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UNCOVERING *POIESIS*:
THE ROLE OF PRODUCTION IN TECHNICAL COMMUNICATION, WORK,
AND PUBLIC LIFE

By
Thomas E. Vosecky

A DISSERTATION

Submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Rhetoric and Technical Communication

MICHIGAN TECHNOLOGICAL UNIVERSITY

2011

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This dissertation, “Uncovering *Poiesis*: The Role of Production in Technical Communication, Work, and Public Life,” is hereby approved in partial fulfillment of the requirements for the Degree of DOCTOR OF PHILOSOPHY IN RHETORIC AND TECHNICAL COMMUNICATION.

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I also acknowledge IGI Global and Routledge, the publishers who were kind enough to grant permission to reuse previously published material. Those permissions can be found in the appendix.

Preface

This dissertation can be read on several levels. First, it is a report on a collaborative project between the Computer Science Department (specifically the Software Engineering Program) and the Humanities Department (specifically the Rhetoric and Technical Communication Program) to develop case studies that focus on issues of communication in the workplace, and the results of the use of them in the classroom. My argument here is that through case study teaching we are simulating real-world experience in a meaningful way, essentially developing a teachable way of developing *phronesis*, the reasoned capacity to act for the good in public.

Second, it can be read as a “how-to” guide relating how the construction of those case studies came about in an effort to assist any educator who may wish to construct their own case studies. To that end, I have included a discussion of the ethnographic methodologies employed, and how it was adapted to our more pragmatic ends.

Finally, I present my overarching argument for a new appraisal of the concept of *techné*. This reappraisal emphasizes its productive activity, *poiesis*, rather than focusing on its knowledge, the reasoned capacity to make, as has been the case in the past. I propose that focusing on the *telos*, the end outside the production, contributes to, the diminishment, if not complete foreclosure, of a rich concept of *techné*.

As mentioned above, much of the development of the case studies was a collaborative project involving faculty, graduate, and undergraduate students from the Computer

Science and Humanities Departments. The faculty members involved were thanked in my acknowledgments, and the graduate and undergraduate students are acknowledged in the text where appropriate. Due to this collaborative nature, I have use the pronoun “we” when the interactions were a group effort, and reserved “I” for my individual contributions.

Some previously published material that appears in this dissertation includes selections from *Speaking of Software: Case Studies in Software Communication*, which I coauthored with Ann Brady, Marika Seigel and Charles Wallace (2008) and which appeared in *Software Engineering: Effective Teaching and Learning Approaches and Practice*. Though written in a largely collaborative manner, my primary contribution was to the construction and presentation of the cases, and the adaptation of the ethnographic methods I used. The permission from the publisher, IGI Global, to reuse this material can be found in Appendix 2. Other previously published material includes selections from “Making and Acting: Ethnographic Development of a Case Study Approach” for which I was first author, and also represents a collaborative effort with Marika Seigel and Charles Wallace. This first appeared in *Technical Communication* in 2008, and was reprinted in *Qualitative Research in Technical Communication* in 2011. This appears in modified form in Chapter Three: Theory Applied and Chapter Five: Project specific Methods. Permission from *Technical Communication* was not required as the authors retained rights. Permission from the publisher, Routledge, was obtained. Statements concerning both can also be found in Appendix 2.

Abstract

This dissertation is a report on a collaborative project between the Computer Science and the Humanities Departments to develop case studies that focus on issues of communication in the workplace, and the results of their use in the classroom. My argument is that case study teaching simulates real-world experience in a meaningful way, essentially developing a teachable way of developing *phronesis*, the reasoned capacity to act for the good in public.

In addition, it can be read as a “how-to” guide for educators who may wish to construct their own case studies. To that end, I have included a discussion of the ethnographic methodologies employed, and how it was adapted to our more pragmatic ends.

Finally, I present my overarching argument for a new appraisal of the concept of *techné*. This reappraisal emphasizes its productive activity, *poiesis*, rather than focusing on its knowledge as has been the case in the past. I propose that focusing on the *telos*, the end outside the production, contributes to the diminishment, if not complete foreclosure, of a rich concept of *techné*.

Introduction

At many universities that focus on science, engineering or other technical fields of endeavor, the technical communication classroom has long been where students who pursue degrees outside the liberal arts acquire their writing skills. Responding to a perceived lack of writing ability on the part of their graduates, in the early 1900's engineering schools developed these dedicated writing courses, usually in alliance with English departments. Basically prescriptive, these courses followed a "forms" approach that taught the correct way to put together memos, letters, and reports. Responding to the instrumental methods common in the textbooks of the day, Miller (1979) has called for a more humanistic approach, one that includes considerations of civic responsibility and social action for the public good—*phronesis*. Dunne (1993) has also sought a more phronetic approach in the realm of teacher education, specifically to counter the behaviorist emphasis on quantifiable results that was becoming prevalent (and can still be seen) in the school systems.

The difficulty that arises when advocating for a phronetic pedagogy is that *phronesis* can not be taught directly. *Phronesis*, a "reasoned state of capacity to act" (NE 1140a4), is a wisdom acquired through habituation and gained through experience (NE 1142a14). The purpose of this research is to explore ways that have been suggested to facilitate training in *phronesis*. The point of this training is to shorten the time required for students to come to an understanding of their civic responsibility in their classroom, in their worlds

of work, and in their communities. To that end, I present a method that has been shown to be efficacious in the classroom. By using *techné* and its action *poiesis*, educators can successfully simulate the years of experience normally required to acquire the capacity for good action in public—*phronesis*, as envisioned by Aristotle—within the time frame of a semester or less.

Unlike *phronesis*, *techné*, “a reasoned state of capacity to make” (NE 1140a5), can be taught. Janet Atwill (Janet M Atwill 1993; Janet Atwill and Lauer 1995; Janet M Atwill 1998) has called for this kind of a production-based approach to teaching writing, seeking to revitalize *techné*. Unfortunately, as her reliance on *logos techné* (art of discourse) might suggest, she eventually advocates for a style based more on *phronesis* than on *techné*, one that relies on good actions, in public, with others. When she teams with Lauer, they seem to diminish, if not ignore the full, rich capability of the technite, the person who possesses and deploys the knowledge of *techné*. Relying on what I will later argue is imperfect interpretations of Aristotle (NE 1140a5-15, *Rhetoric* 1358b), they claim that the “end of an art is *not* a product, but the use made of the artistic construct” (29). They impoverish the actions which make up *techné* in favor of the actions of the user, the recipient of the result of those actions. They suggest that it is only that result, the end outside of the action of *techné*, which has value.

Similarly Dubinsky (2002), in his attempt to define *techné* as something other than “knack”, relies on the idea of working toward the communal good as his “tempering agent”. Like Mitcham (1994), Dubinsky’s concept of *techné* becomes very unflattering to

the working technite, suggesting that carving wood is “simple”: more technique than *techné*.

It is these and other promulgations of a diminished or impoverished *techné* that have stood in the way of a *techné*-based pedagogy. These imperfect forms of *techné* are described quite well by Wild (1941) as his inversion, which separates the maker from the made. Heidegger (1953) expands this to include the separation of people from the technology they create, and sees the thing made as constituting standing reserve—with dire consequences. de Certeau (1984) lays this problem at the feet of the engineer, who “takes” the *techné* from the artisan and installs it in a machine, leaving only implicitly known stories and fables to guide the day-to-day actions of artists and craftspeople. Many modern artists and craftspeople are no longer technites in the full, rich sense of the term. They have lost, in a sense, the ability to explain themselves.

A pedagogy rooted in *techné* requires the recovery of a richer notion of *techné*, one which draws on both theory and personal experience. Key to this notion will be the concept of *poiesis* (making). This richer notion must consider the four causes attributed to Aristotle, (Physics, 194b, 23-35) with particular attention to the final cause. Unfortunately, as we will see with Atwill and Lauer, this is commonly seen only as an end outside the making (*telos*); outside the activity of *poiesis*.

Activity is central to both *phronesis* and *techné*, usually termed *praxis* and *poiesis* respectively. Unfortunately, these terms are often used loosely. *Praxis* can be any action,

despite its usual connection with *phronesis*. *Poiesis* is generally associated with *techné* as a more precise usage. For Aristotle, it is the action of *techné*: it is production, or the making of (usually) some thing. It is the *end* of the action that determines its importance both as product and as use in a specific application.

As acknowledged by Aristotle in the Nicomachean Ethics “a certain difference is found among ends; some are activities, others are products apart from the activities that produce them” (NE 1094a 3-5). As product, *ergon* is often overlooked in favor of the *telos*, the end outside the work, the purpose the product is used for. By restoring the intrinsic value of the product as *ergon*, we acknowledge and celebrate the achievement of the technite in the work itself, and at the same time respect the needs and opinions of the end user. I call this a *techné* of *phronesis*: a reasoned capacity to make which is informed by a reasoned capacity to act. The significance of this move is that where *phronesis* cannot explain itself to those without *phronesis*, and is generally unsupported by theory (being more of a situational and kairotic display of knowledge), and the impoverished forms of *techné* devalue the maker leading to a mere technique that admits no civic involvement, *techné* in its rich form promises both.

Can we educate students in a way that completes Aristotle’s somewhat contradictory prescriptions that we need experience as well as theory (Meta 981a1), all in a manner that can explain itself discursively and be useful in the world? I believe it is in *poiesis*, the activity of making, that these can come together. For students in the classroom, and their instructors, *poiesis* can provide a framework for reflection that is complex and satisfying;

it suffers none of the lacks of either an impoverished *techné* or an unexplainable (hence unteachable) *phronesis*. Working with the rich conceptions of *poiesis* provided by Wild and Heidegger allows for the inclusion of the action and ethical implications that are involved with any act of production in a way that other methods do not. *Poiesis* incorporates an internal end that values the maker as well as an external end important to the community or, as Aristotle frames it, the good of the state (NE 1094b 5-10). A model based on *poiesis* will be significant in that it can provide a framework that can hold and guide the reflections of both master and apprentice.

The difficulty with a pedagogy based on *poiesis* is that often educators can not accommodate all students with “real world” making. Three ways of providing the experience of the workplace are in common use: internships, class-based projects, and case studies. Internships or co-ops, arguably the most real of workplace experiences, often occur relatively late in a student’s college experience. They may become frustrated, disillusioned, or worse: discover that the career path they have been pursuing is not really “for them.” Class-based projects where the students work for a client suffer the same dilemma in that they are often presented in upper-division courses. In addition, they are often less than adequate simulations of real experience: they are often seen as “superficial” by the students (Freedman et al. 1994), and confounded by misdirection by the “clients” (Blakeslee 1997; 2001). It is better to expose the students to the ethical dilemmas and political realities they may face early; in an introductory course. It is there that we must simulate that “real world” experience if we wish to do the best by our students.

Case study teaching methods provide a third means of simulating real-world experience. The stories that make up case studies can capture the essence of everyday situations. Aristotle's claim that stories can be "an imitation...of action and life" (*Poetics* 1450a17-18) provides grounds for Martha Nussbaum (2001), in *Fragility of Goodness*, to agree with Aristotle that "imitation is natural" and that it is through imitation that we learn (*Poetics* 1448b; 5-9). Well made assignments with their basis in rich, detailed case studies can fill an educators desire to simulate the experiences of others, and enable educators to present those simulations (and dilemmas) to their students. When students first analyze then reflect on a case, they bring their knowledge to discursive consciousness. When students can put into words the lessons of the case, and explain the reasons for their decisions, they will have acquired the craft, the *techné* of what they do. This gives them the ability to teach their new-found capabilities, further reinforcing the learning of themselves and others. And that craft will become, as Brady (2007) found, their guide "as they investigate knowledge that changes from one social context to another, one community to another, one practice to another" (16), a guide that will allow them to better cope with the workplace.

Although there is much "how-to" material on case studies available, such as Wasserman's *Introduction to Case Method Teaching* (1994), Rosson and Carroll's textbook *Usability Engineering: Scenario-Based Development of Human Computer Interaction* and the associated Usability Case Study Tool (<http://ucs.ist.psu.edu>), the work of Herreid (1997a) and others (available at the National Center for the Teaching of Case

Studies in Science), and some reporting in the IEEE journal (notably, the *Transactions on Professional Communication* December 2004 special issue on case studies) , it appears there is a lack of theoretically grounded work in this area. There is also a history of case study use in technical communications to explore and educate, exemplified by Zoetewey and Staggers' (2004) "Midwest Air Disaster" case, that could benefit from more explicit theoretical underpinnings . Included in this section is learning theory as it applies in the classroom. Freedman and Adam (1996) have shown the usefulness of Lave and Wenger's (1991) "legitimate peripheral participation", Rogoff's (2008) "guided participation", and Vygotsky's apprenticeship models of learning.

To this end I have created two rich, detailed case studies in conjunction with the Computer Science and Humanities departments at Michigan Technological University. Sponsored by a National Science Foundation grant, I worked for three years to gather ethnographic data and write up the cases. I also supervised and contributed to the creation of other cases, all available at <http://www.speaksoft.mtu.edu/cases/>.

To begin, I provide some background on the two projects that led to the development and use of the first case. Initially, I worked with the Computer Science Department at Michigan Technological University to gather the ethnographic material that would eventually be used to develop the case. I then worked with the Humanities Department as the case used in Technical Communication courses, and again with Computer Science as it was used in Software Engineering courses.

In chapter two I offer explication of the concepts of *techné* and *phronesis*, and their aligned actions of *poiesis* and praxis. I review how they have been interpreted, and sometimes misinterpreted, by scholars from various fields, and suggestions of how they have been used, or might be used, in pedagogical approaches.

Chapter two also theorizes how those concepts informed construction of the cases. Since they are critical to our pedagogical goals of helping students to create documents (the making, or *techné* aspect) that are ethical and promote the common good inherent in any situation (the acting, or *phronesis* aspect), we seek to share our method of developing these rich, compelling cases, and demonstrate how our goals have been accomplished through their use. I believe that if the concepts of making and acting are not understood and intentionally incorporated at the beginning of development of the cases, then they will be present in only the most tangential of ways, unnecessarily complicating the discovery process of the students.

Chapter three examines the use of one ethnographically based Speaking of Software case study in a classroom, again using *techné* and *phronesis* as a theoretical lens. This initial use of the Seabase case study was in a technical communication course comprised of students majoring in technical communication, business, engineering, as well as software engineering and computer science. While the Seabase case study has also been used with success in a Software Engineering classroom, here I report only on the use in the

Technical Communication class predominately due to its more heterogeneous composition.

The case studies we developed from the student projects have also been used in other classrooms, with initially good reception. I also report on two of those trials, showing how the concepts of *techné* and *phronesis* are “rediscovered” by students when the cases are ultimately deployed in the classroom. These examples demonstrate our method of using ethnography not just for research, but to train (T. Miller 1991).

In chapter four I review the ethnographic methods used to create the cases. I have followed two Software Engineering student capstone projects through the Computer Science department (CS), one internal (Maze) and one external (Crane, with Mechanical Engineering). Access to these sites was with the permission of all involved, and has returned some rich data on interaction between client and student. My fieldwork consisted primarily of observation and interviews. As a research assistant with CS, I followed the students as they worked on their Senior Design Projects for clients both outside and inside their major. I gathered data on how they navigated client interactions and developed case studies based on the process. I believe these “thick descriptions” provide fertile ground for beginning an investigation of how students learn a new genre. Judicious coding of these descriptions following the methods described by Strauss and Corbin (1998) was used to develop themes that were then verified with the participants. It became an iterative process that is, as Charmaz (2005) describes, more constructivist than the original grounded theory allows.

Chapter five provides project specific methods we used to develop the cases. Our work was not initially a true ethnography in that we did not spend years doing fieldwork with the intent of explicating a culture. Rather, we adapted proven ethnographic techniques to inquire into specific communication issues. This chapter provides a road map for others who may wish to embark on a similar project.

Chapter six concludes the discussion of the pedagogical aspects of this work. I propose *poiesis* as a valuable operative agent in a *techné*-based pedagogy; an agent that can include acting well with others even as it guides production. Finally I discuss the implications of this proposal to writing classroom pedagogy, and offer some recommendations on their application to current and future practice.

That said, my pragmatic inquiry concerned how to simulate experience in a classroom. I have developed one technique that does just that. Drawing on a rich notion of *techné* (and its activity *poiesis*) has provided the ground for first developing the simulation as a case study. Once in use in the classroom, these concepts also allowed for theorizing its use by the students. That is, I was able, by using responses to the simulation, confirm the value of my technique. I have, in essence, created a teachable knowledge of how-to-act, in effect creating a *techné* of *phronesis*.

Chapter seven offers a second conclusion that details the poetical aspects of this work. Having been a technite (of auto repair) for many years, I have an implicit understanding

(gained through experience) of *techné*, and its activity of *poiesis*, that many do not possess. I have made this understanding more explicit, explain it, brought it to “discursive consciousness” if you will. In doing so I have fleshed out in almost autoethnographic form what I have provisionally called a rich *techné*. But the limitation of many autoethnographies is their focus on the particular. By examining and writing in the experience of others, initially those of the Senior Design Projects I followed, I have uncovered practical examples of the more universal aspects of *techné*. Theorized in these instances as well, this work is a first step in rewriting our field’s more common understanding of *techné* in an “impoverished” sense. Using this rich notion of *techné* as it is found in the classroom and the workplace, I provide an experiential account of a “*techné of phronesis*”, and how that concept is inseparable from *poiesis*, and further demonstrate its value in pedagogical applications.

Chapter One: Background

This chapter discusses the more practical aspects of the project that contributed to the creation of this dissertation. Initially, the focus was to develop pedagogical material for use in undergraduate software engineering classrooms. Specifically, the desire was to create what might be called “thick descriptions”, that is, case studies that would introduce beginning students to real-world software development issues and the communications that surround—and sometimes create—those issues. A second thrust was to investigate how a case study approach can be beneficial when used in technical communication classrooms.

Whereas computer science professionals are often intimately involved with requirement elicitation and need clear communication with the client to succeed, technical communication professionals are often seen as “outsiders” in those situations, useful only as recording secretaries and report writers. Their need is to develop skill at bridging between the content areas of the software engineers, the client, and their own specialized field, in essence becoming managers of the social processes of the workplace. This chapter explains the background which gave rise to both missions, and why our case studies effectively and uniquely address the concerns of both fields.

Project purpose: Computer Science

Speaking of Software—NSF funded Project

In a 2006 issue of *Technical Communication* Brady, Johnson and Wallace reported on the interdisciplinary project “Speaking of Software: Integrating Communication and Documentation Techniques into an Undergraduate Software Engineering Curriculum.” Speaking of Software is an NSF-funded project intended to “increase opportunities for all those participating to view communication as a rhetorical act and to integrate the theories and pedagogies of technical communication and software development” (318). Brady, Johnson and Wallace emphasize the possibilities that the Speaking of Software project provides for interdisciplinary collaboration, particularly for outlining what technical communication might “give back” to other disciplines in ways that might increase the visibility of the field both in academia and industry.

In order to reach this goal, project participants developed case studies to be used in software engineering courses to teach the rhetorical complexities of communicating with stakeholders—from the client to the end user—in the software development process. At the time that this first article was written, one case study had been developed but had not yet been employed in the classroom. Now, these case studies have been successfully used in the classroom and have yielded some unexpected insights. Subsequent sections of this report will share the qualitative methods used to develop the cases, and cover some of the results of that use.

The literature of software engineering presents the need for capturing recurrent difficulties in the process of software development. In other words, groups of individuals often create a massive and valuable knowledge base concerning the process of project design, developing effective means of dealing with the ambiguities of the situation as they go. Ethnography-based methods capture that knowledge from the lived experience of groups and individuals. Incorporating this knowledge and experience into pedagogical tools, the cases developed for the Speaking of Software Project have the potential to instill that experience in others. Students can achieve this simulated experience through their reflection on and imitation of the concrete examples of situations that can arise in any workplace.

The initial goal was to develop case studies for Software Engineering classroom applications. This goal was complicated by the proprietary nature of the processes and products found in the workplace. This remains particularly true in software development, where the need for secrecy often outweighs pedagogical goals, and prevents students and faculty from sharing their workplace experiences. Turning to the students themselves avoided this problem. While this may be considered a convenience sample in some respects, we believe it is a valuable and representative one. The Software Engineering program requires a Senior Design Project capstone course, where students work on real, practical software projects for outside clients and other stakeholders. An added benefit is that our method captures and presents the real experiences of fellow students, which students can then extrapolate to situations they are likely to find in entry-level positions.

Students appreciate these compelling stories about problematic communications that are familiar to them.

Project purpose: Technical Communication

Why teach “making” and LEARN “acting”? (and how)

For students who pursue degrees outside the liberal arts, the technical communication

classroom is perhaps the best hope for acquiring the communication skills they will need

in the workplace. These dedicated writing courses first appeared in engineering schools

as a response to a perceived lack of writing ability on the part of their graduates.

Basically prescriptive, they followed a “forms” approach that taught the correct way to

make memos, letters, and reports. Most educators and practitioners today would probably

consider this approach to making documents a “degenerate” *techné*, even if they might

not use that precise terminology proposed by Wild (1941). A degenerate *techné* would

imply that the person—the technical communicator, in this case—does not understand

why she is making what she is making—merely that she must make it. Making (*techné*)

in its proper application is a “reasoned state of capacity to make” which does include

knowing the “why” of what is done (NE 1140a8). Atwill (1993; 1998; with Lauer 1995)

has called for a production-based approach to teaching writing, seeking to revitalize

techné. One common textbook that exemplifies this approach is Four Worlds of Writing

(1991). In the various writing strategies presented, the importance of audience, context

and purpose are explained in exhaustive detail, providing the student with the theoretical

background (the “why”) of what is suggested. In advocating peer review and the

subsequent revision of documents, the emphasis is on practicing the genre in use. Finally,

copious checklists provide rules and procedures for grammar, spelling, and mechanical

conventions.

In 1979 Carolyn Miller called for a more humanistic approach, one that included considerations of civic responsibility and social action—*phronesis*—as opposed to the more instrumental methods found in the textbooks of the day. Dunne (1993) also sought an approach based more on acting specifically to counter the behaviorist emphasis on making (and quantifiable results) he saw gaining strength in the school system. *Phronesis* as a “reasoned state of capacity to act” has as its goal good action, in public, with others (NE 1140b5). Gained through experience (1142a14), it is a wisdom acquired through habituation (augmented, in a way we will explore, with “training” through imitation). While Aristotle admits that in situations where practical purposes are concerned, experience is “in no way inferior” to *techné* (Meta 981a14), it remains that “men [or women] of mere experience” cannot directly teach their understanding (Meta 981b9) since each situation is unique, and not amenable to reduction to a set of rules or procedures.

The importance of the distinction between making and acting is not limited to the theoretical realm or the academic classroom; it has implications and applications on the job as well. Brady (2007) has discussed the implications of our teaching, showing how what we teach and what students learn is taken to the workplace. Once on the job, the technical communicators she studied used their knowledge to make sense of “existing information” and negotiate more effectively with the stakeholders. Brady’s respondents recognized this negotiation as a social process: being in the workplace moved their knowledge from the mechanistic applications of “making” they had initially used in the classroom to “acting,” or working with others in the “rough and tumble of public spaces”

(p. 59). The noted professor of philosophy Hubert Dreyfus (2006) has accounted for this movement with a series of stages, relying on Heidegger's "Being and Time". The student, or new employee, begins as a novice, moves through competence to expert status, and then on to mastery. Although Dreyfus' non-cognitivist approach to acquiring new skills raises certain difficulties, that discussion is beyond the scope of this discussion.

Thomas Miller (1991) notes the deficiencies of inexperienced workers: although they possess the theory and the know-how, they lack the experience and common sense to put that knowledge into practice. This resembles the difference that Johnson-Eilola (2004) points to between a functional and a conceptual understanding of technology or genre. For example, those entering a technical and professional communication course or a workplace as novices will frequently rely on prepackaged templates to create new (to them) genres such as resumes, memos, or business letters. In Johnson-Eilola's words, these templates are "instructing users in functional but not conceptual aspects of technologies" (p. 179). Novice students with little to no experience in resume design, for example, plug in information as instructed by a word processing application's "wizard," often making resumes that "look" right, but that pay little attention to their ultimate end: to get them hired. Created with only functional skill they prominently feature summer employment at fast-food chains in chronological work histories and leave out internships, course projects, and other valuable material that actually demonstrates that they are qualified for the job at hand. After receiving instruction about the conceptual—which in this context means rhetorical—aspects of resume design, they may begin to acquire competence, using their full "reasoned capacity to make" to tailor the design and content

of their resume to particular employers. They will only master the resume when they have used it in real situations—at career fairs and during job interviews, for example. Once the (now not-so-new) student or employee has entered this stage, her response can encompass the total context, both task-related and social, becoming not just making a resume, but acting with it. She will have moved toward acquiring the practical wisdom that is necessary to engage with others about her resume (or any other task in the classroom or the workplace), modify it on the fly, and even know when to break completely with best practices.

Dreyfus proposes an additional stage, where the individual who has mastered a skill couples that mastery with creativity to transform the world. While Dreyfus' examples—Galileo, Martin Luther King, Jr., Larry Bird, and Henry Ford—are, by his own admission dramatic. Brady (2007), in her own ethnographic study of women writers in the workplace, provides examples that are more mundane. For instance, “Frances” mentions involving the client in the process of creating documents, seeing them more as partners than as just recipients of the final product. “Billie” concurs: “You can’t say ‘this is just the way it’s going to be’” to the client (p. 57). Compared with the past, when the mantra of the engineer was “we can make whatever they throw over the wall,” a transformation is underway. User testing was perhaps the beginning. Working *with* others, rather than just *for* them, is becoming the valued action of the workplace. Technical communication practitioners like Frances and Billie have changed the world of documentation, developing and implementing new best practices that include, rather than ignore, the client and the user.

The workplace does not always welcome this kind of change, especially from new employees. From my experience in management, I can attest that often the status quo is in fact the best course of action. It is not always necessary to reinvent the wheel when the old wheel works just fine. While it would be counterproductive to continuously stifle the very knowledge and creativity sought from the new hire, mundane jobs sometimes call for mundane solutions. Understanding and explaining tasks in terms of making and acting provides a resolution to this dilemma. Some tasks require one, some the other, and some both. It is experience that determines which is called for in any given situation.

Why use case studies to educate?

In the classroom, unfortunately, there is neither time nor availability for “real world” making that can accommodate all students and prepare them for the world of work.

Projects where the students work for a client are a start, but often are less than adequate as simulations of real experience: they are often seen as “superficial” by the students and confounded by misdirection on the part of the “clients” (Freedman, Adam and Smart 1994; Blakeslee 1997, 2001). In internships or co-ops, students may find that three or four years of work in their major did not adequately prepare them for real-world tasks. They may become frustrated and disillusioned. The aim of a case study approach is to expose the students to the workplace situations, ethical dilemmas and political realities they may face by simulating that “real world” experience.

Aristotle's *Poetics* suggests that well-crafted literature can be "an imitation...of action and life" (1450a17-18). Good case studies that capture the essence of a situation do the same. Martha Nussbaum, in *Fragility of Goodness* (2001), has explicated this overlooked aspect of the *Poetics*, noting that Aristotle suggests that "imitation is natural" and that it is through imitation that we learn (1448b; p. 5-9). When students reflect on and discuss the case, they bring their knowledge to discursive consciousness, reinforcing their learning. They will have begun to acquire the craft, the *techné* of what they make. That knowledge will become, as Brady found, a guide that will allow them to better cope with the various social contexts and practices of the workplace.

Why our case studies?

As noted above, Freedman, Adam and Smart (1994) report that students sometimes see case study simulations as "artificial". Thomas (1995) suggests that some of that feeling may come from unrealistic expectations placed on the students by having them adopt the role of a bank president, for example. Instructors are asking them to play roles too far from their existing or imminent experience.

In contrast, the cases in this dissertation present the experiences of students as they complete their Senior Design Projects, imitating the kind of "entry level" positions they will find when they enter the workforce. This approach has the dual benefit of holding their interest while in school and later of easing their transition into the workplace. We have enlivened our case studies even more by responding to user reports of what works, and what does not. We have had some success: one reader of a case, for instance, said he

“couldn’t put it down; it read like a novel.” Comments like these confirm that case studies can be improved by including some literary techniques, such as those suggested in the *Poetics*.

Exploring the benefits of client-based projects, Spinuzzi and Blakeslee have both written on workplace collaborations. For Spinuzzi (1996) any workplace will do; the importance is to bring those experiences back to the classroom, share them with others, and reflect on them. Blakeslee (2001) finds that the kind of feedback the students receive on their performance is critical yet varies widely depending on the client or supervisor. Our cases simulate the ambiguity and goal-driven nature of the workplace. Their use in the classroom asks the students to make their analysis and interpretation of the situations presented explicit, fostering learning about how they might act were they actually in that situation. In the next chapter I explain the concept of *techné*, and how it has been used in technical communication pedagogy.

Chapter Two: Pedagogy

Teaching *Techné*(ically)

In the *Nicomachean Ethics*, Aristotle writes that making (*techné*) is not doing, nor is doing making (1140a7). The purpose of this chapter is to review some of the conceptions of *techné* that have been suggested over the years, and explore how they might be deployed in the classroom. Some have argued for a Technical Communications pedagogy based on doing (C. Miller, T. Miller, D. Sullivan, and A. Blakeslee, to name a few); others have recommended one based on making, or, more usually, a combination of the two (Atwill, Lauer, Johnson; and again, the list is far from complete). Given our postmodern sensibilities, rarely do we find advocates of teaching from a purely theoretic approach. I will argue that *poiesis* is the missing term (or, in the enthememic sense the tacit, understood term) that will allow me to answer the larger question “Can we teach *techné* (ically)?” with a provisional yes.

Historical Overview

Plato, Isocrates, and Aristotle each founded a school in ancient Greece, and each promulgated a slightly different understanding of *techné*. Early philosophers tended to include experience in *techné*, while later writers tended to disregard the value of practical experience in favor of more explicit teaching. For Plato, *techné* was a “point of departure” for his more philosophic goals (Wild 1941, 255); for Isocrates *techné* was a discursive route to the production of character (Atwill 1998, 34); and for Aristotle it was more pragmatic, concerned with practical application: “rather than arguing that students

of rhetoric must study philosophy and prepare to guide audiences to the true and the good as their primary mission, [Aristotle] believes that the study and practice of rhetoric itself is sufficient for meeting civic needs” (Gordon 2002, 153).

Plato—The Making of Techné

While most modern considerations of *techné* focus on Aristotle’s work, in 1941 John Wild produced “Plato’s Theory of *Techné*: A Phenomenological Interpretation”. In a move close to any technites heart, Wild notes that the Platonic usage of *techné* includes inseparably both “art” and “craft” of modern usage, where art pertains to the production of beautiful things, and craft reserved for the production of useful things. Thus the ancient definition is one that applies to the bricklayer as it does the musician (255). Wild begins his definition of *techné* as “any act that can give a rational account of itself, explaining *why* it does what it is doing”, which Wild credits to Gorgias (256). This ‘ability to explain itself’ is a critical element in both the processes of teaching and learning, an often missing element in the arguments of those who favor a more experiential approach.

Wild forms his interpretation based on a careful analysis of a wide range of Plato’s work; here I have retained the titles (but not the line numbers) to honor Wild’s scholarship, and make evident (with Wild) that Plato’s discussion of *techné* must be teased out from a variety of texts, as opposed to those discussions found relatively intact as in Aristotle. According to Wild, Plato’s concept of *techné* requires the knowledge of a “standard or form” (Statesman), and how to achieve the desired end through action (Phadreus),

physical matter to be acted upon (Cratylus) (257), and the work (*ergon*), the “completed action, the material arranged in its proper form” (258). But this “work” is not necessarily limited to a physical product; such as the ever-popular rudder often put forth as one example of *techné*. There is also a further end, the “for the sake of something” (Gorgias) (259); the end outside the work or product itself, or *telos*. The corresponding example of *telos* is steering the ship with the *ergon*, the aforementioned rudder. The activity that goes on during this ‘bringing things into existence’ is, without Wild explicitly acknowledging it, *poiesis*.

Wild contends in “perfected” *techné*, all five factors are known in advance, there is also a flow, a sequence to them: the ‘for the sake of’ leads, followed by the *ergon*, then the form, then the procedure, and finally the material. When we have only procedure and material, we have “mere technique” (259) or, as it is called in this work, an “impoverished *techné*”. This less than perfect condition has often been applied to the work that happens on an assembly line, while perfect *techné* is reserved for craftsmen and artisans.

More important to an eventual discussion of teaching is Wild’s observation that the *practice* of *techné* inverts the order and moves from the material (‘what needs fixing’ in his example) to the “for the sake of”. *Practice* here can be read two ways. In Wild’s example it refers first to the practice of a craft, as we say ‘practicing medicine’. The doctor is not presented with the ‘for the sake of’, which is health, but with the injury to be fixed. This still remains *techné*, provided that the practitioner is guided by knowledge in

the proper order (260). The way to that guiding knowledge (the second interpretation of *practice*) is through exposure and repetition—the ‘getting your hands dirty’ part—which Wild refers to as “practice or direct experience” (*empeiria*) (261). Wild claims that if the person learns mainly the form or structure (*eidos*) he will follow the path of the theorist. Conversely, if he learns primarily technique he becomes a technician, while the true master attains both (260).

According to Wild, Plato divides science (*episteme*—reliable insight which is not subject to change) into two classes: the knowing arts (insight alone for its own sake) and the directing arts (arts and crafts which involve technical action, but also possess scientific insight). This is the theory/practice binary often debated in rhetoric and technical communication circles (cf. Atwill; Atwill and Lauer; C. Miller). He further divides the practice side of the binary into one part that brings into our possession that which already existed (269), and one part that brings something into existence, a division he presented in the *Sophist*.

While it is the division involved with “bringing things into existence” that usually receives the most attention, Wild also provides informative comments on education. While the producing arts may degrade into mere technique, education may degrade into control (the ‘useful or practical’ argument that Callicles offers in *Gorgias*), “indoctrinating the student with customs, theories, and habits” (277). Prior to this degradation exists the potential for a more effective manner of teaching “regulative”. While “lengthy and arduous”, this method “helps the child to help himself” by “enabling

him [sic] to distrust his own opinions, and discover the [reason for things] himself” (276). As Sullivan, Rutter, and others have advised, we must be cautious to avoid this degradation, and aware of what ideologies we might be unconsciously indoctrinating into our students.

Protagoras and Isocrates—the Doing of Techné

Linking Plato to Isocrates via the dialogue *Protagoras*, Atwill (1998) uses the words of Socrates’ foil to explain logōn *techné* tradition as: “The proper care of his personal affairs, so that he may best manage his own household, and also of the state’s affairs so as to become a real power in the city, both as a speaker and a man of action [318e-19]” (150). In contrast to Plato’s concern with eternal truth and individual achievement of the contemplative life, Protagoras’s logon *techné* is “inextricably tied” to civic involvement. “It is an art in which all citizens must have a share”, one which sees virtue not as something solely within the individual but as something coextensive with social life; and has more to do with the construction of an ethos than with precepts and prescription (154). While usually all forms of civic action are more commonly reserved for *phronesis* than *techné*, that Protagoras (and as we will see later Isocrates) would include it in *techné* supports Wild’s contention that the term, for the ancients, carried a richness of meaning not clearly understood today.

Atwill claims that “unlike Plato, Protagoras insists that virtue can be taught” (19) but Isocrates, more in line with Plato, does not (20). Both reject Plato’s notion of a “single model of virtue” for a more contingent one that allows for an interpretation of ‘virtue’

that is not static and eternal. For Isocrates, the character he promises to teach is measured “by the esteem one earns from one’s peers” (28).

This emphasis on a sense of virtue based on situational conditions in the social sphere is reflected in Sipiora’s (1995) claim that the Isocratean *paideia* was based on *doxa*, ethics, *phronesis*, and *imatio* (12) since “*doxa*, not Platonic *episteme*, produces the kind of conviction that moves the person to action” (18). For all Atwill’s desire to place Isocrates’ “*logōn techné* tradition” within *techné* proper, Isocrates’ emphasis on *doxa* (opinion or ideologies) of the *audience* as opposed to the craft itself, and his claim to make his students good citizen/orators (18) seems to place him more in a mode of *phronesis* than *techné*. However, as Sipiora argues, while Isocratean teaching is focused on discovering the “pragmatic and expedient”, it does not rule out the power of the art of rhetoric as an adjunct to *phronesis* (17). Although a modern understanding might make it hard to agree with Atwill’s placement of Isocrates’ pedagogy as *techné*-inspired, it is certainly one approach to an integration of *techné* and *phronesis*.

Aristotle—The Ends of Action

That Atwill (1993) could be unaware of this difficulty seems unlikely; more probable is that she is trying to find a ‘bridge’ that could resolve the ‘theory-practice’ binary she explored in “Instituting the Art of Rhetoric: Theory, Practice, and Productive Knowledge in Interpretations of Aristotle’s *Rhetoric*”.

Reminding us that Aristotle sets out three “orders of knowledge”—the theoretical (involving philosophy, math, and natural sciences, the practical (ethics and politics) and the productive (which “subsumes all *technai*, or arts, from medicine and architecture to poetics and rhetoric” (93)). Although she claims that, per Aristotle, they shared “three critical characteristics: their epistemological and axiological indeterminacy, their implication in an ‘interested’ act of social exchange, and their contingency on time and circumstance” (93), it is unclear what she offers to support this claim. While from my reading of Aristotle those traits could certainly be ascribed to *phronesis*, and in some ways to *techné*, I do not recall seeing *theoria* linked to “indeterminacy” and “contingency” in any substantive way.

Leaving theory aside for the moment, Atwill’s claim that “The relationship Aristotle creates between *praxis* as action and practical knowledge [*phronesis*] ... is not an easy one to decipher....The *telos* of practical knowledge is clearly *eudaimonia*,...but is it an action (*praxis*) or is it a state (*hexis*)?” (98) needs some attention. One way to decipher the relationship was provided by Michael Bowler (2006): In ancient times, *praxis* referred to an activity whose *telos* is the activity itself (personal communication). We can take a walk; not for the exercise or health, but just for the activity. Taking a walk may help us be healthy, but that may be neither our intention nor our end. Not every *praxis* must be reduced to a means-end outcome (though many can be, and are). Nor must every *praxis* be directed toward good, some obviously are not.

This difference between the state (*hexis*) and the action (*praxis*) is an important one, and perhaps that difference is more clearly made in the original Greek:

ἐπεὶ δ' ἡ οἰκοδομικὴ τέχνη τίς ἐστι καὶ ὅπερ ἕξις τις μετὰ λόγου ποιητική, καὶ οὐδεμία οὔτε τέχνη ἐστὶν ἣτις οὐ μετὰ λόγου ποιητικὴ ἕξις ἐστίν, οὔτε τοιαύτη ἢ οὐ τέχνη, ταυτόν ἂν εἴη τέχνη καὶ ἕξις μετὰ λόγου ἀληθοῦς ποιητική. (NE 1140a7-9)

(“Now since architecture is an art and is essentially a reasoned state of the capacity to make, and there is neither any art that is not such a state nor any state that is not an art, art is identical with a state of a capacity to make, involving a true course of reasoning”.

(Ross translation)

Here Aristotle is direct. Architecture (οἰκοδομικὴ) is an art (τέχνη), which is a reasoned state (μετὰ λόγου ἕξις); the action (ποιητική, making) is only one possible action that can be “aligned” (to use Dunne’s term) with a “reasoned state”. Similarly, in Aristotle’s delineation between acting and making:

ὥστε καὶ ἡ μετὰ λόγου ἕξις πρακτικὴ ἕτερόν ἐστι τῆς μετὰ λόγου ποιητικῆς ἕξεως

the μετὰ λόγου ἕξις [reasoned state] of πρακτικὴ [acting or practice] is different from the μετὰ λόγου ἕξις [reasoned state] of ποιητικῆς *poiesis* or making]. (NE 1140a4-6)

More worrisome than their opinion on the teachability of *phronesis*, however, is Atwill and Lauer's (1995) take on Aristotle's definition of *techné*. In "Refiguring Rhetoric as an Art: Aristotle's Concept of *Techné*", they interpret Aristotle's *techné* to be: "Only productive knowledge has no ends in itself: its origin, or first principle (*arche*) is in the artist and its *telos* is in the user (NE 1140a5-15). The end of an art is *not* a product, but the use made of the artistic construct" (29). To bolster this interpretation they rely on the *Rhetoric*, where Aristotle reports that it is the hearer that "determines the speech's end and object" (1358b). While this is consistent with many other places where Aristotle expresses similar sentiments (on rudders and housebuilding, for example), this view leaves out the importance of *poiesis*. In the Ross translation of their quote I find no reference to the *telos* of *techné* whatsoever. In 1140b Aristotle states that "for while making has an end other than itself", that does not imply that there is *only* an end other than itself, just that there *is* an end other than itself in the activity of *techné* (*poiesis*), which for the activity of *phronesis* (*praxis*) there is not. For *phronesis*, to resurrect an old adage, doing good in public is its own reward.

If we look back to Plato's *Republic* we can find a similar sentiment: "Excellence or beauty of every structure, animate or inanimate, and of every action of man, is relative to the use for which nature or the artist has intended it" (X, 601). But Plato, through Socrates, outlines a much more symbiotic relation between maker and user, where the user indicates the good and bad of the thing made to the maker, telling the maker how the thing should be made, and the maker will "attend to his instructions", noting that the maker has only a correct belief, which is gained from talking to, and listening to, the

user” (X, 602). This striving for the good, in concert with others, suggests a certain phronetic component to *techné*.

Also often cited in support of her contention (as Atwill does in *Reclaimed*) is this passage from the *Politics*:

‘There are some arts whose products are not judged solely, or best, by the artist themselves, namely those arts whose products are recognized even by those who do not possess the art; for example, the knowledge of the house is not limited to the builder only; the user...the master of the house will be even a better judge than the builder...’ (Pol. 1282a18-24)

Yet even here there is no indication that Aristotle intends that the user is the only judge of the product; just a ‘better’ judge within the confines of his use of it. His point seems to be that the maker is not the sole judge either: once the product escapes the maker there are others who will judge it, and it would be the wise maker who takes this into account.

In the *Physics*, just before describing the “four causes”, Aristotle supports this more complex interpretation when he tells us that:

“The arts that govern the matter and have knowledge are two, namely the art which uses the product and the art that directs the production of it. That is why the using art is also in a sense directive; but it differs in that it knows the form, whereas the art...concerned with production knows the matter. For the helmsman knows and prescribes what form the helm should have, and the other from what wood it should be made and by means of what operations” (194b1-7).

There are, then, two dispositions of *techné* that are often conflated. One is the *techné* of production, and one the *techné* of use. Both involve an activity (*poiesis*). The difference is that “while all things are ‘for the sake of’ the end, though they differ from one another in that some are activities, others are instruments” (195a). To bring this to a modern example, if the end is health through reduced cholesterol, exercise is an activity that can bring that end about. The cholesterol-reducing drug Crestor is an instrument that can also bring about that end.

Dunne (1993) falls prey to a conflation of his own, but in the area of *phronesis*. In *Back to the Rough Ground* he begins well by defining that Aristotelian *praxis* is “conduct in a public space with others...without ulterior purpose and with a view to no object detachable from himself...” but finishes his sentence with “[a person] acts in such a way as to realize excellences that he has come to appreciate in his community as constitutive of a worthwhile way of life” (10). With this interpretation he implicitly links *praxis* to *phronesis* (as do so many) and elides the possibility that *praxis* can stand alone. The difficulty inherent in this view is that by restricting virtuous action *only* as an action of *phronesis*, there is left no space for virtuous action in the action of *techné*, *poiesis*.

Impoverished Techné

In “Refiguring Rhetoric”, Atwill and co-author Janice Lauer (1995) examine the manner in which *techné* has been “suppressed” by a theory/practice binary (25). They position the two poles of this binary as the theoretical (rhetoric as end in itself; an “inquiry into the nature of communication”) and the practical. Practical rhetoric, seen as a “means to an

end” has two variants: the handbook tradition (26); and the “statesman/orator tradition (drawn from Kennedy’s work in his *Classical Rhetoric and its Christian & Secular Tradition*) which includes both epistemological and practical considerations (27). While applauding their intention of rescuing *techné* from suppression in the binary, I find two things troubling. The first is their somewhat cavalier use of the term “practical”. At times it connotes something pragmatic, even *techné* related, as in “practical rhetorics contend...that rhetoric is valuable for its application in practical situations” (26). At other times their usage is more in keeping with Aristotle’s practical knowledge (*phronesis*), as when they discuss the actions usually falling within the statesman/orator tradition, where “rhetoric is instrumental to the welfare of the individual and the state, a condition described by Aristotle’s interpretation of *eudemonia*” (27).

Hannah Arendt (1958), in *The Human Condition*, provides an interesting take on *techné* and *phronesis* in her tripartite division of the *vita* active into labor, work, and action. She positions labor as those biological necessities of life; work as production; and action as “the only activity that goes on between men without the intermediary of things or matter” (7).

For her, in ancient Greece “to ‘labor’ meant to be enslaved by necessity”, and was inherent in the human condition. It was acquiring food and shelter, and other ‘necessities’ required to sustain life (84). ‘Work’ for Arendt, “fabricates the unending variety of things whose sum total constitutes the human artifice. They are mostly, but not exclusively,

objects of use and they possess durability” (136). As an object of use that is durable, the thing produced, the product itself would be *ergon*. As for Plato and Aristotle, part of what guides fabrication is outside the fabricator (140)—a model (*eidos*) in the sense of the formal cause of what is made (142).

Putting a Heideggerian read on Wild’s consideration of there being two ends in *techné*, Arendt writes that “During the work process, everything is judged in terms of suitability and usefulness for the desired end, and nothing else. The same standards of means and ends apply to the product [*ergon*] itself. Though it is an end with respect to the means by which it was produced, and is the end of the fabrication process, it never becomes, so to speak, an end in itself, at least not as long as it remains an object for use” (153). She refers to this as a chain, where “every end can serve again as a means in some other context” (154). As in Heidegger, one end is in ‘use’ (ready-to-hand), and another, perhaps ‘impoverished’ state, is ‘just there’ (present-at-hand). Importantly, we shouldn’t think of the ‘end’ as static, reduced to either an end-in-itself or an end-outside-itself; “end” can be both depending on context: in-itself for fabricator, from the point of view of the fabricator outside-itself for user, internal again (for the user) in that use.

Action, for Arendt, discloses the agent, just as making discloses the product and labor the need. Men appear as men [as opposed to objects] through speech and action (176). Yet she sees it as the retrospective revealing of “the historian, who indeed always knows better what it was all about than the participants” (192). In Arendt we find another devaluation of the maker: the maker is not the best judge of the thing made. We saw a

similar move in Atwill, and Atwill and Lauer. For them it was the user of the product.

Arendt takes it one step further. For her, neither the maker nor the user is the best judge, she reserves that honor for the historian.

If it is the historian who reveals (and inscribes) action for Arendt, then for de Certeau (1984) it is the engineer who is proximally responsible. Tracing the loss of personal action on the part of the artisan to before the industrial revolution, in *The Practice of Everyday Life* he notes that Fontenelle in 1699 described a “linguistic inversion” wherein the “improper” language of the practitioners is introduced by ethnographers “into the field of scientific written language” (67). In the middle 1700s this “third man” who “mediates between the ‘man of the theorem’ and the ‘man of experience’ would be the engineer” (69). Detaching ‘know-how’ from human performance, the engineer installed it into machines; he replaced manual competence with “regulatable combinations of forms, materials, and forces” (69). What remains to the practitioner has “no legitimacy with respect to productive rationality” (69). This lore is transmuted into stories, narratives that guide everyday practices (70). But for de Certeau, “this *knowledge* is not *known*” (71, italics in original) to the subject. If it is not known nor reflected upon it cannot “explain itself” under the terms Wild proposes; then it is not perfected *techné*, but some impoverished form of it.

Teaching Techné(ically)—Application

So how can we teach *techné* (ically)? Dubinsky (2002), in “More than a Knack: *Techné* & Teaching Technical Communication” calls for training teachers to be technites, as this

will make them reflective practitioners who “understand the critical need for situational uses of knowledge” (120). He allows that while some argue that more experience (repetition) will “lead to effective teaching” (130), Dubinsky disagrees: they become ‘men of experience’, but not reflective, a skill they will need to “enable them to make both practical and ethical judgments” (130). He claims that while many scholars want more classical rhetoric, they eschew *techné* because of its prescriptive (handbook) nature; they see it as ‘impoverished *techné*’, which echoes Wild’s argument on the ‘inversion’ of *techné*. “The issue”, claims Dubinsky, “is between knack and art” (132).

While he calls on Dunne’s argument that the “knowledge about an activity, which is explained by the *technites*, requires someone observing the actual making (the *poiesis*), paying close attention to the way the technites works (322)”, he seems less than generous to the poor technite who “only” works with wood; diminishing his *techné* in favor of that of the physician (135).

Although he wishes to “revitalize *techné*, tempered with *phronesis*”, the remainder of his comments belie his emphasis on *techné*. His agreement with C. Miller (1989) that technical communication pedagogy should be a ‘matter of conduct rather than production...a matter of arguing in a prudent way toward the good of the community rather than of constructing texts’ (23) seems to place him firmly with those who wish to take a phronetic approach. That said, his suggestion that we “take what Aristotle called a ‘reasoned state of capacity to make’ and show it is both a knowledge and a ‘capacity for action’ that can benefit students and society” (143) is promising.

Like Atwill, Lauer, and Dubinsky, Carl Mitcham (1994), in *Thinking through Technology*, seeks to revitalize *techné* (with a hard tie to scientific knowledge) through a philosophical *episteme*. Mitcham reviews in great detail the history of technology as seen through the writings of many of the outstanding theorists of the twentieth century. Possibly due to his extensive philosophical background, he seems at times to go too far in the direction of theory; almost losing the experiential as he tries to stand back from the “demands of practice” (7) in his attempt to “create more space, more open ground” for ethical reflection.

We can view Mitcham’s definition of technology (the making and using of artifacts) as an analogue of *techné*. But he, like others, can be very unflattering to those of us who claim *techné*: “it is a largely unthinking activity. It emerges from unattended-to ideas and motives, while it engages with unreflected-upon objects” (1), which is closer to an impoverished than a true *techné*. Although he is trying to inform us on the humanities’ philosophy of technology, he stays, for the most part, closely within the instrumental and epistemological. In his discussion of “technology as activity”, the activity is not the action of *phronesis*, but *techné*: “the craftsman gives natural materials forms which would not naturally arise in them” (211). Even when discussing the politics of technology—while admitting the politics is Aristotle’s master art and therefore decidedly phronetic—Mitcham can’t avoid the rational, rule-governed and logical.

We can ask: Does experience ever come to inform Mitcham's thought? There are a few places where Mitcham acknowledges experience. One is in his discussion of *techné*, where he translates "*phronesis*" into the later, Latin, *prudentia*, and claims that "the definition exactly parallels the one given earlier for *techné*" (124). The citation he provides is Aristotle's statement about both having a "reasoned capacity to...", from there they diverge wildly. Obviously this is a grammatical parallel only, the *content* of the two phrases set up a well-established polarity. Mitcham then reduces political concerns to "nomos", or law, and equates judges to the equivalent of artisans. Mitcham also considers experience in his epilogue, in the Heideggerian sense of "being-with", which is "disclosed through technical engagements and is therefore primarily social...[this] world is composed not solely of tools and artifacts, but of tools used with others and belonging to others" (276).

Dunne seems to be on the same page as Mitcham with his view that the modern world attempts to see rationality as coextensive with technique (227). Instead of just exploring why that is so, he tries to correct the situation by showing that theory and experience, far from being separate domains (like he sees *techné* and *phronesis*) can be found within *techné* (229). He shows how in the *Metaphysics* Aristotle himself suggested a connection, and how theory, "for all its primacy, does not displace *phronesis* as the ordering agent in our lives" (241).

But we need to be careful with Dunne and his use of that word "the", which suggests a single ordering agent. Remember, his goal is to argue against "behavioral objectives"

schooling. For all his quotes of Aristotle that link *techné* with experience, such as: “*Techné* arises when, from many notions gained by experience, one universal judgment arises” (Meta1.1.981a; 5-12), there always seems to be the link to theory and the invariable; here, a “universal judgment”. However, he is correct when he says of the *Metaphysics* that “what seems to be missing is some conception of how *techné qua techné* can be complimented by experience” (282), and that Aristotle lets experience slip by in favor of the explanatory power of *techné*, and of theory in general. The same might be said of Dunne, as he tries to explain Aristotle’s theorizing. Again, this is in line with the difficulties McCarthy and Wright see in the design of technology: too much emphasis on the instrumental—on the efficiency of design—and not enough attention paid to the human interaction.

In the epilogue, Dunne lets it all slip in favor of *Phronesis*, forgetting even his own carefully crafted definitions. How else can we explain the statement “ [from his argument] an important role should be given to practicing teachers who are not only *phronomoi* but are also well equipped to teach apprentice-teachers to become *phronomoi*” (370). *Phronesis* as teachable? Not according to Aristotle. He follows with more examples drawn from *techné*, even calling on a context-bound *logos* of good practice he outlined earlier. It seems like, in closing, he became aware again of his purpose, to argue against instrumentalism of the “behavioral objectives” model that he neglected his own work. He seems to have discounted the importance of *techné* and theory to make his case.

So how can we avoid problems like too instrumental an approach that conveys only theory from some handbook or the unbounded relativism (and ultimate unteachability) of a phronetic approach, or some combination that collapses one into the other? Elsewhere I have explored the possibility of a *techné* of *phronesis*, that is, a reasoned capacity to make, with that making informed by a reasoned capacity to act. In other words, we must strive to educate technites in a way that completes Aristotle's somewhat contradictory descriptions that first say:

“If, then, a man has the theory without the experience...he will often fail”
(Meta.A1: 981; 20-24)

Yet a few lines later says that:

“We think that *knowledge* and *understanding* belong to art rather than to experience, and we suppose the artist to be wiser than men of experience ... because the former know the cause, and the latter do not... thus we view them as being wiser not in the virtue of being able to act, but of having the theory for themselves and knowing the causes. And in general it is a sign of the man who knows and of the man who does not know, that the former can teach, and therefore we think art more truly knowledge than experience is; for artists can teach, and men of mere experience cannot.” (Meta.A1: 981a25-981b10)

Poiesis—The Action of Techné

Poiesis, for Aristotle, is production, making: it is the action of *techné*. In his example, architecture (οἰκοδομική) is an art (τέχνη), which is a reasoned state (μετὰ λόγου ἔξις);

poiesis (ποιητική, making) is only one possible action that can be associated with that “reasoned state” (NE 1140a7-9). Further, as Heidegger (1953) explores Aristotle’s four causes, we can see the resonance with *poiesis*. The four causes are the material (matter); the formal (idea); the final (the end); and the efficient (what ‘brings about’, the action of the producer). And when these four causes “play in unison” (10) production as *poiesis* is revealed for what it is; a coming together of different factors that shows us something we had not seen before. For Wild, “perfected” *techné* accomplishes *poiesis*. There is also a flow, a sequence to the causes: when we have only procedure and material, we have “mere technique” (259) or, as some have called it, an ‘impoverished *techné*’. This less than perfect condition has often been applied to the work that happens on an assembly line, while perfect *techné* and its action *poiesis* are reserved for craftsmen and artisans.

Atwill (1993) then shifts her focus to *techné* and the bifurcations commonly ascribed to Aristotle: “If practical knowledge is identified in some way with ‘acting’, then productive knowledge is concerned with ‘making’. It is a *poiesis* distinguished by instrumentality as well as epistemological and ethical indeterminacy” (99). If the “it” in the second sentence refers to “productive knowledge”, there is a problem similar to the one that plagues the *praxis-phronesis* relationship. *Techné* is not *poiesis*; it is, as Dunne interprets Book VI of the Nicomachean Ethics, “aligned” with it: “Aristotle there aligns *techné* with a kind of activity he calls ‘making’ or ‘production’ (poiēsis)” (9). Notable in his interpretation is that he sees *poiesis* as a kind of activity (*praxis*). This supports the contention that *poiesis* is in fact a *praxis*, albeit perhaps different from the *praxis* associated with *phronesis*. By

removing the idea that *praxis* is only linked to *phronesis*, it becomes possible to speak of a *praxis* of *techné*, which is *poiesis*.

Teaching Poietically

I believe it is in *poiesis*, the activity of making, that theory and practice come together. I have developed, and used, a tentative pedagogy for teaching technical communications that focuses on *poiesis*, rather than *theoria*, *phronesis*, or some static interpretation of *techné*. Incorporation of Martin Heidegger's read of *poiesis* as laid out in *The Question Concerning Technology* allows for the inclusion of the action and ethical implications that are involved with any act of production in a way that other methods do not.

Heidegger gives us the "ancient" definition of a thing (in his example technology, which I will reinterpret as 'production') as "*what the thing is*" (4). When dealing with the question of what production is, he relates that the common two answers given are 1) a means to an end, and 2) a human activity, two of the very attributes that, in the case of the former 'impoverish', and in the latter unduly complicate our pedagogical goals. Heidegger calls this the "instrumental and anthropological definition" (5). If we further explore this definition in light of the four causes that Heidegger explains through Aristotle, we can see the importance of *poiesis*, where means and activity are combined. The four causes are the material (matter); the formal (idea); the final (the end, but not specified as *ergon* or *telos*); and the efficient (what 'brings about', the action of the producer).

When these four causes “play in unison” (10) production is revealed for what it is; a coming together of different factors that shows us something we had not seen before. Another useful interpretation of this playing in unison (one that could easily be brought into a classroom) is to picture it as that poetic “aha” moment of creativity or inspiration that most everyone has experienced at one time or another. To qualify as this, the production must be within the four causes, the third of which (the end) can be interpreted as use in a context.

Heidegger claims we sometimes forestall immediate use in favor of storage (14). Storage is not an end use, but directed toward another use (15). Setting something aside for the future accomplishing of something else, unlike the poetic revealing described above, is a never-ending process, much like Arendt’s chain. Heidegger’s term for this is standing-reserve. A difficulty arises when thinking of standing-reserve: things are standing-reserve for whom? Unlike Atwill, Lauer and Dubinsky who seem to marginalize the technite, Heidegger seems to marginalize the *user* of technology in favor of the production process. Heidegger’s example of the airplane on the tarmac as standing-reserve tends to break down when we ask the question: standing-reserve for whom? To the future flier, it is standing reserve without a doubt. But that is where Heidegger stops. We can imagine several other situations, or users, to whom that self-same airplane, at that same time, is not standing-reserve. To the bank that carries the loan on it, it is collateral. And to the rabbit huddled underneath it, the effect of the combination of the four causes results in an immediate effect: shade. Neither of the last two, I would argue, is standing-reserve, they both have a specific and useful end at the moment of examination.

Application and Discussion

The use of standing reserve can be used in an enlightening way in a technical communication classroom. Although a difficult read for undergraduates unfamiliar with Heidegger (and philosophy in general), I have successfully used *The Question Concerning Technology* in classrooms for years. Providing a handout of the section relevant to standing reserve (14-18) keeps the reading accessible, and Heidegger's examples (windmills, hydroelectric plants, airplanes, etc.) are compelling. Often the students take to material on their own, and class discussion can clarify the finer points.

When applied to the production of a resume and a cover letter, both can be seen as prime examples of standing reserve, especially in the context of the assignment. The students are producing something now to be used later. The skills they acquire and the documents themselves can both be seen as being stored for future use. Making these functions explicit to the students as standing-reserve has, I believe, not only allowed them to see documentation in a new light, but removed some of the resistance they express to producing work that they see no immediate use for. The students respond to this well, and in general agree with Heidegger. Storage—standing reserve—is not in and of itself a problem, as long as there will be some future use. Damming a river, building a hydroelectric plant, eventually provides electricity. Saving money for future use is a good idea. But a one student put it, the miser dying on his sacks of gold has no purpose. And

for the students, having to learn things they see no future use for is equally pointless. And that is Heidegger's argument: separating making from use is the real danger.

I believe these small moves in the classroom will enable a discussion of any document—or technology—in multiple ways as suggested by my interpretation of Heidegger:

1. As something produced now, in a *poiētic* moment
2. As something being used, but later, again in a *poiētic* moment
3. As something produced now but stored to be used later, a stage where it is
standing-reserve

In bringing out this third option, this third way of seeing any production, we can open the door for thinking about what it means “to produce” something *poiēticly* and not. This allows discussion of Aristotle's—via Heidegger—discussion of the four causes; and about the “appropriateness” (ethics) of “that which brings about.” As currently taught, one of the goals of a technical communication course is to “complicate” how the students see documents.

One of the difficulties in teaching Technical Communication at an institution that focuses on training engineers is that many of these budding engineers, from civil, mechanical, electrical, or other fields, are deeply invested in the instrumental perspective. As C. Miller (1979) wrote “scientists, engineers, teachers of technical writing and their students tacitly share the positivist theory about the role of rhetoric in science. Consequently, students look upon writing as a superfluous, bothersome, and usually irrelevant aspect of their technical work” (615). Yet from my experience in teaching writing courses

(composition and technical communication), philosophy, and rhetoric over the past ten years, Heidegger's emphasis on the inclusion of human activity in the production of and ultimately reflection on technology resonates with these future engineers. This reflection on the human aspects of activity, and ultimately societal consequences, can be seen as the progenitor of the acquisition of the Aristotelian concept of *phronesis*, and will be discussed in detail in the following chapter.

Teaching Phronetic(ally)

Whereas *techné* concerns production—the making of some thing or bringing about some state of affairs—and can be taught through rules and procedures as well as practice, *phronesis* cannot be taught in such a direct fashion. *Phronesis* is too kairotic, too situation-dependent to be broken down into a transmissible set of hard and fast rules.

Phronesis

Phronesis has been contrasted quite well with *techné* in previous sections. To refresh, and highlight the differences, *phronesis* is the reasoned capacity to act. Specifically, it is doing good not only *in* public, but *for* the public, as well as for one's own good.

Phronesis relies on *aisthesis* (intellectual perception) (NE1142a/27). Where practical purposes (*prattein*, usually translated as action) are concerned experience (*emperia*) is “in no way inferior” to *techné* (Meta 981a14), it remains that “men of mere experience” cannot teach their understanding (Meta 981b9), because they have no knowledge of the ‘why something works’ in contrast to why something does not, nor do they have universal tenets to pass along. Becoming phronetic, a phronemai, is therefore generally considered to require experience. Teaching phronetically can then be understood as facilitating student learning through experience. However, when providing real-world experience is impractical, educators often attempt to achieve the same goal through simulating experience.

The purpose of this section is to review the concept of experience which, for Aristotle and others, is the central requirement to become a phronemai.

Introduction to Experience

Interest in “experience” has surged in recent years. In the popular press, a recent *AARP Bulletin* features “Heirs of War,” an article by Suzanne Freeman (2005) recounting the efforts of the children of World War II veterans to “uncover their parents’ lost stories” (21). An effort to record the life experience of early aviators before they are gone is underway at the Experimental Aviation Association. The National Geographic Society sponsors a similar program as well, providing guidelines on how to preserve the personal narratives of our elders. For the last two, the effort is predominately an altruistic attempt to record history in the words of those who lived it. What caught my eye about Freeman’s article was the attitude of the people who undertake this search. The children of the veterans wish to come to “understand their parents’ wartime experiences,” to “walk in the places where their parents’ walked” (21). They wanted to simulate their parents’ experience: feel it, not just record it.

John McCarthy and Peter Wright (2005) attempt to explicate the need for experience in software engineering, and fill that need through the use of case studies. In *Technology as Experience*, they argue that those who design, use and evaluate interactive systems need to be able to understand and evaluate people’s felt experience with technology.

Freeman, as well as McCarthy and Wright, all struggle with this separation between real and simulated (or recorded) experience. For Freeman’s interviewees, it is the relationship between knowledge and experience. In her examples, we can see the veterans’ children

recognize their lack of experience, and watch as they try to uncover some of it by simulating the events in their parents' lives. They take their trips to historic battlefields to try to gain the practical wisdom of their forebears. Moving to the more pragmatic issues of designing software, we can watch as McCarthy and Wright bring the debate over the value of experience to one of today's concerns, Human-Computer Interaction (HCI), and the technology it embodies. "We don't just use technology;" they write, "we live with it. Much more deeply than ever before, we are aware that interacting with technology involves us emotionally, intellectually, and sensually" and try to uncover and "provide foundations for a clearer analysis of user experience by developing a way of looking at technology as experience" (x). What became of the value Aristotle placed on experience, that we now have two authors, coming from what seem like two divergent perspectives, both trying to restore experience to our lives?

I offer these two examples because they mirror two ancient concepts described by Aristotle in the *Nicomachean Ethics*. In Book VI he defines five states, or ways of coming to truth: practical wisdom (*phronesis*), art or craft (*techné*), scientific knowledge (*episteme*), philosophic wisdom (*sophia*) and intuitive reason (*nous*) (3; 15). The last two will be of little concern here as *sophia* refers to a contemplative life unconcerned with practical affairs, and *nous* pervades all the other four in equal measure. In other words, *sophia* is too particular, and *nous* too unique to be of practical value. The first two, practical wisdom and art or craft, are the operative elements in both Freeman and McCarthy and Wright. (The quest for scientific knowledge, as interpreted by Bacon, Locke, and others, has disrupted both to some degree.) But practical wisdom (*phronesis*),

and making (*techné*), have frequently been portrayed as incommensurate; two different ways of being that share only *nous* (intuitive reason) in their application. Practical wisdom is seen as inherently experiential; so much so that it cannot be taught, only learned. *Techné*, on the other hand, relies on a body of knowledge that is taught to the apprentice; in some respects making a bowl or a vase is a matter of trial and error guided by the master.

McCarthy and Wright explain the problem as they see it: “While there is a great deal of concern with *user experience* in the in Human-Computer Interaction and related fields...it is often unclear what is meant by this idea” (ix). While the need for user experience might be unclear to McCarthy and Wright, the idea that people need experience in their lives to become effective in the public sphere is hardly new. It has long been apparent that “experience” is a necessary, though often overlooked, element in our relations with others.

According to Edward P. J. Corbett (1995) both Aristotle and Isocrates were aware that practice—observing and imitating exemplary models—aided education (4). Aristotle believed that “a young man is not the proper hearer of lectures on political science; for he is inexperienced in the actions that occur in life” (NE 1095a; 4), and more drastically that “If a man has the theory without the experience...he will often fail” (Meta.A1: 981; 20-24). As Sipiora explains it, Isocrates *techné* chose to focus on the activity (*praxis*) of imitation and on the “pragmatic value in shaping social cohesion and bonding as a way of promoting the continuity of cultural forms” (14).

But what *are* we as educators trying to do when we attempt to “simulate” experience?

The use of narratives (such as case studies) to simulate the experience of others has a long history in education. According to Geza Kardos and C.O. Smith (1979) case studies are “an account of an...activity, event or problem containing some of the background and complexities actually encountered” in real life. Although they claim that in 1979 the use of case studies was new to engineering education, Clyde Herreid (1997) writes that “the formal use of cases entered the academic scene at the turn of the century...at Harvard Law School.”

But what is the nature of that which we seek to simulate; that is, what is it to “experience”? Hans-Georg Gadamer (2004), in *Truth and Method* provides an interesting analysis of the history of the term. Beginning with the German word, Erlebnis, he relates that initially the meaning was “to be there when something happened” which implies that “what is experienced is always what one has experienced oneself” (61). Reading that back against Freeman, it would seem entirely possible for the grown children of those veterans to have the experience walking in the places where their parents’ walked. But the situation on beaches of Normandy is far different today than it was on D-Day. So these descendants have the experience of “being there” but the “something happening” is hardly similar. The permanent content of the experience, which Gadamer refers to as “Das Erlebte”, is obviously one thing for the fathers, another thing for their children. Although both experiences are “directly given”, and both can become the “material for imaginative creation” (62, citing Dilthey), the final form of that creation must be based

more on the material provided by those who were in the situation *at the time* than the imagination of those who were not if it is to maintain any verisimilitude. This information is not objective data in the scientific sense, these “units of experience are themselves units of meaning” (65).

Loss of the Value of Experience

It seems possible that Gadamer is positioning *Erlebnis* here as a thing we acquire rather than as a process we undergo. One only has to look at his choice of words: “*what* one has experienced”, “material”, “units of experience” and “units of meaning”, and particularly his read of “*Das Erlebte*” as the permanent content of the experience. *Das Erlebte* is profound and unforgettable. But it is more likely that Gadamer is showing what he believes to be a devaluation of the concept of experience. By setting *Erlebnis* as what has become the more common everyday understanding of experience, he clears a space to later resurrect a richer, fuller concept of experience, i.e., “*Erfahrung*”.

With Dilthey, Gadamer traces this objectification of experience to the time of the Industrial Revolution, when the impetus was to distance knowledge from its roots in nature and tradition. Martin Heidegger (1966), in a 1955 memorial address for the composer Conradin Kreutzer, presented a similar line of thought; foretelling equally dire results. He proposed that man is in a flight from thinking (45). Beginning with the assertion that man’s nature is to be “a thinking, that is a meditating being” (47), he claims that modern technology—including radio, television, magazines, and even the memorial lecture he is embarking on—are seen as mere entertainment that require no reflective

thinking at all (44). What has replaced reflective, meditative thinking is what Heidegger terms “calculative thinking”. It researches and plans. It organizes the situation we are in with the aim of achieving definite results. While meditative thinking is concerned with the “thingness of things”, calculative thinking is not. Heidegger relates the proclamation of eighteen Nobel laureates that “Science is a road to a happier human life” (50). And Science, presumably, is the ultimate expression of calculative thinking. The attitude that Science will come to the rescue of modern man, that is fulfill his needs for fuel and other basic requirements, Heidegger demonstrates with a quote from the American chemist Stanley: “The hour is near when life will be placed in the hands of the chemist who will be able to synthesize, split and change living substance at will” (52).

Does this attitude still prevail? Is it accurate? I put this question to a chemist: Could a chemist analyze, split, then using chemistry synthesize (that is, re-create) the original substance? Say, for the sake of argument, a single malt Scotch? His answer was an unequivocal yes. But that certainty also came with certain provisos.

The first difficulty was time, in that each analysis requires it. Some kinds of analysis are relatively quick, others may take days. The second and somewhat related proviso was cost. Obviously, someone has to pay for the equipment, the chemicals involved, and for the time of the chemist doing the analysis. Finally, and perhaps the most important reservation (in that it complicates the first two), is knowing what to look for in the substance under analysis. Not only does each compound in the substance require a separate analysis, but the analyst must know which tests to run. That is, he or she must

have some inkling of what is in the substance, and from that decide the proper procedures to employ. That is, the chemist must know what is in the substance before starting the analysis. Chemical analysis is good at identifying the presence of an element within a substance, and the quantity/percentage of that element to the whole. But knowing what to look for in the first place may be more a matter of the experience for the chemist, and perhaps some measure of luck combined with technique. Paraphrasing Aristotle, technique loves chance, and chance loves good technique.

This is not to say that the full analysis could not be done, theoretically. Given unlimited resources—time, money, and qualified personnel, it quite likely could be. But the substance in question would have to be extremely rare to justify the effort.

Fortunately, Scotch whiskey is, excepting perhaps a few well-known brands, not all that rare; nor is it that hard to come by. As Murray (1997) relates in *The Complete Guide to Whiskey*, “[T]he making of whiskey is not a difficult task. The making of a good whiskey, however, is another matter entirely” (8). Would the synthesis of the chemist produce a good whiskey? His response, far from the unequivocal yes at the theoretical possibility, was much less sure. The efficient, economical solution is to rely on the distillers’ art, experience and technique. Will the creation of the “Water of Life” ever be placed in the hands of the chemist to synthesize? Even with the promise of the rationalization, industrialization, and technology of modern life let us hope not. Interpreting Heidegger, the result of that kind of calculation and organization would surely produce something alien to the nature of Scotch, and to our nature as well.

In a similar vein Richard Rorty (1979), in *Philosophy and the Mirror of Nature*, argues that appreciation of experience was lost during the Enlightenment, when reliance on reason and the scientific method was seen as the way to discover the unassailable foundations of knowledge of the world. Rorty argues against even the possibility of these foundations. His notion of knowledge is that it comes to us through dialogue, in the same manner as “acquiring a new virtue or skill by imitating models, a matter of *phronesis* rather than *episteme*” (319).

Rorty’s argument for pragmatism is complex, and well beyond the scope of this inquiry. But his quote above does allow entry into the subject, encompassing as it does the concepts of virtue, skill, imitation, and *episteme*. I will show that the loss of experience has roots older than the enlightenment. The way we know—or try to know—the world that comes down to us from John Locke (and other major authors) incorporates versions of Aristotle’s five forms of knowledge in a manner that established a hierarchy where:

1. “pure knowledge” (*episteme*) was reserved for scientists and academicians (themselves)
2. making (*techné*) was privileged over doing (*phronesis*)
3. and the value of experience fell through the cracks and was lost.

This hierarchy is pervasive, and can be seen in philosophic thought long before the empiricism of Locke, and the “new scientism” that was spawned by the enlightenment. The division between the “ways of knowing” are perhaps most explicit in Aristotle, as stated above, but the pursuit of *episteme* as an elitist pastime is also found in the Platonic

vita contemplativa. Placing doing over making also has an elitist history: making was the province of craftsmen, who provided the necessities of life. With those necessities assured, doing—and deliberating on what was “good to be done”—was reserved for the few who ruled. Placing making over doing was especially appropriate for industrialization, as Arendt has claimed, when the masses became mere “cogs in the machine.” (The epitome of this move can be seen in Taylor’s scientific efficiency, where the knowledge of the craftsman is further reduced to a set of rules or procedures, and doled out from on high at the discretion of the privileged few.)

However, for Aristotle, the hierarchy is not as clear-cut as some would have it. Early in the *Metaphysics* he dwells on the relationship between theory and experience: “If, then, a man has the theory without the experience...he will often fail” (Meta.A1: 981; 20-24). Yet a few lines later he valorizes the need for theory *over* experience, “theory” in this passage referring to the body of knowledge an art or craft relies on:

“But we think that *knowledge* and *understanding* belong to art rather than to experience, and we suppose artist to be wiser than men of experience (which implies in all cases that wisdom depends in all cases rather on knowledge); and this because the former know the cause, and the latter do not. For men of experience know that the thing is so, but do not know the why and the cause. Hence we think also that the master-workers in each craft are wiser than the manual workers, because they know the causes of the things that are done (we think the manual workers are like certain lifeless things which act indeed, but act without knowing what they do, as fire burns—but while the lifeless things perform each of their functions by a natural tendency, the laborers perform them through habit); thus we view them as being wiser not in the virtue of being able to act, but of having the

theory for themselves and knowing the causes. And in general it is a sign of the man who knows and of the man who does not know, that the former can teach, and therefore we think art more truly knowledge than experience is; for artists can teach, and men of mere experience cannot.” (Meta.A1: 981a25-981b10)

This passage foreshadows the split Aristotle imposes between *techné* (craft or art) and *phronesis* (practical wisdom acquired through experience) in the Nicomachean Ethics. In Book IV, chapter 4 he separates *techné* and *phronesis* “the reasoned state of capacity to make is different from the reasoned state of capacity to act, hence too they are not included one in the other, for neither is acting making nor is making acting” (1140a, 1-6).

Relating this loss to the academic sphere Robert J. Conners (1982), in “The Rise of Technical Writing Instruction in America” agrees with this and suggests that courses in technical writing began with the increase in science and engineering training in the latter half of the nineteenth century (1860-1900). These courses, however, under the influence of the industrial revolution avoided an earlier emphasis on the “classics of Greek and Roman philosophy” and turned to the more modern languages and liberal arts (334). Reacting to the perceived “illiteracy” of engineers, engineering schools established English departments in the early 1900s and developed specialized writing courses to meet their needs—the “first recognizable technical writing courses” (326). Yet the rift between engineering and English departments continued and in 1923 Sada Harbarger’s *English for Engineers* (who her editors listed only as S. A. Harbarger to avoid identifying her gender) featured technical forms (letters and reports)—that still remain the basis for many textbooks today (337).

Although the Hammond Reports of 1940 and 1944 called for more “humanistic-stem courses—mostly literature, economics, history and social studies” to “offset the narrow vocationalism of the engineering curriculum”, it was not until the 1950s that this humanistic-stem movement “won out” (340). Notably, in 1954 Mills and Walter began the pragmatic connection with the workplace that continues today when they based their *Technical Writing* on surveys of business and industry, and followed two basic assumptions: use a rhetorical rather than “forms” approach and the pragmatic criterion of “does the technical writing work?” for the reader (342). But through the 1960s there remained a heavy emphasis on “forms”. The more humanistic rhetorically-based texts began to gain prominence in the early 1970s but were still not widely accepted.

But at the same time, for Gadamer there is also the aspect of experience as being lived through. The significance of experience comes from the way it alters us, not from its original content. *Erlebnis* contains, in some measure, the possibility of enriching us and maturing us, as when we undergo any “test or trial” (69). But that enriching and maturing, I would argue, moves us into the realm of process.

Another way to resolve this “problem” of this devaluing of experience is to see it as an artifact of reading Aristotle incompletely, and focusing too much on chapter 6 of the *Nicomachean Ethics*. Aristotle offers this explanation at the beginning of Book 1:

Our discussion will be adequate if it has as much clearness as the subject matter admits of. Now actions admit of much variety and fluctuation of opinion, and may be thought to exist only by convention, and not by nature. And goods also give rise

to similar fluctuation because they bring harm to many people...We must be content then in speaking of such subjects...to indicate the truth roughly (Bk 1, 3: 1094b;15-20).

What I take this to mean is that Aristotle, for his time a master of distinctions, is allowing for imprecision *based on the nature of the subject*. This is consistent with the rest of his work, in that both *techné* and *phronesis* deal with the variable, which, by definition, are “things that could be otherwise”. We need to remember that Aristotle is not offering hard and fast definitions, because that is not possible, although it seems like it. He is offering description.

Experience Revalued

Admitting that the concept of experience is obscure, not quite 300 pages later Gadamer attempts to resolve some of these contradictions between product and a process by introducing another German term: experience as “Erfahrung”. Negatively viewing the attempts of science to objectify experience with rules, methods, and procedures, Gadamer argues that this removes the historical aspects, in that it “takes no account of the inner historicity of experience” (346). Like a diminished *techné*, the diminished experience as understood by science and technology can hardly be considered rich experience, merely a set of data points.

But those data points are also necessary, just as knowledge of material is necessary before *techné* can create something new. Likewise, they are valid, until contradicted by a new experience (350). For example, when replacing the exhaust system on a vehicle it is

common practice to cut the old parts off with an oxy-acetylene torch. In the hands of a skilled operator, the torch can slice through one layer of metal (the muffler) while leaving the underlying layer (the exhaust pipe) undisturbed and, more importantly, undistorted. In this way, the mechanic with experience can replace the bad part while saving the good part. This was the “directly given” of the experience, valid based on multiple experiences with the material. Then one day the common experience was contradicted. The Ford Taurus, I believe it was, introduced the stainless steel exhaust.

In a standard exhaust, the parts are made of mild steel, which is steel with a low carbon content. This makes the pipes relatively easy to bend and clamp. It also makes them relatively easy to cut with a torch, because when the technician heats the pipe to its melting point and adds oxygen, the iron in the steel oxidizes (think of *really* fast rusting) and is burnt away. But stainless steel, with its high content of chromium, will not oxidize in the presence of heat and oxygen. Much like the protective oxides that form on aluminum, the oxides that the chromium forms on the surface of the steel prevent it from rusting. This protective coating also prevents the flame and oxygen from reaching the underlying iron. When the flame cannot reach the iron there is no rapid oxidization, no burning away of the steel, i.e., no cutting. The metal of the pipe simply puddles and drips in place. The Erlebnis-based old knowledge no longer worked.

The above example illustrates Gadamer’s meaning when he writes “that life experience is clearly valid so long as it is not contradicted by new experience ... is clearly characteristic of the nature of experience” whether in science or life (350). Life experience is not the

sum total of life or science, but it is a necessary condition of either. If the technician did not hold the experience of flame cutting, built up over many applications of torch to metal, he or she could hardly be called an experienced technician. Yet we must not view experience solely in terms of its result: the ability in this case to cut with an acetylene torch. As Gadamer suggests experience is a process, and one that is “essentially negative” (353).

When learning to cut, the new technician cannot rely on *Erlebnis*; he or she has not yet acquired that content. But some of it can be passed along. A more experienced technician will show the new one how to light the torch, adjust the flame, hold the flame at the proper angle to the metal, and what shade of red the metal should be before adding the essential burst of oxygen. The new tech is then given some scrap metal, often a discarded muffler, and told to go practice. At first, he will fail, and fail badly. The torch will go out and he will light it improperly (usually with a loud bang as result), he will cut too shallow or too deep, weld instead of cut. He will experience multiple negative outcomes of torch cutting. Yet through this practice, this process of *Erfahrung*, he or she will eventually acquire the *Erlebnis* (how the flame, metal, and angle should look, and the knowledge of what is a good result). When this happens, “the experiencer has become aware of his experience; he has become ‘experienced’”. He has acquired a new horizon in which something can become an experience for him” (354). Then with that experience in hand, possessing that horizon, he will be ready for the next non-conforming experience (such as what to do about stainless steel exhaust systems), as long as he remains open to the experience.

Transitioning this renewed appreciation of experience into classroom practices, Carolyn R. Miller's (1979) "A Humanistic Rationale for Technical Writing" suggests we reexamine these positivist roots (outlined above) that have guided technical communication (and its pedagogy) and move to a more humanistic (consensual) basis. She argues that it is "the common opinion that [it] is a 'skills' course with little or no humanistic value is the result of a lingering but pervasive positivistic view of science.... an efficient way of coercing minds to submit to reality" (610). She recommends an approach that is "more humanistic and less coercive" (611), one which sees knowledge as created, relative, rhetorical. The "new epistemology" she describes, where "[r]eality cannot be separated from our knowledge of it; knowledge cannot be separated from the knower; the knower cannot be separated from a community" (615) supports the view I will explore in detail later: that there is a phronetic (socially active) component to a rich *techné* that, like the positivist roots Miller posits, that is often overlooked in favor of technique.

Almost as if she were writing from present-day Michigan Technological University, she claims that "scientists, engineers, teachers of technical writing and their students tacitly share the positivist theory about the role of rhetoric in science. Consequently, students look upon writing as a superfluous, bothersome, and usually irrelevant aspect of their technical work" (615). The more critical part of her argument is that our teaching reinforces that view.

Adopting an Isocratean approach and foreshadowing later beliefs about the relationships between genre, community and social action, she writes that “We can teach technical or scientific writing, not as a set of techniques for accommodating slippery words to intractable things, but as an understanding of how to belong to a community...to write well is to understand the conditions of one’s own participation—the concepts, values, traditions and style which permit identification with that community and determine the success of failure or communication” (617).

Russell Rutter’s (1991) “History, Rhetoric, and Humanism: Toward a More Comprehensive Definition of Technical Communication” provides further insight to the origin those positivist beliefs, and, like Miller, he argues for a more humanistic conception of what he will call *technical communication*. Rutter echoes Newman’s nineteenth century argument for a liberal education’s value because it “teaches that person to value ideas more than facts and systems and because it confers powers of persuasion and empathy without which cooperative endeavors remain impossible” (24).

Yet contra Mills and Walter, Rutter believes that “our role is not to simulate corporate training in the university classroom” (citing Winkler and Mizuno) for that would lead to the sort of courses that are, as Dobrin (2004) suggests “so heavily mortgaged to pragmatism that it lacks cohesiveness and moral purpose?” (22). He suggests we teach the students to think well collaboratively, not only as individuals; and to converse, and so to participate in social life (following Bruffee). And of course, doing good in public is the cornerstone of a phronetic approach to life, or a good pedagogy.

In this, Rutter is in agreement with Dunne's objection to the modern worlds' attempt to see rationality as coextensive with technique (227). Both try to correct the situation by showing that theory (facts and systems) and experience (gained from participation in social life), far from being separate domains, have a connection (229); one suggested by Aristotle himself in the *Metaphysics*: theory, "for all its primacy, does not displace *phronesis* as the ordering agent in our lives" (241).

On Practical Experience (Or Is It Pragmatic?)

Carolyn R Miller (1989), in "What's Practical about Technical Writing" explores the theory/practice distinction as well. For Miller, *phronesis* is concerned with the practical, with getting things done, with efficient and effective action. Practical rhetoric therefore seems to concern the instrumental aspect of discourse—it's potential for getting things done—and at the same time to invite a how-to, or handbook, method of instruction. While we might consider this approach more pragmatic than practical, Miller argues that technical writing partakes of both these dimensions of practical rhetoric. However, while early Greek rhetoric also involved both dimensions, they "emphasized that rhetoric was a *techné*...[which] initiated a handbook method of instruction" (14) which overshadowed the experiential aspects.

She explains (following McKeon and Garver) that Aristotle's rhetoric may be "practical [phronetic], rather than theoretical [epistemic] or productive [*techné*]" (22). She argues that as academics and instructors, we should appreciate that a phronetic method can

create knowledge and work toward the communal good. Like both Rutter and Dobrin, she argues that we should not just replicate existing practices, thereby making our students “more valuable to industry”, we should “question those practices and teach [students] to do so too” (23).

McCarthy and Wright pursue a similar end in their program to incorporate human values in the design of technology. But where Mitcham leans heavily on the rational and logical; and Dunne tries with arguable success to restore the human to “human action,” McCarthy and Wright begin with the recognition that, while experience has come to be a favorite child of those seeking to understand and design technology, the “turn to practice...has become heavily laden with theoretical and methodological encumbrances” (42). In saying this, they avoid falling prey to the same trap that Dunne configures: to argue against instrumentalism with the tools of instrumentalism. The tools they offer for analyzing felt experience draw on John Dewey and Mikhail Bakhtin’s use of aesthetics as “the paradigm of rich experience” and, with them, hope to “restore the continuity between aesthetic and ordinary experience” (79) . They present these not as foundational; rather, their “four threads of experience” are “ideas to help us think more clearly about technology as experience” (79). These threads are the sensual, the emotional, the compositional, and the spatio-temporal. The sensual refers to being involved pre-reflectively; that is, responding to our situation based on what our senses provide us: a child-like engagement with the on-going. They use the emotional thread to look at the quality of a particular experience based on the values, needs, goals, and desires of the person involved. The compositional thread is “concerned with the relationship between

the parts and the whole of an experience” (87). Here, we examine the situation as we might a novel, or a movie. Do the parts hang together? What makes this one engaging, where another is not? Does it make sense; why or why not? What makes us care about it: is it something in the situation, or something in ourselves? The fourth thread, the spatio-temporal, examines how an experience alters our sense of space and time. Becoming engrossed in a novel, or a computer application, we might lose the perception of space around us; our world collapses to the event before us. Or talking on a cell-phone, we might forget the public space we inhabit as we think of only our “private” conversation. An experience might cause our time-sense to change as well; a few minutes in the dentist’s chair can seem like hours.

After thinking through an experience in terms of the four threads, McCarthy and Wright give the next step as “putting it into circulation” (118, citing Turner) by writing “narratives of experience”. Admitting the problems inherent in constructing *any* narrative, creating and deploying case studies holds the promise of accomplishing what Dunne argues for, a way to teach practical wisdom. Reading these case studies can provide a simulation of what the experience felt like—at least from one viewpoint—that otherwise might be obtainable only through direct experience. In a classroom, using case studies can allow students to become virtual participants in an experience. The reflection on and discussion of that participation that follows the exercise can be the initial steps of the students ability to develop the theory behind the actions on their own, an ability that will hopefully continue to improve over time.

Can We Teach Phronetically

The difficulty here is that, for all the desirability of a phronetic approach to technical communication instruction, most authors have overlooked a basic dilemma. In particular Dunne, arguing in favor of phronetic approach, recommends that “an important role should be given to practicing teachers who are not only *phronomoi* but are also well equipped to teach apprentice-teachers to become *phronomoi*” (370). Unfortunately, according to Aristotle, *phronesis* is not teachable; it can only be gained through experience (Meta.A1: 981a25-981b10). So, while Miller tries to carve out a space for the practical, ultimately her program seems more pragmatic than phronetic.

Janet M. Atwill’s (1993) “Instituting the Art of Rhetoric: Theory, Practice, and Productive Knowledge in Interpretations of Aristotle’s *Rhetoric*” also examines Aristotle’s three “orders of knowledge”, but comes to a very different conclusion than Dunne and Miller. Her goal is to make a space for a model of rhetoric (which is at the core of our technical communication pedagogy) based on productive knowledge (*techné*). But first she needs to disabuse us of the long-standing tradition of a theory/practice binary; that is, she shows that rhetoric is neither solely a practical art (as proposed by Cope in the 19th century); nor is it primarily a theoretical one (as suggested by Grimaldi in the 20th).

Atwill frames Grimaldi’s take on rhetoric as a “paradigmatic example of epistemological foundationalism” (105). More useful is her explication of Cope’s focus on rhetoric’s relation to politics, its ‘action’ over its ‘production’ (101). Cope identifies “the ‘practical’ quality of the art not only with ‘acting’ but also with ‘experience’”, where (much like

Isocrates view of *techné*) “memory, by repetition...gives rise to experience, *empeiria*, and from it proceeds art, and ultimately science” (based on Metaphysics 980a27-981a2) (103). Still, while Cope looks for principles, not process (105), his description of the process provides insight on how we might use Atwill’s argument for a productive knowledge model that does not require a stable object of knowledge, eschews “description” and “interpretation” in favor of construction, and “never attempts to overcome the contingencies of time and circumstance” (113). As a means to teach through *techné*, her view of “making” incorporates aspects drawn from the more relativistic area of *phronesis*.

Dale Sullivan (1990), exploring the “Political-Ethical Implications of Defining Technical Communications as a Practice” also begins with the observation that writing instruction has lost touch with its traditions, and begun to “indoctrinate students, turning them into the sorts of people who will fill the available slots in our technological society” (212). Or, as Rutter eloquently puts it

focusing on the culture as an entity into which writers must fit themselves is similar to focusing on model reports as containers into which writers must fit their materials...[N]either really addresses the question of what a technical communicator will be. If fitting information into pre-existent content outlines is supplemented only by an emphasis on fitting new graduates into pre-existent cultures, I do not think the result will be progress” (30).

Rhetoric, as deployed in technical communications, is sometimes reduced to teaching skills—an “impoverished” *techné*—that are separable from both maker and made, “relieving the writer of responsibility” (213, citing Halloran). But Sullivan argues, like

Miller (1979), for a richer version, an “enculturation” model, albeit one that enculturates them to a particular genre/workplace. While the addition of the social aspect is an improvement, Sullivan poses the moral question: “What are we enculturing our students into?” (213).

Sullivan concludes that the genre we indoctrinate our students into is the military-industrial complex (214), and following C. Miller advises using *praxis* (action) for the definition of technical communications instead of *techné* (forms) since, at least in the classic sense, the *praxis/phronesis* connection with virtue as the ability to deliberate about the public good (rather than the mere expediency of *techné*) insures responsible social action. (214).

His resolution has been to adapt his course to teach the “real” world while also making students “aware of the values embedded in [it] and the dehumanizing effects of it” (215) by using an “apprenticeship model of teaching” that positions the teacher as “master” in the relationship (217). However, his practical solution of teaching forms first then ethics later is problematic, although common. Too often the discussion of ethics is relegated to the end of the course, added on as what might seem to be an afterthought, and presented when the students are more concerned with completing projects, papers, and worrying about final exams. In other words, their focus is elsewhere. Is there a way to do both simultaneously?

Valuing Genre as the Site of Phronetic Action

Sullivan credits the “enculturation to a genre” he refers to as based in Carolyn Miller’s 1984 “Genre as Social Action”, widely cited as “seminal” in the way rhetoric—and technical communication—has come to consider genre studies. Yet it seems that her emphasis on action has fallen by the wayside in favor of a textual and/or situational definition.

Her oft-quoted definition “genres as typified rhetorical actions based in recurrent situation” (159) sets the stage for a collaborative model of the workplace, one that can (hopefully) be learned. But she points out the notion of genre has become problematic due to its local and individual nature; yet, it remains “a rhetorical means for mediating private intentions and social exigence; it motivates by connecting the private with the public, the singular with the recurrent” (163).

Her focus on genre may be an answer to teaching phronetically. Studying genres allows the admittance of form and action, and ties both to the community in which they arise, hopefully for the betterment of all. “For the student,” she writes. “genres serve as keys to understanding how to participate in the actions of a community” (165). Yet, as Freedman, Adam, and Smart (1994) suggest, explicit teaching *about* genres seems difficult, if not impossible. Teaching *about* genres, as we shall see in the discussion of teaching *about* experience, requires a different approach.

Learning Theories

Three major theoretical positions can inform how we come to learn genres. From a practical standpoint, Lave and Wenger (1991) in *Situated Learning* explore a pedagogical level. Their question concerns how learning takes place, and how to make it more effective. The process they call “legitimate peripheral participation”, and their statement that “learners inevitably participate in communities of practitioners” (29) fits precisely with our goal; to provide our students tools and methods to first recognize and fit into those communities, and eventually effect positive change within them.

Anthony Giddens (1979) *Central Problems in Social Theory* proposes a “duality of structure” wherein we both know the rules of society and at the same time participate in their construction and maintenance. Defining “action” as “a stream of actual or contemplated causal interventions of corporeal beings in the ongoing process of events-in-the-world” (55), Giddens provides a complete, if lengthy, explication of what Aristotle meant by acting. Relating this intervention to the “more generalized notion of *Praxis*” (56) places his formulation of the process well within the Aristotelian, for whom *praxis* can be an operation of practical wisdom. Giddens claims the actor in this situation is possessed of “practical consciousness, which is tacit knowledge embodied in what actors know how to do”. Opposed to this is his “discursive consciousness...What actors are able to ‘talk about’ and in what manner or guise they are able to talk about it (73)”. If we can talk about it, presumably, we can teach it, it must be *techné*. Yet his emphasis on action, temporality and contingency harken to *praxis* and when deployed for the common good (which is not necessarily always the case for Giddens) *phronesis*.

Pierre Bourdieu (1977), in *Outline of a Theory of Practice*, like Atwill and many others, wishes to move us away from the structuralist/foundationalist theory side of the binary. His solution is to position practice as the proper way of being in and understanding the world; that the privileging of science (theory) leads to a neglect of the social conditions that make science possible (1).

Bourdieu, writing to modify the classic anthropological perspective, wants to break with objectivism, which “grasps practices from the outside”, in favor of “constructing their generative principle...within the very moment of their accomplishment” in order to establish a “science of the *dialectical* relationship” between structure and the dispositions that actualize and reproduce them (3). So for Bourdieu the binary is still there, and while theory has a place, it is not privileged one. As for Atwill, knowledge is construed in the relation to specific conditions at a specific time.

Bourdieu’s theory does not view action as “mere *execution* of the model” which can lead us to an “imaginary” outcome (we think we represent subjective purpose as *the* objective meaning (30)), rather in the richer sense of practices as something people *make* and *do*: “the product of strategies (conscious or unconscious) oriented towards the satisfaction of material and symbolic interests” within a specific situation (36).

Similar to Giddens “Duality of Structure”, Bourdieu’s “Habitus” (systems of durable, transposable *dispositions*) mediates between structures and practices. These principles

can be objective without being bound to rules, fitted to their goals with or without a conscious intent or an “express mastery” of procedure, and collectively orchestrated without the need of a conductor (72). “Each agent, wittingly or unwittingly, willy-nilly, is a producer and reproducer of objective meaning” (79). Important to any discussion of teaching phronetically is the distinction “wittingly or unwittingly”. If we read wittingly against Giddens notion of discursive consciousness (what actors are able to ‘talk about’ consciously) we are close to a definition of the knowledge of *techné*—a reasoned state that can be explained and taught. Unwittingly, however, read against Giddens sense of practical consciousness (tacit knowledge embodied in what actors know how to do) is more at home within *phronesis*, knowledge that comes to be internalized through experience rather than explicitly taught.

Further, Bourdieu gives us one possible route to this type of learning, one that resonates well with Sullivan’s call: “Between apprenticeship through simple familiarization, and, at the other extreme, explicit and express transmission by precept and prescription, every society provides for *structural exercises* tending to transmit this or that form of practical mastery” like riddles and ritual contests, challenges, and “let’s pretend”, people learn “the schemes generating the strategies of honor” (89).

Teaching Phronetically: Classroom Practice

Much has been written about various styles of technical communication pedagogy. My purpose here is to review some of these through two lenses: first, how the authors might

place them into Aristotle's theory-practice-production classifications, and secondly what the authors have found advantageous about their respective methods as they relate to the theorists discussed above.

Aviva Freedman's (1993) "Show and Tell? The Role of Explicit Teaching in the Learning of New Genres" asks "can explicit teaching of features of genre enhance students' acquisition? Her "strong hypothesis" says that no, "explicit teaching is neither necessary nor useful (if even possible)". Her "restricted hypothesis" is less harsh, answering the question with a resounding "maybe" for certain students, certain subjects, and certain circumstances (222). Explicit teaching would reside in the theoretical side of the theory-practice-production classification; the teaching of rules, forms, and prescription.

Freedman uses genre in Miller's sense, but in a somewhat reductionist way. She saw that her students discovered the rules of a genre, but made no attempt to formulate them (229). Her claim that "genre knowledge is tacit" (231) is similar to Giddens "practical knowledge", whom she cites. Essentially, the students learn the rules, but not in a way that they can articulate them. In Giddens terms, they lack "discursive knowledge". She adds that this tacit knowledge is unavailable to the "master" as well: "Control of craftsmanship, or *techné* does not necessarily entail conscious learning or explicit formulation of rules" (236) which seems a bit overstated in both my read of Aristotle and my experience—unless you put an awful lot of stress on the "necessarily"—but does align well with Bourdieu.

With the same goal as the reflective exercises we have our students complete, Freedman recognizes that “Full genre knowledge...only becomes available as a result of having written” [avoiding the question of whether we can ever have “full genre knowledge”]. Achieving this reflection adds a phronetic aspect to an otherwise explicit approach.

But when she continues with “meta-awareness [discursive knowledge] can flower into conscious, reflective knowledge” (236-7) she seems to contradict her earlier belief that knowledge stays tacit. Unfortunately, for all her discussion of *phronesis and techné*, Freedman never seems clear on whether she is talking about a model based on practice or production; her recommendation that guided participation take place in the situational context suggests a mix of both where teachers set up “facilitative environments” where they can “stage” the context (238).

Her “Rejoinder” to one critic only muddies the waters. She claims that learning is phronetic (273) but she attributes the ability explicitly only to teachers. Apparently students are not capable of this type of learning. In this, she would seem to agree with Aristotle, in that *phronesis* is not available to the youth, who have not yet acquired the requisite experience. However, in the next breath she disagrees with Aristotle (and countless others), arguing that teaching a craft does not require explicit explication. These comments seem to demonstrate if not an inadequate understanding of the concepts she explores, then at least some confusion in communicating them.

Freedman, joined by Christine Adam and Graham Smart (1994) refine their argument for a phronetic approach in “Wearing Suits to Class: Simulating Genres and Genres as Simulations”. They start to respond to Miller’s 1979 call for human action with the recognition that “discourse is shaped by the anticipated hearer/reader’s response [and] other elements in the textual, social, cultural and political context” (197), but move the stress from *all* action to just the reader’s response to a text (197). Where Miller seeks to expand the notion of genre to feature its dynamic aspects, Freedman seems content to bury “action” in a long list of attributes (198).

Also, they note the use of simulation is seen as “superficial” by both students and instructor. As one student explains “Did you notice how he [the instructor] keeps looking out the window a lot?” (203). Perhaps their simulations are just not real enough.

They provide a useful distinction between workplace and academic writing: “For those whose goals are action oriented, writing is instrumental; for those whose goals are epistemic [learning], the writing is its own end” (citing Willard 1982), although their confusion about Aristotle’s divisions continues. They note that the students were “never deceived” that their writing was epistemic (203) while “in the workplace, by contrast, it is the [action proposed by] the text that is paramount” (207).

They also report research by Giltrow and Valiquette (in press) “that students are expected to spell out explicitly some of [their] knowledge” and “student writing is the knowing made manifest for inspection...even to the extent of boredom for the reader” (205). This

is a good fit with both Giddens explicit/discursive, and what I have termed the “teacherly” role I have seen some professors assume when they try to simulate a client. Even their industry consultant adopts this style when serving as a part-time instructor, and becomes more concerned about the student’s learning than the task itself. Finally, although they claim that the wearing of suits was “emblematic [and] enabled a stance towards experience, a way of construing reality that matched that of the ‘suits’ of the workplace” (220), they end with the not very hopeful belief that students must be in a real situation: “None of this know-how will have been made available through simulations, no matter how realistically or elaborately staged” (221), and “only through exposure to relevant professional contexts...will writers acquire the genres appropriate to these milieus” (222)

Joseph Dunne’s *Back to the Rough Ground* (1993), discusses the difficulties with the “behavioral objectives model” he sees as on the loose in the school system. His concern is the instrumentalist underpinnings of this method, where all problems of teaching are reduced to finding the most effective means available (1). His answer is to avoid this “lure of technique” in favor of a more experiential, phronetically based approach. His penultimate chapter is devoted to the experiential aspect of *techné*. In it he shows that, far from the more common understanding that making and doing are mutually exclusive, Aristotle suggests several ways they can be seen as coextensive.

Does this attitude mean we have to give up on teaching experience in either practice or production mode, and fall back to prescriptive lecturing on theory? Perhaps not, as

Freedman & Adam (1996) suggest when they revisit the topic in “Learning to Write Professionally: ‘Situated Learning’ and the Transition from University to Professional Discourse”. While still believing in the distinction between workplace and academic writing, and not wholly rejecting the impossibility of simulating real-world experience in the classroom, they pursue what they see as a more attainable goal: to teach students *how* to learn new genres, as opposed to the genre itself (395).

Building on Rogoff’s guided participation and Vygotsky’s apprenticeship models (398), and Lave and Wenger’s Legitimate Peripheral Participation (apprenticeship with an end focused “on something other than learning”, “a purpose above and beyond the initiations of newcomers” (399)), they seem to be moving away from a phronetic mode and toward one that is production based. Or perhaps, like Atwill, they are proposing using *techné*-based methods to foster the students ability to learn phronetically.

They identify some important differences between the school and workplace writing experiences. In the classroom learning takes place through what they call “Facilitated Performance” where the guide/instructor is “oriented entirely to the learner and to the learner’s learning [with] no explicit direction by the guide” (403). Rather, the guide collaboratively “models” an appropriate approach and “after students struggled with it” (403), provided “corrective feedback” (404). Eventually, students “reproduced discipline-specific terms” (406) and thinking.

Contrasted with the more phronetic method of the institution, in the workplace learning draws on *techné*'s ability to accommodate chance and is achieved through "Attenuated Authentic Participation", which is similar, but, "all the more significant for being tacit and implicit, complicating the transition into the workplace" (408). Learning takes place "through active processes (in this case writing), guided by mentors, and mediated through cultural tools" [word processors and software] (409). However, "the differences are the nature" of the collaboration [and in] the improvisatory nature of the task ["not carefully sequenced and designed" (413), as in classroom], the task's authenticity and validity, and the "varied and shifting roles played by the mentor and learner" [which newcomer must learn, and learn "from whom they can learn" it (415)]. The tasks are focused on external goals; learning is incidental, participants unaware of it (410).

Clay Spinuzzi (1996), in "Pseudotransactionality", while critiquing Freedman & Adam's "classroom writing" as "pseudo", actually adopts a similar stance on the internal/external ends of classroom/workplace writing, and the teaching practices associated with each. With some non-specified references to Bourdieu's "habitus"—or something very much like it—(343, 344) as definition of "activity network" (AN) he suggests that while we can't simulate workplace activity network, what we *do* do is prepare minds so they will be better able to cope when they go into workplace (345)

He advocates having students join other AN's (like Enterprise, USG, or other student groups) then discussing difference(s) in the writing classroom (346), but interestingly notes that "the particular AN is not important": the idea is to gain generalizable skills

through analysis. As a way to avoid the contradiction inherent in trying to teach *phronesis*, he transforms our job from “teacher” to “analysis guider” in the manner of a master technite. While an interesting and potentially valuable approach, Spinuzzi’s emphasis on moving knowledge from Giddens practical to discursive dimensions lets content and structure slip by the wayside, in much the same way the process movement in composition was accused of doing.

Two articles by Ann Blakeslee explore the issue of using production-based projects to foster phronetic learning. “Activity, Context, Interaction and Authority: Learning to Write Scientific Papers in Situ” (1997) follows the interactions (conversation and written) of a graduate student and his physics professor/mentor as the student tries to write his first article. Whether her inquiry in an academic setting generalizes that well to an “advanced professional” one is problematic; but she does not address that.

She uses a “situated learning” (apprenticeship) model and suggests that participation in a domain “teaches students to perform the domains activities: Learning thus occurs through doing” (135). While this is phronetic, often she displays a poor understanding of *techné/phronesis*. For example, her statement that the goal of apprenticeships, per situated learning theorists, “is to transmit knowledge and authority to beginners” (126) would be more *techné* than *phronesis*. As is her contention that “scaffolding, then, is support, provided as needed, to help newcomers perform unfamiliar tasks” (140) by setting appropriate “intermediate” tasks.

She found that the professors/mentors “indirect and implicit” manner of support impedes student progress (141), in a way similar to what Freedman and Adam found in the workplace. Yet the professor’s “indirectness” was deliberate. He responded in this manner, he said, so that [the student] could “gain experience addressing and responding to the problems in the test on his own” (142). The student saw this not as instruction, but as “input” from someone who knew the task better. For the professor, then, this is a very *techné* way to go about it, but the student appears to be learning phronetically. Blakeslee values this combined approach since “Not being prescriptive can help the students be more creative...prescriptive or cookbook approaches...militate against such creativity” (145).

We can also see one limitation of Giddens practical/discursive consciousness here. When the professor expects the student to come to practical awareness on his own by refusing to provide discursive advice, the students progress suffers. Better, I think, are her suggestions to “provide greater support and direction to help students undertake and perform new tasks” and “make more explicit the aims and goals of the process” (158), at least at the beginning of instruction.

Blakeslee’s “Bridging the Workplace and the Academy: Teaching Professional Genres through Workplace Collaborations” (2001) explores “how classroom-workplace collaborations help us to teach professional genres...how they replicate workplace activities and convey features of workplace genres and how they serve as transitional experiences” (169). She identifies and explores four issues that can inform our pedagogy:

exposure, authenticity, transition, and response (170), and how they can make our attempts to simulate experience more effective.

By working with real clients, on real projects, students gain exposure to workplace (176), and although the students may view the projects as artificial, they still see some authenticity (178) in them. In order to facilitate the transition from the classroom to the office, Blakeslee recommends that we not remove all frustration from the projects (182), but “allow students to carry out tasks [from] workplace, but in a supportive environment” (183). Finally, she found that the students were dissatisfied with client feedback (186); the clients responses did not include enough direction and tended to be either overly critical or overly complementary (187-8). She suggests that instructors may need to train clients (189), a finding in agreement with my observations of client/student interactions as well.

As in her earlier work, we can see how the paucity of response by the client, while sometimes less than well-intentioned, leads us to see the value of providing *some* discursive awareness. However, there does seem to be a requirement of *some* ambiguity if learning is to proceed phronetically.

Chapter Three: Theory Applied

In this chapter I move away from the strictly theoretical aspects, and examine how the concepts of *techné* (making through *poiesis*) and *phronesis* (good activity, *praxis*, informed through experience) can be seen in more practical applications. First, I look at the Seabase case study, drawing out how the students' actions can be interpreted in terms of those concepts. Secondly, I look at how the actions of students in Technical Communication courses can be classified in those same terms¹.

Making and Acting: Theorizing One Case

The significance of the concepts of making (*techné*) and acting (*phronesis*) can be made clear by looking for their presence in the cases. Often, individuals will have difficulty separating what they make from how they act, but this ability can be critical to success in the classroom and, by extension, in the workplace. The Challenger disaster is a case in point. From a communication standpoint, the engineers involved became too focused on making the flight happen and not passing on bad news (Winsor 1988) that they overlooked whether they would be acting ethically for the greater good (Gross and Walzer 1997). The following examples demonstrate that difference and how the case studies can bring these concepts to light, and make them useful as heuristics to guide what we make and how we act, increasing effectiveness in both areas.

¹ The material in this section includes previously published selections from "Making and Acting: Ethnographic Development of a Case Study Approach". This first appeared in *Technical Communication* in 2008 and was reprinted in *Qualitative Research in Technical Communication* in 2011.

In the “Seabase” case study, Software Engineering Senior Design students (called the “SE team”) worked to develop software to control a ship-mounted crane. The crane would be used to transfer loads from one ship to another while at sea, and be controlled by a joystick, much like a video game. The SE team would write a program that would compensate for the rolling of the ocean, making the crane easier to use for the operator. The collaborative project with mechanical engineering faculty and students was at times overwhelming. The SE Team had to learn to program in a new language, Matlab, and to navigate the culture of Mechanical Engineers as well. As new members of an ongoing project, they had to make both their controller and their place in an established, yet to them foreign, work environment.

Making the controller seemed straightforward to the SE Team. As one member described the situation when interviewed at the end of the project:

Question:

What product are you making?

Answer:

We're supposed to port code, existing C-code into a "Matlab" format. Basically the code is supposed to stabilize a payload for the crane. It was pretty vague in the beginning. We thought we were going to actually be designing the code, whereas we end up to find out we're just like porting some existing code...

We can see from his answer that at the beginning of the project, this self-described “technical guy” was concerned about the scope of the task: *designing* the code seemed

formidable, merely *porting* it well within their “capacity to make.” But complicating the task was the “acting” aspect, working with others in an unfamiliar situation. This excerpt from the case, shown in Figure 3.1, captures the difficulty.

Module C Story

On Wednesday of the fourth week of the semester (Sept. 22) the leaders of the three crane project teams meet with project advisors Hank Taylor and Nancy Smith. They decide that since the “point of meeting is to get regular coordination of the teams, they will continue the meeting of team leaders on Wednesday from 12-1 on”.

Representing the SE Team are JoAnn, Ken and Bob; Matt and Ben come for the crane builders; and Jon is there to talk about the platform.

[Minutes of Sept. 22 Crane Team Leaders meeting](#)

The items on JoAnn’s summary of the meeting are:

- The SE Team will work on crane, not on the platform, this term.
- In a discussion of scope of the SE Team’s part, Hank says the crane part is the “biggest, nastiest part” and he thinks the GUI for the platform will take about an hour and is the easiest part.

Figure 3.1. Excerpt from Module C Story, Seabase case study.

As an example of how we presented this scenario in the case study, the hyperlink to an email from one project advisor in mechanical engineering is available only after following the hyperlink to the meeting minutes shown in the excerpt. To get to this information, the undergraduate students analyzing the case must dig into and ferret out the information, much like the SE Team had to do at the time. This adds to the effectiveness of the case as a simulation of real life, when not everything is presented clearly and immediately. The email highlights an all-too-common problem when working with others. The two advisors, in their roles of clients, hold differing opinions on what should be the most difficult part of the project. Advisor Hank Taylor feels “the crane [controller] is the ‘biggest, nastiest’ part” and a side project to design a GUI is “the easiest part.” However, one week before, Advisor Nancy Smith indicated the opposite:

“The GUI design is a good project for the SE team,” and “working on only the crane controller would be ‘too simple.’” The questions posed to the student users of the case (excerpted in Figure 3.2) ask them to reflect on and offer solutions to this disparity.

Module C Questions

1. How would you characterize the interactions among Hank, Nancy, and the team members?
2. It's interesting that Hank says that the “crane part” is going to be “the biggest, nastiest part”, and that the GUI design will be easiest. On the other hand, Nancy seems to be saying the opposite: the controller will not be very difficult, and the GUI will be more challenging.
 - Why might they have such different opinions?
 - How can the SE team resolve this difference?

Figure 3.2 Module C Questions, Seabase case study.

This exemplifies the dilemma of working with others while trying to promote a common good. The arena of acting is too dependent on the particulars of the situation; it cannot be codified into a set of rules, condensed into a “how to” manual, as the making of a product often can be. The multitude of variables involved helps explain the difficulty of teaching *phronesis* directly. Aristotle’s “capacity to act” and do what is appropriate in any situation can only be gained by experiencing a variety of situations and reflecting on them.

Never would we argue that teaching “making” is easy—we know it is not. It is just that teaching the aspects of life that comprise “acting” directly is impossible: what rules, what universals are there to rely on and pass on to students when it comes to human interactions? It is only through experience and imitation that we learn how to act well. The richness and immediacy of our cases provide a path to simulating the experience of

the workplace. In responding to the excerpt above, students must put themselves in the place of the SE Team and learn how to deal with the particulars of the situation. It is here we find the value of our ethnographically developed case studies, and our theorizing of them through the concepts of making and acting.

Simulating workplace actions in the Classroom

We have successfully used our case studies in both technical communication “service” courses where the students come from a variety of majors and in software engineering classrooms where a much more homogeneous audience receives the cases. The depth of the cases helps simulate the complexity of working on a collaborative software project, and their breadth helps to hold the interest of students from other disciplines. While our initial focus was on improving communication skills, here we look deeper to see how the concepts of making and acting have facilitated that endeavor. The examples I offer here draw on the first use of the Seabase case study in technical communication classes, where the heterogeneity of the audience more accurately reflects a typical workplace than does the homogeneity of a software engineering class. This interdisciplinary service course typically attracts students majoring in technical communication, business, engineering, as well as software engineering and computer science. Here I report specifically on two trials, summer 2006 (a two-and-a-half-week unit out of seven weeks) and fall 2006 (a four-week unit out of fourteen). We (the instructor and I) were fortunate in that each interdisciplinary team working on the case included a software engineering or computer science student. The overall goal of the unit was to analyze the multiple communications efforts of the SE team (including emails, meeting minutes, timelines, requirements

documents, risk documents, reports, and presentations) as they developed the software for the crane controller. Specific assignments included writing memos and final reports, and preparing for in-class discussions.

Making/Techné

In one exercise the technical communication students considered and discussed the purpose(s) and audience(s) for a given set of meeting minutes. They then rewrote the minutes to improve their usefulness as a record of the meeting and as a report to other stakeholders. This production can be read as *techné*, the reasoned capacity to make. For both the SE team developing the controller software and the technical communication class members reviewing the actions of that team, creating these documents contributed to their communication skills. The skills of the SE team, unfortunately, never seemed to progress much past Dreyfus' novice stage. Their reliance on rules and procedures led to confusion and, ultimately, failure.

The technical communication students, on the other hand, by vicariously experiencing and reflecting on the efforts of the SE team, began to move beyond just competence. Their analysis of the situation led to alternative, more appropriate ways to create the documents. They began to master the art of technical communication. Where the SE team would create documentation almost by rote (their attitude being “this is what the instructor or client wants”), the technical communication students saw the value of the documentation to their own efforts (for example, they created a timeline because they

knew it would help guide the project, not just because it was required). Like Aristotle, we value the masters of their crafts “because they know the reasons of the things which are done; ... Thus the master craftsmen are superior in wisdom, not because they can do things, but because they possess a theory and know the causes” (Meta 981b1).

The students also demonstrate a discursive awareness of their skill, in that not only can they find and repair inadequacies in the documents, they can explain why they are important. Wild begins his definition of *techné* as “any act that can give a rational account of itself, explaining *why* it does what it is doing” (p. 256). In compiling a final report, some students noted that the SE team’s timeline was missing dates: “The biggest problem is that there are no dates at all on the timeline,” they wrote. “The team has not worked out starting times, durations, and, most importantly, deadlines.” The technical communication students recognized that the timeline was probably written in a rote manner merely to fill a requirement of the course, with no apparent realization by the SE team that it had a purpose, or an audience that would really use it. In our terms, the technical communication students recognized the SE team as novices, using a “degenerate” *techné* (if that). Further, the technical communication students demonstrated their more advanced skills by producing a revised timeline with dates and deadlines, and laying out who on the SE team should have been responsible for which tasks.

Acting/Phronesis

Their discussions and analysis also explored how the inadequacy of the communicative efforts on the part of the SE team contributed to the action (more usually inaction) of those involved in the Seabase project and, eventually, to its outcome. Going beyond just an analysis of the communication-related causes that contributed to the failure of the Seabase project, the technical communication students the technical communication students modeled behaviors in an attempt to advance the knowledge of future SE students. One example of this is the recommendation reports they wrote for the SE students that were crafted to help the next generation of SE Senior Design classes avoid the pitfalls the Seabase project encountered when making their controller.. They became teachers, an ability Aristotle considers a sign of knowledge (Meta 981b 8). Taking the point further, Aristotle describes this acting for the human good as the realm of *phronesis* (NE 1140b20). To reiterate Dreyfus' claim, by demonstrating virtuous behavior the SE students could then imitate, a portion of the SE world has been transformed. As T. Miller (1991) hoped, our technical communication offerings have "ceased being a technical skills course and instead become 'practical,' in the most valuable sense of that word" (p. 71).

Chapter Four: Methods Background

Beverly Moss (1992) describes ethnography as “a qualitative research method that allows a researcher to gain a comprehensive view of the social interactions, behaviors, and beliefs of a community or social group” (p. 155). However, this project should not be mistaken for a classic ethnography. Our goal was to create case studies that contained the richest descriptions possible, not to explicate a culture. We could not perform the years of fieldwork required of such endeavors due to limited resources, both financial and chronological. Nor did we try to record much beyond the development sessions proper, the exit interviews with the student participants, and some extended reflections on the data to help insure the veracity of the interpretations. We did follow standard and proven ethnographic techniques when writing it up (in our project, creating the cases) to present the material in as real a manner as possible.

Initially this chapter provides a brief historical overview of those qualitative methods typically used in ethnographic investigations to provide background for a reader not familiar with the subject area. I then review some of the procedural and ethical issues inherent when undertaking any fieldwork, integrating and briefly explicating specific issues that arose in the planning and execution of our investigation. I then look more closely at the question of the ethical practice of qualitative research as it has been defined by Institutional Review Boards, and provide examples of my experience with the one that approved our project at Michigan Technological University. Following that I review the method of analysis I chose to use, Grounded theory, and the results obtained. Finally, I discuss the methods of presenting the data obtained, and provide rationales for the

choices of those methods. These sections remain largely theoretical, discussing as they do the larger issues involved when doing qualitative research. Later I will examine how those issues were applied and adapted to our specific project and defend the choices made.

History

Clair (2003) begins a history of qualitative methods with Herodotus' *History*, written in the 5th century B.C.E. Pomeroy, et al. (1999) tell us that Herodotus “interrogated informants of his parents’ generation” to write the story of the Persian wars and “discover what history revealed about human nature and the way the world works” (260). We equally could credit his contemporary Thucydides’ *History of the Peloponnesian War* with that honor.

Van Maanen (1988) divides qualitative research into anthropological and sociological. Initially, there was the “armchair mode” of anthropology—researchers who did not even leave home, but relied on the journals and letters of explorers, traders, and tourists (15). Later, anthropologists were known to spend a long time in the field, studying cultures which were “exotic” (14)—at least to them. Some of these were “verandah anthropologists,” so called because once in the exotic locale they rarely left their porch, letting the culture come to them.

Van Maanen further reports that the sociological branch began in the late nineteenth century in Britain, and was implemented as “urban ethnography” in the 1920s by the

Chicago School (16). Rather than traveling to foreign climes, they tried to gather and report on what people (often the poor) were up to in the cities of America.

This early work—especially in anthropology—was, as Clair points out, concerned with saving a picture of the culture, not the culture itself (8). As Clifford and Marcus (1986) put it “the main motif that ethnography as a science developed was that of salvaging cultural diversity. The ethnographer would capture in writing the authenticity of the changing cultures, so they could be entered into the record” (24).

This capturing was done by observing the culture under study. For Agar (1996), “we” observed “them” and then wrote an authoritative book that described what we saw, confident in the positivistic belief that it corresponded to reality: “our notion of ‘social’ or ‘cultural’ or ‘human’ research grew out of the Western tradition of ‘scientific’ research” (2). But while that may work for describing a piece of steel or a chemical reaction, understanding people, what they do and why they do it, is a little more complex. According to Denzin and Lincoln (2005), as qualitative methods moved into the 1980s the author was no longer “the authority”; “the observer has no privileged voice...the central task of theory is to make sense out of a local situation” (17). We have abandoned the concept of the aloof, detached observer in favor of Agar’s “participant observer” (20). That method emphasizes participation over observation as the means of coming to grip with the practices of everyday life (9).

A crisis of representation arose in the mid-1980s. As Denzin and Lincoln tell it: we cannot capture lived experience itself (19), we can only tell a story that represents what we as people involved in that experience make of it. The move away from a positivist certainty that there is a describable truth “out there” is captured nicely by this story told by Clifford

Ethnographers are more and more like the Cree hunter who came to Montreal to testify in court. But when administered the oath he hesitated: “I’m not sure I can tell the truth...I can only tell what I know” (8).

In summary, our intention in pursuing and presenting this research was to gather material from a local culture, albeit one foreign to those of us from the Humanities Department, with the goal of the eventual edification of future Software Engineering students. We therefore make no claims of capturing the authentic of an entire culture, only of re-presenting one part of it as faithfully as we possibly could. To this end we were participant observers and, while trying to minimize any “guiding” of the participants towards our ends, were hardly aloof or detached. We also insured—again as much as possible—that the stories were those of the participants by seeking their input as to their veracity as collecting data portion of the research came to a close in the form of exit interviews, as well as after the case studies were written up.

Fieldwork Methods

Silverman (2005b) describes “what you can (and can’t) do with qualitative research”. Noting that no one method fits all projects, he advises choosing “a method that is appropriate for what you are trying to find out” (6). Likewise, Lauer and Ashford (1988)

provide eight designs that range from quantitative to qualitative. Their goal is to help readers “discriminate among types of research...and to select designs appropriate for their own situations” (3). More to the point is Creswell (1994), who suggests that for some questions a “mixed methods” approach is useful in that it incorporates a means of triangulation (15). With those aims in mind, the *Speaking of Software* project was established to incorporate multiple method to avoid falling into what Silverman calls “simple inductivism” (78), that “just being there” would be enough. This was to further ensure the reliability of the data we gathered (and the analysis of it), and also to provide a range of evidence to support the robustness of our interpretations. The methods employed included participant observation, where the researcher observed and recorded the team as they worked, data mining on the documentation they produced, and short exit interviews with the participants. The analysis was based on Straus and Corbin’s grounded theory method, and the write-up emulates what Van Maanen refers to as a realist tale, brought up to date and presented in an electronic format.

There is a difference in outlook among those who value qualitative and quantitative work. For Silverman (2005a), qualitative provides detail and quantitative can “identify variance” (8)—presumably in search of validity to back up your work to positivists. For Lauer and Ashford (1988) qualitative (which they frame as “rhetorical”) provides the grist for the quantitative mill (6). They all agree that, as Silverman puts it, “if resources allow” (8) an approach that combines methods can be advantageous. It is in that context of “if resources allow” that I will later consider the *Speaking of Software* research

project, and argue that despite those limitations the mixed method approach chosen returned solid, robust information.

For Giddens, writing in *Central Problems in Social Theory* (1979), resources are “the ‘base’ or ‘vehicles’ of power” which make up the “structures of domination” within which we operate, and which we reproduce (69). One of those resources, in his words a “more historically significant” one than even Marx thought, is time (210). Although as Van Maanen (1988) tells us in *Tales of the Field* ethnography is usually “extensive fieldwork in exotic cultures” (13), it is also possible to compress that experience into a shorter period. While spending only a limited time in the field runs the risk of reducing the breadth of the information obtained, if the research has a specific goal, as did the Speaking of Software project, discovering a great depth of depth of information is possible. In addition, a shorter period of investigation can help keep costs down and keep the project within budget, and sometimes the time is limited by the nature of the project itself. Both these were concerns for this project. In the case of the former, we were limited by the albeit generous NSF grant, and in the latter by the fourteen week semester. In contrast to the myth of the “lone ethnographer” as related by Denzin and Lincoln—Malinowski off with his islanders (15)—our project included the necessities of group work, both on the part of the subjects and the researchers.

Early in any project it is necessary to reflect on and make explicit the researcher’s backgrounds and motivations, in order to make clear the agendas of all involved and the possible bias and personal interest we brought to this project. As Agar (1995) suggests, it

is not whether we are biased—we are—but how those biases affect our work and how we document them (92). Our background is “the initial framework against which similarities and differences in the studied group are assessed” (93). In addition, this helps avoid the danger of the researcher guiding the respondent rather than getting a “free” response to the questions (Schaeffer & Maynard (2002, 582); and provides transparency and thereby increases the credibility of our work (Rubin & Rubin (1995, 85).

Participant Observation—Introduction to Fieldnotes

Emerson, Fretz, and Shaw’s (1995) classic *Writing Ethnographic Fieldnotes* provided our ethnographers, some entering the field for the first time, a framework to use between observation/participation and authorship. In it, they situate their specific method(s) for fieldnotes within their larger ethnographic method of participant observation. While not dismissing other more passive or detached methods, the authors clearly feel that immersion is the preferred route to understanding those under study (2). That said, they note that in such circumstances one cannot be a “fly on the wall” (3), and should not try to be. Rather one should appreciate the deeper understanding possible through participation and revel in it, while at the same time being conscious of, accepting, and reporting the risks and benefits of this method on the culture under study, the ethnographer herself, and ultimately the written report and its audience.

The inseparability of method and findings is particularly important to understand when doing ethnography at a research institution such as Michigan Technological University. Emerson, Fretz and Shaw make it explicit: “*what* the ethnographer finds out is inherently

connected with *how* she finds it out” (11). They also note the implications of that process to the accurate depiction of indigenous meaning: “what it means to them” (12). For the Speaking of Software project, the indigenous meanings are twofold. First, there were those of the client, i.e., the meanings found in the language and practices of mechanical engineering. Second, there were the meanings held by the Software Engineering students. Often these were in conflict. As C. Miller (1979) wrote “scientists, engineers, teachers of technical writing and their students tacitly share the positivist theory about the role of rhetoric in science. Consequently, students look upon writing as a superfluous, bothersome, and usually irrelevant aspect of their technical work” (615). As our goal was to create case studies that would appeal to and resonate with students in these fields, the constructivist outlook of Emerson, Fretz and Shaw allows appreciation of what the event, story, and interaction means in the culture under study as it is recorded, and facilitates accurate attempts to translate it to another audience.

Their suggestion is to immediately record the fine details of the culture (14), to allow for later recall, reconstruction, and analysis. The researcher is to be open and flexible (26), and mold notetaking to the situation when possible. In an effort to be unobtrusive as possible, the authors recommend strategies to first maximize the content of these jottings when writing, and second to act as mnemonic devices when writing them up later. Specifically, students should jot down initial impressions of the scene—sights, sounds, smells, and so forth (26), then focus on “key events or incidents”, along with the reaction to them—their own and that of the members (27). Finally, they should look for variations and exceptions (29), and record them as well.

As we moved from these jottings (which were hastily written down while observing) to creating full fieldnotes, we consciously set aside the time to do so (immediately whenever possible) (40). We also emphasized the importance of balancing full description with capturing essential detail (47), and organized the fieldnotes in order to improve recall at later dates, using chronology, ranking by apparent importance, and topic areas (48). Emerson, et al. recommend creating “fieldnote tales” as an intermediary step between jottings and further analysis. This process combines episodes which recount action and move in time into loosely constructed scenes, which help order thinking and understanding (89-91). They recommend using asides (brief reflections and reactions that clarify or interpret something just noted), commentaries (longer comments to an imaginary audience) and in-process memos (methodological questions, connections seen among other notes, potential areas to explore (101-3) to expand and illuminate the jottings done in the field, and begin the process of coding (for which they follow grounded theory methods).

These strategies helped make the case studies “come to life” by including concrete details that create a rich visual, oral, and tactile image that captures the ambiance of the situation (69) by including impressions of all senses whenever possible. We described the characters using verbatim quotes and rich depictions of their actions to give that “you are there” sense (76), but avoided tagging them with stereotypes or evaluative comments that may have constrained us later (71).

Short Exit Interviews

To employ the concept of “triangulation as a validity tool”, as Hesse-Biber and Leavy (2005a) recommend in “Validity in Qualitative Research”, the Speaking of Software researchers performed short exit interviews to expand and support our findings and “earn the confidence of the reader that she or he have “gotten it right”” (66). In this case, given both the scholarly and the practical ends of this project, this became no mere academic exercise, but a real-world adventure in social interventionism as we provided a metacognitive view of the project and the social interactions that occurred during it, and some (early) analysis of the efficacy of those interactions. This was done as a way of “repaying” the students for their participation in the project; to help them, as well as helping future students that would use the cases.

These interviews used a mix of fifteen open- and closed-end questions, and some prompts should they prove necessary. The questions were grouped into four categories, to elicit the interviewee’s opinions on details of the project, their evaluation of the teamwork, information about interactions with the client, and their view of the end user of the product. (See Appendix 1.) Following the advice given by Pfeiffer (2006) in *Technical Writing: A Practical Approach* (an undergraduate textbook) most of the questions were objective to make it easy for the respondents to answer them, and to allow convenient data reduction (422), all without pushing a particular point of view (423).

Due to the short, one-shot nature of the interviews, worries about the researcher biasing the answers was minimal. Additionally, we arranged for the interviewer to be a researcher other than the one who had observed the team. In order to maintain some structure across the interviews we wrote out the questions, asked them exactly as written (Fowler and Mangione 1990 p. 35, in Schaeffer and Maynard (2002), digitally recorded the answers, then transcribed everything as completely as possible. By doing this, we had a permanent record of the questions as they were asked, and the responses as they were received.

However, recording the interview brought its own set of concerns. While the use of a digital recorder may cause a loss of spontaneity, the effect, if present at all, was very short-term. It was also less intrusive than extensive note-taking, and allowed the interviewer to focus on the interview questions (and follow-up questions) instead of trying to write everything down. Instead, the notes act as a reminder of interesting responses, body language, interruptions, setting, and other details the tape might not capture.

Transcribing the interview made it easier to compare responses of multiple interviews, or individual answers in a long interview. This was especially true as we were interviewing four people from each project (three students and the client), and sought consistency across the interviews. Obviously the recording did not insure consistency. Rather, it allowed us to check for it during analysis.

Consent—Institutional Review Boards

Institutional Review Boards (IRBs) occupy an unenviable position at research institutions. Created initially to protect the subjects of study from undue harm at the hands of the researchers, they must now also draft procedures that protect the institution from potential lawsuits arising from the effects of misguided research. Due to this new role, IRBs are often seen as excessively bureaucratic, if not outright obstructionist, by researchers. This section will lay out the history and concerns that led to the creation of IRBs, and provide a “road map” for dealing with them successfully.

As we began this project we were aware of two major issues in dealing the subject of “consent”. The first, posed as a rhetorical question, is ethical: why do we need to ask our respondents for permission to use their lives? The second is more pragmatic: how do we resolve the first with the requirements of an Institutional Review Board—without ruining our research?

In the early days of ethnographic research, the first issue, asking for permission from the respondents, never came up. As Clair points out, the “salvage efforts” of Boas, Sapir, and Mead were not aimed at helping the culture under examination, but at providing a data base for the Western anthropological community (6). With the linguistic turn, and its “emphasis on language to create culture, as well as to understand culture” (13), researchers began to reconsider the position of the respondent as a co-author, rather than an object of study. Goodall (2000) notes these changes in the “ethical conscience” with the coming of the “*postmodern era*” (153). For him, the question is: “who owns the rights

to this story?” It is a choice between two rights; and there is no one best answer. The important point is that the question is considered, weighed, and that as researchers we find an answer all—participants and researchers alike—can live with (159).

Given that our postmodern sensibilities demand a more cooperative effort between researcher and respondent, we must address the question of *when* we should inform our subjects that we were researchers, and how much to tell them of our purpose?

Institutional Review Boards (IRBs), coming from a scientific stance, say before beginning; that is, at the first meeting with the participant. But doing that may foreclose entry, or the accuracy of what is discovered. Goodall’s advice: “it is absolutely essential that you [tell them]. *Eventually*” (his italics, 160). We chose to disclose our identities as researchers during the first meeting with the project teams, as well as providing a description of our goals, along with the informed consent paperwork.

There seems little doubt that, as Warren (2002) points out, IRBs can “constrain” the research project (88) in the ways Goodall suggests. Yet the goal of an IRB—protecting the participants from harm—is a valid one. No one, I think, would want a repeat of Milgram’s “Eichmann Phenomenon” experiments of the 1960s, yet the information gained is valuable; would the research have been as meaningful if the subjects had been informed that no one was actually receiving the shocks?

Recently IRBs have sought to protect the institution from harm more than they do the participants, as Lincoln and Tierney (2004) argue. Although still tasked with “assuring

compliance with federal law” that protects the participants (including confidentiality and anonymity), a main concern has become “pressure from the political right” (220). This pressure tries to make qualitative researchers retreat to some more quantitatively-based model that, as Denzin and Lincoln (2005) argue, leave “scholars...confronting the methodological backlash of “Bush science” in its manifestation as the No Child Left Behind Act (20).

The importance of these issues is not that these issues are resolved in some grand sense (for as we have seen, even someone with the experience of Goodall offers no “resolution”) but in appreciating the dilemmas and dealing with them. Being sensitive to the rights of all involved is critical to *all* phases of research; data gathering, analysis and reporting alike.

In my experience, a careful rhetorical analysis of Michigan Technological University’s IRB website opened the door to analysis of the rationale behind its rules. Looking at the information on the overall elements of informed consent on the Michigan Technological University IRB website I found the first item pertained to the voluntariness of the respondents (they use the term “subject”). Considering the list as a hierarchy this would indicate that voluntariness is of paramount importance. Continuing the analysis of the webpage I discovered the same entreaty repeated again under the heading “Information”. Here it stated that the respondents were to be informed that they were free to withdraw from the research at any time. This repetition strengthened my belief in the import of voluntariness. Reading on, I found three more instances referencing the voluntary nature

of participation in the section titled “Information Required on Consent Forms”. First it restated that participation is voluntary, and that the respondent may withdraw at any time, second was a rather oblique reference to the “conditions of participation, *if any*” (italics mine), and finally that “the subjects are at liberty to withdraw at any time without prejudice or penalty”. These five mentions within two pages confirmed the priority of voluntariness, as no other term showed this amount of repetition as the Institutional Review Board explained its processes.

With that in mind, on the consent form I created a heading titled “Voluntary Participation”. For clarity and emphasis I listed under that heading only two sentences:

I understand I am free to decline to answer any questions at any time.

I understand that I am free to withdraw from this study at any time.

Notice particularly that while in the second instance I reiterated the identical language used on the IRB website, in the first I expanded the protection beyond mere withdrawal to *selective* participation. I included this to make it clear to the participants that they had ultimate control of their situation.

To end this example, I return to what seemed the second most important concern, which the respondent may not only withdraw, but that that withdrawal must not incur any “without prejudice or penalty”. This I addressed on the consent form with the following under the heading “Risks and Discomforts”:

My participation (or lack of it) will have no effect on my grade.

This statement was instantly noticed, and well appreciated by the students when they filled out the consent form.

By providing certain guarantees to the participants—freedom from harm by disclosing the purpose of the study, the right of confidentiality, the right to discontinue participation at any time, and an offer to provide them a copy of the results—I helped gain the necessary approval (number M0109) in a timely manner.

Analysis—Grounded Theory Coding

I chose grounded theory coding as a method of analysis for two primary reasons. Since our primary data was the recorded (and transcribed) interactions of the teams, and the teams with their respective clients, we had an accurate (or as accurate as recording and transcription allows) of the actual conversations. While we were able at later times to temper these with our observations, grounded theory coding provided the best potential for capturing the meanings of the participants, rather than our impressions of them. In the second place, one of the major goals of this project was to attempt to capture the real world interactions of the participants: students in entry level positions interacting with clients. Too many case studies present situations far removed from what graduating students are likely to encounter, and the grounded theory method allowed us to stay close—and true—to the actual interactions by preserving their original language.

However, the ultimate goal of grounded theory is theory building; for the Speaking of Software project itself that was not our goal. Rather, our short term goal was merely to present a descriptive story, and identify some themes that can be presented to future students to aid their inquiry into “what is going on” in the various situations. That is, our aim was to provide cases for undergraduate students to study, discuss, and from which they can draw their own conclusions (construct their own theories) (145).

Strauss and Corbin (1998) present their grounded theory method (a refinement of earlier work by Glaser in 1978, and Glaser and Strauss in 1967) as a way to make sense of data and interpret it theoretically while staying close to the data. It allows the researcher to strive for reliability and validity while accounting for bias (x). In their objectivist stance the method features a strong stress on the means of analysis (8) which provides some standardization and rigor to qualitative research (13).

Grounded theory generally admits no pre-conceived ideas to the analysis of the data. That is, the analysis should always start from scratch. It derives theory from the data, which is “systematically gathered and analyzed; data collection, analysis, and eventually theory stand in close relationship to one another (12). Although a somewhat idealistic aim, their method seems a good fit for beginning ethnographers (as they claim), especially those coming from a scientific/engineering background. It is a way to get started in qualitative analysis by applying a pre-given set of tools.

Strauss and Corbin define three modes of the process: description—words chosen to convey a mental image (like metaphors); conceptual ordering—organizing data according to properties and dimension; and theory—well-developed concepts related to each other; a framework to explain or predict (15).

Their method of coding starts with “microanalysis”, a detailed, line-by-line (or word-by-word) “deconstruction” of the data (descriptions found in the transcript) to generate initial categories (researcher supplied descriptions) (57). This focuses the researcher on inherent meaning, and on details. It teaches the researcher to recognize “how much is packed into small bits of data” (65). It is here that the method is perhaps most useful to the beginner; and potentially moves him or her away from a merely “surface” read of the data. (An experienced researcher might scan the transcript for interesting bits (70)).

The next stage of their method (although in practice *all* stages are concurrent) they call open coding. The aim is to identify concepts that will later be used to develop theory. Starting with phenomena—central ideas of “what is going on here”—they are labeled as concepts using terms that are often taken from the words of the respondents themselves (in vivo codes) (105). These are then grouped into categories with explanatory and predictive potential (113). In my work with the Speaking of Software project, one category we identified was labeled “access” and referred to the students difficulties in working with the departmental computers. One property or characteristic of access was the interactions with the system administrator, and this varied along the dimension of how accommodating he was in the given instance. Examining this category over time,

and looking at in comparison with the category “progress” (axial coding) we begin to see a certain explanatory power—why the project occasionally fell behind schedule and a certain predictive power as well—that a future interaction would likely follow the pattern of the past if no remediation was attempted.

We followed the same project for two semesters and, in terms of the *first* semester, reached theoretical saturation (143). The data from the second semester suggested some new areas of inquiry, and those areas are different from those uncovered in the first. With that in mind, we moved to selective coding—integrating and refining the theory (143). We looked for what might be the central category, and tried to relate all the others to it (147).

Charmaz (2002) proposes that contrary to the objectivist stance of Corbin and Strauss (and Glazer before them) where “the meaning inheres in the data and the grounded theorist discovers it,” a constructivist approach “sees both the data and analysis as created from shared experiences” of the researcher and the participants (677). The method provides some tools, but it does not guarantee knowing.

She suggests that during coding, the constructivist approach “encourages the researcher to be reflexive” about his or her preconceptions (683). In coding the data from the Speaking of Software project, one interest I brought in is defined by the goal of the grant, namely to inquire into the conversational interactions of the participants with the aim of enlightening future students on how things might work in the real world, and provide

some tools to empower them when they face similar situations. Exposing the undergraduates to the difficulties of communication in the workplace, and having them respond through analysis and recommendation, our case studies “promote actions that eliminate problems, by studying oppressed and/or powerless populations and giving them voice” (35). This is critical interventionist research as Rubin and Rubin (citing Thomas, 1995) describe it. In that sense our project can also be considered what Charmaz (2005) calls “social justice research” in that we are committed to changing practices (512).

Access, the category discussed above, demonstrates the viability of Charmaz’ social justice emphasis. As described, the question of who controls the resource is an important one, and one that was never resolved (513). This dilemma shows an ongoing interplay between categories, with “leadership”, “task division”, “negotiation”, and “progress” all playing roles. In a post-project interview with one participant, he agreed with my analysis. He had been on an internship, and also seconded the “irresolvability” of the dilemma, due to the conflicting yet very valid needs of the parties involved.

Further, to insure reliability and avoid bias, she suggests asking a colleague or participant to code the data and compare the results (519). I trained Jon (the undergraduate assistant on the project) to do this. I allowed him to view my codebook, and initially he was in agreement with the descriptions I provided. He went back and reviewed the data itself to look for further examples, and developed additional categories as he saw fit and, most importantly, found negative examples in his fieldnotes that were not obvious in the transcripts I was examining.

While, as Coffey and Atkinson (1996) point out, even “Glaser (1992) accuses Strauss of [making]...grounded theory into [an] unduly prescriptive recipe for analysis” (48). Their contention that it avoids a summary approach where the data are just reduced to categories (49) is especially useful in training new researchers who, (at Michigan Technological University at least) are prone to do just that. In addition, a grounded theory approach, in my opinion, encourages reflection on—and more importantly documentation in the form of memos—their reasons for making the choices they did. As a somewhat seasoned researcher, this kind of information is crucial to evaluating the newer researcher’s progress in learning qualitative methods, and in assisting their efforts to do so.

Writing It Up

Emerson, Fretz and Shaw (1995) provide illustrative examples of how to turn fieldnotes into a finished ethnography. As stated earlier, our goal was to construct case studies, not full ethnographies. With that said, it is important to remember that one of our primary goals was to capture, and eventually present, those cases in as rich and realistic manner as possible. To achieve that goal, we drew heavily on the methods for creating ethnographies, to maintain that “you are there” feeling.

Emerson et al. suggest the use of excerpts (thematic to begin with, then “evocative and persuasive” statements and situations added in as necessary (175)) to develop a story line, and a commentary to link them together (174). They compare the differences between

“integrative” style, where the excerpts are included in the story, and the “excerpt” style that typically uses block quotes, and leaves the vignettes somewhat separate from the text (179).

Recommending the introduction as a way to orient the audience to the text (and vice versa), the authors suggest including links to other scholarship (197). This serves to establish a theoretical frame for the ethnography (200). Also in the introduction the reader should find information regarding the setting of the ethnography (where, and with whom the fieldwork was done) (198), as well as a discussion of the specific method (how it was accomplished) (201). The conclusion, then, should summarize the ethnography and restate what was found; it should complete the world picture as outlined in the ethnography, and interpreted by the ethnographer, a “metacommentary” (205).

For the body of the report, they rely on the methods that Van Maanen presents in *Tales of the Field*. For Van Maanen, realist tales are “by far the most prominent, familiar, prevalent, and recognized form of ethnographic writing [which] push most firmly for the authenticity of the cultural representations conveyed by the text” (45). This is the style used to present the Speaking of Software case studies. They typically follow four conventions. Experiential author(ity), where the author is absent and as an “impersonalized conduit” (47) presents only a descriptive narrative of what members “say, do, and presumably think” in the institutional voice of credentialed scholars (46). It’s typical form is a “documentary style focused on minute, but mundane details of everyday life” (48). Those details are not random, but accumulate to make some

important point (usually structural); they “suggest intimacy and establish presence” and “draw in the audience” (49). It attempts to present the natives point of view as brought out by quotes (49), but must also include what they make of it (50). Still, the ethnographer has “final word” on depiction (Malinowski style) (51).

The discussion offered here falls somewhat into what Van Maanen calls confessional tales, as it is an attempt to “unmask fieldwork” (91) and bring it into a more “philosophical, artistic, phenomenological, or political craft” (92). Distinguished by its “highly personalized style and self-absorbed mandates” (73), it is a “response to...realist conventions that have proved embarrassing” (74). Notice that it follows Van Maanen’s three conventions, including a personalized author(ity) that speaks in terms of “I saw” instead of “He did” (75), displays more of the fieldworker’s qualities and point of view, and (hopefully) convinces readers it is real (79) by its very naturalness.

Goodall (2000), in “Ethics of Writing Ethnography” provides an interesting take on the question: “who owns the rights to this story?” (6). Although there is a long discussion of plagiarism and citation format, the upshot seems to be to highlight that we credit other scholars, but not the “other” we study (4). This brings out issues of authorship: Whose voice is it? Publishers/reviewers may not like collaborative (studier/studied) work; and then there is the problem of which voice gets picked from all you hear? When original comments were included (especially in the material from the second semester, where we made substantial use of recordings), we considered the risks to the subject, both in his community and in ours. There may be legal—not to mention physical—ramifications to

being an “informant”. We were aware of them in the field, made every attempt to conceal identities in the final case studies, always opting for the path of least harm (8).

Methods Summary

For the Speaking of Software project we wished to inquire into the communication practices of computer science students as they worked with clients on their Senior Design Projects, with the goal of improving the student/client communications. Unfortunately for the students we observed, they were not directly the beneficiaries of our work. Instead, we developed case studies to present to sophomores in the program; *they* would have the chance to better themselves. To this end, we adopted as much of a fly-on-the-wall, independent observer status as possible. A secondary reason for this method was the end goal of the project, to see if we could produce the cases without an observer present by having the students record their interactions themselves. We also conducted “exit interviews” with the students we followed, with the aim of gaining validity by presenting them with some findings and getting their opinions of them. This also served to provide some measure of critical intervention, as we “enlightened” the students at that time to our interpretations of what we thought of the interactions (and how certain situations might have been handled differently) based on early analysis of the data, as well as our greater life experience. Some may argue that more intervention earlier in the project might have been better, but we were constrained by the established scope of the project, which was to let the students work things out for themselves.

As an intermediary step we brought in an untrained undergraduate research assistant from the computer science department to do some of the observing. Initially, I advised him not

to become involved but just to record the meetings, using a digital recorder and taking split-page notes. Due to the objections of the client this proved unworkable, so we modified his position to more of a participant, while trying to minimize his contributions to areas concerning communication, and comment only on the software aspects. As the project progressed, I trained him on grounded theory coding, and had him do some of his own as well as check mine for accuracy.

In the following chapter I will explain how I adapted the foregoing methods, and used them for our more pragmatic ends, providing a condensed “road map” for anyone who might want to construct their own case study.

Chapter Five: Project Specific Methods

In this chapter I turn from the more theoretical aspects of qualitative research, and detail the actual methods employed in developing the Seabase case study. The purpose here is to explain the reasoning behind the choices that were made, focusing on those that were necessary due to the time frame available. A second purpose of this chapter is to provide a succinct “how-to” guide for those educators who may wish to develop their own case studies tailored for the requirements of their classrooms and institutions².

Developing the Case Studies: Applied Ethnography

To develop our case studies, we applied proven ethnographic methods to capture and present views of real software development settings, making them available for future study. Using a qualitative case study approach we sought to focus particularly on the “important aspects or variables” of individuals working in small groups (Lauer and Asher 1988). From those identifications, we developed case studies to be explored and analyzed by other students. Our goal was to simulate the workplace situations students will need to be able to cope with as they pursue careers in technical communication, computer science or other fields out in the real world.

Collecting Data

Any development process produces a massive amount of data, and the Seabase Project was no exception. The SE Senior Design students generated various versions of the code

² The material in this section includes previously published selections from “Making and Acting: Ethnographic Development of a Case Study Approach. This first appeared in *Technical Communication* in 2008 and was reprinted in *Qualitative Research in Technical Communication* in 2011

itself, along with meeting minutes, email, internal documentation and weekly progress and final summary reports for their clients. The SE students also reflected daily on their efforts and consolidated that information and their documented code into one-page progress reports submitted to the Senior Design instructor. Accessing this material was the first step of our case development. On the Senior Design Projects, *ad hoc* email lists were the method of choice for the project teams to communicate among themselves and with others. By the simple measure of being included on these lists, our research team of graduate students and faculty was able to view, and more importantly save, this original material. The Senior Design instructor, client and SE students themselves provided additional material.

Seabase, the first case study developed, was primarily archival in nature. Observing standard qualitative research practice (Lauer and Asher 1988; Kirsch and Sullivan 1992; Agar 1996) graduate students from the computer science department and the Rhetoric and Technical Communication program in the humanities department collected the written material from the Senior Design students and attended and recorded selected meetings. This case contains over one hundred pages of text, approximately one-half hour of audio excerpted from the meetings, and six video files.

For subsequent cases, the graduate students were present at the majority of the students' meetings, including meetings with clients, acting as participant observers. The graduate students recorded the conversations with digital audio equipment, diagramed the rooms (including how people moved about and where they positioned themselves in relation to

both the room and each other), and wrote field notes. These field notes included fine details of the interactions that might not be apparent on the audio recordings to aid the researchers in their later recall, reconstruction, and analysis of the situations (Emerson et al. 1995) Further, the field notes attempted to capture and explain what the researcher thought of key events and incidents, and noted the non-verbal reactions of all participants. Key events and incidents included major changes in the direction of the project, sometimes due to unexpected changes in the client's requirements, and sometimes due to factors outside the stakeholders' control. Incorporating these descriptions of the setting and details of the action (both visual and oral) captured the ambiance of the encounters and brought life to the cases, providing future users of the cases with that "you are there" feeling.

However, we felt it unnecessary to construct Emerson et al.'s concept of full fieldnote tales. Instead, we adapted their concept. We arranged the raw fieldnotes into what we considered a chronological account before progressing to the write-up. This worked well because our data was already episodic in that the students often set their milestones by week, and we were compiling it in the same way, creating what would become self-sufficient modules as we went. Additionally, many of our "reflections, clarifications, expansions and illuminations" were done over the weekends, when the students typically did not meet, allowing for a timely recapitulation of the weeks activities. Also, our period of data gathering was relatively short term, covering only a little more than a fourteen week semester. Given the short time span and the already mentioned episodic nature of the data, we felt we had little need for the type of memory aid full fieldnote tales

represent. Even with that limited period of observation it seemed to us that we amassed a huge volume of data. Across the two semesters we followed the project, we collected over one thousand pages of notes and student-developed documentation, close to twenty-five hours of audio recordings, and fourteen video files, some with animation. Of course, this could in no way be compared to the volume that accrues in a much longer project, where more rigorous recordkeeping and interim explanation/interpretation would be necessary as an aid to recollection when the study was finally written up. Finally, we were again constrained by the nature of the funding of the project, which limited the amount of time the graduate students could spend working on it. In other words, this was not a full-time job, even if it approached that status at times.

These later cases tend to be richer than the first in that they make much more use of audio recordings. One in particular contains over five hours of audio excerpts, in addition to one hundred and forty eight pages of text and fourteen video files, some with animation. (Note that these figures represent primarily the contribution of the Senior Design teams. The amounts do not include the original code they were furnished, which itself totals more than one hundred and forty pages of single-spaced text.)

As the projects wound down, the graduate students conducted semi-structured interviews with the Senior Design students and their clients. These interviews helped to triangulate results and interpretations, to support early findings and “earn the confidence of the reader that the researchers have ‘gotten it right’” (S.N. Hesse-Biber and Leavy 2005b).

We have on file signed and IRB approved informed consent forms from all participants covering the observations, interviews, and any subsequent use of the material collected.

Constructing the Cases

The first step to construct the case studies was to arrange the entire corpus of original material into a chronological summary account, including hyperlinks to the original documents. The graduate students then parsed it into modules, with each module covering (usually) one week of the semester. To assist the students in identifying and examining the issues presented in the cases, we also prepared a set of questions for each module designed to provoke inquiry into the events. As an instructional aid, we developed some password-protected background material for the instructor giving an “insider view” of the situations, where the SE project teams were headed, and suggestions for classroom use.

For ease of use by both instructors and students, we also created a thematic version. Rather than moving chronologically through the account, we identified some themes that allow the users to focus on certain aspects of the case, potentially reducing the time commitment considerably. The entire case is still available, but the themes provide pre-selected entry points that can be followed independently of the case as a whole, if desired.

These versions were prepared using the grounded theory method of Strauss and Corbin. Reading through the chronological account, the graduate students started with a detailed,

line-by-line analysis, moving between the chronological account and the descriptions available in the transcripts. This analysis generated initial categories, focused around inherent meaning and details, and identified central issues. These were labeled as emergent themes, using the original terms used by the students whenever possible.

For example, one theme was related to the difficulty the Senior Design team working on the Seabase Project experienced when required to learn and work with an unfamiliar engineering-specific programming language, Matlab. The various occasions when the students had problems were then abstracted from the case and listed separately in chronological order, using the heading “MATLAB”. Other problem areas were also identified and grouped under their own thematic headings.

By looking across themes, and comparing the content of interactions and when they occurred, an analysis can begin to demonstrate some explanatory and predictive power. For example, on occasion questions that arose in the MATLAB theme (when the students were working on their own) were not satisfactorily answered in the “client interactions” theme (when they received no clear direction from the client, who was quite familiar with the Matlab program). This frustrated the SE students and impeded their progress on the project. These observations help explain why the project could not stay on schedule. This method of comparing across themes also provides some predictive power. It is likely that any future interactions between the students and their client would be a repetition of those of the past if no new approaches were tried.

Another category arose during grounded theory coding also relates to the frustration of the SE students in an unexpected way. This category concerned occasions when the students were stymied in their effort to produce something, a power point presentation in one instance, for example. When this occurred, the SE team lost not only the ability to produce, but the capacity as well. That is, not only did they fail to produce the presentation (in that example), but they lost the capacity to deal with the situation. Instead of dealing with the problem, perhaps by planning a new approach, their reaction more likely was to throw up their hands in defeat and put off further action. This category did not make it into the cases as presented, as it was too far removed from our central goal of looking at communication practices. However, it does support my overarching contention that the value of making (*poiesis*) is often overlooked as a necessary element of production. That being said, I will offer an extended discussion of this category in my poietical conclusion.

Presenting the Cases

We chose to present our cases in the “realist tale” style because this is “by far the most prominent, familiar, prevalent, and recognized form of ethnographic writing” (Van Maanen 1988). Those familiar with documentaries will recognize how this style can expose the mundane, but nonetheless important, details of a situation. Like any documentary, these details gather to make a point about life. Beyond that, the details can inspire a sense of intimacy in the user; they feel they are in the presence of the participants, a part of the action, involved. To this end we use quotations, recordings, and the student’s own documentation and reflections to authentically represent the

participants' point of view. We consulted with the participants for input on the accuracy of those representations to insure we remained true to their impressions of the process of dealing with stakeholders, tempered by our analysis and pedagogical goals.

Bowing to the exigencies of the modern world and modern student, we have moved beyond the typical, paper-based presentation. Our case studies combine text, audio and video material into multimedia packages, where students in a Software Engineering or Technical Communication course can read text, hear audio clips or watch animations. The "Seabase" case, for example, is comprised of 14 modules, each of which correspond to roughly one week of the semester. Each module contains a narrative detailing what happened that week in which links to original documents that the team produced and audio files are embedded. By embedding hypertext links to the original documents and recordings rather than including them in an unwieldy appendix, this electronic format enhances usability, accessibility and portability. In addition, it adds to the reality of the case. For example, excerpts from an email might be included in the module, but the document that came with it as an attachment is left as a separate file. To access the information the student must open that attachment, as did participants with the original email. Requiring this action expands the reader's role from passive observer to active participant, raising interest in the case by making it seem more real.

Our cases preserve the plain language used by the students and retain specific references to people, programs and equipment. Using the vocabulary of the application domain (mechanical engineering, in this instance) imparts contextual information with which the

SE students struggled, but that subsequent users might find insignificant. Encouraging this kind of constructive questioning of even something usually seen as transparent and mundane, such as language, elicits important details that might be otherwise missed (Sutcliffe 2003).

To simulate the problems of dealing with the issues of real clients, we designed the presentation of the material so that information concerning project requirements is imparted in stages, much as often occurs in the real world (this presentation is described in more detail below). In some cases, we present examples of communication failure, helping students reflect on what went wrong and develop alternatives they might pursue to avoid these difficulties themselves (Gale 1993).

Next, I will address the value and implications of using the case studies in a technical communication classroom, and how they can be used to teach phonetically.

Chapter Six: Pedagogy Conclusion

In this chapter I conclude the discussion of pedagogical concerns. First I present a summary describing the value of the use of case studies in the classroom. I follow that by considering some of the implications of that use, and end with my recommendation for teaching phronetically.

Value of Case Studies

Instructors are frequently caught in a pedagogical bind. Similar to the practices of the early years of technical communication instruction, using a “forms” approach—what I have equated to an impoverished *techné*—is relatively straightforward: craft the assignment to meet certain goals, have the students do it, and compare the result against those goals. But what is missing from this approach, as so many have recognized, is the rough and tumble, kairotic atmosphere of the workplace. That is where the phronetic approach comes into its own: working well with others is highly valued, creatively responding to the situation more important than blind adherence to rules. But as I have argued earlier, there are difficulties with directly teaching *phronesis*. In this section I discuss the strengths and limitations of some methods that have been used to bridge the divide between *techné* and *phronesis*, and argue for the value of a case study approach.

Spinuzzi (2004) and Blakeslee (2001) have both written about workplace collaborations, or client-based projects. For Spinuzzi the importance is to share and reflect on the experience in the classroom. Blakeslee finds that feedback is critical, but that the quality and usefulness of such feedback varies widely. Using the case study I developed, I provide examples of sometimes less-than-clear feedback in client-based projects.

Unfortunately, there is often neither time for nor availability of real workplace positions that can accommodate all students. Even if we place them in internships or co-ops, often this occurs relatively late in their college experience. At that stage, they may find three or four years of work in their major did not adequately prepare them. They may become frustrated, disillusioned, or worse—discover that the career path they have been pursuing is not really “for them”. It is far better to expose the students to the ethical dilemmas and political realities they may face early; in an introductory course. It is there we must simulate that experience, for it is through experience that students learn. Further, using the same source materials, I demonstrate the value of simulating the ambiguity and goal-driven nature of the workplace, while at the same time recognizing the need to respond “teacherly” manner, and ask the students to make their learning explicit through memos and reports.

Freedman, Adam and Smart (1994) have noted that students report that the simulations they find in many case studies are “artificial.” I wholeheartedly agree with Thomas’ (1995) opinion that some of that feeling may come from the unrealistic expectations we place on the students by asking them to play roles too far from their existing or imminent

experience. We can hold their interest and ease their transition to the workplace if we have them adopt “entry level” roles as they work through the case studies. I have enlivened the case studies I developed by soliciting comments from the people using them, instructor and student alike. As an indicator of success, one reader of a case I developed for SE told me “he couldn’t put it down; it read like a novel”. Incorporating literary techniques (such as those recommended by Aristotle in the *Poetics*) improved the cases, which then improved their acceptance by the students. Providing overwhelming detail in a well-told story based on real experiences reduced artificiality, and allowed students to respond in a manner consistent with their existing expertise.

Another option exists to simulate workplace experience: student-generated projects. Here we must also develop projects that are not superficial, and treat them like they matter. One way to do this is to let the students choose their own projects, ones that matter to them. It is more difficult than teaching from a “canned” case, one where we know all the facts, and most of the “right” answers in advance. The ambiguity involved (and, at times, the intentional ambiguity of our responses) can provide a taste of real world experience. The students wrestle with ethical issues at the same time as they develop a product.

The cookbook approach works well enough to begin with, but at some point the students must be creative enough to supply their own solutions, and we as instructors must support those solutions (within the protected confines of the institution, at least). At other times, we must play the role of the boss, and point out deficiencies—cold-heartedly. For this is something they will encounter in the workplace too: pragmatism at its finest. The

instructor must become a technite of education. She must know when to support the students in phronetic manner by letting them make mistakes and learn from those experiences, and when to guide more explicitly in the manner of a master of the craft teaching an apprentice.

Freedman (1993) asked “is explicit teaching possible?” and answered that, except for certain individuals, in certain circumstances, it is not. Like Sullivan (2004), I think some explicit teaching is not only possible, but necessary; otherwise we commit the students to reinventing the wheel each time we enter a classroom. However, there needs to be a balance between teaching explicitly and learning through experience. In some cases it is better to front-load the knowledge, and then allow the students to use it, as we might explicitly deliver “the rules” of production under a *techné*-based pedagogy. I have found this approach works well with straightforward assignments like progress reports. The students must report certain things—are they on schedule, what have they accomplished in the reporting period, what difficulties need to be resolved. In other situations, a style based on a phronetic approach is more successful: we wait for the students to “discover” the proper course of action themselves through experience, and only later supply them with the knowledge to use. I am reminded of a scene from the movie “The Eiger Sanction.” Clint Eastwood and Arthur Kennedy are climbing a sheer rock wall, with Eastwood in the lead. He turns back to Kennedy and asks “is this the right way?” Kennedy responds “Well, it’s one way, I guess.” The point is that Eastwood must learn from his own experience, and the route he chooses may ultimately be better than the one Kennedy might know.

To say that something works for certain students in certain circumstances is not enough. We also need to find out what works, for who, and why if we want to advance our pedagogy. One way we discovered this was to ask the students themselves.

Case studies can be developed based on the experiences of the students themselves. Too often, the canned cases used in the classroom are based on the experience of the instructor, often gained from his/her work in industry, or as a consultant. As valuable as these cases may be, the role of a consultant is not usually an entry-level one, nor is that of bank director or department head. Yet these are the scenarios into which the students are asked to place themselves, the roles they are asked to adopt. It seems to be better to develop the cases based on entry level work, the kind of challenges the students might face in the first job. We have had some success in generating cases based on the actual difficulties students face in their Senior Design Projects, which they have reported to be consistent with their real-world experience on internships. A further advantage is that the use of a Senior Design Project allows for exposure to the ethical dilemmas and workplace cultures they face, while following a production based project.

In either situation we must ask students to reflect, and bring their knowledge to discursive consciousness. We can do this within a grading rubric to judge their learning. But then, allowing them to revise the assignment and improve their grade inspires reflection on the shortcomings of the original. Bringing knowledge to discursive awareness through reflection reinforces the students learning as well: they become

technites, capable of teaching it to others. And when they can do that, they will have acquired the craft, the *techné* of what they do. And that craft will become, as Brady (2007) found, their guide “as they investigate knowledge that changes from one social context to another, one community to another, one practice to another” (16), a guide that will allow them to better cope with the workplace.

Implications

The examples provided of our experience using the Seabase case in a technical communication classroom show that the students have learned valuable lessons about communication and about working on interdisciplinary teams. One lesson concerns the importance of valuing the skills of others; that is, team members must come to appreciate other member’s capacity to make. The technical communication students learned this the hard way when they saw their own skills were frequently underappreciated, reflecting an intra-team conflict Myers and Larson (2005) suggest is rooted in relations of power. In evaluating the situation, one technical communication student explained her frustration working on a multidisciplinary team analyzing the Seabase project. “I did not like how my team functioned. Skills possessed by some were overlooked or not valued. The function of my team was to ‘please the instructor’ and not to do a good job working on the assignment.” This kind of conflict between engineering and technical writing students is all too common, and possibly rooted in the positivistic attitudes carried over from the industrial revolution. But regardless of its roots, it remains something we should prepare our students to encounter.

Another valuable lesson exemplifies the possibility of the Isocratean ideal of learning to act well with others through imitation. In a case still under development, the Senior Design Project team needed root access to the departmental computers, something the system administrators were unwilling to grant. Though the situation was frustrating to his team, one member drew on his workplace experience in explaining the inherent difficulties of acting in the interests of “the good” that are sometimes conflicting, depending on from which side of the situation the good is seen:

“They want to keep the machines [computers] secure, and that’s reasonable. That’s actually what I do in my coop internship position, I’m an information security intern, and we handle thousands of requests each month asking for access.”

He was able to appreciate the dilemma from both sides, and demonstrated an insightful understanding of the workplace, and the situation-bound nature of acting in it. He was also able to communicate that understanding not only to his team but, through the case study, to future students. The advantage of ethnographically developed case studies like ours is that they capture the realities of those situations, and present them to students as compelling examples of real dilemmas, simulations they can learn from through imitation, analysis and reflection.

Like Brady (2007), we believe that these lessons are taken from the classroom and applied when students get “on the job.” We believe this is facilitated by the reality of our cases, made possible through the method we used to develop them. By relying on the

tested procedures of ethnography, we have faithfully recorded and reported the real experiences of real students working with real clients. Students particularly appreciated the inclusion of the actual documents as created by the SE team, and the conversations that surrounded their creation. Too often, the material in case studies is reduced to a minimum, rendering it sterile and incomplete. By employing ethnographic methods, our cases overcome this problem.

The students in our technical communication courses became aware of how documentation can contribute significantly to a project's success or failure. In the Seabase project, the inclusion of the actual emails, minutes, reports and so forth created by the SE team allowed the students to experience first-hand the repercussions of lacking both knowledge of and experience in applying principles of audience, purpose and context.

The challenge of working with people from other disciplines is common. Management, designers, engineers, production, sales and technical communication personnel must be able to reach consensus if the goals of the company or client are to be achieved.

Simulating the experience of real situations, and encouraging reflection on and discussion of those situations, helps prepare students majoring in technical communication for those challenges, and deepens the appreciation of the value of communication skills for those students who major in other fields. For a student graduating with a degree in scientific, professional, and/or technical communication, this experience is crucial as they join the workforce and become practitioners.

Recommendations

As Brady (2007) points out in “What We Teach and What They Use: Faculty Teaching and Students Learning in STC Programs and Beyond”, “students learn what we teach, both practically and theoretically...[they] take it with them to the workplace, apply it, and improve their understanding of it with repeated use” (1). This mirrors the Isocratean approach of Miller. Brady’s study of the composing strategies of eight students shows that what we do as instructors has lasting effects, that when we “‘synthesize genre knowledge with social knowledge to create situated pedagogy’ (Johnson, “User Centered” 164) in our classrooms” (25) the students do, in fact, learn something.

Teaching technical communications is often seen as an impoverished *techné*: pragmatic skills delivered through mentoring or apprenticeship. There is a need, as Blakeslee points out, to “transmit knowledge and authority to beginners”. But our production-based methods can allow us to *at the same time* achieve a purpose “above and beyond the initiation of newcomers” that Freedman and Adam note, achieving the collaborative and humanistic goals Miller recommends. We do want to take Spinuzzi’s advice and “prepare minds so that they will be better able to cope in the workplace”, yet at the same time follow the advice of Sullivan and Rutter and help our students avoid becoming slaves to it. With Blakeslee, we want to stimulate the creativity that can be deadened by a cookbook approach, yet recognize that not all students can enjoy the benefits of actual workplace collaboration.

Teaching phronetically, understood as facilitating the students learning through experience, has the potential to move us beyond an emphasis on a theoretical, facts-based approach, and beyond a skills/technique method that has been characterized as “cookbook” or an impoverished *techné*. Thinking of *phronesis* in this way suggests a way to if not resolve, at least sidestep the Aristotelian dilemma that *phronesis* can not be taught. Placing the burden of becoming phronemoi on the students differs little from current practice; we already understand that their learning is, in large measure, up to them.

A further recommendation addresses the clients. I have seen first-hand the varieties of their approach, and suggest that we should be providing those who so generously volunteer to work with our students with some guidance; perhaps an instruction manual for being a client. While it is not necessary to make clients into teachers—indeed that would in some ways lessen their value as clients qua clients—as instructors we also carry the responsibility to see to it that our students receive the best experience possible. The difficulty in removing the ambiguity from our simulated workplace is balancing that action against the gains students might achieve with more explicit responses.

Chapter Seven: Poietical Conclusion

Rutter (2004) has suggested that experience/*phronesis* is the “ordering agent” in our lives. Aristotle suggests that politics is the master art (NE 1094a 28), with *phronesis* playing a “controlling part” (NE 1141b 24). But Aristotle, like Arendt (1958) many years later, admits that physical needs must be fulfilled before we have time (and energy) for those loftier pursuits. These needs are filled by workers through their capability to produce, whether rich or impoverished.

Techné then appears more likely to be the ordering agent, the one whose actions provides first for our physical needs, freeing us to contemplate and determine what might be considered the good life. Put differently, and perhaps somewhat harshly, modern interpretations have reduced *techné*, and its activity *poiesis*, to mere technology. This can be interpreted as elitist attempts to maintain power over the other; e.g. the owners and supervisors can reduce to mere assembly-line technique the work of those whose actions can be conveniently construed as having no end outside itself. A rich notion of *techné* must reject this impoverished view where production is only for the purpose of maintaining the lifestyles of certain segments of society at the expense of those who labor. A rich notion of *techné* must see the technite as attending to both the work at hand, as well as its eventual use in the world. John Wild (1941) is a primary source on Plato’s concept of *techné*, which he positions as production. Importantly, he also defines *techné* as the art with the ability to “give a rational account of itself, explaining *why* it does what it is doing” (256). Giddens (1979) terms this ability to explain as discursively available. Protagoras and Isocrates, as described by Sipiora (1995) and Atwill and Lauer (1995),

avored what was called *logon techné*, an approach more grounded in imitation and civic action than Plato's. Aristotle provides a description of both *techné* and *phronesis* in the *Nicomachean Ethics* that may be responsible for the split between the two (making is not doing, nor is doing making). I returned to the original sources to explore the roots of the split between *techné* and *phronesis*, a divide that continues to exist today.

Over the years since Aristotle this distinction between these two ways of coming to truth has become a binary: either something is *techné* or it is *phronesis* (leaving aside for the moment the other three of the ways Aristotle says we can come to truth). Usually these commentators tend to favor one side of the binary over the other, just as I suggest Aristotle does. Authors frequently do this because they see one side as more representative of the way they see the world: it has more explanatory potential, it seems a better fit, or it is just more useful.

I am no different: I tend to favor *techné* as a way of being-in-the-world over *phronesis*. My personal valorization of *techné* over *phronesis* arises in large part from my background. Prior to my entry into the academy—or perhaps more of a reentry after a twenty-five year absence—I worked as a mechanic and manager of various automotive repair facilities.

I believe my experience reflects one of the most valuable parts of McCarthy and Wright's (2005) proposal—the importance of “felt life.” As they put it:

“In order to do justice to the wide range of influences that technology has on our lives, we should try to interpret the relationship between people and technology in terms of the felt life and the felt or emotional quality of action and interaction” (12).

Three pages later they state that “it is difficult to develop an account of felt experience with technology.” I see injecting my experience as one way to fulfill the objectives McCarthy and Wright seek as they try to bring “user experience” to the art of making, and to show important differences between Freeman’s practical wisdom and mere knowledge. Applying Aristotle’s dictum of “Each man judges well the things he knows,” my intention is to search for the experiential *in* the experiential: to go “to the thing itself” in real life—noting, as I say them, the inherent difficulties of both object and the ground of that search.

To buttress my experience, and give some common ground, I draw on Douglass Harper’s (1987) *Working Knowledge*. In it, he has presented in a relatively accurate ethnographic picture of Willie, a man with whom I share the trade of mechanic. Though Willie’s situation is less formal than mine was, I believe Harper has caught the mix of *techné* and *phronesis*; of skill and experience that I seek to investigate. Drawing on Willie’s experience and my own will, I believe, allows readers to first gain a deeper understanding of *techné* than can come from a strictly hermeneutic approach, and secondly to come to an appreciation of the tie it has to *phronesis* through the common element of experience. In addition experience, far from being absent in *techné*, is as crucial to *techné* as it is to *phronesis*, but usually undertheorized.

An Experiential Accounting

This is the world I know, where the social is mediated partly by tools. I consider an auto repair shop a social order, or at least a community, and there are tools used with others and belonging to others, as Mitcham suggests. Learning the ethics surrounding those tools is part *techné*, and part *phronesis*.

There are “shop tools” with one set of responsibilities, and “personal tools” with another. In both cases a new employee is taught the rules of use, “teachable” implying *techné*. “Don’t abuse them” is one rule, “put them back when you are done” is another. In Harper’s *Working Knowledge* the situation with the wheel puller exemplifies the *techné* involved “This wheel puller is strong...but you have to hit it in the right place. If you hit it [wrong], a person can *very* easily mess this up”. And Willie recognizes that Harper’s wife has that *techné*: “she has that knowledge—a kind of mechanical knowledge that comes to her when she is doing things like that. An average person you don’t hand a tool like that” (29). In my shop we had an “average” person (a mechanic with years of experience), but he lacked that *techné*. The tool, a ball joint press, used the same principle as the wheel puller, a screw to exert pressure. You could hit it, but hit it wrong and the tool was ruined. This guy ruined three of them at last count; no *techné* there.

Phronesis comes in with the care of the tool, and a view to the good of the shop. A *phronomoi* would tell the boss the tool was ruined, so it could be replaced. As it was, when another member of the community went to use the tool, he would find it unusable,

and the shop would suffer on many levels. This aspect goes beyond the mere technique, (which he apparently never learned); beyond the mere care of the tool to care for the community. This aspect is learned; I don't think it can be taught (though with this guy we tried). You learn it when you go to use the tool, it's broken, and you come to feel how the actions of another have affected you. This attitude, this ethic, can be seen, and Willie knows it when he sees it: "Not everyone shares the use of the shop and the tools. If you are willing to learn, and Willie has sensed that you will handle the tools properly, you are invited to use them" (29).

A different level of care surrounds the use of personal tools. Here, if the tool is damaged, the responsibility is to *replace*, not just *report*. This is what happened when Willie borrowed the backhoe. When it broke "there was no question about fixing it—if you borrowed something and it broke while you had it, you fixed it whether it was your fault or not" (188). Violating this ethic has social consequences, ranging from the "don't ask to borrow" signs posted on many toolboxes (and often supplied by Snap-On, a major tool manufacturer), to the "decidedly aloof and distant" attitude Willie showed the owner of the backhoe, who didn't understand the ethic of "borrowing". Willie acted phronetically, and ensured the good of the community by applying his *techné* and fixing the backhoe; the owner did not act within those bounds and was, for a time, excluded from the community. (It is this same exclusion that was felt by Freeman's interviewees, which they tried to ameliorate through simulating the experience of their parents.) When Mitcham reduces all to the logical and rational he, like the owner of the backhoe, is

missing an important part of the world: the experience that informs both *techné* and *phronesis*.

Towards a Techné of Phronesis

Like the “felt experience” of Freeman’s respondents, these simulations of experience can increase knowledge (*episteme*) along with practical wisdom. A picture of Omaha Beach—or even a movie—is not the same experience as standing there; and being there today is not the same experience as being there on June 6th, 1944. Each experience carries with it its own knowledge as well, admittedly with some overlap. Practical wisdom comes best through “real” experience, as Samuel Taylor says: judgment is forced upon us by experience. But Taylor does not comment on the quality of judgment, and for Aristotle phronetic judgment can only be good. How then to resolve Will Rogers’ more pragmatic “good judgment comes from experience, and a lot of that from bad judgment”?

Simulating experience then would seem to be more *techné* than *phronesis*, since *techné* can be deployed for either good (as it should be) or bad (in Aristotle’s example, the teacher allows the pupil to follow a wrong course in order to better learn the right one). But we cannot always have real experience: sometimes it is too costly, too time-consuming, or too dangerous. Do we want to allow bad *techné* when lives are at stake? Or is it better to simulate experience through *techné*, practice *phronesis* in the controlled environment of *techné*? The creation and use of case studies, like a present-day visit to the battlegrounds of war, is then a craft, a *techné of phronesis*. And the key to any viable *techné of phronesis* can be found in the action of *techné, poiesis*.

Heidegger (1953) reviews a poem by Hölderlin in an essay titled “...Poetically Man Dwells...”. His argument, in contradiction to Rutter ’s claim that we live and act phronetically, is that we live (dwell) poetically, (but do not confuse this with the sometimes sappy greeting card rhymes, which can represent an impoverished sense of poetry). For Heidegger, the action of poetry is a making, in the Greek *poiesis*, that calls “that which in its very self-disclosure causes the appearance of that which conceals itself” (223).

Poetry is the name we give to what is often considered the highest of language arts: that which evokes in the reader the experience of the author. Yet this may inadvertently impoverish a larger meaning when we reserve it so. Colloquially, we speak of the “poetry in motion” of Michelle Kwan, Michael Phelps and, until recently, Tiger Woods; yet they are artists of the swing, the skate and the stroke, not poets of the word. As society moves toward the mundane, the vulgar understandings, first the importance of the poet is lost, then that of the artist. Eventually, the impoverished term technician describes the making that only supports life, but does not expand it. My aim has been to examine—and hopefully help to correct—this trend, and restore the poetical—as poietical—as the way we are in the world. A rich pedagogy based on *poiesis*, the joining and balancing of *techné* and *phronesis*, of making and doing, can accomplish this end. Following the prescriptions contained herein is one to approach that possibility.

Finally, let me return to my overarching argument, that it is the overlooked *activity* of *techné*, namely *poiesis*, which is the ordering agent in our lives. Here I differ with Dunne, Mitcham, McCarthy and Wright and the others. I agree with their appraisal that *phronesis* can be an ordering agent. However, where I differ is that it does not seem to me to be that it can be the *primary* agent. Aristotle himself claims that *phronesis* is not found in the young because they lack experience (NE 1142 13-17). This would lead to the conclusion that it is only as we age can our lives be ordered. I believe that while that may be accurate in the sphere of “doing good in public”, I cannot believe that it is true overall. Even in younger days our lives can be ordered. This is especially apparent within the concept of *techné*: what is the whole apprenticeship tradition if not a way to order a life?

In both *techné* and *phronesis*, it is the activity which brings competence. Historically, for *phronesis* the two are inseparable—it is only through activity (experience) that we are understood to gain the competence of acting for the good. My argument for a *techné of phronesis* has suggested that that there is another way, through simulating experience. But that simulation is only a simulation as presented to the students. To begin the students on the path to *phronesis* the situation must be as real as possible, and that is the goal, and success, of our case studies.

At the heart of both *techné* and *phronesis* then is activity. For *techné* it is the making (*poiesis*); for *phronesis* doing (*praxis*). In the realm of *phronesis* this poses minimal difficulty except for those who wish to educate the youth, and that difficulty has been addressed earlier, and a provisional solution proposed. In the realm of *techné*, however,

the stakes are different. I have argued, as does Wild, for the possibility of a diminished or impoverished *techné*, where the activity includes no consideration of the public good.

Also included in this definition would be the situation where the maker has the reasoned capacity to make, but not the ability. Two examples here might help. When I managed a service garage, I would occasionally hire a new mechanic fresh out of a vocational/technical school. He or she might have the theory, the reasoned capacity to make (the repair), but often lacked the hands-on ability that only comes with experience. I am another example, but with the chronology reversed. When I was young I could play the guitar. After years of being a mechanic, with extensive nerve damage to my hands, I no longer have the dexterity. I assume I still have the capacity, but no longer the ability.

Moving away from the experiential, I offer another piece of support for my argument that it is activity and experience that lead us to ordering our lives, in whatever fashion that may be. In developing the case studies I used grounded theory somewhat unconventionally to develop the themes embodied in the cases. However, a more usual application of grounded theory contributes to my argument that action—*poiesis*—is the critical, yet overlooked element of *techné*. Simply put, the times when the members of the Software Engineering team were most dysfunctional were when they were unable to act. In these instances their capacity to act was limited by their inability to act. This may seem a conventional truism, that if you cannot perform a task you cannot perform a task. But reading this through the lens of grounded theory supports a more fine-grained interpretation of *techné*. As I argued earlier, many conceptions of *techné* are impoverished in that they omit one important element or another. Most commonly, the

undervalued element is the activity of the maker. This often stems from what I have argued are incomplete interpretations of the ancient texts which lead to the belief that it is only the *telos*, the end use of the thing made that has value. The undercurrents of this belief quite probably originate with the upper-class elitism brought about by the industrial revolution, when technology made mass production possible and, as Bourdieu argues, the spirit of the craftsman was embodied in the machine, thus devaluing both the maker and the thing made. Reestablishing the importance of the actual making in the process of production should be our goal.

A few examples that rise from grounded theory analysis show the pervasive nature of this devaluing. Setting an alarm clock incorrectly prevented one member from attending an important organizational meeting, and resulted in not only hard feelings but no progress (no making). A lost flash drive resulted in no progress in another meeting as the data on it was needed, yet unavailable. (The drive was eventually found, and then progress was made.) A sick child got in the way of making progress in yet another meeting; the parent again had material that was needed to make the requisite charts. A car that would not start, the occasional illness, and responsibility to other classes all interrupted the activity of making, and endangered the project. Without activity, the “capacity to” means little. *But for the most part, these interruptions were passed off with a “well, these things happen” attitude.* Even the participants were unaware of how they valued the capacity (“of course, I could have”) over the activity itself (“but I couldn’t/didn’t because...so it’s not my fault”).

And without activity, the risk is that *techné* becomes diminished, if not non-existent. This is what the data from the two Seabase studies support. In the first iteration, the students were unable to overcome the lack of making, and the project eventually failed to make anything. In the second the following semester they were able to overcome, thanks largely to one very dedicated member, and were successful in making the controller software.

In this dissertation I hope that my contribution, aside from constructing the cases themselves and providing a road map for others who might wish to do same, is to show that *poiesis*, the activity of making, is the overlooked term in consideration of *techné*, unlike the privileged place *praxis*, the activity of doing, occupies for *phronesis*. Further, that it is inclusion of making, in a real and valuable sense as opposed to what might be seen as “busy work” by the students, which should be an imperative in our pedagogy. As Heidegger says, quoting Hölderlin, “...poetically dwells man upon this earth”.

References

- Agar M. 1996. *The Professional Stranger*. Academic Press.
- Arendt H. 1958. *The Human Condition* Chicago: University of Chicago Press.
- Aristotle. 1947a. *Nicomachean ethics*. In: McKeon R, editor. *Introduction to Aristotle*. New York: Random House.
- Aristotle. 1947b. *Physics*. In: McKeon R, editor. *Introduction to Aristotle*. New York: Random House.
- Aristotle. 1947c. *Metaphysics*. In: McKeon R, editor. *Introduction to Aristotle*. New York: Random House.
- Aristotle. 1954. *Rhetoric*. New York, New York: Random House.
- Atwill JM. 1993. Instituting the art of rhetoric: Theory, practice, and productive knowledge in interpretations of Aristotle's *Rhetoric*. In: Poulakis T, editor. *Rethinking the history of rhetoric: Multidisciplinary essays on the rhetorical tradition*. Boulder, CO: Westview Press. p. 91-115.
- Atwill JM. 1998. *Rhetoric reclaimed: Aristotle and the liberal arts tradition*. Ithaca, NY: Cornell University Press. .
- Blakeslee AM. 1997. Activity, context, interaction and authority: Learning to write scientific papers in situ. *Journal of business and technical communication* 11(2):125-169.
- Blakeslee AM. 2001. "Bridging the workplace and the academy: Teaching professional genres through workplace collaboration. *Technical communication quarterly* 10(2).
- Bourdieu P. 1977. *Outline of a Theory of Practice*. Cambridge, UK: Cambridge University Press.
- Bowler M. 2006.
- Brady A. 2007. What we teach and what they use: Teaching and learning in scientific and technical communication programs and beyond. *Journal of business and technical communication* 21(1):37-61.

- Brady A, Marika Seigel, Charles Wallace, Thomas Vosecky 2008. Speaking of Software: Case Studies in Software Communication. In: Heidi Ellis SD, Fernando Naveda, editor. Software Engineering: Effective Teaching and Learning Approaches and Practice. Hershey, PA: IGI Global Publishing. p. 75-97.
- Charmaz K. 2002. Qualitative Interviewing and Grounded Theory Analysis. In: Gubrium J, Holstein J, editors. Handbook of Interview Research: Context and Method. Thousand Oaks, CA: Sage. p. 675-95.
- Charmaz K. 2005. Grounded Theory in the 21st Century: Applications for Advancing Social Justice Studies. In: Denzin NK, Lincoln YS, editors. Handbook of Qualitative Research. Thousand Oaks, CA: Sage. p. 507-536.
- Clair RP. 2003. Expressions of ethnography: Novel approaches to qualitative methods. Albany, NY: State University of New York Press. p. 3-4.
- Clifford J, Marcus GE. 1986. Writing Ethnography: The Poetics and Politics of Ethnography. Berkeley University of California Press: University of California Press.
- Coffey A, Atkinson P. 1996. Codes and Coding. Making sense of qualitative data. Thousand Oaks, CA: Sage. p. 26-53.
- Connors RJ. 1982. The rise of Technical Writing Instruction in America. Journal of Technical Writing and Communication 12(4):329-52.
- Corbett EPJ. 1995. Classical Rhetoric: The Basic Issues. In: Gabin RJ, editor. Discourse Studies in Honor of James L. Kinneavy. Potomac, NJ: Scripta Humanistica. p. 25-40.
- Creswell JW. 1994. Research Design: Qualitative and Quantitative Approaches. Thousand Oaks, CA Sage.
- de Certeau M. 1984. The Practice of Everyday Life. Berkeley: University of California Press.
- Denzin NK, Lincoln YS. 2005. The Discipline and Practice of Qualitative Research. Handbook of Qualitative Research. 3 ed. Thousand Oaks, CA: Sage. p. 1-32.
- Dobrin DN. 2004. What's Technical about Technical Writing? In: Johnson-Eiola J, Selber S, editors. Central Works in Technical Communication. New York: Oxford University Press. p. 107-123.
- Dreyfus H. 2006. Can there be a better source of meaning than everyday practices? Reinterpreting division I of Being and Time in the light of division II. In: Polt. R, editor. Heidegger's being and time: Critical essays. Lanham, MD: Roman and Littlefield. p. 141-54.

- Dubinsky JM. 2002. More than a Knack: Techné & Teaching Technical Communication. *Technical communication quarterly* 11(2):129-145.
- Dunne J. 1993. *Back to the rough ground: Practical judgment and the lure of technique*. Notre Dame, IN: University of Notre Dame Press.
- Emerson RM, Fretz RI, Shaw LL. 1995. *Writing Ethnographic Fieldnotes*. University of Chicago Press.
- Freedman A. 1993. Show and Tell? The Role of Explicit Teaching in the Learning of New Genres. *Research in the Teaching of English* 27(3):222-51.
- Freedman A, Adam C, Smart G. 1994. Wearing Suits to Class: Simulating Genres and Simulations as Genre. *Written Communication* 11(2):193-226.
- Freedman A, Adam C. 1996. Learning to Write Professionally: "Situated Learning" and the Transition from University to Professional Discourse. *Journal of business and technical communication* 10(4):395-427
- Freeman S. 2005. Heirs of War. *AARP Bulletin* 46(5).
- Gadamer H-G. 2004. *Truth and Method*. New York, New York: Continuum International Publishing Group.
- Gale FC. 1993. Teaching Professional Writing Rhetorically: The Unified Case Method. *Journal of Business and Technical Communication* 7(2):256-266.
- Giddens A. 1979. *Central Problems in Social Theory*. Berkeley University of California Press.
- Goodall HLB. 2000. *The Ethics of Writing Ethnography. Writing the New Ethnography*. Walnut Creek: AltaMira Press.
- Gordon J. 2002. Techné and Technical Communication: Toward a Dialogue. *Technical communication quarterly* 11(2):147-164.
- Gross AA, Walzer A. 1997. The *Challenger* Disaster And The Revival Of Rhetoric In Organizational Life. *Argumentation* 11:75-93.
- Harper D. 1987. *Working Knowledge: Skill and Community in a Small Shop*. Berkeley, CA: University of California Press.
- Heidegger M. 1953. *The Question Concerning Technology and Other Essays*. NY: Harper and Row. p. 3-35.
- Heidegger M. 1966. Memorial Address. *Discourse on Thinking*. New York: Harper & Row. p. 45-57.

- Herreid CF. 1997a. What is a Case: Bringing to Science Education the Established Teaching Tool of Law and Medicine. *Journal of College Science Teaching*(November):92-94.
- Herreid CF. 1997b. What is a Case: Bringing to Science Education the Established Teaching Tool of Law and Medicine. *Journal of College Science Teaching*(November):92-94.
- Hesse-Biber SN, Leavy P. 2005a. Validity in qualitative research. The practice of qualitative research. Thousand Oaks, CA: Sage. p. 62-68.
- Hesse-Biber SN, Leavy P. 2005b. *Qualitative Research Inquiry. The Practice of Qualitative Research*. Sage.
- Johnson-Eilola J. 2004. Relocating the value of work: Technical communication in a post-industrial age. In: Johnson-Eilola J, Selber S, editors. *Central works in technical communication*. Oxford: Oxford University Press. p. 175 – 192
- Kardos G, Smith CO. On Writing Engineering Cases. *ASEE National Conference of Engineering Case Studies*; 1979.
- Kirsch G, Sullivan P. 1992. *Methods and Methodology in Composition Research*. Southern Illinois University Press.
- Lauer JM, Asher W. 1988. *Composition Research/Empirical Designs*. New York Oxford University Press.
- Lauer JM, Montague G, Lunsford A, Emig J. 1991. *Four Worlds of Writing*. New York: HarperCollins Publishers, Inc.
- Lave J, Wenger E. 1991. *Situated Learning: Legitimate Peripheral Participation*. Cambridge Cambridge University Press.
- Lincoln YS, Tierney WG. 2004. Qualitative Research and Institutional Review Boards. *Qualitative Inquiry* 10(2):219-34.
- McCarthy J, Wright P. 2005. *Technology as Experience*. Cambridge, MA: MIT Press.
- IRB Tutorial [Internet]. [updated March 24, 2011, cited. Available from: <http://www.mtu.edu/research/administration/integrity-compliance/review-boards/human-subjects/IRB-tutorial.html>
- Miller CR. 1979. A Humanistic rationale for technical writing. *College English* 40:610-17.
- Miller CR. 1984. Genre as Social Action. *Quarterly Journal of Speech* 70(2):151-7.

- Miller CR. 1989. What's Practical about Technical Writing. In: Fearing BE, Sparrow WK, editors. *Technical Writing: Theory and Practice*. New York: Modern Language Assn. of America. p. 14-21.
- Miller TP. 1991. Treating professional writing as social praxis. *Journal of advanced composition* 11(1):57-72.
- Mitcham C. 1994. *Thinking Through Technology: The Path between Engineering and Philosophy*. Chicago, IL University of Chicago Press.
- Moss BJ. 1992. Ethnography and composition: Studying language at home. In: Kirsch G, Sullivan P, editors. *Methods and Methodology in Composition Research*. Carbondale, IL: Southern Illinois University Press.
- Murray J. 1997. *The Complete Guide to Whiskey: Selecting, Comparing, and Drinking the World's Great Whiskeys*. Chicago: Triumph Books.
- Myers LL, Larson RS. 2005. Preparing Students for Early Work Conflicts. *Business Communication Quarterly* 68(3):306-17.
- Nussbaum M. 2001. *The fragility of goodness: Luck and ethics in Greek tragedy and philosophy*. Cambridge UK: Cambridge University Press.
- Pfeiffer WS. 2006. *Technical Communication: A Practical Approach*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Plato. *The Republic*. New York: Random House.
- Pomeroy SB, Burstein SM, Donlan W, Roberts JT. 1999. *Ancient Greece: A political, social, and cultural history*. New York: Oxford University Press.
- Rogoff B. 2008. Observing sociocultural activity on three planes: participatory appropriation, guided participation, and apprenticeship. *Pedagogy and Practice: Culture and Identities*. Thousand Oaks, CA Sage.
- Rorty R. 1979. *Philosophy and the Mirror of Nature*. Princeton, NJ: Princeton University Press.
- Rubin HJ, Rubin IS. 1995. Choosing Interviewees and Judging What They Say: More Issues in Design for Qualitative Research. *Qualitative Interviewing: The Art of Hearing Data*. Thousand Oaks: CA: Sage. p. 65-92.
- Rutter R. 2004. History, Rhetoric, and Humanism: Toward a More Comprehensive Definition of Technical Communication. In: Johnson-Eiola J, Selber S, editors. *Central Works in Technical Communication*. New York: Oxford University Press. p. 20-34.

- Schaeffer NC, Maynard DW. 2002. Standardization and interaction in the Survey Interview. In: Gubrium J, Holstein J, editors. *Handbook of Interview Research: Context and Method*. Thousand Oaks, CA: Sage.
- Silverman D. 2005a. Selecting a Topic: Using Theories, Choosing Methodologies. *Selecting a Topic: Using Theories, Choosing Methodologies*. 2 ed. London Sage. p. 77-138.
- Silverman D. 2005b. What You Can (and Can't) Do with Qualitative Research. In *Doing Qualitative Research: A Practical Handbook*. 2 ed. London: Sage.
- Sipiora P. 1995. A Rhetoric of Ethics and Cultural Understanding: The Quest of Isocrates. In: Gabin RJ, editor. *Discourse Studies in Honor of James L. Kinneavy*. Potomac, NJ Scripta Humanistica. p. 11-24.
- Spinuzzi C. 2004. Pseudotransactionality. In: Dubinsky JM, editor. *Teaching technical communication*. Boston, MA: Bedford/St. Martin's
- Strauss A, Corbin J. 1998. *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage.
- Sullivan DL. 2004. Political-Ethical implications of defining technical communications as a Practice. In: Johnson-Eiola J, Selber S, editors. *Central Works in Technical Communication*. Oxford: Oxford University Press. p. 212-219.
- Sutcliffe A. 2003. Scenario-based requirements engineering. Paper presented at the IEEE International conference on requirements engineering.
- Thomas SG. 1995. Preparing Business Students More Effectively for Real-World Communication. *Journal of business and technical communication* 9(4):461-474.
- Van Maanen J. 1988. *Tales of the field: On writing ethnography*. Chicago: University of Chicago Press.
- Vosecky T, Marika Seigel, Charles Wallace. 2008. Making and Acting: Ethnographic Development of a Case Study Approach. *Technical communication quarterly* 55 (4):405-414.
- Vosecky T, Marika Seigel, Charles Wallace. 2011. Making and Acting: Ethnographic Development of a Case Study Approach. In: James Conklin GFH, editor. *Qualitative Research in Technical Communication*. NY: Routledge. p. 276-293.
- Warren CB. 2002. Qualitative Interviewing. In: Gubrium J, Holstein J, editors. *Handbook of Interview Research: Context and Method*. Thousand Oaks, CA Sage.
- Wassermann S. 1994. *Introduction to case method teaching: a guide to the galaxy*. New York, NY: Teachers College Press, Teachers College, Columbia University.

- Wild J. 1941. Plato's theory of techné: A phenomenological interpretation. *Philosophy and phenomenological research* 1(3):255-293.
- Winsor D. 1988. Communication Failures Contributing to the Challenger Accident: An Example for Technical Communicators. *IEEE Transactions On Professional Ccommunication* 31(3):101-107.
- Zoetewey MW, Staggers J. 2004. Teaching the Air Midwest Case: A Stakeholder Approach to Deliberative Technical Rhetoric. *IEEE Transactions On Professional Communication* 47(4).

Appendix 1-Speaking of Software Exit Interview

Project _____ Date/Time _____ Place _____

Interviewee _____ Interviewer _____

PRODUCT DETAILS:

What product are you making?

Tell me something about it.

Can you tell me some specific details about it?

What are the most important qualities that the product should have, from the client's point of view?

Of the above qualities, which do you feel confident about being able to (or were able to) deliver?

Are there any that you won't be able to deliver?

What do you consider your resources for this project? By resources, I mean people or information outside of your team that make your work easier or better?

TEAMWORK:

What do you see as your role in the team?

Who are the other people on your team, and how would you describe their roles?

What are some things you did to make sure that you kept up to date on what your other team members were doing?

How would you characterize the amount of interaction on your team: not enough, just right, or more than enough?

Example of interaction that worked:

Well?

Can you think of any kind of interaction that didn't work so well?

CLIENT INTERACTION:

How would you characterize the amount of interaction with the client: not enough, just right, or more than enough?

Example of interaction that worked well, not well – things learned from client – things explained to client.

Describe what you've done in keeping your client up to date on what you're doing.

USER INFO:

Describe the typical user of your product, as the client has described him/her.

Can you think of other kinds of users, different levels of users?

Give me a story or stories about someone using your product.

Think of a scenario of how you imagine your product will be used – “use case.”

What will users be able to do with your product that they can't currently do without it?

How will users benefit from your product?

What kind of advantage will it give them?

How will it make their tasks/job easier?

What knowledge and skills are you assuming your users will have before using your product?

What do you think will be the hardest aspect of your product for a user to learn?

Appendix 2-Permissions

Permission for: **Speaking of Software: Case Studies in Software Communication.**

With Marika Seigel and Charles Wallace. In "Software Engineering: Effective Teaching and Learning Approaches and Practice". Heidi Ellis, Steve Demurjian, Fernando Naveda, editors. IGI Global Publishing, Hershey, PA. October 2008

Selections appear in modified form throughout this dissertation.

01/01/2011 13:17

396-487-2061

CHEMISTRY MTU

PAGE 01/01

Request from Author for Reuse of IGI Materials	
<p>IGI Global ("IGI") recognizes that some of its authors would benefit professionally from the ability to reuse a portion or all of some manuscripts that the author wrote and submitted to IGI for publication. Prior to the use of IGI copyrighted materials in any fashion contemplated by the IGI Fair Use Guidelines for Authors, the author must submit this form, completed in its entirety, and secure from IGI the written permission to use such materials. Further, as a condition of IGI providing its consent to the reuse of IGI materials, the author agrees to furnish such additional information or documentation that IGI, in its sole discretion, may reasonably request in order to evaluate the request for permission and extent of use of such materials.</p>	
<p>IGI will consider the special request of any author who:</p> <ul style="list-style-type: none">• Completes, signs and returns this form agreeing to the terms; and• Agrees that any IGI copyrighted materials will be labeled with the standard IGI identification, for example "This chapter/paper appears in <fill in publication title here> edited/authored by <fill in name of author/editor here> Copyright 2010, IGI Global, www.igi-global.com. Posted by permission of the publisher."	
<p>Title of article/chapter you are requesting: <u>Speaking of Software: Case Studies in Software Communication</u></p> <p>Title and book author/editor where this IGI material appears: <u>Heidi Ellis, et al.</u></p> <p><u>Software Engineering: Effective Teaching and Learning Approaches and Practice</u></p>	
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<p>Your name: <u>Thomas Vuosky</u></p> <p>Your signature: _____</p> <p>Organization: <u>Michigan Technological University</u></p> <p>Address: <u>303 W Douglas</u></p> <p><u>Houghton, MI</u></p> <p><u>49931</u></p>	
<p>Fax: <u>906-487-2061</u></p> <p>E-mail: <u>tvuosky@mtu.edu</u></p>	
<p>For IGI Use</p> <p>Request accepted by IGI Global: <u>Jan Travers</u></p> <p>Date: _____</p> <p>Digitally signed by Jan Travers DN: cn=Jan Travers, o=IGI Global, ou, email=jtravers@igi-global.com, c=US Date: 2011.01.24 10:35 -0500</p>	
<p>Please complete and mail or fax this request form to:</p> <p>Jan Travers • IGI Global, 701 T. Chouteau Avenue • Hershey PA 17033 • Fax: 717/533-8661</p>	

Permission for: **Making and Acting: Ethnographic Development of a Case Study.**

With Marika Seigel and Charles Wallace. In "Qualitative Research in Technical Communication". James Conklin and George F. Hayhoe, editors. Routledge, NY. 2011

Selections appear in modified form in Chapter Three: Theory Applied and Chapter Five: Project specific Methods.

Copyright.com Special Order Update
(10109202)

Wednesday, January 19, 2011 12:36:15
AM

From: notices@copyright.com
To: tevoseck@mtu.edu
Reply To: info@copyright.com
Dear Thomas Vosecky,

On 01/14/11, you placed an order to purchase the rights to use copyrighted material. Since the rightsholder for this material does not pre-authorize CCC to sell these rights, we have contacted the rightsholder to determine whether the right you requested is available and to determine the price for the right. We have updated information on the status of your order:

Order Summary:
Original Order Date: 01/14/11
Confirmation Number: 10109202

Updates on Items You Ordered:
Qualitative research in technical communication, 49622252
Current Status: Granted
Fee: \$3.50

We will automatically include the fee for your purchase (see above) on the next invoice we send for your account. If you have decided to cancel this order, please review your order on-line. You can always cancel your order prior to being invoiced. Please review the following special terms, which apply to the rights that have been granted: Granted gratis for original author.

Dear Mr. Vosecky,

Thank you for contacting Copyright Clearance Center (CCC) with your inquiry. Your Order Confirmation page is your proof of permission (we suggest you print a copy for your records). Please be sure to review any special terms and conditions set by the rightsholder.

If proof of permission is needed by your publisher or third party, we suggest that you print and use the citation information that is provided on your order confirmation page and the order's order history page. Sometimes referred to as the "attribution" or "credit line," the citation information can be used to ensure that you properly give credit to the rightsholder of the content you are using.

Sincerely,
Hanna

Hanna Sta. Ines
Customer Service Representative
Copyright Clearance Center
222 Rosewood Drive
Danvers, MA 01923

-----Original Message-----

From: Thomas Vosecky [<mailto:tevoseck@mtu.edu>]
Sent: Monday, April 18, 2011 1:25 PM
To: info@copyright.com
Subject: Re: Copyright.com Special Order Update (10109202) [pfCase:227260, pfTicket:5298030]

I received the invoice, and paid it.
Can you send me something in writing, with a signature, to confirm the t permission has been granted?

A scanned document attached to an email would work, if image quality is good.

Thanks
--Tom

----- Original Message -----

From: Info@copyright.com
To: "Thomas Vosecky" <tevoseck@mtu.edu>
Sent: Monday, February 14, 2011 3:01:22 AM GMT -05:00 US/Canada Eastern
Subject: RE: Copyright.com Special Order Update (10109202) [pfCase:227260,
Dear Mr. Vosecki,

Thank you for your correspondence.

Please be advised that Order Detail ID 49622252 will be invoiced approximately 60 days after the order date. Since the order was placed on 01/14/2011, you may expect to be invoiced by mid-March.

I hope this is helpful.

Sincerely,

Hanna

Hanna Sta. Ines
Customer Service Representative
Copyright Clearance Center
222 Rosewood Drive
Danvers, MA 01923

-----Original Message-----

From: Thomas Vosecky [<mailto:tevoseck@mtu.edu>]
Sent: Friday, February 11, 2011 12:03 PM
To: info@copyright.com
Subject: Re: Copyright.com Special Order Update (10109202) [pfCase:227260, pfTicket:5280490]

Thanks for letting me know.
So I should get an invoice for the other one fairly soon>

--Tom

----- Original Message -----

From: Info@copyright.com
To: "Thomas Vosecky" <tevoseck@mtu.edu>
Sent: Friday, February 11, 2011 5:21:52 AM GMT -05:00 US/Canada Eastern
Subject: RE: Copyright.com Special Order Update (10109202) [pfCase:227260, pfTicket:5280254]

To: tevoseck@mtu.edu
Sent: Wednesday, January 19, 2011 12:36:15 AM GMT -05:00 US/Canada Eastern
Subject: Copyright.com Special Order Update (10109202)

Dear Thomas Vosecky,

On 01/14/11, you placed an order to purchase the rights to use copyrighted material. Since the rightsholder for this material does not pre-authorize CCC to sell these rights, we have contacted the rightsholder to determine whether the right you requested is available and to determine the price for the right. We have updated information on the status of your order:

Order Summary:

Original Order Date: 01/14/11

Confirmation Number: 10109202

Updates on Items You Ordered:

Qualitative research in technical communication, 49622252

Current Status: Granted

Fee: \$3.50

We will automatically include the fee for your purchase (see above) on the next invoice we send for your account. If you have decided to cancel this order, please review your order on-line. You can always cancel your order prior to being invoiced.

Please review the following special terms, which apply to the rights that have been granted: Granted gratis for original author.

Permission for: **Making and Acting: Ethnographic Development of a Case Study.**

With Marika Seigel and Charles Wallace. Technical Communication. November 2008. V55, no.4. 405-414

Selections appear in modified form in Chapter Three: Theory Applied and Chapter Five: Project specific Methods.

RE: Copyright.com Special Order Update (10109202)
[pfCase:227260, pfTicket:5280254]

Friday, February 11, 2011
5:21:52 AM

From: Info@copyright.com

To: tevoseck@mtu.edu

Dear Mr. Tom Vosecky,

Thank you for contacting Copyright Clearance Center.

Please be advised that permission for Order detail ID 49624219 has been Denied because the author of the requested material retains the right to the content. You will need to contact the author directly for permission.

I hope this is helpful. Should you have any questions, please feel free to contact us.

Sincerely,

Hanna

Hanna Sta. Ines

Customer Service Representative
Copyright Clearance Center
222 Rosewood Drive
Danvers, MA 01923

-----Original Message-----

From: Thomas Vosecky [mailto:tevoseck@mtu.edu]

Sent: Thursday, February 10, 2011 3:43 PM

To: info@copyright.com

Subject: Re: Copyright.com Special Order Update (10109202)
[pfCase:227260, pfTicket:5280254]

You have gotten permission for reuse for the book chapter. Great.
Appreciate it.

I also requested permission for an article in "Technical Communication",
with the same title.

Just wanted to make sure you are still pursuing that one; that it did
not fall through some crack.

Thanks

--Tom