Learning Transfer or Transforming Learning?: Student Interns Reinventing Expert Writing Practices in the Workplace

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L'article rend compte d'une étude qualitative portant sur les expériences de 24 étudiants de premier cycle inscrits à une majeure en rédaction, au moment de leur entrée dans le monde du travail. En exerçant des tâches de rédaction dans une variété de genres discursifs, ces internes ont mis en œuvre et approfondi des pratiques d'écriture d'experts par le biais de leurs interactions avec leurs collègues de travail et d'artefacts culturellement construits. Remettant en question la conception cognitiviste du transfert des connaissances, l'étude suggère que la transformation de l'apprentissage a permis la réinvention des pratiques des experts. L'étude présente aussi une variante du modèle d'acquisition du savoir en situation de débutant en décrivant comment les internes ont compensé leur manque de savoir-faire sur le terrain par l'accès aux éléments cognitifs inhérents aux artefacts culturels.

> When I started, I was just a student intern; my name was Martha Smith, JAI—"Just an Intern." ... [But] by the end, it was different—it was like being ... a real tech writer.

Recent research on workplace writing has revealed the extent to which discourse is enmeshed, in locally specific ways, in the culture, work practices, and technologies of professional organizations (Dias, Freedman, Medway, & Paré, 1999; Ornatowski, 1998; Smart, 2002; Winsor, 2000). For educators aiming to prepare students for the writing they will do in their professional careers, a key implication of this research is the need to reexamine traditional notions regarding the transfer of knowledge and skills learned in school to the sites, situations, and tasks our graduates will face in the workplace (Beaufort, 1999).

Traditional cognitive theories of *learning transfer* portray school-acquired knowledge and skills as commodity-like entities that are acquired by individuals, carried into new environments, and then applied (Lave, 1996). Reifying knowledge and skills in this way can limit our understanding of what our students actually experience

when they move from the classroom into professional settings. We need to rethink the relationship between what students learn in school and the writing practices they will engage in as novices in the workplace.

The study reported in this article addresses the issue of learning transfer, examining the experience of student interns from an undergraduate major in Professional Writing as they re-interpret, enact and further develop what they have learned in the classroom in accomplishing writing tasks in their respective work sites. In what follows, we begin by describing the study, outlining its theoretical orientation as well as the participants, research sites, and methods of data collection and analysis. We then present our findings and discuss the implications that we draw from them.

The Study

Theoretical Orientation

> To orient our research conceptually, we have drawn on an activity-based theory of genre. Following in the research tradition prompted by Carolyn Miller's (1984) ground-breaking scholarship, we view genre as textually mediated socio-rhetorical action that, in many professional organizations, is central to the accomplishment of work (Bazerman, 1988; Berkenkotter & Huckin, 1995; Smart, 1999; Schryer, 1993; Winsor, 2001). In addition to social conceptions of genre, we have also drawn on activity theory—an extension of the Soviet cultural-historical school of psychology developed by Vygotsky (1962, 1978), Leont'ev (1978) and Luria (1976)—and its constituent concepts of distributed cognition, expertise, and situated learning.

From the perspective of activity theory, discourse can be viewed as part of an "activity system" (Cole & Engeström, 1993): a local, historically and culturally situated sphere of goal-directed collaborative endeavor, in which cognition—thinking, knowing, and learning—is diffused, or distributed, across a number of individuals and their work practices and, at the same time, mediated by culturally constructed artifacts. The term "artifact" is defined broadly here to include material, conceptual, and linguistic constructs such as digital technologies, built environments, formalized policies, analytical methods, systems of classification and standards, as well as discourse genres with their conventionalized texts and patterns of collaboration (Bazerman, 1994; Bowker & Star, 1999; Engeström, 1992; Engeström & Middleton, 1998; Goodwin, 1997; Hutchins, 1995; Russell, 1997; Suchman, 1987; Wertsch, 1997).

An activity system, while having a strong cultural-historical dimension, is constituted through the moment-to-moment agency and social negotiations of the people who participate in it. Such systems change constantly, continuously recreated as their participants respond to internal tensions or initiatives, to the possibilities afforded by newly available tools, or to external pressures and influences (Smart, 2002).

Within organizational activity systems, written genres—with their networks of conventionalized texts and discourse practices—often play a key role in distributing cognition across a group and its work activities, functioning as vehicles of shared thinking, knowing, and learning (Freedman & Smart, 1997). Further, texts constitute a significant resource for "organizational memory," providing an historical record of work processes, problems/solutions, accomplished knowledge, and decisions.

Activity theory also posits a particular conception of expertise. Traditionally, expertise has been seen as a personal attribute or property, one that is acquired, possessed, and deployed independently by the individual. The knowledge and skills that constitute expertise are reified as objects—"furniture of the mind," as one study put it (Brown et al, 1993). Activity theorists tend to view expertise quite differently, as in the position taken by Yrjö Engeström (1992): "Expertise has been understood as a property of a professional or craftsman.... I suggest a radically different perspective. Expertise is [an] interactive accomplishment, constructed in encounters and exchanges between people and their artifacts" (p. 1). The distinction here, according to Jean Lave (1996), is between "a view of knowledge as a collection of real entities, located in heads, ... versus a view of knowing ... as engagement in changing processes of human activity" (p. 12).

For Lave and Etienne Wenger (1991), the development of one's ability to engage in expert practices—or "situated learning"—occurs through participation in a "community-of-practice." A primary form of such development is apprenticeship—a process in which "newcomers" to a community learns its expert practices through taking an active part in authentic but ancillary community tasks, under the guidance of more experienced "oldtimers" and with only limited responsibility for the outcome. In addition to its focus on active participation, the theory of situated learning also posits that the development of expertise is intrinsically connected to the growth of a "knowledgeably skilled identity." According to Lave (1991), "Developing an identity as a member of a community and becoming knowledgeably skillful are part of the same process, with the former motivating, shaping, and giving meaning to the latter, which it subsumes" (p. 65). (See also Smart, 2000, on this topic.)

From this perspective, learning to write in workplace settings can be seen as part of a larger process of learning to participate in the culture, and work activities of an organizational community-of-practice. Such learning generally occurs incrementally, as an in-

dividual is assigned increasing difficult writing-related tasks, with guidance and feedback from more experienced members of the community. Aviva Freedman and Christine Adam (2000) describe this apprenticeship process in their study of student interns from a Public Administration Master's program working in government settings. One of Freedman and Adam's findings, however, was that the interns they observed had interactions with experienced co-workers that were more "complex, subtle, shifting, and nuanced" (p. 50) than the apprentice-mentor relationship described by Lave and Wenger: while the interns did have certain opportunities to learn about organizational writing practices directly from more experienced colleagues, these opportunities often involved various different people as well as fleeting situations and hit-and-miss circumstances.

Situated learning theory also complicates traditional cognitivist notions regarding the transfer of learning, which depicts a process in which individuals transport previously acquired knowledge and skills, as internalized properties or objects, into new contexts where they are then applied. Lave (1991) critiques this traditional perspective: "The vision of social existence implied by the notion of transfer ... treats life's situations as so many unconnected lily pads. This view reduces the organization of everyday practices to the question of how it is possible to hop from one lily pad to the next and still bring knowledge to bear on the fly" (p. 79).

For theorists of situated learning, learning is *always* "embedded in the particularities of specific practices [as] an aspect of culturally, historically situated activity" (Lave, 1996, pp. 24, 30), so that learning to function in a workplace is not a matter of transporting knowledge and skills previously acquired in school, and then applying them, *as is*, in a professional setting. Rather, the scene is one in which an individual, with a history of participation in various communities-of-practice, including those situated in classrooms, enters a worksite and joins a new community-of-practice, with his or her prior experiences inscribed in body and mind.

A final tenet of Lave and Wenger's (1991) theory of situated learning relevant to the present study is that learning is not the unique preserve of newcomers, but rather is ubiquitous and ongoing within a community-of-practice. All participants—experienced members as well as novices—are continuously engaged in learning as an intrinsic aspect of the "thinking and knowing" that occur as people engage in the everyday "negotiation and renegotiation of meaning" associated with collaborative activity. As Lave (1996) puts it, "People in activity are skilful at, and are more often than not engaged in, helping each other to participate in, changing ways in a changing world" (p. 5). Whether bringing new interpretations to routine events or responding creatively to exceptions and change, participants in a community-of-practice are constantly expanding their "understanding and knowledgeable skills" as they work together to accomplish their goals.

In our study, we employed the theoretical perspectives discussed above to "help name, explore, and explain what [we were] seeing" in our data (Fishman & McCarthy, 2001). And with our findings, we hope to close the loop by contributing some new texture to existing theory.

Participants, Sites, and Research Methods

The 24 interns in our study were undergraduate students, almost all of them seniors, in a Professional Writing major at a large public university in the U.S. Midwest. The Professional Writing program prepares students for a range of writing-intensive careers in technical communication, journalism, editing, and public relations. The rhetorically-framed curriculum aims to help students, through experience in a range of workplace genres, develop expert practices in areas such as reader-centred writing, research, use of digital technologies, and collaboration.

The interns were placed in a variety of settings, including high-tech companies, newspapers, a magazine, nonprofit organizations, a university press, a media and public relations firm, and an auto manufacturing plant. They spent either ten or twenty hours a week in their host organizations, depending on the number of credit-hours taken, over a 15-week period, and also participated in a weekly two-hour seminar at the university, team-taught by the two authors of this article. In their worksites, the interns worked in a variety of genres, including print and web-based user documentation, computer-based training materials, newspaper and magazine articles, texts for museum displays, newsletters, employee handbooks, grant proposals, book manuscripts, websites, and scripts for cable TV features, for university tele-fundraising, and radio and TV advertisements.

In our study, we gathered data from fourteen interns during the 2001 spring semester and from ten interns during the 2002 spring semester. The data included work logs, short reports, field-notes taken at the weekly seminar, messages posted to a class e-mail listserv, and tape-recorded interviews with selected interns and contact persons in their host organizations. We analyzed the data as we collected them, identifying and exploring emerging themes. In our analysis, we were particularly interested in the interns' own perspectives on their workplace experiences. The relationship between data and theory was reflexive: we employed theories in interpreting data, but our ongoing data analysis frequently prompted us to augment and adjust our theoretical lenses.

Our Findings

On the most general level, what we observed in our study, as the interns moved into their respective worksites and took on writing tasks in different genres, were novices re-interpreting *enacting* and *further developing* expert practices—with the *performance* and *learning* occurring simultaneously. Typically, the interns were not given an opportunity to rehearse the genres in which they were working, nor to gain experience through inconsequential assignments; rather, they were almost immediately placed in situations where they were expected to contribute as practitioners competent enough to accomplish significant work assignments. As researchers, we were not surprised by this expectation, since the host organizations knew that the interns were seniors in a specialized Professional Writing program; nor, as teachers, were we particularly alarmed, because of the support the interns received from us and from one another in the two-hour weekly seminar and through the class e-mail listserv. Indeed, perhaps the most interesting aspect of the study was observing how capably the interns handled the challenges they faced. In almost every case, the interns were able to meet or surpasse the host organization,s quality expectations for the specific written genres the interns had been assigned.

If we discount the cognitivist notion of learning transfer—where school-acquired knowledge and skills are commodity-like entities acquired by an individual, carried into a new environment, and then applied independently by the individual—then how are we to explain the interns' workplace accomplishments? What is the relationship between what the interns learned in their Professional Writing classes and what they were able to achieve as novice writers in their respective work environments?

Our findings suggest that what occurred might best be characterized, not as the *transfer of learning*, but rather as a *transformation of learning* that made possible the *reinvention of expert practices*. The interns, having previously developed the expert writing practices needed to perform well in academic activity systems (see Brown et al, 1993, and Dias, 2000, on classrooms as activity systems), were able to resituate and extend—or reinvent—these practices in their new worksites in simultaneous acts of performance and learning.

Further, this performance/learning of expert practices was, to borrow from Yrjö Engeström (1992), an "interactive accomplishment, constructed in encounters and exchanges between people and their artifacts" (p. 1). It was the interns' engaged participation in the activity of their worksites—with its interactions among co-workers and the mediations of cultural artifacts—that allowed them to function and learn, simultaneously.

We need to add two further points to this overview of our findings. The first is our recognition, as the study proceeded, of how the interns' growing sense of themselves as competent practitioners contributed significantly to their capacity to enact/learn expert practices. This is not to say that the interns felt none of the initial disorientation reported in other studies of writing interns (Anson & Forsberg, 1990; Gaitens, 2000)—they certainly did. One manifestation of this disorientation was the affective binary that we observed among the interns when they first perceived differences between workplace genres and the corresponding school versions of these same genres (as, for example, with user documentation or the analytical report): while one common reaction was, "I don't know anything," other individuals declared that "they're [the host organization] just doing it
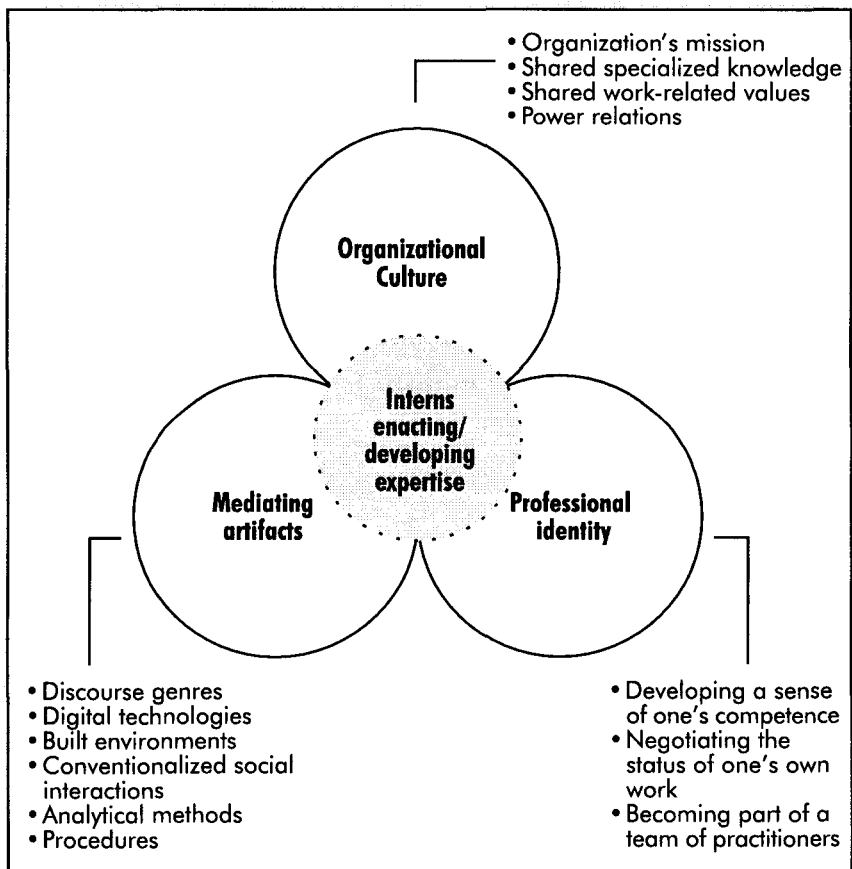

• Organization's mission
• Shared specialized knowledge
• Shared work-related values
• Power relations

Organizational Culture

Interns enacting/ developing expertise

Mediating artifacts   **Professional identity**

• Discourse genres
• Digital technologies
• Built environments
• Conventionalized social interactions
• Analytical methods
• Procedures

• Developing a sense of one's competence
• Negotiating the status of one's own work
• Becoming part of a team of practitioners

Figure 1. Transforming Learning / Reinventing Expertise

wrong." Nevertheless, despite such feelings of disorientation, the larger trend among the interns in our study was a burgeoning sense of professional identity as they succeeded in accomplishing the writing tasks they had been assigned.

The second point relates to the transformation of learning mentioned above. Operating as writers within the activity systems of their respective worksites, the interns appeared to find new ways of learning, ways that were different from those they had used in the activity system of the classroom. (See also Freedman & Adam, 2000.) Rather than depending heavily on other people—as they had with their teachers and classmates in school—the interns became remarkably resourceful in exploiting the distributed cognition, or "intelligence" (Pea, 1993), embedded in culturally constructed artifacts. Further, the interns also began to recognize that in the workplace, there is no necessary end-point for learning, no fixed destination—as in school with the completion of a paper, semester, or degree. They started to see learning as more of an ongoing, evolving process that encompasses all the participants in a worksite; and indeed they sometimes found themselves assisting other, more experienced co-workers in certain tasks (Freedman and Adam observed similar situations).

Below we elaborate on these findings in some detail. (See Figure 1 above for a visual overview of the findings.) While our analysis included data gathered from all 24 interns in the study, for illustrative purposes we will draw on interviews with four individuals: Sally, Martha, Anne, and Mark, all of whom were seniors in the Professional Writing major when they did their internships.

Written genres enmeshed in activity

Bonnie Nardi (1996) argues that "it is not possible to fully understand how people learn or work if the unit of analysis is the unaided individual with no access to other people or to artifacts for accomplishing the task at hand. Thus we are motivated to study ... relations among individuals, artifacts, and social groups" (p. 69). And indeed, in observing the interns in our study, we were struck by how deeply the genres in which they were working were embedded in complex sets of relations among people and culturally constructed artifacts.

For example, one of the interns, Sally, worked in the training department of AutoBuild, a large automotive plant (the names of the interns and host organizations mentioned in this article are pseudonyms). Her assignment during her internship was to produce a computer-based training (CBT) program for AutoBuild employees on the topic of Statistical Process Control (SPC), a Japanese-inspired approach to enhancing productivity and quality-control in manufacturing. As a preliminary task, Sally spent a week using an on-line tutorial to teach herself how to operate ToolBook Instructor, the computer software she would employ to create the CBT training pro-

gram on SPC. After gaining a certain competence with ToolBook Instructor, Sally got on with the work of developing the training program. The sphere of activity and distributed cognition in which she was functioning was rich with mediating artifacts (as broadly defined in activity theory) and with co-workers, as she describes below. (The artifacts Sally refers to are in bold type the first time they are mentioned, and references to her co-workers are italicised.)

> While researching **Statistical Process Control,** and also the **ToolBook Instructor software** itself, I ran into a few problems. Number one, I wasn't a bit familiar with the software. After doing a week-long **[on-line] tutorial** on ToolBook, I tackled the subject of Statistical Process Control.... Two **Quality Control** leaders in the Japanese workplace, Dr. Demming and Dr. Juran, originally implemented SPC. So I went to the AutoBuild **internal library** to research these two doctors. And after getting sufficient information, I compiled my notes and research into a **Word file.** I then met with my supervisor, *Dave,* and a computer expert for AutoBuild, *Don.* The three of us came up with a **plan** for how we wanted the **CBT program** to look, what information it would contain, and the time frame for completion of the program. [Next] after [some] time spent **storyboarding,** I compiled a **presentation** on the layout of what the [training] program [in Statistical Process Control] would look like, using **PowerPoint.** After showing this presentation to *my supervisor* and *Don,* I then went to work on importing the information into ToolBook.... *Dick,* an SPC guru, agreed to help me with the SPC details. He provided me with an **instruction book** for the SPC **classes** that he teaches. *Don* and *Dave* agreed that I should just use a **"cut-and-paste" procedure** [to take] the information [from] the instruction book and [put it into] the ToolBook presentation [on SPC]. I'm currently working on the design and layout of ... the content, using ToolBook. And I've been doing **usability testing** throughout my **project** on *various co-workers.*

Sally was working in a culturally and historically situated sphere of activity in which she interacted with various people, both immediate (Dave, Don, Dick, and other co-workers) and historically remote (Drs. Demming and Juran). She also interacted with an array of mediating artifacts including digital technologies (ToolBook Instructor and its on-line tutorial, Microsoft Word, PowerPoint, the laptop computer used to operate the software), built environments (the training area, the library), analytical methods (Qual-

ity Control, and more specifically, Statistical Process Control), procedures (storyboarding, usability testing, cut-and-paste, the larger procedure of the 'project' itself), structured social interactions (meetings, training classes), and texts in a variety of genres (instructional material in the on-line tutorial for ToolBook Instructor, the instruction book for previous in-house classes on SPC, the project plan, the PowerPoint presentation, books and journals from the AutoBuild library).

Interns drawing on cultural artifacts

What we saw in our study differed in certain ways from Lave and Wenger's (1991) model of apprenticeship. Most significantly, the interns in our study were typically assigned major, rather than ancillary, writing tasks to accomplish, and second, they were expected to work independently, rather than in an ongoing apprenticing relationship with a mentor. As with Freedman and Adam (2000), we saw that the interns' opportunities for guidance from more experienced co-workers were "fluid and indeterminate" (p. 49). But we also noticed something else: none of the interns received regular, intensive coaching from a more experienced co-worker. Indeed, a common cultural aspect of the interns' worksites was that novices, when encountering a problem, were encouraged to make every effort to solve it themselves before asking their supervisors or other colleagues for help—this appeared to be part of an ethos of professionalism. Sally explains her situation at AutoBuild: "I try as much as I can to get things done by myself, without having to ask for help. [Sometimes] I'm forced to ask for help from Dale about certain technical difficulties; however, I make sure that he knows I've exhausted all other avenues of research before [going to him for help].... This is something we've discussed."

With only limited opportunities for hands-on coaching from more experienced co-workers, the interns became extremely resourceful in drawing on the distributed cognition, or "intelligence" (Pea, 1993), embedded in various cultural artifacts in their respective worksites. A case in point is Mark, who worked as a technical writer at DataSearch, a high-tech firm whose major product was a sophisticated search engine sold to other organizations that used it to manage computerized databases. Mark's assignment during his internship was to participate in the production of user documentation for a new version of the search engine, which was under development. While he could at times consult with his co-workers in the Documentation Department and had some access to engineers and programmers in the Research & Development Department, he also developed strategies for tapping into the distributed cognition available in artifacts such as texts. Below Mark provides us with an example:

> You need to read the material you're given. If you're given a department
> guide, it's probably going to be as boring as watching wallpaper dry, but
> you've got to read it—it's amazingly helpful. You don't want to go to
> your manager with a question and have him say, "Well, actually, you know,
> that's on page 2 [in the department guide]." That department guide—
> not an exciting document at all, but definitely worthwhile.

In another case, Mark drew on the "foundation notes" for the project he was involved in—a detailed written record of weekly meetings of senior managers and the staff from Documentation and Research & Development. This record—which constituted a form of organizational memory—included transcripts of all meetings, which were tape-recorded, as well as copies of any documents or diagrams that had been discussed. When Mark learned about the "foundation notes" early on in his internship, he decided to read through the entire record from the beginning of the project, which had been in progress for a year by the time his internship began.

This reliance on texts, either available in the immediate environment or accessed through the Internet, was a recurrent strategy among the interns. For example, Anne, who was working on a major ($40,000) grant proposal for a nonprofit organization, obtained guidelines as well as samples of previously successful proposals from the website of the government funding agency to which she was applying. She explains:

> With grant writing, [the government agency] gives you an information
> packet with detailed guidelines that tell what they want in each section,
> and even how each section is graded. And they'll also reference you to
> other grant proposals on their website, grants from other organizations.
> And you can go and access those grants and use them as a template,
> grants that other people have written, that have been successful. And so
> you can use [this material].... They're basically saying, "These people
> gave us what we want, and we want you to do the same thing."

Similarly, Martha, an intern with ManageWell, a company that specializes in creating computer-run productivity tools for organizations and in offering related training, frequently accessed—via the Internet—product information and on-line tutorials for new-to-her software programs that she needed to use in order to accomplish her work of producing user documentation and training materials. In other cases, interns drew on texts such as in-house style guides, policies/procedures manuals, let-

ters, memos, minutes of meetings, document templates, annual reports, newsletters, websites, and previous samples of the genres they were producing—all with a view to accessing the distributed cognition embedded in these textual artifacts.

Print and electronic texts, however, were not the only cultural artifacts used in this way by the interns. Regularly scheduled, conventionally structured meetings, where the participants in a project met to discuss progress and problems, were another type of cultural artifact that could prove helpful to the interns by displaying patterns of culturally appropriate social interaction. Below Mark explains how meetings functioned for him as a theatre of both effective and ineffective social behavior:

> By watching what goes on at meetings, I saw that there were some people, who when they stood up to say something, or walked over to the whiteboard to draw a diagram, they were really holding everyone's attention. And then you could see that there were other people who always had to have something to say, and whenever they'd stand up at a meeting, the attention would just kind of wane, because they always seemed to need to say something, no matter how irrelevant or redundant. And so just by watching you could see what works and what doesn't.

Others types of mediating artifacts also served the interns as vehicles of distributed cognition. We have already seen how Sally was able to draw on various analytical methods, procedures, and technologies in producing a computer-based training program. Mark's internship at DataSearch offers another example. The Documentation Department employed an approach for producing software documentation that combined analytical methods known as "structured writing" and "single-sourcing" with a digital technology called FrameMaker+SGML. After reading the departmental guide when he arrived at DataSearch, and getting a sense of what this approach involved and how it defined his role as a writer, Mark was immediately able to begin collaborating productively with his co-workers: "They threw me into the fray pretty much right away ... 'Go write that chapter.' It was kind of draconian—like a 'live-fire' situation. But it worked out OK because of the system we use." The intelligence embedded in the different artifacts that constituted the documentation system—analytical methods and digital technology— allowed Mark to contribute effectively from very early in his internship, even though he was a novice in the organization.

Martha's experience at ManageWell provides another instance of the use of cultural artifacts as well as an explicit example of an intern simultaneously performing and further developing expert practices. ManageWell's main product is a software program called AdminOrganizer, which enables an organization to manage informa-

tion related to functions such as sales, revenues, payments to suppliers, and employee salaries. In order to write user documentation for AdminOrganizer, Martha needed to understand how it worked. She found that she could employ the software itself, with its analytical structure of "modules" and "functions," as a vehicle for learning. Further, Martha began the task of producing the documentation for AdminOrganizer even as she was learning how to use the software. She explains:

> I had to learn to use AdminOrganizer in order to write documentation for it.... They had two computer-based programs that walked you through what AdminOrganizer is intended to do. I looked at those, but after that I was still kind of lost because that just gave an overview. So I decided to go through it like I was one of our customers, going through the different modules and functions. I set up a fake company, and set up my inventory, and started making sales orders and purchase orders, and accounts receivable, payable; I set up the payroll for the employees—like I was the head of this company. And so I learned it as I went though it.... And I took notes for the documentation as I went along.

The four individuals quoted above were typical of the interns in our study in that they simultaneously performed and further developed expert practices in the course of accomplishing significant writing tasks—without the aid of regular hands-on coaching from more experienced co-workers, or for rehearsals or trial runs in the genres in which they were writing. A key factor here was the interns' ability to draw on the distributed cognition inherent in culturally constructed artifacts such as digital technologies, print and electronic texts, analytical methods, procedures, and the social interaction on display at meetings. In doing this, they were learning a new way of learning.

Interns reinventing expert writing practices

As mentioned earlier, our study suggests that what the interns experienced was not learning transfer, but rather a transformation of learning that made possible the reinvention of expert practices. Having developed expert writing practices in previous academic activity systems, the interns were able to resituate and extend—or reinvent—these practices in their new worksites. As they took on and succeeded in, the writing tasks they had been assigned, the interns both enacted and further developed expert practices—with performance and learning happening at the same time. It was their engaged participation in the activity of their worksites—with its interactions among co-workers and the mediations of cultural artifacts—that allowed the

interns to function in this way. Below we describe this reinvention of expert practices as it relates to reader-centered writing, research strategies, use of digital technologies, and collaboration.

Reader-centered writing

In the Professional Writing major, rhetorically informed practices of reader-centered writing were central to the curriculum. In the academic activity system, the students' readers were usually either the instructor or other students, with some infrequent opportunities to write for audiences outside the classroom. In their internships, the interns were able to draw on these previous experiences with reader-centred writing practices to interpret the rhetorical landscape of their worksites. As Mark put it, describing his experience at DataSearch: "There's a whole host of cultural and reader-centered stuff that goes on, and being able to recognize it was a big part of things." For the interns, this ability to "read" their rhetorical environments could result in sophisticated, subtle understandings of the multiple audiences for texts they were producing. Mark, for example, was able to resituate and extend his school experience with reader-centered writing practices in his new sphere of activity as a technical writer with DataSearch, as we see in the interview excerpt below, where he describes one of DataSearch's customers:

> We sell our software [a search engine] to SecuritiesTrader [a financial services firm], who then [build their own database] around it. And so when their client, Joe Day-Trader, goes to SecuritiesTrader and uses their database, he's not explicitly interacting with our software—he goes through SecuritiesTrader' shell and our stuff's the core.... So we're writing our documentation for the people at SecuritiesTrader—the programmers, the [database] administrators, the testers there. We're not writing to the everyday guy, Joe Day-Trader. So with the whole concept of reader-centered writing—we have to remember that we're writing for advanced to expert-level programmers and people like that.

Sally also spoke about her understanding of the readership for her computer-based training program: "First I had to determine who my audience would be. On the one hand, I was creating this lesson for AutoBuild employees. However, I knew that this didn't mean just the plant workers. I was pretty sure that the upper management of AutoBuild would also be taking more than a cursory glance at it."

For the interns, the reinvention of reader-centred writing practices also implied a different kind of relationship with readers, one that involved a close, personal identification with the readers' particular needs. We can get a sense of this from Martha's comments about the customers who would use her documentation for the AdminOrganizer software program:

> Our goal [in producing documentation] was to bring in more customers, and for the ones that we already had, to help them better understood how to use our software, so that they could be successful in their business. With the new documentation I created, I thought our users were better equipped to handle the software; if they needed to find something, they could find it and not have to go through eight pages of text.

Mark spoke of a similar relationship with the readers of the user documentation for the database search engine produced by DataSearch: "When we sell the product, it's out there in the world. And we've got to make really sure the documentation can support it, rather than putting our users in a position where they've got to call us saying, 'I need to talk to one of your programmers.'" And for Sally at AutoBuild, "it [was] neat to know that the [computer-based training] program I produced is actually going to be used by people, used by the employees."

Anne's task of producing a grant proposal for a nonprofit organization provides a related example of this sense of connection with people who would potentially be affected by the writing. The grant proposal aimed to secure funding for a support program for modest-income single mothers, a group Anne could relate to personally. She explains:

> In a sense, in writing this proposal, I was creating a program for people. I wasn't just writing something; I was actually creating a program—I was setting its goals, so I was creating the program. And that was intimidating. …When I finally found the statistic I was looking for—on the Internet, on a government website—and that statistic made the case, well, it was just the best feeling in the world.

Research strategies

In the Professional Writing program, the interns had been trained to do research as an essential part of invention. With close guidance from their instructors, they had learned strategies for locating print information in libraries and on the World Wide Web as well as for generating information through interviews, surveys, and focus groups. In their

worksites, however, the interns were themselves usually responsible for deciding when research was needed and what combination of strategies would be most effective in a particular situation, and they became very adept at doing this.

At the same time, they came to understand that while in academia plagiarizing other people's thoughts and language was unethical, it was a different story in the workplace. The interns quickly realized that appropriating other texts, produced within or outside of one's organization, was not only common practice but was viewed as the most intelligent way to operate. Anne describes how this practice allowed her to be successful as a grant writer:

> Another thing I learned, is that you can plagiarize, and that just fasci-
> nated me. With grant writing, [the government funding agency will] ref-
> erence you to other grant proposals. And you can go and access those
> grants [via the Internet] and use them as a template, grants that other
> people have written, that have been successful. And so you can use [this
> material], and why invent the wheel if it's already been done? … This is
> an entirely different set of rules from school.

Use of digital technologies

The Professional Writing program taken by the interns was technology-inten-sive. All the courses in the program, with the exception of the internship class itself, were held in a computer classroom, where students had access to a variety of different softwares, such as Microsoft Office™, FrameMaker™, PageMaker™, Dreamweaver™, Acrobat™, and QuarkXpress™. In their worksites, however, the interns often found themselves relating to technology in a new way. Instead of classroom situations where they were guided by instructors in learning to use new softwares, the interns often found themselves operating on their own. We have seen how Sally employed an on-line tutorial to teach herself how to use ToolBook Instructor before beginning the task of developing a computer-based training program. Martha describes a similar situation at ManageWell, where she discovered the best approach, for her, for learn-ing to use a new software on her own:

> Knowing how to go about learning a software on your own was impor-
> tant. I figured out that what works best for me is to actually go through
> [the software]. I have to sit down at the computer like I know what I'm
> doing and I go through it and produce a document. Like with InDesign™:
> first I did some research; I looked on the Internet to find out exactly
> what InDesign™ does. Then I just sat down and went through it and

produced a flyer. I tinkered until I got it right, and when I got something right I wrote it down, exactly what I did. I figured out the features [of the software] and wrote them down.

Here, once again, we see an intern learning a new way of learning—with this transformation of learning enabling her to resituate and extend expert writing practices in her new worksite.

Collaborative writing
Another central feature of the curriculum in the Professional Writing major was an emphasis on collaborative writing. Students had frequent opportunities to work together in project teams. Mark describes his experience with collaborative writing in school:

When we'd get together as a team, we'd kind of negotiate what would need to go into the document, and a couple of people would write it and make sure all the sections would work together. For the most part it was one or two people writing it and everyone else sitting around and throwing in what they wanted. Somebody would be typing and we'd get to a section on, say, the colour green. "Well, Jim, you did the research on the colour green, so tell us what you know about the color green," and we'd type it in.

According to Mark, the collaborative writing practices he participated in at DataSearch were qualitatively different from those he had experienced at school. The situation at school was "on one end of the spectrum, and here [at DataSearch], with collaboration, we're on the other end of the spectrum." He elaborates:

At DataSearch, we do 'books' [of user documentation] that can range from 100 pages to, say, 700 pages. And [a book] will have 'chapters'; and within those chapters each section is its own little 'inset.' And we do collaborative writing in that I'll write an inset, Mike will write an inset, Brad will write an inset. Each of does our part on our own and inputs it to FrameMaker™. And it's kind of a leap of faith: you have to say, "Well, OK, in this chapter I have to assume that Brad will get the job done here, Mike will get the job done there, and I just have to follow our style guidelines and do my own insets for this chapter—no more, no less—and then put it into FrameMaker™, and it'll all work together."

The examples above illustrate how the interns were able to draw on expert writing practices developed in the activity of the classroom and to resituate and extend these practices in accomplishing writing tasks in the activity systems of their new work environments.

Growth of professional identity

The development of a "knowledgeably-skilled identity" appeared to be a key factor in the interns' reinvention of expert practices. Part of this evolution in self-identity came from a sense of achieved competence, as defined by the expectations of the organizational culture. Mark explains what this means for him:

> For me, being professional means that you get stuff done on your own; no one has to hold your hand through it. You know what has to be done, you have a rough estimate of when it has to be done, and you get it done.... Now I feel much more like a professional than I did when I started. I'm expected to know what I'm doing next, what I should be working on, what need to get done by 5:00 o'clock today. And I do. It's like the kid-gloves are off: "You've been trained; you've got the skills to do this—go for it."

At the same time, though, developing a "knowledgeably-skilled identity" could also involve the sense of becoming a recognized member of a team of professionally competent practitioners. Martha describes how this evolved for her:

> I didn't know anything when I started at ManageWell. I was just a student intern; my name was Martha Jones, JAI: 'Just an Intern'.... I had to figure out a lot of different things. And part of it was learning how to talk to other people in our company—the program developers, the trainers, the QA [Quality Assurance] people—and how to work with them.... But by the end of my internship, though, people were coming to me when they had questions about the documentation or even about the software itself. And that made me feel really good.... I eventually got to where I felt like I was really part of the team.... *So by the end, it was different—it was like being ... a real tech writer.*

This example also illustrates how the interns, typically, not only came to understand that processes of learning are inherent in an activity system, as it constantly develops shared knowing-in-practice, but also to see that they themselves, even as novices, could in certain situations play the role of mentor for co-workers.

In other circumstances, the growth of professional identity could also involve the need to negotiate the status of one's own work. Martha describes an incident in which a co-worker had taken the credit for a piece of work that had actually been done by Martha:

> I was doing a set of PowerPoints and uploading them to the server for our virtual classroom. And I did 16 of them in one night, because they needed to be done the next day for a training session, and I got them late. So I did them, and I was up until 5:00 a.m. And the next day, George [Martha's supervisor] called me and said, "Why didn't you get those PowerPoints done." And I said, "I did them all." And he said, "Well, Jack says that he did them." I said, "No, I did them. You go to the server and find out the IP address for the computer that uploaded them. And so he did, and found out it was my computer. So I said, "That's my computer; that's my work."

As Martha explains, how she reacted to this situation was very important for her evolving sense of self as a practitioner:

> I had to do something about what had happened, though I didn't really know how to go about it. So I just decided to get them together and let them know how I felt. I told George I wanted to see him and Jim—to talk about what had happened. So the next week, we had a meeting— George, Jim, and John, that's George's boss, and me. I told John what had happened: that it was my work and that somebody else had been claiming they did it; and that I didn't appreciate that ... I wanted them to recognize that I do my own work, and I do my work well.... Now I have experience dealing with these situations, it's sure to help. I'm much more confident now. I know I can stand up and say, "Hey, you're not going to take credit for this. This is *my* work."

Martha was fully aware, however, of the power relations in play in this situation: "It's a very delicate situation when you're dealing with bosses and their bosses; you got to try to let them know that you're upset, but still got treat them with respect."

One of our more striking observations about the interns' reinvention of expert practices was the synergistic relationship between expertise and a sense of professional identity. The enactment and further development of expert practices appeared to contribute to the growth of professional identity—though there is nothing really newsworthy about this. What did surprise us, however, was how a growing sense of personal competence appeared to make the interns more effective in carrying out their assigned writing tasks.

An explanation for this could be that an enhanced sense of competence as practitioners led the interns to *expect* to be successful in dealing with challenging situations and thus to be more resourceful and effective in their work.

Implications

We believe that our study has certain implications for theory, pedagogy, and future research. On the level of theory, the study adds some texture to our understanding of how written genres are embedded, in locally specific ways, in the environments and work activities of professional organizations. Perhaps the key contribution of the study, however, is its support for the challenge that theorists of situated learning have brought to bear on the cognitivist concept of *learning transfer*. What we hope to have added to this critique is a more detailed picture of what it is that occurs, absent the notion of learning transfer, when students move from the classroom into the workplace: a *transformation of learning* and *reinvention of expert practices*. As well, in describing how the interns in our study simultaneously enacted and further developed expert writing practices, we corroborate the view that "part of the nature of a shared practice [is] that learning what it is and enacting it are inseparable" (Barnes, 2001, p. 25). And finally, we offer a variation on the apprenticeship model of situated learning by describing how the interns in our study compensated for the lack of hands-on mentoring by accessing the distributed cognition inherent in culturally constructed artifacts.

In terms of rhetorical theory, our study has enriched our own understanding of praxis, defined as the enactment of discursive practices informed by context-specific rhetorical, ethical, and political understandings. First, because praxis is always situated in human activity, it is invariably accomplished through interactions with other people and with material, conceptual, and linguistic artifacts such as digital technologies, built environments, analytical methods, and discourse genres. And second, since human activity is constantly changing, the nature of praxis continuously evolves, which in turn requires ongoing learning on the part of those who would deploy it.

With regard to pedagogy, each of the authors redesigned and taught a course in the Professional Writing program during the time we were conducting our research. In both cases, we attempted to apply what we were learning from the study to our teaching. Brown taught a course in Research Methods in which she engaged her students in a single, semester-long research project, with a local nonprofit organization as the client. She shared with the class the responsibility for defining the specific goals of the project, at the outset and then stage by stage, and collaborated with them throughout the semester to decide what work had to be accomplished next and what combination of research strategies would be needed.

Smart taught a capstone course in Advanced Professional Writing in which the students assumed part of the responsibility for designing their individual plans-of-study. Among the projects the students undertook were these: learning an unfamiliar digital technology on one's own, researching the use of the technology in the workplace, and developing instructional materials for it; participating with the authors of this study in the design and presentation of a workshop on research methods for practitioners at a chapter of the Society for Technical Communication in a nearby city; and collaborating in a team to produce a piece of print or on-line documentation for a non-profit organization in the local community.

In both courses, we aimed to provide our students with experiences that, among other objectives, would prepare them for what we believe they will encounter in their careers after graduation. We created spheres of activity in which the students collaborated with classmates, practitioners, and clients in the community and interacted with cultural artifacts such as digital technologies, project-management methods, and analytical procedures in accomplishing large-scale writing projects that lasted weeks, months, or even the whole semester. We also provided our students with opportunities and exigencies outside the classroom that would prompt them to reinterpret, enact and extend expert writing practices they had developed in school.

Looking to future research, we believe that our discipline must continue to explore the relationship between what students experience in our classrooms and what they experience in the worksites they enter after graduation. To grow as a field, Professional Writing needs ongoing research to develop a larger body of field-specific "grounded theory" (Glaser & Strauss, 1967; Strauss & Corbin, 1998), that is, theory derived from the analysis of data that has been systematically gathered in a range of classrooms and worksites. Such research would allow us to address three issues that are fundamental to our curricula and pedagogy:

- *Significance* – Are the versions of expert writing practices that we build into our curricula similar to, or at least resonant with, the expert writing practices our students will need to perform in the worksites they enter after graduation?

- *Learning* – If the answer to the first question is yes, are our students successfully learning these expert writing practices in our classrooms?

- *Reinvention of practices* – If the answer to the questions above is yes, how do our students fare when faced with the challenge of resituating and reconstituting, in the activity of new worksites, the expert writing practices they have learned in our classrooms?

With the study reported in this article, we hope we have made a useful contribution to addressing these issues at least in part, and, in the context of this special issue, to have cast some light on the expertise of professional writers and its development.

NOTES

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2 The quotations from the interns have been edited for false starts, hesitations, fillers, and redundancy. As well, a space with three periods (…) indicates that verbal material from an utterance has been omitted in the quotation.

REFERENCES

Anson, C. & Forsberg, L. (1990). "Moving beyond the Academic Community: Transitional Stages in Professional Writing." *Written Communication, 7,* 200–231.

Barnes, B. (2001). Practice as collective action. In T. Schatzki, K. Knorr Cetina, & E. Von Savigny (Eds.). (2001). *The practice turn in contemporary theory.* London: Routledge.

Bazerman, C. (1988). *Shaping written knowledge: The genre and activity of the experimental article in science.* Madison: University of Wisconsin Press.

Bazerman, C. (1994). *Constructing experience.* Carbondale: Southern Illinois University Press.

Beaufort, A. (1999). *Writing in the real world: Making the transition from school to work.* New York: Teachers College Press.

Berkenkotter, C. & Huckin, T. (1995). *Genre knowledge in disciplinary communication: Cognition/culture/power*. Hillsdale, NJ: Lawrence Erlbaum.

Bowker, J. & Star, S. L. (1999). *Sorting things out: Classification and its consequences*. Cambridge, MA: MIT Press.

Brown, A., Ash, D., Rutherford, M., Nakagawa, K., Gordon, A., & Campione, J. (1993). Distributed cognition in the classroom. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations* (pp. 188–228). Cambridge, UK: Cambridge University Press.

Cole, M. & Engeström, Y. (1993). A cultural-historical approach to distributed cognition. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations* (pp. 1–46). Cambridge, UK: Cambridge University Press.

Dias, P., Freedman, A., Medway, P. & Paré, A. (1999). *Worlds apart: Acting and writing in academic and workplace settings*. Mahwah, NJ: Lawrence Erlbaum.

Engeström, Y. (1992). *Interactive expertise: Studies in distributed working intelligence*. Research Bulletin 83. Department of Education, Helsinki University.

Engeström, Y. & Middleton, D. (1998). Cognition and communication at work. Cambridge, UK: Cambridge University Press.

Fishman, S. & McCarthy, L. (2001). An ESL writer and her discipline-based professor: Making progress even when goals don't match. *Written Communication 18*, 180–228.

Freedman, A. & Adam, C. (2000). Write where you are: Situating learning to write in university and workplace settings. In P. Dias & A. Paré (Eds.) *Transitions: Writing in academic and workplace settings*. (31–60). Cresskill, NJ: Hampton Press.

Freedman, A. & Smart, G. (1997). Navigating the currents of economic policy: Written genres and the distribution of cognitive work at a financial institution. *Mind, Culture, and Society 4*, 238–255.

Gaitens, J. (2000). Lessons from the field: Socialization Issues in writing and editing internships. *Business Communication Quarterly, 63*, 64–76.

Glaser, B. & Strauss, A. (1967). *Discovery of grounded theory*. Chicago: Aldine.

Goodwin, C. (1997). The blackness of black: Color categories as situated practice. In L.
     Resnick, R. Säljö, C. Pontecorvo, & B. Burge (Eds.), *Discourse, tools, and*
     reasoning: Essays on situated cognition. Berlin: Springer.

Hutchins, E. (1995). *Cognition in the wild.* Cambridge, MA: MIT Press.

Lave, J. (1996). The practice of learning. In S. Chaiklin & J. Lave (Eds.).
     Understanding practice: Perspectives on activity and context. (3-32). New York:
     Cambridge University Press.

Lave, J. (1991). Situated learning in communities of practice. In L. Resnick, J. Levine,
     & S. Teasley (Eds.). (63–82). Washington, DC: American Psychological
     Association.

Lave, J., and E. Wenger. (1991). Situated learning: Legitimate peripheral
     participation. Cambridge University Press, Cambridge.

Leont'ev, A. (1978). *Activity, consciousness, and personality.* Englewood Cliffs, NJ:
     Prentice Hall.

Luria, A. (1976). Cognitive development: Its cultural and social foundations.
     Cambridge, MA: Harvard University Press.

Miller, C. (1984). Genre as social action. *Quarterly Journal of Speech 70,* 151–167.

Nardi, B. (1996). Studying context: A comparison of activity theory, situated action
     models, and distributed cognition. In B. Nardi (Ed.). *Context and*
     consciousness: Activity theory and human-computer interaction. (69–102).
     Cambridge: MIT Press.

Ornatowski, C. (1998). 2 + 2 = 5 if 2 is large enough: Rhetorical spaces of technology
     development in aerospace engine testing. *Journal of Business and Technical*
     Communication, 12, 316–342.

Pea, D. (1993). Practices of distributed intelligence and designs for education. In G.
     Salomon (Ed.), *Distributed cognitions: Psychological and educational*
     considerations (pp. 47–87). Cambridge, UK: Cambridge University Press.

Russell, D. (1997). Rethinking genre in school and society. *Written Communication*
     14, 504–54.

Schryer, C. (1993). Records as genre. *Written Communication 10,* 200–234.

Smart, G. A central bank's 'communications strategy': The interplay of activity, discourse genres, and technology in a time of organizational change. In C. Bazerman & D. Russell (Eds.) *Writings selves and societies: Research from activity perspectives.* San Diego, CA: *Mind, Culture, and Activity* and Fort Collins, CO: Academic.Writing. Forthcoming.

Smart, G. (2000). Reinventing expertise: Experienced writers in the workplace encounter a new genre. In. P. Dias & A. Paré (Eds.). *Transitions: Writing in academic and workplace settings* (pp. 223–252). Hampton Press.

Smart, G. (1999). Storytelling in a central bank: The role of narrative in the creation and use of specialized economic knowledge. *Journal of Business and Technical Communication 13,* 249–273.

Strauss, A. & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory.* Thousand Oaks, CA: Sage Publications.

Suchman, L. (1987). *Plans and situated actions: The problem of human-machine communication.* Cambridge, UK: Cambridge University Press.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Vygotsky, L. (1962). *Thought and language.* Cambridge, MA: MIT Press.

Wertsch, J. (1997). *Mind as action.* New York: Oxford UP.

Winsor, D. (2001). Learning to do knowledge work in systems of distributed cognition. *Journal of Business and Technical Communication 15,* 5–28.

Winsor, D. (2000). Ordering work: Blue-collar literacy and the political nature of genre. *Written Communication, 17,* 155–184.