able to bridge the gap between the two contexts. They wanted to find out if the case-study writing done in these courses was adequate in preparing students for workplace writing—if such context simulation could facilitate transfer (195). They examined the issue of genre, much like Russell and Dias, as a social tool used to accomplish a goal within an activity system, rather than as the prescribed structure that a text takes on. Using this theory of genre, Freedman, Adam, and Smart studied a college course in financial analysis that simulated workplace writing tasks; they examined the students' writing and the instructor's evaluations as objects and tools within the activity system of the course, and of the academic institution as a whole, to better understand the way the writing produced both shaped and was shaped by the context of the class.

Over the course of their study, Freedman, Adam, and Smart found that the writing situation of the course provided the students the opportunity to play roles similar to those they might encounter in the workplace. In fact, the writing that the students produced very much resembled the types of documents that they might be required to compose on the job (195). However, the researchers also found that the classroom setting hindered the simulation of the workplace environment; the presence of the instructor and his expectations and the casual dress of the students were constant reminders that the course was, in fact, a course—that in spite of the case-study writing assigned, the context of the academic institution was not in any way forgotten. The writing produced for the course still targeted the professor as its primary audience. The students were constantly aware that their writing was supposed to demonstrate their knowledge of the course material and was going to be evaluated by their instructor. They were also aware

that the end result of their writing was not to instigate some action within a financial organization, but to receive a grade in the course (204). Because writing assignments are aimed at the instructor for the purpose of demonstrating knowledge, students' practice with academic writing is somewhat limiting (Anson and Forsberg 202). Though students may practice various genres of writing in school, those genres are generally assigned for similar purposes and similar audiences (usually to demonstrate knowledge to an instructor).

Also, in academic settings, the roles of subjects within the activity system are more clearly defined; students know that the instructor is the authority on the tasks assigned. On the other hand, in professional settings these guide-learner roles may be blurred. A novice writer in the workplace may not be able to determine the best person from whom to seek writing assistance; an experienced employee may not understand that newcomers are not yet equipped to handle certain tasks. And beyond these differences in roles, there are also varying levels of expertise. As Dias et al. explained, "there are new oldtimers and old-oldtimers; fresh newcomers and more seasoned newcomers" (193). Consequently, the hierarchy of workplace settings may be less obvious than the institutional hierarchy that exists between teacher and student.

Another fundamental difference discovered between the simulated workplace writing done in the course and actual writing on the job was the role of the text. In the academic course, the focus of the writing assignments was the process of writing—the practice of putting words down on paper to demonstrate some newly-acquired skill. On the other hand, in workplace writing the focus is the text itself and what information the reader can acquire from it (Freedman, Adam, and Smart 207-208). Poorly written texts in an academic course usually receive a poor grade with the understanding that the student will learn from the criticism received and perform better next time. In the workplace, the form, content, and tone of writing are much different than

those of academic writing because workplace writing targets a completely different audience. In the workplace, errors and confusing language are not merely obstacles to be overcome by practicing. The text must accomplish some action-oriented goal, and an inadequate text does not work to help reach that goal. In workplace writing there is much more at stake; a multi-million dollar business deal may fail if the documents produced to facilitate the deal are not successful at convincing all parties involved to participate in the transaction. This is, essentially, the aspect of writing on the job that classrooms cannot possibly simulate.

These differences between workplace writing and academic writing are very much related to the distinctiveness of the two environments as contexts for learning and composing. In academic institutions, writing courses are designed for learners. Learning is, after all, the explicit goal of academic institutions and the courses they offer. On the other hand, at work writers are often unaware that they are learning; learning occurs, but it is generally secondary to the accomplishment of workplace writing tasks (Freedman and Adam 410; Dias et al. 188). These differences in objectives between the contexts of school and work make them two completely different activity systems. As a result, there is a fundamental difference between the writing produced in each context—one that shapes how the writer approaches the writing task and ultimately shapes the writing produced. Academic writing is rather straightforward; it is produced to demonstrate knowledge to an instructor. But workplace writing is much more complex. Workplace documents accomplish all sorts of goals—some explicit, some merely implied—and in order to understand completely how these texts function on so many levels at once requires an understanding of the intricacies of the organization in which it is produced. For this reason, simulating workplace writing exercises in the classroom can only take students

so far. The gap between the two contexts may simply be too wide for students to cross, even if instruction has attempted to narrow the divide with hugging techniques.

To further understand the differences between academic and workplace writing, Anne Beaufort studied the writing of four employees working for a non-profit employment resource agency (Job Resource Center). The subjects of Beaufort's study had little writing experience beyond the general composition courses required in most colleges and universities. The subjects came to JRC with very little experience in workplace writing, and as a result training themselves to write effectively for the agency without neglecting their duties was a difficult process.

The agency's mission was threefold: 1) to implement training programs that were more effective than those of competing agencies, 2) to raise $3 million each year to finance the programs, and 3) to network with the community to generate political and social support for the agency (Beaufort 35). In examining the writing tasks performed by the subjects, Beaufort found that four distinct discourse communities emerged to help the writers meet these goals: federal/state government agencies, city government agencies, charity organizations, and businesses (32). They all served the employment resource agency by providing financial assistance to support the agency's training programs, but they all had distinct methods of communicating with the agency.

Since the documents produced for each of these communities were vastly different from one another, Beaufort concluded that each had its own genre. Grant proposals were required for both federal/state and city government agencies. In these proposals, the workers were required to outline a strategic plan for the programs requiring funding, but writing to the US Department of Education required a more formal tone and a more detailed plan than writing to a local agency that was just down the block from JRC (36, 40). However, in communicating with charitable

organizations, the request for funds was secondary to the relationship that the writing established between the organization and JRC. As a result, any request for funds was preceded by a letter of intent which served to smooth the way for subsequent financial assistance (44). Furthermore, in communicating with businesses, Beaufort found that words seemed to hold special meanings—that many words served more than their obvious purposes. For example, if the subjects asked someone from a local business to "stop by," it usually meant that they were trying to be courteous to preserve the agency's relationship with the company so that financial support would continue (48-49).

Beyond recognizing the different genres required by the JRC workers, Beaufort also realized that those genres were dependent upon five domains of situational knowledge: knowledge of discourse communities, knowledge of subject matter, knowledge of genre, knowledge of rhetorical strategies, and knowledge of the writing process (63). She observed that these domains existed on a continuum from general (writing process) to specific (discourse communities) (64). First and foremost, in writing for JRC, the subjects had to be able to apply the appropriate steps in producing documents (ex. making notes, outlining, revising, etc.) (73). They must also be aware of the purpose of the document being produced and its intended audience (70). Once they understand the purpose of the writing, they must be able to choose the appropriate genre (67), which requires knowledge of JRC's literacy training programs and an understanding of the discourse community within which the document being produced will exist and participate (64-65). Becoming aware of these five domains was part of the subjects' socialization process at the agency. Once they were able to grasp how these domains worked together in the day-to-day business at JRC, then, as Russell has suggested, they had achieved full participation in the workplace activity system. They had learned to write effectively through

their experiences within the agency's activity system which uses writing as a tool to accomplish its goals.

In examining how the subjects had progressed as writers, Beaufort found that they began writing by demonstrating subject knowledge to their instructors. Then, as a result, they were able to use the knowledge they had acquired to learn more, until eventually they were able to write critically about the subject (174). As their writing increased in complexity, they became more and more aware of discourse communities like history, psychology, etc. (173). As they moved into the workplace, they used their previous writing knowledge to acquire more local knowledge about writing for JRC. Expert writers, then, function much like the chess players that cognitive theorists have studied (see Chapter One); similar to expert chess players who, from repeated performance, have stored countless moves in their memories, expert writers store writing knowledge "by slotting information into well-worn writing plans (i.e., genres)" (177). As writing becomes more and more advanced (or more expert-like), more and more context-specific knowledge is needed. Therefore, when dealing with new situations, experts must be adaptive; they must be aware of when they need more knowledge, how to acquire it, and how to implement it (177).

The writers Beaufort studied, because of their lack of adequate academic preparation for writing at JRC, were at a disadvantage as newcomers to the agency. Although they did not possess the extensive knowledge base of experts, they were able to succeed, but only after taking considerable measures to acquire the knowledge they were missing in order to function as effective members of the organization. They were aware of their lack of knowledge about how to write effectively on the job and learned how to use their supervisors and their co-workers to meet the demands of working at JRC. This adaptability was the key to the subjects' eventual success.

This adaptability is precisely what Chris M. Anson and L. Lee Forsberg have suggested is necessary for student writers to become workplace writers. More than acquiring a set of general writing skills that transfers across contexts, students need to develop skills that they can use to adapt to the unique situations they may encounter in their professions. According to Anson and Forsberg, a "writer must first become a 'reader' of a context before he or she can be 'literate' within it" (225). Writers who are new to a particular context generally encounter a "disorientation stage" in which they become confused and frustrated by their new roles (208, 211). To successfully progress from this stage, writers must have the skills necessary to attain some level of situational knowledge through their participation within the new context in order to perform effectively (225). In other words, they must be adaptable; they must have the skills needed to locate resources within the new discourse community that might help them adjust to their new roles as workplace writers. Like Beaufort's subjects, they must understand their own limitations as writers and understand how to overcome these limitations.

This "adaptive expertise" requires a combination of general and local knowledge. After all, learning is not exclusively general or local but a synthesis of the two, as Perkins and Salomon and Gick and Holyoak have suggested. Michael Carter has also argued that learning cannot be seen as general vs. local, but rather general + local (267). He has suggested that cognitive theorists primarily focus on general knowledge as the basis for learning, stressing general heuristics as the means through which one becomes an expert, while social theorists argue that local knowledge is the necessary ingredient for expertise (266). Carter, on the other hand, does not believe that we can exclude one or the other. He has pointed out how past research on learning and expertise has failed to account for the many facets of writing skill acquisition and application. Scholars like Pólya and Newell and Simon paved the way for educational

movements that focused exclusively on general problem-solving strategies that could be taught and applied in a variety of domains (Carter 267-268). Later, research conducted on expert vs. novice chess players revealed that expertise in a domain is based more on local knowledge than general knowledge (268-269).

Carter viewed this vacillation between cognitive and social theories of knowledge as evidence that perhaps both sides have oversimplified the issue—that both general and local knowledge are needed for writing expertise. He argued that general and local knowledge are merely opposite ends on the same continuum—that as writers become experts they move from the general to the local (269-270), as Beaufort has suggested. The general knowledge serves as a foundation on which more and more local knowledge is built. To illustrate this point, he referred to Hubert L. Dreyfus and Stuart E. Dreyfus's five-stage theory of expertise. In the first, most general stage, the novice possesses only a few broad strategies that he/she can apply to any given situation; sometimes these strategies are applied correctly, sometimes incorrectly. As the novice moves into the "advanced beginner" stage, he/she begins to learn more complex strategies based on the trial-and-error experienced in the first stage. In the third stage, the writer develops a more context-specific understanding of a domain; the writer relies less on the broad strategies that he/she depended on in the beginning and more on context-specific cues that aid the writer in making decisions and solving problems. As the writer moves into the "proficiency" stage, he/she becomes better able to intuit solutions based on the recognition of similar contextual patterns. Finally, in the "expertise" stage, the writer has become so accustomed to the domain that he/she performs effectively within it without having to analyze the context or deliberate over choices; the expert instinctively knows how to solve problems based on his/her experience within the

domain (Carter 271-272). As one's experience within a domain increases, then the reliance on general knowledge for problem-solving decreases (273).

It is this movement across a continuum from general to local knowledge that is illustrated in studies like Beaufort's, Anson and Forsberg's, etc. Recent graduates who are faced with workplace writing for the first time have only their previous academic writing experiences to fall back on. However, as they begin to participate in the community of an organization, they become more and more aware of what tasks they are expected to perform and how to accomplish those tasks.

As Beaufort pointed out, novice workplace writers, like those at JRC, must draw upon the five domains of knowledge (much like those described by Carter), ranging from general writing process knowledge to specific knowledge of the discourse community in which they are writing, in order to become experts. Effective writing is not exclusively a set of localized skills; it requires more general skills as well—skills that may not be tied to a particular context. New workplace writers must use any general knowledge that they may already possess in order to build a repertoire of context-specific skills that will help them write more effectively in the workplace. This is what adaptive expertise is all about—using the skills that you have to acquire the skills that you need. Beaufort's subjects used their previous experience with critical thinking and their general understanding of audience and purpose to move along the continuum to more localized knowledge. Certainly previous training in professional writing tasks would have proven beneficial to the workers at JRC. Nevertheless, the key is that novice workers must start from where they are on the continuum toward more expert performance.

If writing is a combination of both general and context-specific skills, and if these skills exist on a continuum moving from general to specific, then we must take this into account when designing a writing pedagogy that is aimed at producing effective workplace writers. But the question still remains, can professional writing instruction create expert workplace writers, or can it merely move writers along the continuum in the direction of expert performance? To answer this question, Chapter Four will analyze the pedagogical implications of the research presented thus far in the hopes of coming to some viable conclusion about what type of professional writing instruction might yield optimum results in preparing students for the workplace.

CHAPTER FOUR

What does research on transfer mean for the classroom?

There is certainly no perfect remedy for the transfer problem. However, research does provide us with the hope that if the appropriate conditions are created within the composition classroom, then transfer may be more easily and successfully facilitated. While there is no method of teaching that can guarantee transfer, increasing the likelihood that transfer will occur is certainly a realistic goal.

From the research presented in this thesis, we know that acquiring good professional writing skills involves learning both general strategies and context-specific skills. It seems that if the appropriate instructional conditions (hugging and bridging) are met, then skills learned in the classroom may transfer to writing tasks in various settings outside the classroom. Professional writing instructors can implement hugging and bridging techniques to help students recognize connections between the learning context and the transfer context. But these methods alone may be inadequate in helping students connect academic and workplace contexts. As Gick and Holyoak have argued, perceived similarity between two contexts increases the likelihood of transfer, but school and work are two very different contexts for writers.

As Freedman, Adam, and Smart found in their study of simulated workplace assignments in the classroom, the "simulated" aspect of the writing was precisely why it was not as effective as expected in immersing students in the reality of workplace writing. Although the assignments physically resembled the documents produced in the workplace, the students still wrote with the intention of demonstrating knowledge to their instructor rather than moving a professional audience to action as they would have done in the workplace. These types of simulated environments also cannot provide the practice in varied contexts that Perkins and Salomon

believe is important for transfer. School is only one context, regardless of the different types of simulated scenarios instructors attempt to provide. While school and work may use similar genres (operations), but the settings are bound by contextual constraints that necessarily affect the writing produced within both settings. Consequently, academic writing and workplace writing have only general similarities, so instructional methods that attempt to make them more similar than they really are may actually hinder students' writing performance as they move into their professions. Students may try to apply skills in the workplace that they believe will help them accomplish a particular writing task, but because of the incomplete understanding of the differences between writing at school and work, the result may be negative or runaway transfer.

However, as Ann M. Blakeslee has suggested, one way to address this issue lies is by coordinating collaboration between academic institutions and businesses in the community to make professional writing practice in the classroom more meaningful. Instructors can learn about the different types of writing tasks that workers will be required to complete on the job and teach those tasks that are the most meaningful for workplace performance. Ideally, students would receive instruction in many workplace writing tasks; however, due to the limited opportunity to explore these in the college classroom, workplace collaboration is important because it allows instructors to select strategically the tasks that may be most useful to future professionals. Using the inside knowledge that collaborations provide, instructors can more accurately simulate the types of tasks that students will be asked to complete as they move into their respective fields.

These classroom-workplace collaborations may also increase the likelihood of transfer by creating another necessary condition of transfer—authenticity (Blakeslee 170). As Blakeslee has suggested, having students produce writing assignments in the classroom that actually serve a

purpose in the workplace may be the answer to the shortcomings of simulated writing. She believes that while not necessarily a perfect strategy, it may be the best method we have for exposing students to the context of the workplace and helping them understand the social practices involved in writing at work (176). She argues that one important aspect of the school-workplace collaboration is teaching writing skills that are meaningful beyond the classroom because it allows students to feel that the assignments have value beyond earning a grade in the course. If students produce writing that is actually used to incite a particular audience to action within the workplace, they would not only be more motivated to do well on the assignment, but they might also be able to make connections between that assignment and the professional world—connections that otherwise might not be made in simulation courses. These collaborative writing assignments that actually fulfill clients' needs in the workplace may help, at least in part, to facilitate participation in a community of practice; "students participate in workplace activities, but those activities are undertaken for the express purpose of learning" (Blakeslee 182). This type of collaboration between universities and businesses would certainly provide a unique opportunity for students to practice "authentic" writing tasks and "become socialized, at least partially," into the activity system of the workplace (182).

However, these collaborations between academic institutions and the surrounding corporate communities, no matter how useful they may be, are not always feasible. They require increased investments of time and money from institutions that may not have the funds or the staff to design and implement such a plan. As a result, these types of special projects cannot always be counted on to provide a solution to the problem of inadequate workplace preparation. Furthermore, while these collaborations may provide a level of authenticity that simulation classes cannot, they still may not adequately socialize students into the workplace culture

because of the inevitable limitations of composing in an academic setting, regardless of the purpose the assignments might serve beyond the classroom.

If simulations and collaborations do not necessarily work as well as we might hope, we are essentially left with the hugging and bridging techniques that Perkins and Salomon offer. And while these techniques may work in a broad sense to help students transfer the general skills acquired in professional writing courses to the tasks they encounter in the workplace, they may not work as well as we might hope in facilitating the transfer of contextualized skills—especially considering the vast differences that exist between school and work as writing contexts. Bridging and hugging techniques alone may not help students write effectively as they enter the workforce since, even with the best of intentions, instructors cannot simulate the "corporate culture" of the workplace context. Bridging and hugging techniques may provide a means of applying general skills to new contexts, but the localized skills that necessarily require a specific context to be meaningful may not be useful across contexts, regardless of whether instruction employs the techniques necessary to facilitate transfer.

Since school and work have different objectives, they are unique activity systems and therefore unique sites for composing. General skills, like understanding how genre functions in achieving the goals of an activity system that requires written communication, may transfer to the workplace. Students may learn to understand how the audience and purpose of a text determine how that text should be written, and they may transfer that understanding to their professions. However, since the activity systems of school and work are so different, the genres do not function the same way. Therefore, merely teaching the genres that are used in a particular field may not facilitate transfer—even if those genres appear similar on the surface. Understanding the intricacies of how a business letter functions within an organization requires participation in

the "corporate culture" of that organization. We must understand that certain writing skills needed for effective workplace writing are inherently situated in the workplace context.

If these context-specific skills simply will not transfer across contexts, then merely teaching for transfer is not effective in preparing students for workplace writing. In order to alleviate the problem of poor writing skills among workplace novices, what may be required once transfer techniques are no longer effective is the "adaptive expertise" described by Bransford et al. in Chapter One. As outlined by both Carter and Beaufort, knowledge exists on a continuum from general to local. The gap between general knowledge and local knowledge is wide, but there are many stepping stones in between that connect the two. Therefore, instructional methods that facilitate a gradual progression from learning general skills to more context-specific ones may be more helpful than methods that merely prepare students to make the jump from general to local. This instructional methodology is based on what John Seely Brown, Allan Collins, and Paul Duguid called "cognitive apprenticeship"; it incorporates Vygotsky's research on the zones of proximal development[2], Barbara Rogoff's guided participation[3], and Lave and Wenger's research on apprenticeships to help students move toward expert performance in a particular domain. By promoting metacognition, it also helps students develop the "adaptability" that may be necessary for true expert performance.

Using scaffolding techniques, instructors in cognitive apprenticeship classrooms begin by helping students to focus on their previous general writing knowledge; then they assist students in making connections between the new skills being introduced and the old skills they already possess. The students work collaboratively with other students under the close guidance of the

[2] The zone of proximal development is the difference in ability between what a child can do independently and what he/she can accomplish with the assistance of an adult.
[3] Guided participation refers to the process through which instructors build on students' previous knowledge to help them move toward the acquisition of new skills.

instructor and gradually gain confidence by performing tasks appropriate to their zones of proximal development. As they achieve autonomy on each task, they are introduced to a slightly more challenging one. By working collaboratively, students become better able to discuss and reflect upon what they are learning (metacognition); and by working under the supervision of instructors who provide increasingly challenging assignments, students gradually become better able to write independently. By structuring writing classrooms to provide the social interaction that may be necessary for learning, and by designing instructional methods that move students gradually along a continuum from general to local knowledge, instructors can guide students through the learning process and create a meaningful learning situation that will hopefully improve students' performance in new situations.

However, to address the problem of transfer more fully, it may be necessary to take a comprehensive view of professional writing to find a workable solution. It may be helpful to start at the global level of designing professional writing curricula and work down to the local level of instructional methodology. For example, Carter looked beyond the classroom, into the structure of writing curricula to determine that if writing classes are strategically organized so that they move student writers gradually from general writing skills to more contextualized skills, then students may be better able to transfer skills more seamlessly from one level to the next. Carter also supported this notion of "cognitive apprenticeship" classrooms; however, he argued that if students learn to write by moving from general to local, then strategically arranging courses within the curriculum so that they gradually provide students increasing practice with more localized skills, just as the cognitive apprenticeships do at the classroom level, may be useful in helping students learn to write effectively (284). Rather than providing one centralized professional writing course or one particular capstone course near the end of students'

undergraduate coursework, professional writing courses would be required at different levels throughout students' coursework. Each professional writing course required in a particular major would be arranged so that the new skills introduced in the course would connect with students' prior knowledge from previous courses.

The first course in his "scaffolding" approach would introduce students to a variety of writing tasks—"a job application, a personal essay, a letter to the editor, an essay exam" (Carter 284). Then, each course thereafter would help the student to acquire more and more local writing skills until eventually students move into professional writing classes based on their field. As students become more familiar with writing locally within a domain, there would be less reliance on scaffolding techniques and more focus on recognizing the relationship of writing to the discourse community in which it exists (284). As students move into the workplace after graduation, they would continue gaining experience within the domain. The classes cannot provide all of the experience necessary to produce expert workplace writers, but they can provide at least some valuable experience in the domain. Perhaps what is most important, though, is that such classes provide enough experience and metacognitive practice for students to apply the strategies necessary to acquire the local skills they may be missing once they reach the workplace.

Another important way to increase metacognitive ability is through journaling. Although cognitive apprenticeship classes improve students' adaptability by encouraging metacognition through discussion and reflection, journaling may also help students acquire the adaptability that researchers have suggested may help them perform effectively in new situations. As Brian Chaloner has suggested, pairing instruction with journaling exercises provides students the opportunities to reflect on what they learn. It engages them in the learning process and allows

them to "construct a memory of the leaning experience and how it can be applied to the workplace" (22). Journaling provides students the metacognitive ability to monitor and reflect on their own learning so that they can guide themselves through new learning situations outside the classroom without the benefit of a nearby instructor. And as Bransford, Brown, and Cocking explain (see Chapter One) metacognitive ability is what separates adaptive experts from routine experts. This adaptability may help ease writers' transference from school to work. Using journaling assignments in these cognitive apprenticeship classes may help to increase students' awareness of their own learning and help them articulate connections between what they have learned and how they might apply what they have learned in the workplace.

The research presented in this thesis has demonstrated that, in preparing students for writing on the job, it is important to understand that effective writing requires a combination of both general and context-specific skills. Strategies such as bridging and hugging may help facilitate the transfer of broad, multipurpose writing skills (e.g., grammar/mechanics, awareness of audience/purpose, etc.), but that only solves half of the problem. Since *full* participation in the workplace context requires immersion in its "corporate culture," instruction must find a way to move students as close as possible to the expert writing performance they will need to be fully-functioning members of the organizations that will employ them. Cognitive apprenticeships do this by using instructional techniques that build on the general skills that students already have to help them acquire more local knowledge within a domain. It makes the leap from academic contexts to workplace contexts a much smaller one.

In cognitive apprenticeship classes, learning is collaborative and metacognitive. Instructors not only teach new skills, but they also model them so that students move as smoothly as possible along the continuum from general to local knowledge according to their zones of

proximal development. Instructors can help students acquire the general skills that will become the foundation on which more expert knowledge is built. While students cannot possibly acquire in the classroom all of the knowledge needed to perform as expert writers in the workplace, cognitive apprenticeship classrooms and scaffolding techniques (both at the course level and the classroom level) may be the best strategy we have for moving students as far as possible along the continuum toward expertise and improving their performance in the workplace. Full participation in the workplace may not be achieved until the student actually becomes an active member of the workplace community and becomes socialized into the norms and values held by that organization. However, helping students move further along the knowledge continuum may help minimize the time and money that businesses have to spend on novice workers. Students may not arrive in the workplace with the immediate capability of producing expert writing, but they may arrive better equipped to acquire much more quickly what they need for expert performance.

WORKS CITED

Anderson, John R., Lynne M. Reder, and Herbert A. Simon. "Situated Learning and Education." Educational Researcher 25.4 (May 1996): 5-11.

Anson, Chris M., and L. Lee Forsberg. "Moving Beyond the Academic Community: Transitional Stages in Professional Writing." Written Communication 7.2 (1990): 200-231.

Beaufort, Anne. Writing in the Real World: Making the Transition from School to Work. New York: Teachers College Press, 1999.

Blakeslee, Ann M. "Bridging the Workplace and the Academy: Teaching Professional Genres through Classroom-Workplace Collaborations." Technical Communication Quarterly 10.2 (2001): 169-192.

Borkowski, John G., and Nithi Muthukrishna. "Learning Environments and Skill Generalization: How Contexts Facilitate Regulatory Processes and Efficacy Beliefs." Memory Performance and Competencies: Issues in Growth and Development . Ed. Franz E. Weinert and Wolfgang Schneider. Mahwah: Lawrence Erlbaum, 1995. 283-300.

Bransford, John D., Ann L. Brown, and Rodney R. Cocking, eds. "How Experts Differ from Novices." How People Learn: Brain, Mind, Experience, and School: Expanded edition. Washington, D.C.: National Academy of Sciences, 2000. 31-50.

Brooks, Larry W., and Donald F. Dansereau. "Transfer of Information: An Instructional Perspective." Transfer of Learning: Contemporary Research and Applications. Ed. Stephen M. Cormier and Joseph D. Hagman. San Diego: Academic Press, 1987. 121-150.

Brown, John Seely, Allan Collins, and Paul Duguid. "Situated Cognition and the Culture of Learning." Educational Researcher 18.1 (1989): 32-42.

Carter, Michael. "The Idea of Expertise: An Exploration of Cognitive and Social Dimensions of Writing." College Composition and Communication 41.3 (1990): 265-286.

Chaloner, Brian. "An Evaluative Study on Building the Bridge Between the Training Room and the Workplace." Evaluation and Research in Education 19.1 (2006): 21-37.

Dias, Patrick. "Writing Classrooms as Activity Systems." Transitions: Writing in Academic and Workplace Settings. Ed. Patrick Dias and Anthony Paré. Cresskill: Hampton Press, 2000. 11-29.

Dias, Patrick, Aviva Freedman, Peter Medway, and Anthony Paré. Worlds Apart: Acting and Writing in Academic and Workplace Contexts. Mahwah: Lawrence Erlbaum, 1999.

Dillon, Sam. “i need help writing a esay: Workplaces Requiring More Prose.” New York Times 7 Dec. 2004, late ed.: A23.

Dreyfus, Hubert L., and Stuart E. Dreyfus. Mind Over Machine: The Power of Human Intuition and Expertise in the Era of the Computer. New York: Free Press, 1986.

Freedman, Aviva, and Christine Adam. “Learning to Write Professionally: ‘Situated Learning’ and the Transition from University to Professional Discourse.” Journal of Business and Technical Communication 10.4 (1996): 395-427.

Freedman, Aviva, Christine Adam, and Graham Smart. “Wearing Suits to Class: Simulating Genres and Simulations as Genre.” Written Communication 11.2 (1994): 193-226.

Gick, Mary L., and Keith J. Holyoak. “The Cognitive Basis of Knowledge Transfer.” Transfer of Learning: Contemporary Research and Applications. Ed. Stephen M. Cormier and Joseph D. Hagman. San Diego: Academic Press, 1987. 9-46.

Haskell, Robert E. Transfer of Learning: Cognition, Instruction, and Reasoning. San Diego: Academic Press, 2001.

Kirshner, David, and James A. Whitson. “Editors’ Introduction.” Situated Cognition: Social, Semiotic, and Psychological Perspectives. Mahwah: Erlbaum, 1997. 1-16.

Lave, Jean. Cognition in Practice: Mind, Mathematics and Culture in Everyday Life. Cambridge: Cambridge UP, 1988.

Lave, Jean, and Etienne Wenger. Situated Learning: Legitimate Peripheral Participation. Cambridge: Cambridge UP, 1991.

Leontyev, Aleksei Nikolaevich. Problems of the Development of the Mind. Moscow: Progress, 1981.

Lutz, Jean Ann. “Writers in Organizations and How They Learn the Image: Theory, Research, and Implications.” Worlds of Writing: Teaching and Learning in Discourse Communities of Work. Ed. Carolyn B. Matalene. New York: Random House, 1989. 113-135.

Miller, Carolyn R. “Genre as Social Action.” Quarterly Journal of Speech 70.2 (1984): 151-167.

Miller, Carolyn R., Jamie Larsen, and Judi Gaitens. Communication in the Workplace: What can NCSU Students Expect? Center for Communication in Science, Technology, and Management Publication Series 2, October 1996.

Newell, Allen, and Herbert A Simon. Human Problem Solving. Englewood Cliffs: Prentice-Hall, 1972.

Perkins, David N., and Gavriel Salomon. “Are Cognitive Skills Context-Bound?” Educational Researcher 18.1 (1989): 16-25.

-----. The Science and Art of Transfer. n.d. 24 Oct. 2006 <http://learnweb.harvard.edu/alps/thinking/docs/trancost.htm>.

-----. “Transfer of Learning.” 2 Sept. 1992. International Encyclopedia of Education. 2nd ed. 24 Oct. 2006 <http://learnweb.harvard.edu/alps/thinking/docs/traencyn.htm>.

Pólya, George. How to Solve It: A New Aspect of Mathematical Method. 1957. Princeton: Princeton UP, 1971.

Rogoff, Barbara. Apprenticeship in Thinking: Cognitive Development in Social Context. Oxford: Oxford UP, 1990.

Russell, David. “Activity Theory and Its Implications for Writing Instruction.” Reconceiving Writing, Rethinking Writing Instruction. Ed. Joseph Petraglia. Mahwah: Lawrence Erlbaum, 1995. 51-77.

Salomon, Gavriel, and David N Perkins. “Rocky Roads to Transfer: Rethinking Mechanisms of a Neglected Phenomenon.” Educational Psychologist 24.2 (1989): 113-142.

Scribner, Sylvia, and Michael Cole. The Psychology of Literacy. Cambridge: Harvard UP, 1981.

Vygotsky, Lev Semenovich. Mind in Society: The Development of Higher Psychological Processes. Cambridge: Harvard UP, 1978.

-----. “Genesis of Higher Mental Functions.” Trans. Marie J. Hall. The Collected Works of L. S. Vygotsky. Ed. Robert W. Rieber. New York: Plenum, 1987. 97-119.