ABSTRACT

Title of dissertation: THE EFFECTS OF ASYNCHRONOUS PEER REVIEW ON UNIVERSITY STUDENTS' ARGUMENTATIVE WRITING

Ya-Chin Tsai, Doctor of Philosophy, 2006

Dissertation directed by: Professor Wayne H. Slater
Department of Curriculum and Instruction

In contrast to oral response groups, asynchronous peer review (APR) has received relatively little attention in writing research. This study was motivated largely by the question of whether delayed peer commentary relayed by technology could lead writers to revise writing extensively and improve quality. The purpose of this within-subject, quasi-experimental study was to examine the effect of APR on the quality and revision of argumentative writing. A Web-based program, *Calibrated Peer Review™* (CPR), was used to support the peer review process. Two classes, consisting of 22 students and 16 students, volunteered to participate in this study. After taking the pretest, every participant wrote two argumentative essays and completed a survey. For one essay, participants wrote their drafts and revised their essays alone without APR. For the other essay, the participants completed their drafts, participated in the APR activity supported by CPR, and revised their essays. The treatment, i.e., APR, was administered to the two classes in a counter-balanced manner. Repeated-measure MANOVAs were used to gauge changes over time in holistic quality and the primary traits measured by a revised Toulmin model, and revision changes were coded. This study yielded four findings. First, by holistic

quality, the final essays post APR were found to outscore the corresponding initial drafts and the revised essays completed without APR. Second, the final essays post APR were found to outscore the corresponding initial drafts in Claim, Data, Opposition, and Refutation and outscored the final essays completed without the treatment in Claim and Opposition. However, Qualifier did not change at all. Third, extensive surface-based and text-based revisions were produced post APR. Without APR, the participants appeared reluctant to revise. Fourth, the guiding questions used to prompt the peer review process and peer commentary were reported to predominate during the revising process. In conclusion, the entire APR process appears to serve as a catalyst for triggering a great number of surface-based and text-based revisions. Accordingly, revision frequency seems to enhance the holistic quality as well as the four primary traits of argumentative writing.

THE EFFECTS OF ASYNCHRONOUS PEER REVIEW

ON UNIVERSITY STUDENTS' ARGUMENTATIVE WRITING

By

Ya-Chin Tsai

Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2006

Advisory Committee:

Professor Wayne Slater, Chair/Advisor
Professor Robert Gaines
Professor Albert Gardner
Professor Joseph McCaleb
Professor Olivia Saracho

To my mentor and my parents,

who have been supportive without reservation

Acknowledgements

I am deeply indebted to those people whose assistance has been vital to my success in completing this dissertation. I appreciate them from the bottom of my heart.

My chief debt is to my advisor—Dr. Wayne Slater. I never truly realized a pen can be mightier than a sword until he demonstrated his rhetorical prowess. Since my first year at Maryland, I have been privileged countless times to watch him create in writing a credible image. He sold me on rhetoric and my interest was thus kindled. As my mentor, he has always challenged me to live up to my potential and nurtured ambitions for me to be an outstanding researcher. From the inception of this research study, he has proffered extremely constructive suggestions on every aspect from my idea development to the methodological design. I did the work, but he paved the way. In many ways, I am his No. 1 fan.

I greatly appreciate the other committee members—Drs. Robert Gaines, Albert Gardner, Joseph McCaleb, and Olivia Saracho—for their insightful and critical comments. Dr. Gaines, Editor of *Advances in the History of Rhetoric*, enlightened me on rhetoric. When he delivered the course content, I felt like being in the presence of the most famous orator, Cicero, performing persuasive oratory. His influence upon my thinking is beyond description. I would also like to offer my sincere thanks to Dr. Olivia Saracho. Like a best friend of mine, she has been a good listener and the best consultant, always helping me weather the emotional storms and pressure of graduate school at every crucial moment. Professor Joseph McCaleb is so amiable that I will

never forget him. I owe a great deal to Professor Albert Gardner for lending a hand to me.

My heartfelt appreciation goes out to the Dept. Chair, Dr. Stephen Koziol. He cared about my professional development more than anyone. Working as his research assistant, I benefited to a great extent from his expertise in qualitative studies. Like a tutor, he showed me the nuts and bolts of content analysis. Moreover, he had faith in me teaching American students and I was able to hone my teaching skills in the course “Computers for Teachers” every semester. Most importantly, this study would have been next to impossible to take place if it had not been his timely assistance. He is a role model for caring teachers.

I want to express my gratitude to many people who helped me at Maryland. I am grateful to Jordan Schugar for the camaraderie and his help with data analysis, Wen-Hsieng Chuang and Yi-Ju Chen for providing a refuge for me in their home at holidays, Dr, Ru San Chen at Georgetown University for his help with the statistical analysis, the participants of this study, Soo Jung Suh for her friendship, Dian Poore and Robin Walukonis for their helps with student affairs, and Juliana Stover for her editorial assistance,.

Thanks also go to the University of Maryland for the financial support throughout my doctoral study.

I owe very much to my uncle and aunt, Dr. Ing-Min Lee and Mrs. Mei-Jen Lee, for their unconditional love. They constantly invited me for their family reunions to prevent me from being hit by waves of nostalgia for home. I will never forget the talks with my knowledgeable uncle about the New Age, Tai-Chi, and the healthy way

of life. Hanging out with my aunt has always been the most worry-free escape from my stressful academic life.

Last but not least, I owe a debt of gratitude to my parents for their patience and support. My father, more than anyone, fostered my intellectual development profoundly. My mother has always been supportive for these years. With the completion of this dissertation, they finally see the fruit of their labor.

TABLE OF CONTENTS

List of Tables

List of Figures

Chapter I

Introduction

The study of revision has a long history, and the perspectives toward the revising act have changed with time (Fitzgerald, 1994). In the time that the product-centered approach was the leading force, revision was conceptualized as last-stage proofreading, i.e., editorial work at a word- or sentential level. Simply put, revision was understood as the product of textual changes at the local level. In the later phases of writing movement, cognitive activities involved in the writing process were discovered through writers' think-aloud protocols, and scholars started to wonder whether the product model actually stood for what was going on in a writer's mind. With the "paradigm shift" movement (Hairston, 1982), revision was interpreted from the process approach as a problem-solving activity which occurred whenever writers felt a need to do so. In the process model (Hayes & Flower, 1980), revision was seen to go beyond proofreading and editing. It was an individual, cognitive process taking place at any point during writing. In the 1980s, the process model drew criticism for its inadequacy in accounting for the social environment involved in writing (Lindemann, 2001). The sociocultural approach has gradually become the mainstream in the study of writing since, and revision signified the collaboration between the writer and the reader who participated in the context of meaning construction. Despite the various representations of revision (Fitzgerald, 1992), the most complete and

widely accepted definition of revision was operationalized by Fitzgerald (1987, p. 484),

> Revision means making any changes at any point in the writing process. It involves identifying discrepancies between intended and instantiated text, deciding what could or should be changed in the text and how to make desired changes, and operating, that is, making the desired changes. Changes may or may not affect meaning of the text, and they may be major or minor. Also, changes may be made in the writer's mind before being instantiated in written text, at the time text is first written, and/or after text is first written.

To further account for revisions that map onto the writing subprocesses, Witte (1995) classified revision into three categories: (1) predraft revision—the type of change occurring in the planning stage before any thoughts are put down on a piece of paper, (2) during-draft revision—changes happening in the translating stage, and (3) postdraft revision—changes not taking place until an intact draft is finished. Perhaps due to the limitation of research methods, studies on predraft revision have yet to be conducted (Fitzgerald, 1987). In contrast, extensive studies have been conducted on during-draft revision and postdraft revision (Allal, Chanquoy, & Largy, 2004). In particular, postdraft revision was found to have more power than during-draft revision in shaping what a writer intends to say and how a writer says it in the final version of a piece of writing (Chanquoy, 2001; Fitzgerald, 1987).

Despite increasing interests in the study of revision for the last decade (Hayes, 2004), not much attention has been paid to revision in argumentative writing—a required genre in higher education (Butterfield, Hacker & Albertson, 1996).

University-level writing is isomorphic with argumentative writing (Freedman, 1994; Sperling & Freedman, 2001; Spurgin, 1993; Stay, 1995). The sort of written discourse is distinct from expository writing or narrative writing in several features, such as audiences and the use of language (Kinneavy, 1994; Perelman, 1982). Argumentative writing is strongly audience-driven, rests heavily on argumentation, and presents "a process of reasonable inquiry into the best grounds for agreement between a writer and an audience who have a mutual concern to answer a question" (Gage, 2001, p. 37). The process of composing written argument is a critical intellectual move that university students must make in order to join the conversation in the academic community (Gage, 2001). Even though the ability to argue grows with age (Coirier, & Golder, 1993), argumentative writing is the most difficult genre to master and most students are in need of support to learn to write effective argument before they develop to be expert writers (Sperling & Freedman, 2001).

This study proposed here explored the relationship between the construction of argumentative writing and asynchronous peer review (APR), with a special concentration on postdraft revision. There were several objectives to achieve—to investigate how university students carry out revision, to study the frequency of revision, to understand the contextual influence upon revision, and to explore the effect of APR within the compositional frame of argumentative writing. Peer review is an evaluation process in higher education for allocation of research grants and faculty promotion (Sullivan, Brown, & Nielson, 1998). Editors of referred journals also rely on this method to ensure high quality writing for publication. In spite of its prevalence in the academic world, university students often encounter unofficial peer

review in class as opposed to an official, peer review process. The practice of face-to-face, oral response groups suffers from a few drawbacks, including time constraints, face issues, and behavior/social problems (Yarrow & Topping, 2001). In an APR context, students exchange papers and perform mutual critiques in a non-concurrent mode, which bears a resemblance to the official peer review employed by journal editors. They have ample time at hand to contemplate commentary at their own pace and there is no need to critique in the face of the writer. The problems existing in in-class peer review can be reduced. Without physical presence, behavior problems can be reduced to minimum. This study explored whether university students learned to sharpen their revising skills to produce better argumentative texts after an official peer review. The findings of this study will consolidate the knowledge base of literature in the writing field.

Statement of the Problem

Children at the age of four or five are capable of carrying out argument with sophisticated argumentative strategies (Weiss & Sachs, 1991), but it is not always easy to apply the skills to make a hit in written communication even for adults. Children, adolescents, and university-age students all struggle with the production of argumentative texts (Academic Senate, 2002; Fahnestock, 1991; Felton & Herko, 2004; Nystrand & Graff, 2001; Read & Francis, 2001; Slater, 1998; Yeh, 1998a). Inexperienced writers are aggravated by the construction of argument coupled with the problems arising from writing itself.

One reason is on a lack of interlocutor during writing. Interacting with an intended audience is imperative in written communication (Perelman & Olbrechts-

Tyteca, 1971), but most inexperienced writers are not successful in justifying their reasons or making their positions acceptable to the audience. In the absence of the audience during writing, writers do not have to negotiate meaning with a real person. Most inexperienced writers have trouble moving a step out of their egocentricity to conceive of written communication with an abstract audience (Campbell, 1994; Santos & Santos, 1999). They compose argument from the writer's perspective, write down their knowledge directly on a piece of paper (Bereiter & Scardamalia, 1987), and fail to yield reader-centered prose (Flower, 1979).

Apart from the difficulties associated with the creation of argument, it is suffice to say that inexperienced writers have yet to master writing skills in general, especially revising skills, to transform their writing to meet readers' expectation (Bereiter & Scardamalia, 1987). Revision is an indispensable measure that expert writers often take to refine their ideas, but inexperienced writers have a hard time with it (Scardamalia & Bereiter, 1991). Expert writers usually transform their thoughts by way of extensive revision to produce reader-centered texts while inexperienced writers revise at the surface level and write author-based texts (Sailor, 1996).

Within the cognitive model (Bereiter & Scardamalia, 1987), inexperienced writers are weak at managing their mental resources to solve problems. There are two mental spaces for a problem-solving activity: the content space and the rhetorical space. Expert writers evaluate the nature of a problem and then decide to solve the problem in either space for the best result. They choose to solve rhetorical problem in the rhetorical space or be transfer the problem into the content space and treat it like a

content problem, and a content problem is treated in the same way. The metacognition they exercise during the problem-solving process leads to the transformation of knowledge. Inexperienced writers can turn a content problem existing in the content space into a rhetorical problem in the rhetorical space and solve it rhetorically, but not vice versa. So to speak, inexperienced writers hardly monitor their problem-solving process as expert writers constantly do. Without much monitoring, knowledge retrieved from long-term memory is directly put down without being further transformed. In other words, expert writers are able to shape their knowledge and produce skillful, reader-based argument while inexperienced writers only put down what was in their long-term memories and come up with unskillful, author-based arguments. By the account of cognitive process theory (Hayes & Flower, 1980), less experienced writers are overburdened with the problem-solving. If the burden can be lessened, their effectiveness with writing would possibly be increased.

As shown above, the challenges that students encounter during the process of writing arguments drop strong hints for approaches to writing improvement. First, the presence of an audience may draw less experienced writers to pay attention to the necessity of negotiation for meaning in a writing process, a necessary move in argumentative papers. Second, less experienced writers should be proffered with support to lessen the burden of the writing process. Once a portion of the burden is removed, inexperienced writers have a higher chance to transform their knowledge like expert writers do in the revising process to produce a reader-based argument. In

the present study, the two principles were extrapolated to establish the instructional approach to written argument.

Theoretical Frameworks

The present study is attempted to investigate revision changes of argumentative writing post APR and takes root in two major theoretical frameworks that dominate contemporary writing research—cognitive process theory (Flower, 1989, 1994; Flower & Hayes, 1981; Hayes & Flower, 1980; Kellogg, 1994) and sociocultural theory (Bakhtin, 1973, 1981; Vygotsky, 1978, 1986). The former typically posits that writing is an isolated, cognitive activity in a writer's mind whereas the latter presumes that a social context intervenes in the writing process and the written product. Cognitive process theory and sociocultural theory together formulate two major dominate frameworks to portray writing from different perspectives (Sitko, 1994).

Cognitive Process Theory

Cognitive process theory lays out the mental activities during writing and is in sharp contrast to the product-centered approach which establishes its foundation on a drill-and-practice model of language development (Braddock, Lloyd-Jones, & Schoer, 1963). The product approach to writing was the first to emerge in the history of writing research, placing a great emphasis upon the grammatical aspects of finished products. Later, it was found that attention to mechanical parts enhanced the quality of written products only to a minimum degree. A "paradigm shift" happened and signified a critical change of teaching approaches from product to process (Hairston, 1982). With the discovery of nonlinear, cognitive activities during writing (Emig,

1971; Graves, 1973, 1975, 1983), the product-centered approach was criticized for its inadequacy in representing the cognitive activities (Elbow, 1973, 1981; Murray, 1984). Within the cognitive-process framework, writing consists of subprocesses, such as planning, translating, and rewriting (Flower, 1989, 1994; Hayes, 1996; Hayes & Flower, 1980; Hayes & Nash, 1996). Those activities switch recursively, and one activity is embedded in another (Emig, 1971; Graves, 1973, 1975, 1983; Hayes & Flower, 1980). As a matter of fact, the cognitive process models depict what is actually going on in a writer's mind. In stead of placing an emphasis on product, the process-centered approach is all about process (Atwell, 1991; Calkins, 1994; Elbow, 1973, 1981; Murray, 1984).

A legitimate area of discussion inspired by the cognitive process models evolves from attention to the operations of two mental spaces. Take the Hayes-Flower model proposed in 1980, for example. Long-term memory is illustrated as the mental space where a writer deposits topic knowledge, audience knowledge, and writing plans. Working memory is the attentional capacity busy with processing stimuli from the environment and knowledge retrieved from long-term memory, and it is the space where cognitive writing processes (planning, translating, and rewriting) go on. When the processing demands exceed the limit of the capacity of working memory, writing breaks down (Butterfield, et al., 1996). How working memory is allocated to the processes of writing determines literal representation and textual meaning. Inexperienced writers are not as mature as expert writers in allocating their working-memory resources (Drodge, 1991; Flower, 1979; Flower & Hayes, 1981; Hayes, Flower, Schriver, Strartam, & Carey, 1987; Pianko, 1979; Sailor, 1996; Sommers,

1980; van Waes & Schellens, 2003). One solution suggested to elevate the burden coming from the writing processes is to handle the work in long-term memory or receive support from outside.

Cognitive process models that overly portray writing as an individual behavior have been criticized for a lack of attention to the task environment (Lindemann, 2001). Having acknowledged the inadequacy of her earlier account of process-centered approach, Flower gave serious thought to the social factors that are crucial to writing in her later publications (Flower, 1994, 1996a, 1996b; Long, Flower, Fleming, & Wojahn, 1995; Peck, Flower, & Higgins, 1995). A sole look at writing from the cognitive aspect was under attack for failing to address a broader social dimension surrounding writers (Bartholomae, 1985; Bizzell, 1982). This is how the sociocultural perspective started its debut in writing research.

Sociocultural Theory

Sociocultural theory highlights the role that a social context plays in the internal growth of an individual (Bakhtin, 1981; Vygotsky, 1978, 1986). Writing performance represents a result of psychological development of an individual learning from personal interaction in a social environment. The theoretical foundation is built upon the works by two influential Russian philosophers: Lev Semyonovich Vygotsky and Mikhail Mikhailovich Bakhtin. Both scholars endorse the importance of language and environment in support of the development of higher-order thinking. Even though both scholars address learning in general situations, their theoretical ideas have contributed a great deal to the contemporary study of composition (Bizzell, 1988; Bruffee, 1984, 1986, 1996).

Implications of Vygotsky's theory for writing.

Cognitive development emerging as a result of socialization is one of the major themes that run through Vygotsky's sociocultural theory. Based on his observations of children's interaction with their peers, Vygotsky argued that scaffolding evolving out of an interaction process plays a crucial role in triggering maturity of cognition. The social environment becomes a source of higher mental functions. Interestingly, his idea runs opposite to the theory advanced by Jean Piaget, who believed individualism as key to the development of psychological functions.

The concept of scaffolding is elucidated in Vygotsky's explanation for the "zone of proximal development" (ZPD)—the distance between the actual level as determined by independent work and the level of potential development as determined under assistance (Vygotsky, 1978). To maximize learning outcomes, children should work with a more capable person, either peer or teacher, who scaffolds them to carry out a task that they are unable to accomplish without assistance (Young, 2001). In other words, the ZPD is quite identical to the concept of "assisted performance" (Measures, Quell, & Wells, 1997, p. 24).

In addition to scaffolding, Vygotsky advocates the use of semiotic tools, especially language, to mediate interpersonal and intrapersonal development. He defined tools in terms of "various systems for counting, mnemonic techniques, algebraic symbol systems, works of art, writing, schemes, diagrams, maps, technical drawings, and all sorts of conventional signs" (Vygotsky, 1982, p. 137). Among all, language—a semiotic system documenting a culture—is a medium through which people jointly interact and a unique tool that exercises the most influence on higher-

order thinking. Because every language encodes the epistemology of its users, the cultural sources embedded in the linguistic codes may come to shape the language users' understanding of the world. Very young children initially rely on language for communicative needs. As time goes on, the semiotic signs appropriate their thinking within their own culture (Vygotsky, 1978). Vygotsky's widespread stance is that the use of language scaffolds learners intellectual development. Everyone's thoughts and behaviors are socially and culturally mediated by the language which reflects the norm of a society.

Vygotsky had originally proposed his theory to explain psychological development in general. Yet, his account of the social basis of learning made an implication to writing instruction. To foster cognitive development, social resources should be brought into a learning environment to help writers with what they cannot accomplish without support.

Implications of Bakhtin's theory for writing.

Bakhtin's theory (1981, 1986) is in much congruent with Vygotsky's (1978), but stresses social, cultural, and historical dimensions of human interaction to a greater extent. Central to Bakhtin's theoretical framework are his accounts of language in context. Utterances lie at the heart of his sociocultural theory, and the two notions, *dialogic* and *heteroglossia*, further emphasize the communicative and interactive function of language use in a society.

Dialogism, mentioned in Bakhtin's work *The Dialogic Imagination* (1981), reflects a dialectical relationship that an individual bears with the social environment (Measures, Quell, & Wells, 1997). That term is the opposite of *monologue*, meaning

"a two-sided act" (Bakhtin & Volosinov, 1973, p. 85). Language varies by the group of people utilizing it and the functions they perform with it (Measures, Quell, & Wells, 1997). Bakhtin did not explain words or sentences, but stressed the dialogic nature of utterance—situated discourse where meaning is loaded and exists as the primary unit in communication. The utterances we produce seldom stand alone; they are usually in response to and/or in anticipation of other utterances in the past or future. In that sense, language by all means is dynamic, reciprocal, and dialogic. Written language as well displays a combination of writer, audience, previous or later utterances, and a range of social factors that instigate the utterances (Morson, 1986, p. 83).

The term *heteroglossia* represents various forms of expression, illuminating "the authentic environment of an utterance, the environment in which it lives and takes shape" (Bakhtin, 1981, p. 272). This term was used by Bakhtin to explain the influence of environmental surroundings on linguistic form. Everyone's language use always involves heteroglossia (Bakhtin, 1986, p. 89):

> Our speech, that is, all our utterances (including creative works), is filled with others' words, varying degrees of otherness or varying degrees of "our-own-ness", varying degrees of awareness and attachment. These words of others carry with them their own expression their own evaluative tone, while we assimilate, rework, and re-accentuate.

Heteroglossia was originally coined to entail sociocultural appropriation of language and to explain the phenomena of *centripetal* and *centrifugal, official* and *unofficial* verniculars of one national language within a given culture. By Bakhtin's account, the

form of a language was shaped by its user and the functions it performed in that environment. Heteroglossia is context-dependent in that each individual carries his/her unique sociocultural background into interaction. In a word, language is absolute not an individual property. Language use is always subjected to a social context.

Bakhtinian theory makes important implications for the field of writing. Language encodes a socioculture because it represents a collaborative behavior of its users. If writing consists of the writer-audience dialogue, to carry out a successful dialogue with a particular audience, a written text must be situated in a context that shows the patterns of that readership. For university students, they must actualize the dialectical relationship between themselves and the academic community in higher education. Therefore, creating dialogic activities for students to interact with their peers can be beneficial for them to know about the context where their writing should be situated (Bizzell, 1988; Bruffee, 1984, 1986, 1996; Elbow, 1973; Gere, 1987).

Educational implications for composition studies.

Together, cognitive process theory and sociocultural theory have made quite strong impacts on contemporary writing instruction and research. On one hand, cognitive process theory delineate writing from a cognitive perspective. Writing is depicted as the function of cognition heavily depending on the mental resources of a writer. Long-term memory furnishes a writer with content to write about while short-term memory helps a writer with literal representation. Research established on the basis of cognitive processes has been criticized for little attention to the social dimension (Allal & Chanquoy, 2004). In spite of the fact that the social environment

has been pointed out as an influential factor in all the cognitive-process models (Hayes & Flower, 1980), its contribution to the writing process has not been discussed thoroughly in the research studies based on cognitive process theory. In contrast, sociocultural theory highlights the social aspect of writing, which provides additional information to compensate for what has been overlooked in cognitive process research. To get the whole picture of writing, both cognitive process theory and sociocultural theory should be considered to demonstrate the multiple facets of writing.

Calibrated Peer Review

Calibrated Peer Review™ (CPR)—a Web-based program created at the University of California, Los Angeles—was used in this study to facilitate the APR process. The software was initially invented for undergraduate students majoring in science or in related disciplines to experience the type of formal peer review among scientists. The review process supported by CPR is student-centered, intended to promote active leaning and critical thinking with minimal teacher intervention. Though the process simulates blind peer evaluation, the program is claimed appropriate for learners at most levels across disciplines. The Multimedia Educational Resource for Learning and Online Teaching (MERLOT)[1] Teacher Education Review Panel posts an evaluation by one of the software creators on a Likert scale of 1-to-5, and the program was rated with quite high ratings in three categories: (a) *Content*

[1] MERLOT is an international cooperative providing quality Internet resources for higher education. California State University initiated this service in 1997, and over 20 systems and institutes of higher education have entered into the partnership. MERLOT depends on members to contribute information to the database by their descriptions or evaluations of teaching materials. Discipline-dependent editorial boards manage and evaluate the collected online materials. A peer-review process is conducted to estimate whether materials are theoretically sound or research-based. A peer review is conducted after suggested materials have passed a preliminary evaluation (Hanley, 2004).

Quality: 5, (b) *Potential Effectiveness as a Teaching Tool*: 5, and (c) *Ease of Use for Students and Faculty*: 4.5 (Multimedia Educational Resource for Learning and Online Teaching, 2001). So far, over 100,000 students in 450 institutes have registered to take advantage of this free resource since it was made available to the public in 1998 (Champman & Fiore, 2000). By participating in an APR process relayed via CPR, participants are expected to learn to write coherently as writers and to evaluate writing critically as reviewers. This collaborative learning experience was likely to inspire them to hone their reading and writing skills during the process. The potential of CPR has been widely exploited in the scientific territory, thus far its application has not been extended to the educational discipline.

Peer review administered via CPR replicates what scientists deal with the process of conducting research (Champman & Fiore, 2000). In the scientific discipline, a research study starts with a proposal. Scientists write and peer review proposals. As formal peer review weighs much in the advancement of scholarship, students may benefit from participating in it.

Peer review in CPR comprises three subprocesses: manuscript submission, calibration, peer review and self-assessment. After manuscript submission, students are coached with a calibration unit. What they do with calibration is to read and rate three exemplar essays that the instructor has previously uploaded to CPR. The exemplar essays are read one at a time. Specified guiding questions are supplied on the platform to facilitate the rating process. The guiding questions are either constructed by the instructor or withdrawn from the repertoire in CPR. On the platform, the upper part displays one exemplar essay and the lower part displays the

guiding questions. Students only answer *yes* or *no* to the guiding questions in their ratings. Once they are finished with the calibration stage, CPR automatically reveals on the computer monitor how close a student's rating performance is to the instructor's. The instructor's ratings accompanied by tangible commentary make a model from which students obtain inspirations of how they are supposed to comment on peers' writing. Peer reviews relayed via CPR are anonymous and asynchronous—a replication of double-blind peer review prevailing in the academic communities. In the end, students assess their own writing, read peer commentary for them, and revise their initial drafts. The program also keeps the instructor posted by maintaining an ongoing record of peer review.

Statement of Purpose and Research Questions

The purpose of this study was to examine revision that university students made to reconstruct their written argument. The central research question addressed here was whether APR affected postdraft revision and accordingly enhanced the quality of argumentative writing.

Research questions to be answered were proposed as follows:

1. How did asynchronous peer review affect the holistic quality of argumentative writing?
2. How did asynchronous peer review affect the primary traits of argumentative writing?
3. How did student writers revise their argumentative writing?
4. How did university students perceive the influence of the reviewing process on their revision?

Operational Definitions of Key Terms

The key terms in this study were defined in the interest of clarity. The definitions were derived by the researcher for the purposes of interpretation and operationalization within the context and scope of this study:

1. Asynchronous peer review—networked collaborative learning supported by computer technology, through which students evaluate each other's writing on an Internet environment and exchange digitalized feedback in a delayed manner to help writers see their writing from readers' perspective and revise to improve writing
2. Argumentative writing—academic written discourse addressing a controversial issue, in which a position is taken, reasons and supporting ideas are presented, potential counterargument is offered, and refutation is considered
3. Holistic rubric—assessment based on the judge's impression of the overall quality of a writing
4. Primary-trait rubric—assessment based on criteria that are thoroughly and specifically defined for a specific type of genre
5. Revision—textual discrepancy between a final essay and its corresponding initial draft

Significance of this Study

The present study investigated the relationship between postdraft revision and intervention to reveal postdraft revision, the frequency of revision, the influence of the APR context on revision, and the participants' perception of the impact of APR. The processes of producing written arguments supported by a formal peer-review

process have not been researched substantially in writing research, and therefore, this study was carried out to add new information to the literature. A close look at the practice of APR to assist university students revising their argumentative papers provides researchers and practitioners with the insights into the pedagogical values of peer collaboration in a non-traditional mode. The present study may contribute to theory and practice.

This study extends the understandings of three types of readers. First, the results offer writing teachers with a lens to examine the strengths and weaknesses of technology that was specifically created for the purpose of improving writing. Second, the readership includes general instructors, who adopt a writing-across-the-curriculum syllabus and are too pressed for time to teach writing in class. This study illustrates how writing assignments can be recast as a series of discrete steps for students to carry out beyond the classroom. Third, researchers may take interest in this study. Up to this point, the literature is short of experimental and quasi-experimental studies demonstrating the use of specialized programs to lead students to revise. Therefore, scholars of compositions would find much of value in this study. In sum, the findings of this study contribute to the knowledge base of contemporary writing research and provide practitioners and researchers with extensive insights into revision in argumentative writing.

Chapter II

Review of Literature

Revision is the choice of professional writers to perfect writing. Jane Yolen said, “It's never perfect when I write it down the first time, or the second time, or the fifth time. But it always gets better as I go over it and over it.” The prolific writer Neil Simon once argued the necessity of revision by drawing an analogy between revision in writing and swing in baseball games, “In baseball you only get three swings and you're out. In rewriting, you get almost as many swings as you want, and you know, sooner or later, you'll hit the ball.” James Michener also argued that, “I’m not a very good writer. I’m an excellent rewriter.” Since revision is so important to improve writing, what instructional strategies did researchers find effective in driving students to engage in this sort of practice as expert writers do?

Chapter II brings together the theoretical foundations and review literature on argumentative writing and on revision changes in composition. Over the last decade, the body of research on writing evolved from various theories underlying the discipline of composition studies. This chapter centers on issues and research findings pertaining to writing and revision.

Theoretical Framework

The present study draws on three main theories: Toulmin’s model, cognitive theory, and sociocultural theory. The Toulmin model manifests the argumentative categories in argument (Toulmin, 1958). Cognitive process theory stresses cognitive

activities evolving from writing (Hayes & Flower, 1980; Hayes, 1996). Sociocultural theory brings the social context of writing into sharper focus. Clearly, each theory sheds light on a facet of writing itself.

The Toulmin Model

Background and argument fields.

Going against the formal-logic approach to argument, Toulmin (1958) proposed to break down argument into separate parts for analyzing and understanding the form of practical argumentation. During the first half of the twentieth century, the logical dimension has been the primary concern in the study of argument. Formal logic establishes the foundation on syllogism, as a basic module to study argument. The reasoning process (major premise, minor premise, and conclusion) is operated as if it were as consistent and rigorous as mathematics. The relationship between the premises is treated as parallel and simple as in algebra. Stephen Toulmin maintained that the reasoning process endorsed by formal logic is not only inadequate but also insufficient, and criticized the traditional approaches of logicians for the following reasons: (1) it is doubtful that any genuine argument can properly be timeless, (2) the traditional distinction between deductive and inductive arguments is a crude muddle, and (3) argument is a field-dependent phenomenon. He proposed a six-category model consisting of six interrelated categories—claim, data, warrant, backing, rebuttal, and qualifier. Independently, each category carries out a special function within an argument. As a whole, they link closely to each other, like an organism. The syllogism method has no role to play in Toulmin's model.

Toulmin (1958) also advanced the concept of argument fields for argument interpretation and judgment. As people of different professions generate their argument fields by their expertise, argument varies by field. The degree of formality, precision, and modes of resolution differs from one field to another. Therefore, the internal validity of an argument must be examined by the principles of an argument field. Every argument field has its specialized principles for arguers to follow. Moreover, each field has its subfields that function as argument fields.

There are two types of principles that people of an argument field usually rely on to make their judgment of argument-- *field-dependent* principles and *field-independent* principles (Toulmin, 1958). Field-dependent principles entail rules and norms of a particular field whereas field-independent principles are not tied to a particular argumentative field. The notion of field-dependency points to the different modes and styles of argumentation in different argument fields, such as law, politics, ethics, or the arts. Field-independent principles apply to all argument, regardless of argument fields. It can be inferred that the six categories of the Toulmin model are field-independent while content of argument is field-dependent. Knowing the field-dependent principles of a field helps arguers understand the conventions in order to make better argument.

Six categories of the Toulmin model.

The Toulmin model consists of six categories, and each category is defined by its nature in an argument. In terms of textual representation, the six categories are further divided into two types: obligatory and optional. A basic argument must

contain three obligatory categories: data, claim, and warrant. The remaining three categories—backing, qualifier, and rebuttal—are optional.

The category, claim, alludes to the thesis laying out the position taken by an arguer. It represents the central idea of an argument that the arguer wishes an audience to agree with.

The category, data, sets up grounds to support a claim. An arguer may find a variety of evidence for a claim, including facts, examples, or statistical numbers. The arguer's claim appears shaky without explicit supporting data. Reliable data endorses the reasoning process and secures acceptance of the audiences. A b*ecause*-clause, for instance, signals the use of supporting ideas. Data from an unreliable source may reduce the credibility of an arguer. Audiences would probably not adhere to the arguer's claim when the data are found irrelevant, reasons are found inappropriate, or a fallacy is apparent.

The category, warrant, functions to connect data to claim and stems from the principles/assumptions that an individual holds. An explicit statement of warrants is not necessary in an argument, and the arguer usually does not have to spell it out in an argument. It is up to the audiences to infer from their personal beliefs or experiences. As everyone possesses different background knowledge and ideology, warrant can vary from one to another (Toulmin, Rieke, & Janik, 1984). If a warrant is provided in an argument, it is embedded in *if, then* or *since*-clauses.

The category, backing, indicates "generalizations making explicit the body of experience relied on to establish the trustworthiness of the ways of arguing applied in a particular case" (Toulmin, et al, 1984, p. 61). It comprises shared beliefs of an

argument field and legitimates the assumptions behind a warrant. Like warrant, backing is not made explicit in an argument. Its relation to warrant is by analogy with warrant to data and claim. Toulmin (1958) gave a special account of the differences between warrant and backing. That is, warrants are hypothetical and bridge-like statements while backings are categorical facts (p. 105).

The category, quantifier, encompasses adverbial words or phrases which modify and define the scope of a claim. For an arguer to argue with a tone of reservation, a quantifier should be overtly imposed onto an argument. An argument with a quantifier implies the degree of certainty that an arguer holds. A quantifier has several functions: signifying probability of a claim, narrowing the scope of a claim, and indicating potential rebuttals.

The category, rebuttal, stands for an exception that invalidates a claim. It explains certain conditions under which the string of reasoning is restricted. A balanced argument always contains a claim and relevant rebuttal(s). When making a claim without simultaneously addressing a related rebuttal, an arguer creates a biased image and is very likely to attract criticism. The main function of a rebuttal is to broaden the scope of dispute. In turn, it balances the reasoning process in argument. Though it represents a potential objection that audiences may raise, presenting two sides of an issue does not weaken the arguer's point. Instead, it demonstrates an arguer's overall understanding of the issue in dispute. Making reference to rebuttals turns out to strengthen the argument, instead.

Stephen Toulmin found fault with the formal logic and proposed his six-category model as a starting point for argument analysis and judgment. The six

categories work closely as a whole and each component fulfills a specific function. By way of the six categories, the argumentative structure takes audiences through a line of reasoning to secure their acceptance. The model is built on a tenet that the six categories are basic components for constructing argument in every argument field. No matter in what argument field an argument is situated, any sound arguments should always be subsumed into the six categories.

Critiques of the Toulmin Model.

Though the Toulmin model is held in high repute as a valuable system that characterizes a universal structure across fields, one of the main issues inherent in the model itself has to do with the ambiguous definitions of several key categories (Inch & Warnick, 2002). The ambiguity aggravates the complexity of applying the model to either analyze or invent argument. The model has been modified to be a heuristic method to sort out the argumentative components in written discourse (Burkhalter, 1995; Crammond, 1998; Knudson, 1992; McCann, 1989; Standish, 2005; Yeh, 1998a, 1998b), but it still remains a topic of debate about whether Toulmin's logic is pedagogically valuable for writing instruction (Faigley & Selzer, 2003; Fairbanks, 1993; Fulkerson, 1996; Schroeder, 1997).

Several of the categories are truly complex in nature. Inch and Warnick (2002, pp. 323-325) pointed out the reasons for the complication: (a) Many arguers state the claim and data explicitly in an argument without stating warrants to connect the two categories. In Toulmin's reasoning process, there is nothing wrong with an argument without a warrant explicitly attached. When the warrant is left implicit, however, an audience is free to infer from his/her personal experience. As personal experience

varies from person to person, so do the warrants inferred by each individual. The inferred warrants may not sustain the link between the claim and the data. (b) When a warrant is stated in an argument, it is frequently mistaken for the data. Though Toulmin characterized this category with specific sentence structure, most warrants do not take an exact shape in grammatical form. (c) It is hard to distinguish the backing from the data when both are explicitly stated in an argument. A backing must be explicitly spelled out to legitimate a warrant when an audience questions the connection between the claim and the data. In that situation, the backing can be mistaken for the data which must be made explicit in an argument. (d) There should be multiple ways other than the Toulmin model to illustrate an argument. Complex argument may require analysts to think about different warrants to interpret the connections between the claim and the data.

The imprecise definitions of the key categories, such as the warrant and the backing, appear to be the source of problems. The problems unforeseen by Toulmin may impede arguers or analysts who intend to apply the model to generate or analyze argument. Theoretically, the model is viable as a heuristic for instructional purpose. Practically, students may find it challenges arguers to create argument by following the model (Faigley & Selzer, 2003; Fairbanks, 1993).

Despite all the criticisms, more and more researchers and teachers are willing to experiment with the model. The model was introduced as a diagram for the creation of written arguments, as shown in a few university-level textbooks on composition (Clauss, 2002; Crusius & Channell, 2002; Ramage & Bean, 1997; Rottenberg, 2003; Wood, 2001). Rottenberg (2003) adopted the model to teach

college students to compose written argument based on the Toulmin logic. In recent research studies, the argumentative categories of the Toulmin model were treated as criteria for the evaluation of primary traits of argumentative papers (Burkhalter, 1995; Crammond, 1998; Gleason, 1999; Knudson, 1991, 1992; Lunsford, 2002; McCann, 1995; Peled, 2003; Standish, 2005; Yeh, 1998a, 1998b).

To sum up, Stephen Toulmin proposed his six-category model in response to the inadequacy of the formal logic in argument analysis. Despite the deficiencies in the definitions of some categories (Inch & Warnick, 2002), the model has been adapted to characterize argumentative structure in written discourse (Connor, 1990; Yeh, 1998a, 1998b). The structure as demonstrated by Toulmin was modified for the analysis of written argument, and more and more writing researchers adopted Toulmin's logic to analyze argumentative writing.

Theoretical Perspectives on Revision

The conceptualizations of revision have been modified with the shift of approach to writing instruction (Fitzgerald, 1994). In the product approach, revising is understood as error hunting that takes place in a coda to writing. With the discovery of the recursive nature of the writing activities, revision is conceptualized as a problem-solving process that happens when a mismatch is detected between the actual text and the text represented in the writer's mind. To revise is to solve problems that intervene at any point during writing (Hayes & Flower, 1980; Witte, 1985). It is generally accepted that revising is far more complicated than proofreading. Most revision studies evolving from the cognitive perspective have been conducted with very little attention to instructional findings based on

sociocultural theory (Allal & Chanquoy, 2004). Later, the revising-as-problem-solving view was challenged for its inadequate attention paid to the social environment outside of the writer's cognition. The sociocultural framework was proposed in response to the inadequacy of cognitive process theory. Thus, revision is further expanded as outgrowth of a social dimension. Instructional studies are based on the sociocultural framework to provide the social facet of writing to compensate what has been typically marginalized in cognitive process theory. Despite the different focuses, the two perspectives appear compatible rather than conflicting, and become main pillars of writing research.

Cognitive process theory.

Several models based on cognitive process theory have been proposed to account for the writing process. In Hayes and Flower (1980), revising was termed with *reviewing* in parallel to planning and translating. Bereiter and Scardamalia (1987) crystallized the problem-solving steps—compare, diagnose, and operate—in a writer's mind, illustrating revision as a three-part process to solve problems. Hayes (1996) found fault with Hayes and Flower (1980) and Bereiter and Scardamalia (1987), and proposed a new revision model that rendered more details in the interplay among the writer's mental resources. The most obvious contributions by all the models are consistent; i.e., (1) writing is the result of thinking, and (2) to revise is to solve problems.

In Hayes and Flower's model (1980), the entire writing processes consist of a series of nonlinear thinking activities: planning, translating, and rewriting. In the planning stage, writers search mental repertoire, generate and organize ideas, and set

goals for their writing. The goals they set in this stage become criteria to direct subsequent writing activities. In the translating stage, mental representation formulated in the planning stage is translated from mental representation into a concrete form on a piece of paper. In the rewriting stage, writers read to redraft what they actually intend to say. In this model, rewriting is isomorphic with revising. The entire cognitive subprocesses—planning, translating, and rewriting—occur recursively in working memory but are constrained by the task environment and the writer's long-term memory. The task environment is comprised of factors external to the writer's cognition, e.g., the demands of a writing assignment (topic, audience, and motivating cues) and the text produced thus far. The writer's long-term memory embodies knowledge of topic, knowledge of audience, and stored writing plans. Though Hayes (1996) proposed a new model of writing to accommodate more factors related to the writing processes, the Hayes and Flower's model (1980) still dominates the study of composition.

Bereiter and Scardamalia (1987) sketched a CDO model to detail how writers resolve dissonances by comparing, diagnosing, and operating. In the *compare* stage, a writer compares the actual text-in-progress and the text represented in his/her mind, with a goal to evaluate whether the actual text has achieved the intended goals. When a problem or mismatch is detected, the writer makes a diagnosis of the nature of the problem in the *diagnose* stage. In the *operate* stage, the writer tries to find a solution to solve the problem. In the CDO model, the role of work memory is especially emphasized.

The most important contribution of the CDO model is in illustrating how

expert writers and inexperienced writers manipulate their mental resources during writing. All writers may go through the same procedures to develop problem-solving strategies, but expert writers appear better than inexperienced writers at managing their knowledge to meet their goals. Expert writers usually transform their knowledge to achieve their goals while inexperienced writers often put down their knowledge directly without further transformation (Bereiter & Scardamalia, 1987). Expert writers are more experienced in detecting problems and putting themselves in the role of the readers to determine how the readers will react to their writing (Flower, 1979; Scardamalia & Bereiter, 1991). When knowledge is transformed, they produce reader-based prose (Flower, 1979; Flower, 1990). In contrast, inexperienced writers do not perform as effectively as experts. They are not as good at detecting problems or conceiving of readers' reactions in order to adjust their writing. As a result, they simply put down their knowledge without knowledge transformation. When they tell their knowledge directly, they produce writer-based prose (Flower, 1990). Even so, knowledge telling is a prerequisite of knowledge transformation. In a rewriting activity, experts have the advantage over inexperienced writers. Expert writers may either choose to switch to a novice move or behave like experts. When they decide to work as experts usually do, they set more goals and revise globally.

Because the problem-solving process depicted in the CDO model centers on the text-in-progress and the self-set goals by the writer, the model is limited in its accountability. Hayes (2004) argued that the CDO processes should not be applied to explain for a situation where a reader revises someone else's writing.

In a new model of revision (Hayes, 1996), the control structure is included to

further explain how an entire revising process can be triggered and proceeded. The control structure for revision consists of a task schema—a repertoire of knowledge deposited in long-term memory. More specifically, a task schema for revision may be comprised of all or some of the following: a goal (to improve writing), an expected set of activities to be carried out (critical reading, problem solving, text production), attentional subgoals (problems, errors), standards for quality, strategies to fix problems. Writers resort to the task schema when receiving hints from environment stimuli or from self reflection to activate a relevant task schema to perform revision. A task schema is retrieved entirely as an intact unit to manage the revising subprocesses—text processing, reflection, and text production. The three subprocesses are controlled by the task schema.

Hayes' model of revision offers many reference points that account for the failure of revision. Perhaps the writer's task schema is inadequate. It is also possible that the writer has difficulty coordinating the revising processes in working memory. Another possibility is that the writer runs short of mental resources to fix problems.

In sum, the three major models describe how revision is performed in cognition and illustrate potential factors affecting the revising processes. All the models establish theoretical structures for multiple lines of research and instruction on the practice of writing and revision.

The cognitive process theory has spawned critical inquiry into cognitive activities. According to the cognitive process models (Bereiter & Scardamalia, 1987; Hayes & Flower, 1980; Hayes, 1996), what distinguishes expert writers from novice writers is due mainly to their cognitive operations. Expert writers are strategic in

lessening the problem-solving burden imposed upon their mental resources, successful in reconstructing their goals throughout the whole writing process, and good at making extensive and efficient revision to achieve their goals (Faigley & Witte, 1984). Unlike expert writers, novice writers are less strategic in allocating their mental resources to deal with problems, less successful in establishing their goals, and poor at making extensive revisions (Perl, 1979; Sailor, 1996; Sommers, 1980). Most student writers tend to tell their knowledge directly without transformation (Smith, 1995). Within cognitive process models, literal representation is a manifestation of cognitive activities of writers.

Sociocultural theory.

Sociocultural theory gains its importance in response to the inadequacy of cognitive process theory. As cognitive process theory owes a great deal to the meaning-making process of a writer, it is believed that adhering to cognitive operations can make a difference in the final products. Unfortunately, the process-based pedagogy does not always bring about promising results as expected (Gleason, 2001). Revising difficulties can be caused by deficiencies in long-term memory, working-memory, or their task schema. For instance, inexperienced writers may be aware of the need to revise, but still fail to coordinate the subprocesses in their working memories (Bereiter & Scardamalia, 1987). In other cases, writers may detect problems which they lack knowledge to solve (Hayes, 2004). Moreover, a task schema is activated but does not function effectively (Wallace, Hayes Hatch, Miller, & Moser, 1996). In light of all sorts of difficulties described above, sole reliance on the mental resources does not seem to help writers carry out a revising task in an

adequate manner. They need assistance. According to sociocultural theory, a social dimension should be incorporated into the writing process to broaden the scope of the writer's cognition.

Sociocultural theory casts new light on the link between social context and psychological development (Bruffee, 1993, 1996; Gere, 1987). Vygotsky especially remarks on higher-order thinking in relation to the learning of a language and social interaction. He accentuates the function of written language as a tool that supports our ZPD. Though interaction, students receive scaffolding which enables them to perform challenging tasks they fail to be able to perform without assistance. By means of interaction, the interlocutor may model the problem-solving strategies or guide students to solve problems. In writing, it is probably the revising process that requires the most assistance from external sources.

Argumentative Writing—Research Studies

Given that argumentative writing challenges the majority of student writers, researchers take one of the two views to this issue (Mitchell, 1997). The nature view is concerned with a complex constellation of the natural/inner attributes. Research studies driven by the nature view are attempting to account for developmental performance from the perspectives of the innate traits. The nurture view is intended to gauge the interventional effect on performance. Research studies driven by the nurture view are carried out to determine whether writing development grows out of intervention. In comparison to the research trends dominating writing research, the two views appear comparable to the cognitive perspective and the sociocultural perspective.

The Nature View

Researchers who hold the nature view take interest in the relationship between the ability to write arguments and the natural attributes, including age and grade levels (Coirier & Golder, 1993; Crammond, 1998; Golder & Coirier, 1994; Knudson, 1992, 1994; McCann, 1989 and knowledge and beliefs (Slater, 1998). In this aspect, the nature view comes very close to the cognitive perspective dominating composition studies. It is believed that the competency to produce written argument may have to do with the natural attributes.

Age and grade levels.

Argumentative writing challenges writers at all ages or grade levels (Sperling & Freedman, 2001), but older students usually are better at it (Coirier & Golder, 1993). It is obvious that the ability to compose sophisticated written argument is tied to the degree of cognitive maturity. Three stages have been identified (Coirier & Golder, 1993), illustrating the development of argumentative competence in writing: pre-argumentation, minimal argumentation, and elaborated argumentation. The pre-argumentation stage is characterized by one of two criteria: no stance taken, or a stance taken without supporting argument. The minimal argumentation stage is characterized by one criterion: an explicit stance coming with one argument. The elaborated argumentation stage is characterized by the two criteria: a stance taken and supported by at least two unrelated arguments, and then a stance taken and supported by two related arguments. Seven or eight year-olds can reach the minimal argumentative stage, but the elaborated argumentation stage will not be attained until around age 14. Refutation and counterargument were mastered at a later age beyond

14 (Golder & Coirier, 1994). By nature, older students are better arguers than youngsters in writing (Coirier & Golder, 1993; Crammond, 1998; Golder & Coirier, 1994). The developmental stages of argumentative text discourse appear in parallel with the cognitive stages suggested by Piaget (1955). According to Piaget's theory, four stages are illustrated to account for cognitive development (Piaget, 1955): the sensorimotors stage (birth-2 years old), the preoperation stage (ages 2-7), the concrete operation (ages 7-11), and the formal operation (ages 11-15). As shown in the research, argumentative competence is not well developed until the formal operation stage— the last stage of cognitive development. Only when one attains the 4th stage can he/she undertake conceptual reasoning. Argumentative performance in writing seems to reflect age differences, and the ability to write more elaborated argument appears to develop with age.

Research studies on the grade-level factor generate similar findings. Students at higher grades are better at using the primary traits in argumentative writing (Knudson, 1992, 1994; McCann, 1989). Knudson (1992) found that most students had difficulty with argumentative papers, but high-school students used the three required categories of the Toulmin model more frequently than elementary-school students. The age difference is reflected in the use of the three required argumentative categories only. In general, very few students incorporate counterargument (opposition) or refutation (response to the opposition) into their arguments. McCann (1989) also reported grade level difference in written argument performance. Ninth- and twelfth-graders are more skillful than sixth graders in laying out claims, but there are no differences among the grade levels in stating supporting data. Given that the

results make sense, there seems a methodological weakness in the process of data collection in McCann (1989). When students were given 20 minutes to write arguments, they might have spent most of their time producing the obligatory categories with little time to generate counterarguments or refutation in the given time frame. The time issue could have posed a potential threat to the research.

Expert writers usually have better ideas of exploiting argumentative essays than student writers. Crammond (1998) compared essays written by sixth-, eighth-, and tenth-graders, and by expert writers, reporting slightly different findings. Compared to expert writers, students produce relatively lower frequencies of warrants, counter rebuttals, and qualifiers. Sixth- and eighth-graders frequently elaborate their reservations, but tenth-graders, just like expert writers, elaborate countered rebuttals more often. More importantly, expert writers seldom spell out warrants—a performance close to what Toulmin (1985) contended, i.e., no need to state warrants. Yet, some methodological flaws could have posed threats to the results. A portion of text samples were selected from a data pool for analysis, and students and expert writers carried out their writing under totally different circumstances. Those potential weaknesses could have become threats to the results.

Knowledge and beliefs.

One line of research drawing on schema theory assesses the written performance shaped by the mental resources in long-term memory. Knowledge and beliefs are essential resources for the content of writing (Alba & Hasher, 1983; Anderson & Pearson, 1884; Bereiter & Scardamalia, 1987; Kardash & Scholes, 1996; Rumelhart, 1980). Topic-specific knowledge and beliefs can be further partitioned

into three sets of components--epistemological beliefs, strength of beliefs, and need for cognition (Slater, 1998). Epistemological beliefs refer to personal theory of knowledge. Strength of beliefs refers how strongly a person clings to his/her beliefs. Need for cognition refers to self-reporting of the demands for focused thinking in a variety of situations. Epistemological beliefs come to play when a person interprets a message and the strength of beliefs decides what position should be taken. All three factors, more or less, seem to impinge on the interpretation of conflicting arguments and the conclusion of an issue (Slater, 1998). Writers make less decisive conclusions in their argumentative writing when their beliefs show little consistency (Slater, 1998).

Studies of argumentative writing in relation to the age and grade factors make some interesting points. The ability to argue grows with time. Older students are more capable of elaborating arguments than younger students. As students grow older, their arguments become more sophisticated. Moreover, knowledge stored in long-term memory may affect a writer in taking a stance in an argument.

The Nurture View

Researchers who take the nurture view are interested in exploring instruction or assistance that may stretch students' ability to construct written argument. Some researchers subscribe to writing-reading interactions (Crowhurst, 1991; Knudson, 1991, 1994; Monahan, 2000; Poulsen, 1997), and others prefer model- or trait-based instruction (Grande, 2003; Hughes, 2000; Lamm, 1994; McCann, 1995; Peled, 2003; Wallace, 1992; Yeh, 1998a). The concept of *progymnasmata* or exercises has been revived to prepare student writers for full-blown writing (Ampadu, 1999). Computer-supported instruction is integrated into the planning stage (Lin, 2003). A sociocultural

approach has been integrated into the planning stage (Braaksma, van den Bergh, & Couzijn, 2001; Burkhalter, 1995; Gelat, 2003). In addition to instruction, various procedural facilitations have been attempted to change the way students construct their arguments, including audience specification (Redd-Boyd & Slater, 1989) and elaborated writing prompts (Ferretti, MacArthur, & Dowdy, 2000). Despite the proliferation of instructional methods aimed at the planning stage, little research has investigated intervention in the revising stage. In the present study, the researcher sought to fill the literature gap by studying how intervention led students to revise their work across drafts.

Research Studies on Revision

Despite subtle differences in the cognitive process models (Bereiter, & Scardamalia, 1987; Hayes, 1996; Hayes & Flower, 1980), common ground shared by all the models focuses on the essential roles of working memory and long-term memory in writing. Long-term memory contains task schemas and many kinds of knowledge that a writer can retrieve for the substance of a text. Working memory provides attentional space to process knowledge retrieved from long-term memory and coming from external environments to make the literal representation. Within the cognitive frame, it is believed that the two mental resources serve as the two most vital operators determining a successful outcome or a breakdown of a revising change.

Working Memory

Working memory is commonly recognized as the mental space with limited capacity where the revising subprocesses-- compare, diagnose, and operate—occur (Bereiter & Scardamalia, 1987; McCutchen, 1996), and the way it is operated appear

to determine the shape of written performance. In order to understand how writers operate their working memories, a think-aloud technique, an interview or an observational method is often employed to reveal what is going on inside a writer's head (Fitzgerald, 1987; Flower, Hayes, Carey, Schriver, & Stratman, 1986; Flower, Wallace, Norris, & Burnett, 1994; Hayes & Flower, 1980; Perl, 1979; Pianko, 1979). In a think-aloud session, for instance, researchers observe the thinking processes by asking writers to verbalize their thinking online. The protocols manifest the superiority of expert writers over inexperienced writers in manipulating their working memories to achieve their goals.

The most fundamental finding is that expert writers are more skillful than inexperienced writers in allocating their limited capacities in working memory for critical reading, reflection, and text production (Hayes, 1996). Inexperienced writers are so busy managing the overload imposed upon cognition that they may detect a smaller number of problems than expert writers do (Butterfield, Hacker, & Plumb, 1994; Plumb, Butterfield, & Hacker, 1994). When reading for revision, many inexperienced writers take the finished texts as their intended texts and proofread rather than revise globally (Flower, Hayes, Carey, Schriver, & Stratman, 1986). Redeveloping the ideas embedded in the text is sometimes confined to the first paragraph only (Sommers, 1980). What is worse, the revised version is poorer than the initial draft (Perl, 1979). Expert writers, in contrast, appear far more strategic in many ways. They are better at manipulating their mental resources to process knowledge (Bereiter & Scardamalia, 1987; McCutchen, 2000). They detect more problems, correct more mistakes, keep the audience in mind, know how to take a

position, come up with better content, choose stronger language, predict audiences' reactions, organize arguments, and exhibit emotions (Spencer, 2002). The manner in which a writer allocates working memory to revise a text matters (Beal, 1996; Breetvelt, van den Bergh, & Rijlaarsdam, 1994; Chanquoy, 2001).

Long-Term Memory

The relationship between revision outcomes and types of knowledge is a topic of interest in writing research (Flower, Hayes, Carey, Schriver, & Stratman, 1986; McCutchen, Francis, & Kerr, 1997). Long-term memory is a cognitive resource where writers retrieve knowledge for processing in short-term memory. The important constituents in long-term memory include task schemas and various categories of knowledge (Bereiter & Scardamalia, 1987; Hayes, 1996; Hayes & Flower, 1980). According to the cognitive process models, long-term memory seems to intervene in the revising process.

Knowledge of text.

If writers are equipped with rich knowledge about text in long-term memory, they should be in an advantageous position to better their writing. Knowledge about text is various, entailing content knowledge, topic knowledge, knowledge of textual structure, epistemological beliefs, knowledge of error location, or knowledge of how to correct an error. Supposedly, expert writers will write better texts than inexperienced writers because they have more knowledge at their disposal. Thadani (2000) compared strong writers with weak writers, reporting that the former demonstrates more knowledge about text that correlates with the ability to revise. Weak writers are poorer in judging text quality as well as explicitly verbalizing their

knowledge about text. Knowledge about text is also related to the revision that writers make to the papers written by someone else. Bakunas (1994 & 1996) argued that knowledge of content structure helps writers with the problem-solving process. Knowledge of content structure includes knowledge of discursive elements and arrangement. Smith (1995) also reported that content knowledge affects the text disposition.

Researchers seek to determine whether the discovery of a problem and types of revisions are encroached by multiple sources of knowledge. McCutchen, Francis, and Kerr (1997) found that making use of topic knowledge and knowledge of error location somehow increases with the cognitive maturity and affects revision. Topic knowledge is facilitative for college students and middle-school students to make meaning-based revisions, but not surface-based revisions. With the benefit of knowledge of error location, middle-school students make surface corrections rather than revise meaning but college students make surface-based and meaning-based revisions. Butterfield et al. (1994), comparing revised texts about weather in the state of Washington and about the game of cricket by novices and experts, corroborated the correlation between topic knowledge and meaning-based revision. Experts in weather produced more meaning-based revisions in the weather article while experts in cricket yielded more meaning-based revisions in the cricket article. Furthermore, experts specialized in one of the two areas are found to make less surface-based revisions than meaning-based revisions.

If a revising process begins with knowledge of error location, is knowledge of how to correct an error required or sufficient for error detection? Knowing how to

correct an error is not identical to knowing how to detect an error. The former will not come to play in the revising process unless an error is detected. It was found that knowledge of how to correct an error is necessary but not sufficient for error detection (Hacker, Plumb, Butterfield, Quathamer, & Heineken, 1994).

Knowledge of audience.

Adapting to the audience is one of the most vital principles that every arguer should keep in mind (Perelman & Olbrechts-Tyteca, 1971). At a macro level, knowing the audience reflects an understanding of the standards of an argument field in which a text is created (Rafoth & Rubin, 1988). At a micro level, the characteristics of the readers for whom a text is created matter (Kellogg, 1994). Anticipating what the targeted audience cares about has implications for writers (Carvalho, 2002; Schriver, 1992).

Redd-Boyd and Slater (1989) assessed knowledge of audience in the creation of written argument. Audience knowledge was stipulated in one of the three ways—a real audience, an ostensible audience, or no audience. A real audience is a real person who will actually read the document. An ostensible audience exists in a writer's imagination only. No audience is no reader assigned in the prompt. It was found that specifying a real audience did not drive undergraduate students to produce arguments better than writing to an imaginary reader. However, the sense of an audience raised their interest and effort. Moreover, writers tend to rely on strategies driven by audience. Knowledge of audience essentially affects the writing process.

Task schema.

A new feature of Hayes' model of revision (1996) is about the control structure that governs revision. The control structure is a task schema made up of a bundle of knowledge, including a revising goal to achieve, an expected set of activities to be carried out, attentional subgoals, templates and criteria for quality, and strategies to repair problematic areas (Hayes, 1996, p. 17). It is hypothesized that writers will revise globally as long as they are instructed to do so.

The control structure hypothesis has been tested, but research findings are mixed. In Wallace and Hayes (1991), students were prompted during an eight-minute instruction to make global revisions on a text written by someone. The finding revealed that the quality of the revised text was improved. Because it is easier to revise others' documents (Bartlett, 1981), the external validity was damaged. Wallace, Hayes, Hatch, Miller, and Silk (1996) implemented similar instruction to encourage undergraduate students to revise their own papers globally. The instruction was effective for entry-level students, but not basic-level students. The short-term, one-shot instruction might have reshaped writers' task definition, but their basic revising strategies might not have been altered drastically in such a short time. Miller (2002) replicated the instruction for graduate and undergraduate students to revise a short text on the operation of a water treatment plant, but the short-time instruction was not found to bring forth global revisions to a significant extent. In Berninger, Whitaker, Feng, Swanson, and Abbott (1996), middle-school students did not benefit from such revising guidance, either.

The possible effect of revising prompts is still under debate. The principle behind the eight-minute instruction comes very close to the concept of procedural

facilitation (Scardamalia & Bereiter, 1983). Hayes (1996) assumed that a task schema will be triggered to perform global revision when writers are prompted. However, limitations in the writer's cognitive resources are still likely to result in revision breakdown. The causes are various (Fitzgerald, 1987, pp. 489-490): (1) writers do not clearly establish intentions for a text, (2) simultaneously juggling presentation- and content-related goals may fail revision, (3) egocentrism may inhibit writers from establishing intensions and identifying discrepancies between intended text and actual text, (4) discrepancies are detected, but writers have no idea of what/where changes are needed, (5) discrepancies are identified, but writers lack the knowledge to make desired changes, (6) writers have trouble executing the desired operations, and (7) writers may have all the knowledge, but fail to deal with the process.

Clearly, cognition-based intervention may be constrained by a writer's cognitive deficiency. When a writer has yet to learn to coordinate mental resources, the use of prompts to elicit global revision may take effect. For the ZPD of developing writers, receiving assistance from peers or teachers can be more of use than resorting to their internal resources.

Peer Review and Writing

In a learning context, immediate help available to student writers may come from authentic readers adjacent to them—peers or teachers. Though teacher or peer commentary aids writers gaining a sense of how their writing is read or interpreted by real readers, peer commentary is distinct from teacher commentary in features and impact on writing.

Though teachers make comments to inform writers of areas of improvement (Goldstein, 2005; Peterson, 2006; Straub, 1996 & 2000), the overall impact on student writing is minimal (Gere & Stevens, 1985; Hillocks, 1986). Teachers opt to formulate their comments in a chunk as an appendix to the body of student writing or offer diffuse commentary within text. Surprisingly, teacher commentary tends to pertain to mechanics (Matsumura, Patthey-Chavez, Valdés, & Garnier, 2002). Meaning-based commentary on the macro level of a text, such as argument organization, is relatively sparse (Stern & Solomon, 2006). Above all, it arrives along with a grade, symbolizing the end of a writing assignment. More often than not, students are not required to redevelop their work in response to teacher commentary. Many instructors wonder whether students spend time reading the commentary and whether students are able to incorporate the text-dependent commentary into their next writing assignment (Ogede, 2002).

Peer commentary is generated in oral response groups which take place in real-time, face-to-face circumstances. The pedagogical practice of a peer review activity is aimed at motivating student writers to understand their writing from a reader's lens (Shaw, 2002). Students work either in pair or in a group, but multiple reviewers seem to work better than one in providing an array of critiques from different perspectives (Cho, 2004). Given the chance to read and critique, peer reviewers seem to pay more heed to the content than the teacher and develop critiquing skills during the peer review process (Gere & Stevens, 1985; Singh-Gupta & Troutt-Ervin, 1996). Interacting with peers and critiquing papers fosters the development of ideas (Hoel, 1997). Revisions carried out post peer interaction are

made at the word, sentence, and organization levels (Peterson, 2003). Peer commentary is selectively integrated into revisions, but several studies consistently show that quite a few textual changes are untraceable to peer commentary (Connor & Asenavage, 1994; Mendonça & Johnson, 1994; van den Berg, Admiraal, & Pilot, 2006).

In-class peer review appears to add to revision, but it does not always benefit students at all times. Face-to-face interaction sometimes suffers from circumstantial factors, including social and behavioral problems, relationship difficulties (Moll, 2001), or unfamiliarity with the peer review procedure (Yarrow & Topping, 2001). Students may resist criticizing peers' work when face to face with the writers to maintain friendship. Instead of critiquing, they praise. Moreover, the amount of time for developing writers to make thoughtful commentary is an issue, too. They are under pressure to multi-task—to read, critique, and offer advice—in the limited amount of time in class. When peer review is not taken seriously, general peer commentary hardly leads writers to revise in-depth (Goldberg, Roswell, & Michaels, 1995/1996). Furthermore, peer review may be foreign to them, and they have no idea how to perform it in a satisfactory manner. To increase the efficiency of peer review, it works better to coach them on the procedure (Berg, 1999; Zhu, 1995).

The use of technological devices to support peer review or peer interaction did not arise until the late 20th century (Anderson, 2003; Barile, 1998; Barile & Durso, 2002; Crank; 2002; Gehringer, 2000; Hewett & Ehmann, 2004; Kemp, 1998; Pelaez, 2002; Tannacito, 2001; van der Geest & Remmers, 1994), and this computer-based practice and oral response groups share similar features as well as differences in

theory and practice (Breuch, 2004). In practice, both pedagogies are performed with an emphasis on peer collaboration for the purpose of writing improvement. In theory, both are established on sociocultural theory, stressing the necessity of a social dimension in writing. Yet, each format of peer interaction is unique in terms of time, space, and interaction (Breuch, 2004). Face-to-face interaction is synchronous and speaking-based, with the physical presence of the interlocutors in the same space. Computer-based peer review is either asynchronous or synchronous, writing-based, with no need for the physical presence of interlocutors in the same space.

With the similar and different characteristics, researchers are inclined to compare the pedagogical effect of the two practices. van der Geest and Remmers (1994) interviewed students for their reactions toward the use of a technological device to support peer review. According to the interview data obtained from 10 participants, the computer-based group encountered technical difficulties with the software (PREP-EDITOR) while the oral response group was not satisfied with assignments and course management. Similarly, DiGiovanni and Nagawami (2001) surveyed students about their preference for oral response or synchronous peer review (supported by Norton Textra Connect). It was found that students concentrated on task in the online environment and the digitalized peer-review records that allowed them to print out lessened their memory load.

The two exploratory studies were set out to investigate students' attitudes towards two modes of peer review. Therefore, the effect of peer review on revision remained untackled.

With the advance of technology in education, the relationship between peer review modes and revision still remains a major topic of investigation (Hewett, 2000; Liu & Sadler, 2003; Tuzi, 2004). Most studies provide a textual analysis to manifest whether the modes of peer review influence postdraft revision.

Hewett (2000) analyzed how undergraduate students revised their argumentative papers in two synchronous environments—interactive oral and computer-mediated (supported by Norton Connect) group talk. When students were in a face-to-face situation, their oral exchange centered more on idea development at an abstract, global level. When they participated in computer-mediated talk, their attention was paid to the concrete writing task and group management. As far as textual changes were concerned, revision post computer-mediated talk was directly traceable to peer critique whereas revision post oral interaction included more intertextual (imitative and indirect) and self-generated ideas. It was concluded that the type of interaction shapes talk as well as revision.

Liu and Sadler (2003) investigated peer review held in electronic and traditional circumstances in the context of second language learning. While the traditional group discussed their writing orally, the technology-enhanced group used the comment function in Microsoft Word to make comments along with MOO (MUD Object Oriented)—an online platform allowing several people to interact simultaneously—for group discussion. The technology-enhanced group outperformed the traditional group in the total number of comments, the percentage of revision-related comments, and the total number of revisions. Yet, in light of a total of eight participants, the external validity was open to question.

Tuzi (2004) studied the effect of electronic and oral feedback on revision made by second language learners. The researcher developed a website for the participants and visitors to join in the asynchronous peer review, and each essay could be revised as many as five times. Oral feedback for the student writers came from friends, peers, or tutors of the writing center. In spite of students' preference for oral feedback, electronic feedback had a more profound impact on revision and promoted revisions at the global level. Like previous studies, quite a few revisions were not traceable to feedback.

All research studies on peer review suffer from the same methodological limitation (Tannacito, 2001). Without exception, a text analysis method is used to document the correlation between peer review and revision changes. All the research studies were carried out to correlate peer commentary with revision, failing to address the potential influence originating from the whole peer review process, such as reading peers' writing or playing the reviewer role. It is possible that students gain knowledge through making comments (White & Kirby, 2005). Nevertheless, the marginalization of the broader social dimension could have reflected a deficiency in a correlation analysis.

Summary

This chapter reports the previous research findings regarding argumentative writing and revision. From a cognitive perspective, writing is a problem-solving process drawing heavily on mental resources. From a sociocultural perspective, intervention is intended to take the load off cognitive processes and to support the revising process and consequently, improve written performance. Yet, several

research studies show flaws in the research methods. The present study seeks to address as many weaknesses as possible.

Chapter III

Research Method

Chapter III describes the research methods and the data-analysis procedures employed in the present study. This study lends a quantitative perspective to the investigation of the effects of asynchronous peer review (APR) on university students' argumentative writing. Sections ensue under the following broad headings: (a) Participants, (b) Procedure: writing prompts, apparatus, validation of instrument, panel of veteran writing instructors, validation of exemplar essays, instrument validation, and survey, (c) Data Analysis: Rubrics and Coding Scheme for Revision, and (d) Summary.

Method

Participants

University undergraduate education majors enrolled in two sections (Group A & Group B) of a technology-based course at a large, mid-Atlantic land-grant university in the United States were invited to participate in this study. The course centered on a survey of instructional applications of computers, software, and relevant technology for perspective teachers. It is important to notice that the students in this course have been introduced to an array of computer software, e.g., the Hypertext Makeup Language (html). Thus, they were equipped with the skills, such as posting text onto a Web server or creating a Webpage with the html. The

researcher was also the instructor teaching both sections 75 minutes a day for two days a week.

Measures were taken for the students to consent freely to participate in the present study. Participation was voluntary and conditional on a potential participant signing an Informed Consent Form (Appendix 1), which had been previously approved by the university's institutional research review board. Each student received two copies of the form, one to keep and the other to sign and return to the researcher. The full information about the data collection procedures and the possible ethical issues linked to this study were organized and disclosed in the form, such as the purpose and method of the research, experimental procedures, safeguarded storage of the data, confidentiality and anonymity concerns, ownership of the artifacts, questions/withdrawal option, and contact information. Students were informed that participation was not obligatory, and if they agreed to serve as participants, they were free to withdraw their participation at any time without penalty. Each student then decided whether he/she wished to take part in the experiment. Participants were accorded gratitude for their partnership and received three extra points toward their course grades under the condition that they participated in the whole process of the research. Students who declined were given an equal opportunity to receive the three extra points by working on an additional project for the required coursework, and they also went through the experimental processes as one part of their regular class work. However, their artifacts were excluded from data analysis. Because this study was mapped onto the existing curriculum of the technology-based course, there were

no risks to participants. All students were treated with respect, and they left this study with their self-esteem intact.

Twenty-two out of 23 students in Group A and 16 out of 19 students in Group B volunteered to take part in the experiment, i.e., four students turned down the invitation. The students who refused the invitation included one junior and two seniors major in Elementary Education and one senior major in English Education. This subgroup did not yield significant differences from the participants in demographic background. Table 1 displays the demographic information of the 38 participants. Owing to the use of volunteers as participants, the generalizability of the results might be somewhat restricted.

Table 1

Background Information of Participants

Category	Ramification	Group A (N = 22) *n*. of students (%)	Group B (N = 16) *n*. of students (%)
Gender	• Male	1 (5%)	0 (0%)
	• Female	21 (95%)	16 (100%)
*GPA	• Below 2.0	1 (5%)	0 (0%)
	• 2.0-2.49	4 (18%)	1 (6%)
	• 2.5-2.99	6 (27%)	1 (6%)
	• 3.0-3.49	7 (32%)	10 (63%)
	• 3.5 and above	4 (18%)	4 (25%)

Class Standing	• Freshman	0 (0%)	0 (0%)
	• Sophomore	1 (5%)	4 (24%)
	• Junior	15 (68%)	10 (64%)
	• Senior	6 (27%)	2 (12%)
Age	• 18-20	12 (55%)	11 (69%)
	• 21-23	10 (45%)	1 (6%)
	• 24 and over	0 (0%)	4 (25%)
Major	• Elementary Education	15 (68%)	9 (56%)
	• Special Education	6 (27%)	6 (38%)
	• Others	1 (5%)	1 (6%)
Entry Status	• Native student	15 (68%)	10 (62%)
	• Transfer- 2 yr	4 (18%)	3 (19%)
	• Transfer- 4 yr	3 (14%)	3 (19%)
	• Transfer- UM	0 (0%)	0 (0%)
	• Other	0 (0%)	0 (0%)
Language	• Native speaker	22 (100%)	15 (94%)
	• Non-native speaker	0 (0%)	1 (6%)

* Average GPA of Group A: 3.361

Average GPA of Group B: 3.495

Procedure

This quasi-experimental study employed a repeated-measure design to increase statistical power and to control for any possible effect of heterogeneity

across participants. Every participant wrote a total of three essays on topics of technology uses (Table 2). Each writing prompt was explained at the time when it was given to the participants. The instructor talked with the participants about the directions laid down in the prompt to help participants set goals, and participants were encouraged to ask questions to clarify any misunderstandings.

The writing prompts were given to Group A and Group B in a counterbalanced manner. The 1st writing prompt was a pretest administered to the participants as a one-step writing assignment that students had usually done on most curricula. One week later, the participants wrote for their 2nd writing prompt. Two days after finishing their first drafts, Group A carried out APR with the support of CPR while Group B did not receive any special treatment. Finally, both groups were encouraged to revise and submit their latest version of their essays. One week later, the 3rd writing prompt was administered to both groups. Two days after accomplishing their first drafts of their 3rd prompt, Group B carried out APR with the support of CPR while Group A did not received any special treatment. In the end of the assignment, both groups were encouraged to revise and submit a revised version of their essays. Table 2 reveals the counterbalancing order of the writing prompts to both groups.

Table 2

Writing Tasks

	I	II	III
Group A	Software Piracy/Duplication	Advantages of Technology Use	E-Tools for Communication

		(+ APR)	(- APR)
Group B	Software Piracy/Duplication	Advantages of Technology Use (- APR)	E-Tools for Communication (+APR)

Writing Prompts.

The three researcher-constructed writing prompts were pertinent to the use of modern technology in education (Appendix 2). The rhetorical situations were structured to strike a balance among the four elements (subject, message, writer, and reader) in a communicational triangle and appeared meaningful within the participants' experiences of technology introduced in the course. Each of the prompts began with a scenario situated in an educational context: participants were student teachers who made observations of Mrs. Jones—a school teacher teaching in a computer laboratory--and they noticed a few questionable practices in her instruction. In each prompt, participants were asked to address one questionable practice to persuade Mrs. Jones, their audience, to agree with their viewpoints.

Because different types of prompts supported different aspects of cognition (Butcher & Kintsch, 2001; Ferretti, MacArthur, & Dowdy, 2000), content goals and rhetorical goals were both made explicit in the writing prompts to meet the requirements of a good writing assignment (Glenn, Goldthwaite, & Connors, 2003, pp. 93-95; Lindemann, 2001, p. 217; Williams, 1998, p. 245). Content goals aimed at writers' domain knowledge while rhetorical goals, audience expectations (Butcher & Kintsch, 2001). Generally speaking, writers' domain knowledge targeted the thesis statement, reasons, and supporting ideas whereas audience expectations implied

counterarguments and refutations. Making the goals salient appeared to facilitate participants in accomplishing writing tasks (Ferretti, MacArthur, & Dowdy, 2000).

All three writing prompts were pilot tested more than once. In the 1st pilot study, undergraduate writers did not respond very well to the writing prompts with no specification of content goals or rhetorical goals. They complained that they found it difficult to go over the minimal requirement (i.e., 500 words). In the 2nd pilot study, the goals were listed with bullets, but the bullet feature seemed to prescribe the disposition of an essay. In the present study, content goals and rhetorical goals to reach were presented in the writing prompts without bullets.

The final version of the writing prompts passed the close scrutiny of two veteran writing instructors (VWIs) and were judged to be comparable as well as consistent in the aspects of rhetorical situation and format (For background information of the writing instructors, please refer to the section "Panel of Veteran Writing Instructors" below). The comparability and consistency were beneficial for the participants to attain the goals over time.

Apparatus.

The multistep, APR was administered with the software *Calibrated Peer Review*™ (CPR)—a Web-based application developed exclusively to sharpen writers' skills through peer collaboration. The application replicated a science-based model, which honored APR for scholarly journals to secure work of great scholarship.

The program was accessible at http://cpr.molsci.ucla.edu. To log in the system, participants needed to have access to the Internet and a browser (Internet Explore version 4 or higher/Netscape Navigator version 4 or later). Javascript was

enabled for the browser to accept cookies. The cache (temporary Internet files) was also set to "check every time." Pertinent handouts on the operation of CPR and assignment structure were distributed to prepare participants for the upcoming activity (Appendix 3). To get into the platform, every first-time user created a username and password to login to the personal account and went through a concise introduction of CPR. All participants received information regarding the deadlines for accomplishing the stages of an assignment.

On the CPR platform, an assignment cycle consists of three major sequential stages: (1) *Text Entry* (Appendix 4), (2) *Calibration* (Appendix 5), and (3) *Peer Review and Self Assessment* (Appendix 6). In this study participants electronically submitted their first drafts to CPR in Stage 1 (Text Entry), received training in Stage 2 (Calibration), reviewed their peers' work and took the self-assessment exercise in Stage 3 (Peer Review and Self Assessment). The peer review process was electronic, asynchronous, and anonymous. The communication was one-way (reviewer to writer) and writing-based. For each assignment, the instructor chose deadlines in CPR for the start time, text-entry end time, and end time.

1. Stage 1: Text Entry

   Each participant logged into the software and electronically submitted his/her first draft of an essay. Participants were allowed to modify and resubmit their drafts as many times as they wanted before the text-entry end time.

2. Stage 2: Calibration

In this stage, participants received training in preparation for peer review by evaluating three exemplar essays (*calibration reviews*) on the same writing prompt for which the participants had just accomplished their drafts. (The content validity and reliability of the calibrations were previously established by four veteran writing instructors (VWIs) and a group of undergraduate students who took the technology-based course. For details, read the sections below). The exemplar essays were at three quality levels: good, average, and poor. CPR revealed the three exemplar essays to participants in random sequence, one at a time. Participants read each exemplar essay and answered *Yes* or *No* to the questions that were intended to guide the reviewing process. CPR was built for students to hone critical-reading skills, and they were expected to master the reviewing skills after going through three exemplar essays. To successfully review an exemplar essay, a participant had to answer 50% of the content questions and 50% of the style questions correctly, and the gained score should not have deviated by more than 3 points from the rating of an exemplar essay. In case that a participant did not perform to the standard, CPR brought him/her back to retake the calibration(s). Upon passing the calibration(s), each participant received his/her calibration

report in *Calibration Results*, which released the participant's and the teacher's answers. While viewing the report, participants were encouraged to check the teacher-modeled responses as they were detailed keys to the questions. The teacher-modeled responses were intended to clarify participants' misunderstanding, to coach them to read for content, to strengthen their critiquing abilities, and to reveal how the instructor evaluated an essay.

3. Stage 3: Peer Review & Self Assessment

   A. Peer Review—All the drafts previously submitted to CPR in Stage 1 were randomly assigned by the system to the participants for APR. Each participant reviewed three drafts, in sequence, and each draft was reviewed three times by three reviewers. Each draft was attached with the same set of questions shown in the Calibration Stage. The participants not only answered *Yes* or *No* to the questions, but made comments electronically. For the last question, each reviewer assigned a score to the draft on a 1-10 scale, with 10 being the best possible score. The reviewing process was double-blind, and the commentaries were delivered anonymously for the writer to access after the self-assessment exercise.

   B. Self Assessment—Self assessment was subsequent to APR. This exercise was a replication of APR, but the text being assessed

was the participant's own document. No complicated explanations were necessary to answer the questions; what was required for each question was no more than a *yes* or *no*.

After the end-time of the assignment, CPR compiled an electronic portfolio for each participant. The researcher encouraged the participants to revisit the site and integrate peer feedback to improve the final version of their essays.

The APR activity was implemented with the two groups in a counterbalanced order. For one writing assignment, one group was engaged in APR supported by CPR prior to revising while the other group was simply told to revise. The treatments were reversed for the following writing prompt (Table 3). Both groups had the same amount of time for a writing assignment.

Table 3

Experimental Procedures

	Day 1	Break	Day 2, Day 3, & Day 4	Break	Day 5
APR	Text Entry (Draft 1)		Calibration, Peer Review & Self Assessment		Revision (Final Product)
No APR	Draft 1		Regular class work		Revision (Final Product)

Instrument validation.

The instruments used in CPR consisted of the following categories: (a) a total of six exemplar essays for calibration training, (b) questions to guide peer review, and (c) teacher-modeled responses attached to each exemplar essay (Appendix 7). For the six exemplar essays, three were on the advantages of technology (for Group B), and

the others, e-tools for communication (for Group A). The three exemplar essays responding to the same writing prompt were at three quality levels: good, average, and poor. The good text displayed an in-depth analysis, presented coherent argument, and stood out in content and structure. The average text presented a finished discussion, but needed some attention to cohesion and/or organization of proposition. The poor text showed an unsatisfactory effort: poor organization, incoherence, irrelevant statements, and a weak ending or no conclusion. The questions to guide APR were adapted from previous studies and reformulated by one VWI who served on the panel in this study (Berg, 1999; Connor & Asenavage, 1994; Lindemann, 2001, pp. 208-210; Mendonça & Johnson, 1994; Nelson & Murphy, 1992; Paulus, 1999). Teacher-modeled responses were supplied by the researcher and a VWI. All the instruments were triangulated and validated by the panel of experts.

Panel of veteran writing instructors.

To establish content validity of the instrument, the researcher organized a panel that consisted of four VWIs, whose expertise in the area of writing was substantial. VWI 1 was a 2nd-year doctoral student, who had taught English in high school for several years before entering the English Education Program at the University of Maryland. VWI 2 received a Master's degree in English and has taught composition at a university for over 5 years. VWI 3 received a Ph.D. in English, got involved in Freshmen Writing Program for several years, and has taught composition at a university for over 10 years. Expert 4 received a Master's degree in English and has taught Freshmen Writing for over 3 years. Except for VWI 1 (who contributed his

time in the spirit of friendship), all the other VWIs individually received $ 10.00/an hour in compensation for their time.

The researcher worked in tandem with the VWIs to establish validity and reliability of the instruments. The validation procedures are illustrated below.

Validation of exemplar essays.

The researcher tried more than once to validate the six exemplar essays to be used in CPR but was not successful until the 3rd time. The 1st and 2nd attempts were made though email correspondence with VWI 1 during winter break in 2005. The researcher asked VWI 1 to place the exemplar essays for each writing prompt in ranking order from *Poor, Average*, to *Good*. Due to insufficient communication by email, the interrater reliability was unsatisfactory—33%. To resolve the disagreement, the researcher recruited an experienced writing instructor—a non-native English speaker and 3rd-year doctoral student with one-year experience of teaching composition at a community college. In the meantime, she also served as a director in the Writing Center at the University of Maryland. Through email correspondence, interrater agreement reached 100% on the essays responding to the prompt "Advantages of Technology," but 33% on the others.

After the two unsuccessful attempts, the researcher finally decided to adopt a new measure. One month later, the researcher and VWI 1 were face to face to revalidate the instrument. It had been a while, so the reminiscence of previous readings remained minimal and interfered little with his ratings of the exemplar essays. The revalidation procedures consisted of three activities: training, coding, and commenting. In the training stage, the researcher discussed the elements of

argumentative writing with VWI 1. Then, the VWI independently ranked the three essays and commented on the weaknesses and strengths of each essay. After the thorough training and communication, the rater finally reached 100 % agreement with the researcher. Later, the other three VWIs were independently requested to code the essays. The interrater reliability on the quality levels of the essays reached 100 %.

Interrater reliability was established again with a group of pilot university students from within a population very close in academic background to the participants of this study. A total of 17 undergraduate students were divided into 2 groups. One group (9 people) read the exemplar essays on "E-Tools for Communication," and the other (8 people), "Advantages of Technology in Classroom." The essays were randomly ordered in the packets and each student coded the essays independently (Appendix 8). With the return rates 56% (5 out of 9) and 100% (8 out of 8), the Cronbach's alpha reliabilities were .36 and .95, respectively. However, the low reliability (.36) seemed to suffer from an outlier. After outlier removal, the reliability index increased considerably from .36 to .92. With the Cronbach's alphas .92 and .95, the agreement indexes among the students were proved highly unanimous across the board.

Validation of guiding questions.

The guiding questions for APR were validated. The researcher talked with VWI 1 to determine the content relevance and coverage implied in the two sets of materials: (a) the questions used for peer review workshops in academic writing (English 101: Introduction to Academic Writing, 2003-2004, pp. 221-238), and (b) the questions used in previous studies to channel peer-response groups (Berg, 1999;

Connor & Asenavage, 1994; Mendonça & Johnson, 1994; Nelson & Murphy, 1992; Paulus, 1999). Content validity was determined by whether the instrument covered and was relevant to a given area of academic writing (Bachman, 1990, p. 244). Content relevance demanded "the specification of the behavioral domain in question and the attendant specification of the task or test domain" while content coverage refers to "the extent to which the tasks required in the test adequately represent the behavioral domain in question" (Bachman, 1990, pp. 244-245). The central consideration of content validity was placed on the comprehensiveness and representativeness of the instrument (Hatch & Lazaraton, 1991).

After integrating VWI 1's suggestions to make a final repertoire, the researcher requested VWI 2 and VWI 3 to determine individually whether any questions should be added to or removed from the repertoire to better facilitate APR of argumentative writing in an online environment. Finally, their advice was taken in finalizing the questions.

Teacher-modeled responses.

VWI 4 helped the researcher with the teacher-modeled responses to be used in the 2nd stage of CPR. The researcher wrote teacher-modeled responses to the questions attached to each exemplar essay. VWI 4 composed some responses as well as examined the adequacy of the responses against the rubric of this study. Her advice was adopted to add finishing touches to the responses.

Survey.

After the essays were collected, the researcher put together a seven-statement survey as a manipulation check to capture participants' perception of the influence the

APR activity on their revision (Appendix 9). Each statement addressed the potential influence taking place in the APR processes; the influential factors included the exemplar essays, the guiding questions, the teacher-modeled responses, peers' writing, the reviewer role, peer commentary, and the self-assessment exercise. Participants rated each statement on a Likert scale (*strongly disagree*, *somewhat disagree*, *neutral*, *somewhat agree*, and *strongly agree*) and explained their ratings.

The survey was reviewed by two experts with extensive experience of CPR. One rater who had earned a Ph.D. from the University of California, Berkley, was a faculty member at the University of Maryland using CPR in his curriculum. The other rater who received a Ph. D. in Instructional System and Educational Psychology has played a major role in evaluating the effectiveness of the electronic peer-review software in the CPR team. Feedback from both raters was adapted to make the final version of the survey.

Data analysis.

All the essays were processed with *Microsoft Word* to achieve consistency in format for the purpose of data analysis. The layout of the printout was kept consistent across the board in typography (Times New Roman), font size (12 points), and line spacing (Doubled). Code numbers (not linked to a participant's identity) were utilized to replace participants' names and were placed on all the essays with a two-fold purpose: (a) to protect participants' confidentiality, and (b) to prevent any moderator variables, such as rater perception of gender by writers' names (Peterson, Childs, & Kennedy, 2004), from interfering with raters' judgment.

Textual changes were highlighted through the function of *Compare Documents* (on the *Tools* menu in the Tool Bar) in Microsoft Word. In the prior literature on revision (Faigley & Witte, 1981; Fitzgerald & Markham, 1987), revision was manually marked out per 100 words, but the manual method appeared inefficient and might have resulted in inaccuracy. To avoid misidentification of revision changes, this study rested on a seemly more time-saving approach. The software program appeared more efficient and accurate in uncovering textual changes between two versions of an essay.

Rubrics.

Essay quality was estimated with a holistic rubric and a primary-trait rubric. A holistic scoring is based on the presumption that the overall quality is over the sum of the individual parts. The holistic rubric for this study was a combination of a holistic rubric designed for persuasive essays (Ferretti, MacArthur, & Dowdy, 2000) and the *Persuasive Scoring Guide for Grade 12* used for NAEP in 2002. The criteria in the rubric centered on (1) a thesis statement, reasons/examples, supporting ideas, (2) opposition opinions and/or refutation, and (3) disposition and/or transitions (Appendix 10).[2]

[2] The researcher asked the two veteran writing instructors to evaluate two sets of holistic scoring to identify a better one for the purpose of this study. One set was the Persuasive Scoring Guide for Grade 12 used for NAEP in 2002. The other set was the Guide for Holistic [sic] Scoring for Persuasive Writing (Knudson, 1992), and the inter-rater reliabilities were reported (p. 171). Both writing instructors found the NEAP scoring more teacher-friendly and comprehensible. One of them commented as follows:

> I like the NEAP rubric better than the holistic scoring in Knudson (1991). It is much clearer in its presentation and it provides a label for each category (so that I could tell a student that her paper is excellent or uneven in its response to the assignment). I also like how each score includes the evaluation of the same four categories of skill: clarity of position, organization, syntax and diction, and grammar. The Knudson (1991) was not as clear or consistent. The NEAP rubric's evaluations are also worded precisely--I like a sharply worded rubric with crisply delineated categories. This makes it easier for me to target areas that need improvement as I note my students' strengths. I

In addition to a holistic rubric, the rubric in McCann (1989) was modified by the researcher to gauge the primary traits of argumentative essays written by the participants of this study. The McCann rubric consisted of Claim, Data, Warrant, Proposition, Opposition, and Responses to Opposition. For the first three criteria, the range of possible scores went from 6 (highest) to 0 (lowest), with a 2-point interval in-between. For the other three criteria, the scores ranged from 3 (highest) to 0 (lowest), with a 1-point interval in-between. The distances between points in the ordering can be found in the appendix (Appendix 11). The rubric has been fully or partially adopted to analyze written argument in a handful of studies (Burkhalter, 1995; Knudson, 1992; McCann; 1995; Standish, 2005). However, due to a few flaws in the criteria and the scoring methods, some adjustments were made to the rubric and the adjusted model was used for primary-trait analysis in this study.

The McCann rubric was touted as similar to the Toulmin model (McCann, 1989); however, a close look at the rubric revealed that the criteria did not truly correspond to the six elements defined by Stephen Toulmin. According to Toulmin, an argument consisted of six elements: Claim, Data, Warrant, Qualifier, Rebuttal, and Backing. Claim referred to the thesis statement or an arguer's conclusion. Data, which came in assorted formats (evidence, statistical numbers, examples, etc), was used to support the claim. Warrant established the reasoning link between Claim and Data. Qualifier was a word or phrase which expounded that the claim might not hold true in some circumstances. Rebuttal represented a counterargument to the claim.

---

like it because I can change it if I need to. If I need to include an evaluation of citation of secondary sources, then I can simply add one as a bullet point for each category, or I can add a bullet for audience. I can also determine how each weighs quantitatively toward the final grade for the assignment.

Backing was an abstract reasoning in support of warrant. Though the first three elements of the Toulmin model were obligatory in an argument, an arguer did not need to explicate his warrant in an argument. The last three elements were optional in an argument. With Toulmin's definitions, there appear some discrepancies between McCann's model and the Toulmin model.

McCann's rubric differs from the Toulmin model in several aspects. First, two of the elements, Qualifier and Backing, were deliberately omitted in McCann's model. It was understandable that Backing was too abstract to be made explicit in an argument. Because it was not measurable, McCann did not include the trait in the model. Yet, for Qualifier, McCann chose not to measure it, and his choice seemed to run counter to the Toulmin model. Second, Warrant was a primary trait carrying a lot of weight in McCann's model (based on the score ranges in the model). However, according to S. Toulmin, it was not necessary to be explicitly articulated in an argument. It is still open to question whether the trait needs to be explicitly specified in an argument. Third, Proposition in McCann's model seemed to be identical to the conclusion of an argument. According to Toulmin's definition, Claim was the thesis statement as well as the conclusion. When Claim was Proposition, it did not make sense to measure the same trait twice in one argument. Four, since all the primary traits were simultaneously created in an essay, the correlation among the traits could have been high. The obligatory traits and optional traits using different scoring ranges might have imposed problems to statistical procedures, e.g., a multivariate analysis of variance procedure.

The primary-trait rubric is a modified version of McCann's model. Below are the modifications. (1) The modified rubric contained the following five primary traits: Claim, Data, Qualifier, Opposition, and Refutation (Response to Opposition). Though warrant was deemed required in an argument by Toulmin, according to the Toulmin model, an argument did not have to explicitly exhibit it. Therefore, Warrant was excluded from the modified rubric. (2) Qualifier was added to the revised McCann model, with an ordinal scoring method: 1 (occurrence of Qualifier) and 0 (no occurrence of Qualifier). (3) Except for Qualifier, the scoring ranges were made identical for all four traits. The score for each trait ranged from 6 (highest) to 0 (lowest), with a 2-point interval.

Both rubrics had been reviewed by one of the VWIs for face validity before data collection and had been tested for interrater reliabilities after data collection (for the procedure, see the section *Interrater Reliability* below). Interrater reliability of the holistic rubric reached 80.6 %, and interrater reliability of the primary traits ranged between 76.2 % and 100 %. After the reliabilities were established, the researcher rated all data alone.

Coding scheme for revision.

Revision changes were analyzed with a product-oriented scheme in Faigley and Witte (1981), which was established on the basis of text linguistics and cognitive psychology (Appendix 12). The classification of revision by scheme depended on whether new information had been added to the original text. A major distinction in the scheme laid in syntactic changes and semantic changes. Syntactic changes were surface-based while semantic changes, text-based.

Surface-based changes were branched out into two types: *Formal Change* and *Meaning-Preserving Changes*. Formal Changes were further divided into five subcategories: (a) spelling, (b) tense, number, and modality, (c) abbreviation, (d) punctuation, and (e) format. Spelling referred to the word form with correct or incorrect letters. Tense, number and modality referred to the suffix of a word. Abbreviation referred to a word in an abridged or intact form. Punctuation referred to marks adding to or removing from a text to divide words, phrases, or sentences in order to make meaning clear. Format was concerned with paragraphing or indent. Meaning-Preserving Changes were composed of six operations: additions, deletions, substitutions, permutations, distributions, and consolidations. Additions referred to add-ons, and deletions were the opposite of additions. Substitutions meant replacement, and permutations occurred when textual expressions reordered. Distributions represented linguistic parts originally in one segment spreading into two or more segments. Consolidations happened when textual segments were merged. Basically, surface-based changes were largely made at the word or phrasal level without bringing in new information to the text. This study adapted the coding system with the subcategory *Format* excluded due to the fact that CPR had prescribed draft format. Therefore, the format category was not taken into account in data analysis.

Text-Based Changes were divided into two kinds: *Microstructure Changes* and *Macrostructure Changes*. The former alluded to local changes whereas the latter, global changes. Both types of changes were further parsed into the six operations, identical to the operations of Meaning-Preserving Changes. Though both types of

changes altered the textural meaning, microstructure changes were largely made at the sentential level and macrostructure changes, at the paragraph level.

The interrater reliability for the total number of revisions reached 93%, and the interrater reliability for the operations nested in the surface and text-based changes reached 92%. After the interrater reliability was established, the researcher coded the revision changes alone.

Interrater reliability.

The researcher established interrater reliabilities of using the rubrics and the coding scheme in discussions with VWI 1 by going through the following steps (Ortega, 1999). (a) The researcher set aside three different random samples of 10% of the data (one set for pilot testing, another set for rater training, and the other set for interrater-reliability checks). (b) The researcher pilot-tested the rubrics and the coding scheme so as to practice applying the instruments. (c) The researcher implemented solid rater training. (d) The researcher and the rater independently coded the third set of data. (e) The researcher tallied agreements and disagreements by comparing her coding with the rater's. (f) Finally, the researcher talked with the VWI to clarify any misunderstandings or disagreement. Interrater reliabilities were reported in the subsequent sections.

Summary

To summarize, this study embodied a quantitative perspective for a quasi-experimental, repeated-measure research design. This chapter provided information regarding the research method used to assess university students' production and revision of argumentative writing. Without additional selection criteria for any

specific characteristics associated with the participants (e.g., age, sex, race, ethnic origin, religion, or any social or economic qualifications), university students of a convenient source was invited to participate. The instruments were constructed specifically for this study, pilot tested, reviewed, and validated by a panel of VWIs and two raters whose expertise with CPR was substantial. All the data were processed with Microsoft Word for a unified format to prevent any intervening factors from coming to play. The results are reported in the next chapter.

Chapter IV

Results

Statistical procedures are performed to examine two presumptions underlying this study. The two basic presumptions pertinent to this study are listed in the following: (1) the final products post APR are superior to the initial drafts in holistic quality and primary traits, and (2) in comparison with the comparison context (No APR), the experimental context (APR) is relatively more efficient in revamping the holistic quality and the primary traits of the final products.

In this chapter, findings related to this counterbalanced, quasi-experimental study are reported in sequence in which they were presented as the research questions in Chapter I: (1) the effect of asynchronous peer review (APR) on the holistic quality of the final products, (2) the effect of asynchronous peer review (APR) on the primary traits of the final products, (3) revision changes in both contexts, and (4) participants' perception of the effect of APR on revision. To answer the research questions, two phases of statistical analyses were implemented. After preliminary analyses were performed to detect any pre-experimental differences between groups and possible influences of any intervening variables, lead and subsequent statistical analyses were performed to answer the 1st, 2nd, and 3rd research questions. A qualitative analysis was performed for the 4th research question.

Preliminary Analysis

A total of 189 essays were collected. Because one participant in Group A failed to arrive for the pretest, data collected for this study consisted of 37 pretests, 38 initial drafts and 38 final products finished during the peer review processes, and 38 initial drafts and 38 final products completed without the peer review processes. Table 4 presents the means by word count for readers to arrive at an overall understanding of the participants' performance. In the experimental context, every participant turned in a draft as well as a revised, final product. Though all participants turned in their first drafts in the comparison context, only three of the students in Group A and eight of the students in Group B turned in their revised version while the rest did not revise and simply turned in their initial drafts as their final essays.

Table 4

Performance by Word Count

Context	*N*	*M*	*SD*
Pretest	37	578.62	128.42
Initial Drafts in experimental context	38	623.47	128.92
Final Products in experimental context	38	698.08	148.92
Initial Drafts in comparison context	38	623.13	143,29
Final Products in comparison context	38	643.47	145.14

A preliminary analysis was conducted to determine the equivalence between Group A and Group B in their proficiency levels in argumentative writing before treatment. Table 5 reveals performance in the pretest. Twenty-one out of 22

participants in Group A and all the 16 participants in Group B took the pretest (1 missing data in Group A). The holistic performances by Group A and Group B were analyzed. An Independent-Samples T test indicates no significant difference between the two groups before treatment in their proficiency levels in writing an argumentative paper, t (35) = .86, p = .39 (two-tailed).

Table 5

Pretests by Raw Score

Pretest	*N*	*M*	*SD*
A	21	2.90	1.55
B	16	2.50	1.21

A second preliminary analysis was performed to detect any possible influences due to the writing prompts or practice from the onset. A statistical analysis was performed for the mean performances of four data sets, including: (a) the initial drafts written in the experimental context by Group A for Writing Prompt II, (b) the initial drafts written in the comparison context by Group A for Writing Prompt III, (c) the initial drafts written in the comparison context by Group B for Writing Prompt II, and (d) the initial drafts written in the experimental context by Group B for Writing Prompt III. Table 6 displays group performance by writing prompt.

A multivariate analysis of variance (MANOVA) using a between-group variable and two dependable variables (drafts for Writing prompt II and drafts for Writing Prompt III) was performed to examine whether the writing prompts or practice over time confounded the study from the onset of the study. The results

reveal that there are no significant differences between both groups, for Writing Prompt II, F (1, 37) = .030, p = .863, or for Writing Prompt III, F (1, 37) = .028, p = .869. Simply put, neither the writing prompts nor practice came to intervene from the beginning. Since no practice effects were detected, the no-carryover assumption underlying repeated-measures designs was met in this study.

Table 6

Performance by Writing Prompt (II & III)

Group	*N*	*M*		*SD*	
		II	III	II	III
A	22	3.09	3.18	1.54	1.46
B	16	3.00	3.25	1.67	.86

The two preliminary analyses above revealed two results, which legitimize the regrouping of the data to answer the first research question. The first analysis shows no significant difference between the two groups in the pretest. In the second analysis, neither did the writing prompts come to intervene in the initial drafts nor was the repeated practice found to be carried over. Therefore, the researcher redisposed the data for a two-way (Context & Time), repeated-measure ANOVA analysis: (a) the initial drafts written by both groups in the comparison context were grouped as the 1st data set, (b) the initial drafts written by both groups in the experimental context were grouped as the 2nd data set, (c) the final products accomplished in the comparison context were grouped as the 3rd data set, and (d) the final products accomplished in

the experimental context were grouped as the 4th data set. Table 7 displays performances in the two contexts and it is clear that the data sets were not skewed.

Table 7

Performance in Different Contexts

Context	*N*	*M*		*SD*		*Skewness*	
		Drafts	Products	Drafts	Products	Drafts	Products
APR	38	3.13	4.34	1.28	1.40	-.177	-.841
No-APR	38	3.11	3.29	1.54	1.49	.190	.044

Main Analysis

Research Question 1: Holistic Performance

A 2 x 2 repeated-measure ANOVA (a special case of a MANOVA) was performed to assess the main effects and interaction of the two independent variables: Context (APR vs. No APR) and Time (Draft vs. Product). The four data sets for statistical analyses included 38 initial drafts and 38 final products finished in the comparison context, and 38 initial drafts and 38 final products finished in the experimental context. Upon receiving the statistical results, the researcher checked the results in three steps: evaluating the assumptions underlying the repeated-measure analysis, examining the statistical results of the ANOVA, and untangling the interaction if there is one.

The assumptions behind repeated measures are related to the homogeneity of variance-covariance and pairwise correlation coefficients among treatments. Due to equal sample size, evaluation of the homogeneity of variance-covariance is not

necessary in this study. As far as the pairwise correlation coefficients are concerned, the Mauchly's Test of Sphericity (a test of the variance of difference scores for each pair of levels of a variable) is not available in the SPSS printout. There are only two levels of each IV. That is to say, no adjustment is necessary for the repeat-measure result.

Table 8 demonstrates the results of the repeated-measure ANOVA. The main effect of Context is significant, F (1, 37) = 4.948, p = .032, Wilks' Lambda = .882 and so is the main effect of Time, F (1, 37) = 47.917, p = .000, Wilks' Lambda = .436. The interaction between Context and Time is also significant, F (1, 37) = 29.054, p = .000, Wilks' Lambda = .560.

Owing to the significant interaction, simple effects are examined with the Bonferroni procedure to control for the familywise error rate, with alpha at .0125 (two-tailed). The conservative probability level was obtained by the traditional significance level p = .05 divided by four as a result of four simple-effect comparisons following the ANOVA interaction. Holistic quality of the initial drafts does not differ by Context, t (1) = .101, p = .92. The final products post APR are significantly better than the corresponding initial drafts, t (1) = 6.67, p = .000. Final essays completed without APR are better than the initial drafts but do not reach the significant level, t (1) = 2.488, p = .017. There is a significant difference between the final essays produced in the experimental context and those produced in the comparison context, t (1) = 4.031, p = .000.

The answer to the Research Question 1 is straightforward. Figure 1 reveals that the highest achievement is found in the performance post APR. Clearly, the final

products produced in the experimental context are better than the final products produced in the comparison context, and the initial drafts in either context are consistently inferior to the final products completed with or without APR. Though there is a between-draft difference in the comparison context, the improvement was not as satisfactory as that in the experimental context. The effect of APR on the holistic quality of final products is confirmed.

Table 8

Result of A Two-Way, Repeated-Measure MANOVA

Source	*SS*	*df*	*MS*	*F*	*Partial* η^2	*Observed Power*
Context	11.059	1	11.059	4.948	.118	.582
Time	18.480	1	18.480	47.917	.564	1. 000
Context * Time	10.007	1	10.007	29.054	.440	.999
Subject	192.586	37	5.205			
Context * Subject	82.690	37	2.235			
Time * Subject	33.269	37	.899			
Context * Time * Subject	6.256	37	.169			
Total	244.336	151	1.618			

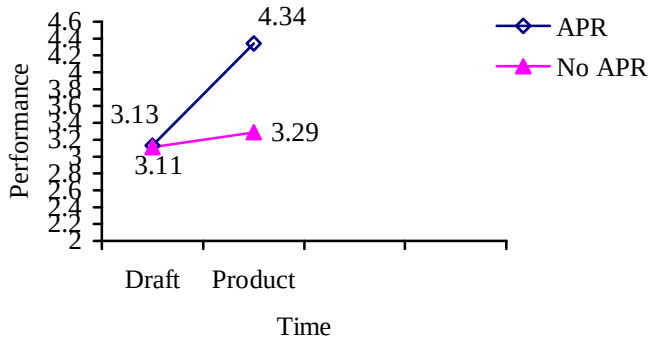


Figure 1. Performance by Context and Time

Research Question 2: Primary Traits

Two statistical procedures were performed to estimate between-group differences in the uses of primary traits in the pretest. A Hotelling's T^2 procedure (a two-group MANOVA) was performed to assess differences between Group A and Group B as well as to examine the assumptions associated with the procedure. Besides, a Mann-Whitney Test for ordinal data was performed to assess any difference between Group A and Group B in the use of Qualifier. Table 9 shows group performances by primary trait.

The two assumptions behind the Hotelling's T^2 procedure—the equality of covariance and the equality of error variances—are examined. The Box's Text of Equality of Covariance Matrices yielded a satisfactory result, F (10, 4917.467) = .655, p = .767. Simply put, the assumption of homogeneity of variance is met. Levene's Test of Equality of Error Variances is satisfactory for Claim (F (1, 35) = .275, p = .603), Data (F (1, 35) = .053, p = .819), Opposition, (F (1, 35) = .460, p = .502), and Refutation (F (1, 35) = 1.733, p = .197). In other words, the assumption of

normality is met. No adjustment is needed for the result of the Hotelling's T^2 procedure.

Table 10 displays the pretest results. No significant differences are found between groups in the use of the four primary-traits with a significance level at .05. As far as the use of Qualifier is concerned, it did not occur in the pretest. Therefore, there is no difference between Group A and Group B in the use of Qualifier in their pretest performance.

Table 9

Primary Traits in Pretest

	M		*SD*	
	A	B	A	B
	(*N* = 21)	(*N* = 16)	(*N* = 21)	(*N* = 16)
Claim	2.952	2.625	2.247	2.029
Data	2.667	2.125	1.826	1.996
Opposition	1.333	.875	1.592	1.258
Refutation	1.429	1.875	2.014	1.544
Qualifier	0.000	0.000	0.000	0.000

Table 10

Pretest Comparisons between Groups by Primary Trait

Source	*SS*	*df*	*MS*	*F*	*Partial* η^2	*Observed Power*
Claim	.973	1	.973	.209	.006	.073
Data	2.664	1	2.664	.396	.021	.133
Opposition	1.908	1	1.908	.897	.025	.151
Refutation	1.810	1	1.810	.542	.015	.111
Total	456.000	37				

$p = .05$

A statistical procedure was performed to examine the effects of Context and Time on the four primary traits of argumentative writing, and a nonparametric test was performed for Qualifier. Table 11 displays the means of the five dependent variables in two contexts. A MANOVA was performed on four DVs (Claim, Data, Opposition, and Refutation) measured in Draft and Product in two contexts (APR & No APR). The data sets were analyzed with a MANOVA for two reasons: (1) to keep Type I error rate down, and (2) to take into account a possible high correlation among the four DVs, which were measured simultaneously.

The assumptions of the MANOVA procedure are examined first. There are two levels of Context and Time; therefore, the Mauchly's Test of Sphericity (a test of the variance of difference scores for each pair of levels of a variable) is not available in the SPSS printout. Evaluation of the Sphericity of Trait is satisfactory ($p > .05$), and so is that of the Context * Trait interaction, i.e., no violation of the assumption.

However, the sphericity of the Time * Trait interaction and the sphericity of the Context * Time * Trait interaction are significant. Apparently, the sphericity assumption is violated. To compensate for the possible failure of the Sphericity assumption, the Huynh-Feldt adjustment is adopted to adjust for degrees of freedom for the two effects.

Table 12 presents statistical results concerning the main effects, the two-way interactions and a triple interaction of Context, Time, and Trait. When all significances are determined at the significance level, $p = .01$, the results show a significant two-way interaction and two significant main effects. The triple interaction (Context * Time * Trait) is not found to be statistically significant, F (2.665, 98.595) = 1.573, $p = .205$ (with Huynh-Feldt adjustment). The two-way interaction between Time and Trait is not significant, F (2.272, 98.595) = 1.470, $p = .234$ (with Huynh-Feldt adjustment) and neither is the two-way interaction between Context and Trait, F (3, 111) = .987, $p = .402$. The main effect of Context is not significant, F (1, 111) = 3.562, $p = .067$. However, there is a significant interaction between Context and Time, F (1, 111) = 48.381, $p = .000$. Two significant main effects are found: the main effect of Time is significant, F (1, 111) = 59.321, $p = .000$, and so is the main effect of Trait, F (3, 111) = 38.125, $p = .000$.

For the trait Qualifier, the result does not reveal any significant difference, X^2 (3) = 1.636, $p = .651$. The use of Qualifier is not different due to Context or Time. Therefore, no further analysis will be performed for Qualifier.

Table 11

Performance by Primary Trait

Variable	*N*	APR				No APR			
		Draft		Product		Draft		Product	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Claim	38	2.94	2.22	4.53	1.72	3.05	1.72	3.26	1.83
Data	38	3.11	1.52	4.00	1.47	3.53	1.35	3.63	1.38
Opposition	38	2.05	1.83	3.58	1.81	2.16	1.82	2.21	1.85
Refutation	38	1.16	1.84	2.63	2.19	1.53	1.89	1.58	1.93
Qualifier	38	.05	.27	.11	.31	.05	.23	.05	.23

Table 12

*Multivariate Analysis of Context * Time * Trait*

Source	*SS*	*df*	*MS*	*F*	Partial η^2	*Observed Power*
Context	22.132	1	22.132	3.562	.088	.452
Time	82.526	1	82.526	59.321*	.616	1.000
Trait	342.553	3	114.184	38.125*	.507	1.000
Context * Time	60.632	1	60.632	48.381*	.567	1.000
Context * Trait	10.237	3	3.412	.987	.026	.263
Time * Trait	3.211	3	1.070	1.470	.038	.380
Context * Time * Trait	2.895	3	.965	1.573	.041	.404
Total	68.105	111	.614			

* $p < .01$

Owing to the significant two-way interaction between Context and Time, a repeated-measure ANOVA is performed for each trait. If a significant interaction is detected, simple-effect analyses are further performed with the Bonferroni procedure to control for the familywise error rate (alpha = .0125, two-tailed).

Table 13 displays the repeated-measure ANOVA for Claim: a non-significant main effect of Context, a significant main effect of Time, and a significant interaction between Context and Time. The Context * Time interaction is significant for Claim; therefore, simple-effect analyses are performed with the Bonferroni procedure (alpha = .0125, two-tailed). The use of Claim in initial drafts does not differ from one context to another, t (37) = .255, p = .800. However, the use of Claim in the final essays is significant better than that in the initial drafts in the Experimental context, t (37) = 5.563, p = .000. The draft-product difference in Claim is not true in the comparison context, t (37) = 2.086, p = .044. However, there is a significant difference in the use of Claim between the final essays in the experimental context and that in the comparison context, t (37) = 3.321, p = .002.

Table 13

Repeated-Measure ANOVA for Claim

Source	*SS*	*df*	*MS*	*F*	Partial η^2	*Observed Power*
Context	12.737	1	12.737	2.438	.062	.331
Time	30.421	1	30.421	31.636*	.461	1.000
Context * Time	17.789	1	17.789	23.332*	.387	.997
Total	28.211	37	.762			

* $p = .000$

Table 14 displays the repeated-measure ANOVA for Data: a non-significant main effect of Context, a significant main effect of Time, and a significant interaction between Context and Time. The Context * Time interaction is significant for Data; therefore, simple-effect analyses are performed with the Bonferroni procedure (alpha = .0125, two-tailed). The use of Data in initial drafts does not differ from one context to another, t (37) = 1.389, $p = .173$. The use of the data trait in the final essays is significant better than in the initial drafts in the Experimental context, t (37) = 4.969, $p = .000$. The draft-product difference in Data does not hold true in the Comparison context, t (37) = 1.434, $p = .160$. The use of data in final essays does not differ significantly by Context, t (37) = 1.190, $p = .242$.

Table 14

Repeated-Measure ANOVA for Data

Source	*SS*	*df*	*MS*	*F*	Partial η^2	*Observed Power*
Context	.026	1	.026	.008	.000	.051
Time	9.500	1	9.500	26.037*	.413	.999
Context * Time	5.921	1	5.921	16.751*	.312	.979
Total	13.079	37	.353			

* $p = .000$

Table 15 displays the repeated-measure ANOVA for Opposition: a significant main effect of Context, a significant main effect of Time, and a significant interaction between Context and Time. The Context * Time interaction is significant for Opposition; therefore, simple-effect analyses are performed with the Bonferroni procedure (alpha = .0125, two-tailed). The use of Opposition in initial drafts does not differ from context to context, t (37) = .339, p = .737. In the Experimental context, it is true that the use of opposition in the final essays is significant better than in the initial drafts, t (37) = 4.713, p = .000. In the Comparison context there is no significant difference in the use of Opposition between the initial drafts and final products, t (37) = 1.000, p = .324. However, the difference in Opposition between the final essays produced in the Experimental context and in the Comparison context is significant, t (37) = 3.949, p = .000.

Table 15

Repeated-Measure ANOVA for Opposition

Source	*SS*	*df*	*MS*	*F*	Partial η^2	*Observed Power*
Context	15.158	1	15.158	4.719*	.113	.562
Time	23.684	1	23.684	20.709*	.359	.993
Context * Time	20.632	1	20.632	22.877*	.382	.996
Total	33.368	37	.902			

* $p < .05$

Table 16 displays the repeated-measure ANOVA for Refutation: a non-significant main effect of Context, a significant main effect of Time, and a significant interaction between Context and Time. The Context * Time interaction is significant for Refutation; therefore, additional analyses for simple effects are performed with the Bonferroni procedure (alpha = .0125, two-tailed). The use of Refutation in initial drafts does not differ from context to context, t (37) = .980, p = .334. In the Experimental context, it is true that the use of refutation in the final essays is significant better than in the initial drafts, t (37) = 4.403, p = .000. The finding does not hold true in the Comparison context, t (37) = 1.000, p = .324. The difference in Refutation between the final essays produced in the Experimental context and in the Comparison context is not significant, t (37) = 2.517, p = .016.

To answer Research Question 2, the use of Qualifier is not found to improve due to Time or Context, but the other four primary traits are found greatly improved from initial drafts to final products in the Experimental context. The findings above

are iillustrated in graphs. Figure 2 shows that, four primary traits in initial drafts did not differ by context. Figure 3 displays that all four primary traits were improved in the final products post APR. Figure 4 reveals that Claim was the only one primary trait that marginally improved in the final products in the Comparison context. Figure 5 demonstrates that, except for Data, the other three primary traits in the final products post APR were better than those in the Comparison context. Thus, the effect of APR on primary traits is positive.

Table 16

Repeated-Measure ANOVA for Refutation

Source	*SS*	*df*	*MS*	*F*	Partial η^2	*Observed Power*
Context	4.447	1	4.447	.901	.024	.152
Time	22.132	1	22.132	20.037*	.351	.992
Context * Time	19.184	1	19.184	17.827*	.325	.984
Total	39.816	37	1.076			

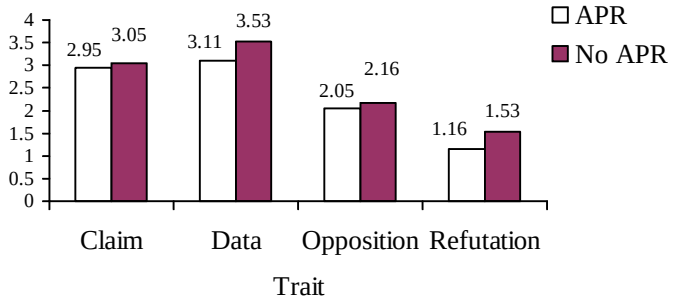


Figure 2. No significant primary-trait difference between initial drafts in different contexts

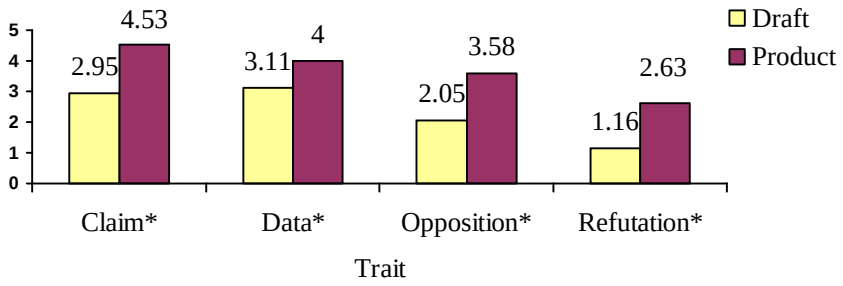


Figure 3. Draft and Product in Experimental context (* p < .0125)

Figure 4. Draft and Product in Comparison context (p < .0125)

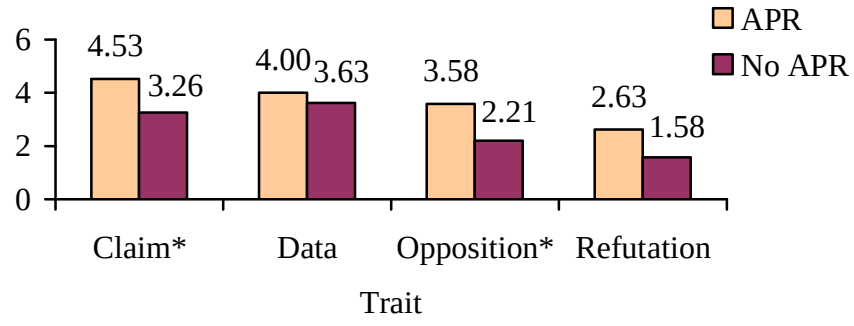


Figure 5. Final Products in both contexts (* p < .0125)

Research Question 3: Revision Change in Different Contexts

To explore how university students revised argumentative writing, revision changes in both contexts were tallied using the coding system and submitted for

statistical analyses. Table 17 and Table 18 exhibit revision changes in the two contexts. In an attempt to investigate whether revision frequency would be context-independent, the frequency distributions of the four major categories produced in the both contexts were submitted for a two-way Chi-square test. Table 19 displays the data for the statistical analysis. Revision changes are found to strongly depend on the context variable, $X^2(3) = 14.142$, $p < .01$. The statistical analysis indicates that the frequency of revision changes in the Experimental context is significantly higher than that in the Comparison context. Formal Changes in both contexts vary significantly, $X^2(1) = 37.565$, $p < .05$. Meaning-Preserving Changes in the two contexts vary significantly, $X^2(1) = 15.447$, $p < .05$. Microstructure Changes in both contexts are significantly different, $X^2(1) = 24.582$, $p < .05$. Macrostructure Changes are significantly different from one context to another, $X^2(1) = 27.379$, $p < .05$. Besides, except for Meaning-Preserving Changes, the frequencies of the other three categories in the Experimental context are roughly three times of those in the Comparison context, individually.

The answer to the Research Question 3 is straight forward. Participants revised much more frequently in the Experimental context than in the Comparison context. Although the revision changes in the Experimental context significantly outnumber the revisions in the comparison context, the patterns in both contexts are fairly identical, as shown in Figure 6. First, surface changes are more frequent than text-based changes in either context. Second, regardless of the context variable, the frequency of meaning-preserving changes is higher than any other types of changes, as shown in Table 19. Third, in each context, macrostructure changes do not occur as

frequently as microstructure changes and are the least frequent of all types, as shown in Table 19. When the frequencies are collapsed for the comparison between surface-based changes and text-based changes, roughly twice as many surface-based changes and about three times as many text-based changes are found in the Experimental context, as shown in Figure 6.

Table 17

Revision Changes in Final Products in Experimental Context

Surface Changes				Text-based Changes			
Formal		Meaning-Preserving		Microstructure		Macrostructure	
Operation	*n*	Operation	*n*	Operation	*n*	Operation	*n*
Spelling	53	Additions	38	Additions	48	Additions	51
Tense, Number, & Modality	20	Deletions	53	Deletions	16	Deletions	11
Abbreviation	4	Substitutions	64	Substitutions	11	Substitutions	8
Punctuation	28	Permutations	10	Permutations	4	Permutations	3
		Distributions	5	Distributions	0	Distributions	0
		Consolidations	4	Consolidations	2	Consolidations	0

Table 18

Revision Changes in Final Products in Comparison Context

Surface Changes				Text-based Changes			
Formal		Meaning-Preserving		Microstructure		Macrostructure	
Operation	*n*	Operation	*n*	Operation	*n*	Operation	*n*
Spelling	3	Additions	18	Additions	12	Additions	15
Tense, Number, & Modality	13	Deletions	21	Deletions	8	Deletions	2
Abbreviation	0	Substitutions	60	Substitutions	9	Substitutions	2
Punctuation	17	Permutations	8	Permutations	0	Permutations	3
		Distributions	1	Distributions	0	Distributions	0
		Consolidations	0	Consolidations	0	Consolidations	0

Table 19

Revisions Collapsed by Categories in Experimental & Comparison Contexts

	Formal Changes	Meaning-Preserving Changes	Microstructure Changes	Macrostructure Changes	*n*
APR	105	174	81	73	433
	(24.2%)	(40.2%)	(18.7%)	(16.9%)	(100%)
No-APR	33	108	29	22	192
	(17.2%)	(56.3%)	(15.1%)	(11.5%)	(100%)

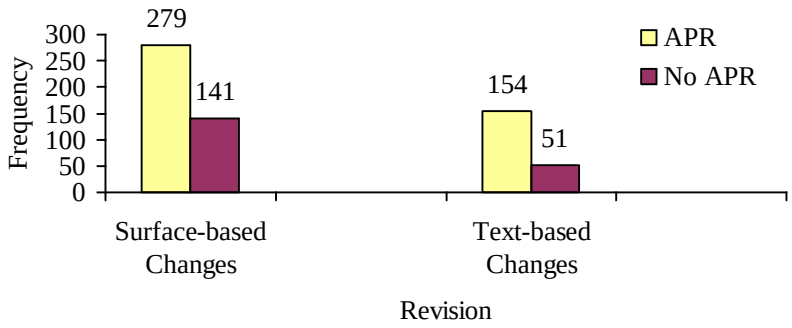


Figure 6. Collapsed frequencies on textual changes

Research Question 4: Participant Perception of APR on Revision

This section consists of two parts. The first part is to reveal the manipulation check of the independent variable, APR by means of a survey. The second part presents participants' written explanations for their answers.

General responses to APR.

This section is organized in accordance with statements in the survey. The findings are arranged on the basis of the statements as they were listed in the instrument.

All the participants responded to the seven statements in the survey. To investigate the influences of the APR processes on revision from students' perspectives, participants' responses to the survey were tallied. Owing to low frequencies in some cells, *Strongly Disagree* and *Somewhat Disagree* were collapsed together, and so were *Strongly Agree* and *Somewhat Agree*. Table 20 displays the participants' responses in terms of frequency and percentage.

The survey was constructed to estimate any possible influences resulting from the APR process, such as the exemplar essays, the guiding questions attached to each essay, the teacher-modelled responses embedded in the Calibration Results, peers'

essays, the reviewer role they had played, peers' commentary on their essays, and self assessment. A roughly equal number of participants either disagreed or agreed with the influence of the three exemplar essays on revision. Over 30 participants strongly or somewhat agreed that two factors--the guiding questions and peer commentary--had contributed to their revisions. In particular, the agreement frequency of peer commentary was higher than any other factors, indicating that most participants perceived peer scaffolding relatively helpful. Over 20 participants strongly or somewhat agreed on the possible influence from the following sources: peers' essays, the reviewer role they had played, and self assessment. Eight participants strongly or somewhat agreed with the possible influence of the teacher-modelled responses on revision, but 26 participants strongly or somewhat disagreed with it. Generally speaking, all the factors were perceived helpful to revision, but it is just a matter of degree. Overall, the teacher-modelled responses seem to be the least influential while peer commentary provided exclusively for each writer seem to contribute the most to revising decisions.

Detailed explanation for effect of APR on revision.

All participants also wrote detailed explanations for why they agreed or disagreed with the relationship between possible influences of the APR process on revision. The 1st statement was about the influence of the exemplar essays on revision. The participants who had opted for agreement reported that the exemplar essays demonstrated the structure and style of essays at three quality levels, which reminded them of what was expected and what had to be taken into consideration in their revision. The participants who had opted for disagreement found the exemplar essays

irrelevant to the subsequent revision. The exemplar essays were deemed exercises simply to prepare them for APR, having nothing specifically to do with revision. The participants who had opted for the neutral stance reported that they could not link any dramatic revisions with the exemplar essays.

The 2nd statement was constructed to assess the relationship between the guiding questions and revision. The participants who agreed with the statement reported that they had taken the guiding questions as a checklist to keep them on the right track and to help them go through the important elements of argumentative writing, e.g., a thesis statement. The participants who strongly or somewhat disagreed replied that they did not use the questions to guide their revision and the guiding questions rarely crossed their mind. The participants who neither agreed nor disagreed with the statement indicated that they did not remember whether they had incorporated all the ideas implied in the guiding questions into their papers.

The 3rd statement was related to the teacher-modeled responses embedded in the Calibration Results. Some participants who found favor with the statement asserted that this component gave them fresh ideas on revision. Other participants disagreed the statement for several reasons. For instance, they did not bother to check the responses because they had successfully passed the calibration stage. Moreover, not all responses were checked unless their answers were marked as incorrect ones by the system. Most importantly, the teacher-modelled responses were not found relevant to their writing. The participants who were neutral on the statement expressed that some of the responses were not in agreement with their thoughts. They felt that the responses just increased their understanding of what was expected of

them as reviewers, not as writers. In general, most participants did not firmly believe the connection between the teacher-modeled responses and their revision.

The 4th statement was intended to address the relationship between peers' essays and their revision. The participants who strongly or somewhat agreed with the statement found reading peers' essays useful: (1) peers' writing modeled additional perspectives that had not previously occurred to them, (2) peers' reasoning approaches were so appealing that they wanted to follow suit, and/or (3) reading peers' work made them realize that they had flaws in common. The participants who did not find favor with the statement expressed that they seldom noticed anything in common while reviewing and that the three essays written by their peers were not qualified as good writing. Though being exposed to peers' writing got some participants to think about their own, they explained that the exposure did not inspire them to revise at all times. A couple of participants held a neutral attitude toward the statement. Some of them reported that there was nothing in common in their peers' writing due to various writing styles. Other said that the peers' papers were nothing to their revision.

The 5th statement focused on whether the reviewer role they had played would help them revamp their artifacts. Twenty-eight participants were in favor of *strongly agree* or *somewhat agree* for many reasons. They maintained that, in the reviewer's shoes, they learned to put themselves in a critical mindset and to objectively develop a critical outlook. Some participants reported that they got a sense of what was expected by way of reviewing peers' work. When it came to revision, therefore, they said that they switched back into the state of mind to read the content from a distance,

more like a reviewer reading someone's paper than a writer checking over his/her own work, and made necessary changes that they themselves had previously recommended to their peers. A few participants noticed their own textual flaws from reading others' papers when playing the role of a reviewer. Even prior to receiving peer comments, they realized what they were supposed to be doing to improve the flow of their argument. The participants who were in favor of *strongly disagree* or *somewhat disagree* also elaborated on their disagreement: though playing the reviewer role opened their eyes to fresh viewpoints and errors in the three papers, they wrote, the reviewing task was repetitive and boring. Three participants held a neutral attitude towards the statement. Though reviewing others' work reminded them of their own work, they explained, the reviewing experience was barely transferred to their revising process.

The 6th statement was concerned with the impact of peer commentary on revision. The participants who chose *strongly agree* or *somewhat agree* had the same opinion that useful commentary was detailed, constructive, or thorough. Without peer assistance, the participants emphasized that they would hardly have had any clues of how their writing was interpreted and what exactly needed to be worked on. It was of great help to know how the content could be enhanced from a reader's perspective. In particular, when the three reviewers were unanimous on something wrong, the critiques were justified and taken. Examples or advice explicitly given by reviewers sometimes were described to make revision easier and to led to major changes. However, some writers were caught in dilemma when dealing with contradicting commentary by three reviewers. Three participants who chose *strongly disagree* or

somewhat disagree explained that unhelpful criticisms seldom went in depth to give details about what was wrong and were brief, harsh, unproductive, or flattering. The writers felt confused when their reviewers simply criticized without further explanations for what needed to be improved. Instead of taking the advice, one participant said he/she totally ignored the criticisms and changed whatever he/she thought should be done. Two participants who had chosen *neutral* complained that their reviewers could have put a little more thought for critical reading and accentuated that the commentary by the reviewers contradicted one another. Facing unhelpful commentary, they had to decide whether the critique should be taken seriously.

The 7th statement cast a light on the effect of self assessment on revision. About 20 participants strongly or somewhat agreed, saying that the exercise allowed them to dissect their own writing objectively against the guiding questions and to pretend as if they had been criticizing someone else's work, from a reader's perspective rather than a writer's. The assessment, they reported, forced themselves to step out of the writer's frame and keyed them into crucial areas that they might not have evaluated as closely and intensely as they normally did. For some participants, the exercise would not have been helpful to stand alone but, in conjunction with peer reviews, it was. Once they found their assessment results came very close to the peer reviews for them, they immediately realized that the commentary was trustworthy and that they needed to repair the flaws that were unanimously acknowledged. But one participant addressed a limitation of the exercise: i.e., being able to identifying one's weaknesses did not simultaneously bring forth strategies for improvement. About 13

participants strongly or somewhat disagreed with the statement, claiming that simply answering *Yes* or *No* to the questions scarcely forced a writer to critically examine the problems. A few participants were sure that their had already composed a fairly good draft to start with, so they hardly had a second thought on anything wrong in their writing when doing the exercise. Five participants were neutral about the statement, commenting that they did not see their papers in a different light in the self-assessment exercise, and that sometimes it became difficult to see anything wrong when you repeatedly read your own work.

Table 20

Participant Perception of influences of APR on Revision

Category	*N*	Strongly Disagree & Somewhat Disagree	Neutral	Strongly Agree & Somewhat Agree
1. Exemplar essays	38	16 (41.9%)	4 (10.5%)	18 (47.4%)
2. Guiding questions	38	4 (16.6%)	3 (7.9%)	31 (81.5%)
3. Teacher-Modeled Responses	38	26 (68.5%)	4(10.5%)	8 (21.1%)
4. Peers' essays	38	10 (26.3%)	6 (15.8%)	22 (57.9%)
5. Reviewer role	38	7 (18.5%)	3 (7.9%)	28 (73.7%)
6. Peer commentary	38	3 (7.9%)	2 (5.3%)	33 (86.8%)
7. Self-Assessment	38	13 (24.2%)	5 (13.2%)	20 (52.6%)

Summary

In this chapter several statistical analyses were performed to answer the four research questions. The assumptions behind each statistical procedure were evaluated to determine whether adjustments were necessary. After the evaluations, interaction and main effects were assessed. When interaction was found statistically significant, subsequent statistical procedures were performed for simple effects. It is found that the final products accomplished after APR are holistically superior to the corresponding initial drafts and the final products accomplished without APR. Four primary traits are found improved between drafts in the Experimental context. However, in comparison with the revised essays in the Comparison context, the revised essays completed in the Experimental context outscored in Claim and Opposition. As far as postdraft revision was concerned, the participants revised more frequently in the Experimental context than in the Comparison context. In the survey, rates as high as 86.8% and 81.5% of the participants expressed in the survey that the guiding questions and peer commentary were the most helpful in boosting their critical sensibility during the revising process. In comparison, the teacher-modeled responses did not seem to exercise influence on revision to a great extent.

Chapter V

Discussion and Conclusion

The strength of APR appears to depend heavily on the reviewer's commitment and the resonances for the writer: (1) reviewers should keep in mind that what they comment on and how they carry it out may enlighten the reviewee; (2) if the writer is willing to listen to their reviewers, there is a possibility that they might transform their thoughts more clearly to communicate with their audience; (3) if the writer ignores attentive reviewers, they may not be able to locate textual flaws that could be improved with revision.

This chapter will recapture the motivation for the present study and the research method, summarize the findings to answer the research questions, discuss theories behind this study, make a comparison between this study and previous ones, list possible limitations and delimitations, and suggest implications for practitioners and researchers.

Motivation for this Study

Though the practice of oral-response groups has been extensively studied for several decades, the pedagogical value of asynchronous peer review has not been subjected to critical examination in the realm of writing research. Quite a few writing studies document that university students do not write as effectively as expert writers in several aspects (Faigley & Witte, 1981; Flower, Hayes, Carey, Schriver, & Stratman, 1986; Sommers, 1980). Expert writers usually transform their knowledge

as they make an effort to reach their goals. In stark contrast, student writers simply tell their knowledge and seldom repair problems in the text. To help student writers, peer interaction is incorporated into the revising process to challenge writers with ideas that did not come across their minds and to enable struggling/reluctant students to move beyond their current competency levels (Hillocks, 1986). The pedagogical application of peer collaboration, such as face-to-face interaction, is intended to put students on the road to achieve higher. Due to some synchronous features, such as time constraints, oral response groups do not always work productively. Therefore, asynchronous peer collaboration is suggested in the literature as an alternative method of peer interaction.

Because the revision process has typically been examined within expositions and narratives (Butterfield, Hacker, & Albertson, 1996), little is known about the degree to which or the ways in which university students' argumentative essays would be reshaped after they engage in delayed peer review. To understand this phenomenon, a main research question was proposed in this study: did interacting with interlocutors in an asynchronous fashion empower students to take more heed of their written argument?

Summary of the Research Method

This quasi-experimental, counterbalanced study aims to investigate to what degree and whether APR relayed through technology helps students with revision and produces better argumentative writing. Emphasis was placed on written argument as a response to Butterfield et al. (1996), which concluded that research about revision changes on argumentative writing has not been studied enough to mention.

Particularly, the present study sought to determine how university students deal with their finished initial drafts, whether they perceive their revising efforts as attributable to the APR process they have experienced, and whether their final performance gets progressively better, deteriorates, or remains unaffected, as a consequence of the postdraft revision.

The APR process in this study is structured and tutorial-based. APR started with the instructor/researcher providing a set of guiding questions to prompt critical reading. On the CPR platform, calibration was the prelude to the peer-review activity. After passing the calibration phase, the participants were prodded to compare their answers with the teacher-modeled responses for two purposes: to clarify any misunderstandings of their ratings for the exemplar essays and to learn to make facilitative comments from the teacher's constructive approach of drafting commentary. By way of extensive practice in rating the exemplar essays, the participants were expected to be equipped with a reviewer's judgment. While engaged in reviewing peers' essays and carrying out the self assessment, they were structured to not only read three peers' drafts critically but also assess their own work against the guiding questions they repeatedly encountered along the line. The peer review activity and the self assessment were two exercises that simulated calibration. After the self-assessment exercise, the researcher elicited students to run through their peers' comments before they developed the final versions of their papers. The APR process drew on a consistent format across the phases, and students learned to recognize what they were supposed to do and how to achieve their goals over time. At the end of the experiment, a survey was conducted to verify the pedagogical value of

the treatment and to ascertain the relationship between the APR and subsequent revisions.

Research Findings and Answers to Research Questions

This study highlights student-centered instruction and generates several findings to answer the four research questions. The first research question concerned the holistic quality of writing post APR. The second research question pertained to the effect of APR on the elements of argumentative discourse. The third research question was pertinent to the relationship between revision changes and the treatment. The last research question was on the participants' perception of the manipulation in relation to their revising decisions. The answers to the questions are provided below.

First, in terms of the holistic quality, the final essays post APR outscored the corresponding initial drafts prior to APR as well as all writing samples completed in the comparison context (No APR). In a word, the essays post APR were of significantly higher quality than the essays completed without the APR process.

Second, the use of the four primary traits (Claim, Data, Opposition, & Refutation) was found to improve significantly over time in the experimental context, but the improvement in the comparison context did not reach the significance level. The use of Qualifier did not show any significant changes by any means. When the final essays completed in both contexts were compared, the differences were found in Claim and Opposition only.

Third, the revision frequencies seem to bear a relationship with the treatment. There were more postdraft revisions in the experimental context than in the comparison context. All four types of revision—Formal Changes, Meaning-

Preserving Changes, Microstructure Changes, and Macrostructures Changes—were found to be more frequent in the experimental context than in the comparison context. Interestingly, the postdraft revisions displayed similar patterns across both contexts. In each context, Meaning-Preserving Changes were the most frequent while Macrostructure Changes were the least frequent, and surface-based changes far exceeded text-based changes.

Fourth, the survey certifies that the entire APR process exerts influence on revision changes. Over 30 participants unanimously indicated that peers' written commentary and the guiding questions exerted the greatest influence upon their revising decisions. Over 20 participants agreed that their revising behavior was influenced by the three sub-activities—reading peers' essays, playing the reviewer role, and doing the self-assessment exercise. Among all possible influences arising from the treatment, the teacher-modeled responses were indicated to affect revision changes least.

Theoretical Background Behind this Study

This study evolves from argumentative theory, sociocultural theory, and cognitive theory. A focus was placed on the idea that internalized social interaction might help to improve higher mental functions. The external support was operationalized as APR, and the experimental manipulation was derived from previous writing research (Breuch; 2004; Hewett, 2000; Tuzi, 2004). The results of the study confirmed the hypothesis that a non-conventional format of social exchange is conducive to higher achievement.

The role of readership interpreted from miscellaneous theoretical perspectives appears to prove valid in this study. The pedagogical application of APR in support of argumentative writing appears to fulfill all the accounts rendered in the theories on which the present study was established.

From the rhetorical perspective, the sense of audience is more about the writer's interpretation rather than the actual confrontation with the reader (Perelman, 1982), but engaging in communication with real readers may furnish writers with the expectations of a real audience. Because anticipating audience expectations lies at the heart of argumentative writing (Redd-Boyd & Slater, 1989), meeting an audience's expectations is the key to successful writing. Typically, audience analysis is the recommended approach to reaching the understanding of an audience. Yet, the analysis approach may seem too abstract for inexperienced writers. Instead of asking them to analyze all possible reactions of an imaginary audience, it seems more pedagogically practical for student writers to actually have a dedicated person to tell them what to underline in making a strong case. This study suggests that university students give serious thought to the commentary from real readers during the process of developing their final versions of written argument. Accordingly, the writers appear to know their writing in more depth. Without a chance to see how their writing is interpreted by a real reader, reluctant students have difficulty detecting faults in their writing.

From a sociocultural perspective (Bakhtin, 1981; Vygotsky, 1986), interacting with a real audience is envisioned as a tool that helps writers with higher-order thinking. When students are engaged in a learning activity which they cannot

accomplish independently, working with an expert or an able classmate would lead them towards a higher level of acumen that they could not have attained on their own (Vygotsky, 1986). In other words, students should have a chance to interact with an interlocutor in order to excel. Of the writing subprocesses, making textual changes has been identified as a challenging activity which puts students through the most difficult hoops (Bereiter & Scardamalia, 1987; Sommers, 1980), and it has been depicted primarily as a goal-oriented, problem-solving process (Flower & Hayes, 1980; Bereiter & Scardamalia, 1987). The revising process is taxing because of the complex subprocesses involved in cognition—text processing (critical reading), reflection (problem solving & decision making), and text production (Hayes, 1996). Peer commentary may function as a supporting resource with which writers can handle the challenges arising from the problem-solving process. This study confirms Vygotsky's theory of social interaction as well as Bakhtin's, whose notion of utterance is evident in this study (Bakhtin, 1986). From the discourse perspective, revised essays post APR may be in response to the preceding comments made by the reviewers. The findings of this study validate the pedagogical value of social exchange. Revision comes as the result of collaboration.

The interpretation of the reader's role by cognitive process models is slightly different from sociocultural theories. From the cognitive perspective (Flower & Hayes, 1980; Bereiter & Scardamalia, 1987), a responsive audience assists writers to become more capable of combating problems by taking some of the burden off a writer's memory (Flower & Hayes, 1980). When part of the burden is taken off, revisers may further process the text in the freed attentional space to solve barriers.

Within cognitive process theories, the presence of a reader helps writers with the workload on working memory. Unlike sociocultural theories, whether reader commentary is helpful to the development of higher-order functions is not quite tackled in cognitive process theories. Yet, sociocultural theories and cognitive process theories share one common feature: the use of peer scaffolding to influence learning. Within cognitive process models, revision is primarily interpreted as the result of problem-solving processes in the writer's cognition.

Explanations for the Results and Comparison with Previous Research

This study has generated four findings. Possible explanations for the findings will be offered and the results will be compared to those of previous studies.

As far as improvement in holistic quality is concerned, the progression from the initial drafts to the final essays in the experimental context is possibly attributable to a considerable amount of text-based revision triggered by the treatment. In the comparison context, a handful of the participants were willing to revisit their drafts while the others worked up no enthusiasm for carrying out postdraft revision. The small number of textual changes generated in the comparison context did not make between-draft differences distinct enough to attain a significance level. In contrast, all of the participants performed postdraft revisions in the experimental context. In both contexts, the participants made fewer text-based revisions than surface-based revisions, but it was the revision related to the textual meaning that mattered, enhancing the quality of the final products.

The findings above are consistent with previous studies reporting that students rarely perform revision without additional support and that self revisions were usually

ineffective (Fitzgerald, 1987; Sommers, 1980). Perl (1979) even reported that spontaneous revision by inexperienced adult writers can make the revised version poorer than the original on the grounds that most student writers interpret the revising act as lexical or phrasal substitution (Sommers, 1980). The participants in this study revised the content to a larger degree of success in the experimental context than in the comparison context. Thanks to the treatment, the writers may feel compelled to process their writing more carefully and take heed of peer commentary. They were successful in pushing the final versions to go in more depth beyond the initial drafts by adding, deleting, substituting, and/or restructuring the content globally.

The performance assessed by the primary-trait rubric was generally in favor of the experimental context, though the Qualifier trait remained unaffected at all conditions. All four primary traits (*Claim*, *Data*, *Opposition*, and *Refutation*) demonstrated marked improvement from the initial drafts to the final products in the experimental context, but the result was not replicated across time in the comparison context. Interestingly, when the final products completed in the two contexts were compared, significant differences occurred only in Claim and Opposition.

Different treatment effects on the primary traits may be due to the way the peer review was configured or the nature of the argumentative elements. The four primary traits—Claim, Data, Opposition, and Refutation—are argumentative elements that writers employ mostly to make a case. The treatment seems to impact exclusively on the reconstruction of four primary traits, with Qualifier excluded. Prior research studies employing a revised Toulmin model as a rubric chose to ignore the Qualifier trait (Burkhalter, 1995; Gleason, 1999; McCann, 1989; Standish, 2005),

except for Crammond (1998). Following Crammond (1998), this study gauged the use of Qualifier in argumentative writing and found that the use of Qualifier was not affected. One explanation is that Qualifier was tackled neither in the writing prompts nor in the peer review activity. Since no treatment was targeted for that specific trait, it surely remained unaffected. If this explanation holds true, it may further corroborate the connection between the treatment and the improvement of the other four primary traits in the experimental context. An alternative explanation for the result may come from its semantic connotation. The other four argumentative elements are used to consolidate the persuasiveness of an argument, while the use of a qualifier, such as *probably* or *possibly,* would restrict the scope of a claim. Yet, most arguers would probably prefer to declare his/her position with an assertive tone of voice in order to sound firm.

In terms of the postdraft revision, a higher frequency of revising behaviors seems to link to the treatment. One possible interpretation of this finding is that the participants in the experimental context took hints about their textual problems and/or acquired repairing strategies out of APR. In contrast, when the participants stayed alone to wrestle with their ideas, over 2/3 of them either simply gave up or did not even bother to add a punctuation mark. This finding is in congruence with the previous studies, concluding that most college students rarely work as diligently as expert writers in revising their initial drafts (Faigley & Witte, 1981; Flower, Hayes, Carey, Schriver, & Stratman, 1986; Sommers, 1980). Most writers appear to be willing to take advantage of assistance to redevelop their thoughts if it is at hand (Hillocks, 1986; McCutchen, et. al, 1997).

After APR, the problems related to surface and meaning show remarkable repairs. Revision frequency may lead to writing improvement, though it is probably the text-based revisions that elicit the actual quality improvement. Cameron et al. (1997) argued that revising frequency positively correlates to writing quality. The production of so many surface-based revisions not traceable to the manipulation was out of the researcher's expectations because only one guiding question implicitly addressed the mechanical aspect and the rest of the questions focused on the real substance. One possible explanation is that surface-based revisions are inevitable side products coming with text-based revisions. It makes sense that writers fix the meaning and simultaneously spawn surface-based changes for the flow of the argument. Previous studies also reported similar findings. Butterfield et al. (1994) reported that expert writers made more surface-based corrections than meaning-based changes. These findings can be explained by assuming that surface-based revisions can occur involuntarily during the process of revising for meaning.

Participants' answers to the survey further elucidate the success of the manipulation. Unlike previous studies utilizing a correlational analysis of peer commentary and revision (Liu & Sadler, 2003; Tuzi, 2004), a survey was performed to assess the possible influence of the entire APR process. A correlational-analysis approach narrowly focuses on text, fails to capture possible influential elements other than peer commentary, and offers no explanations for the broader context. For instance, a training session is intended to prepare participants, but repetitive practice can possibly expose the researcher's expectancy and confound the results. To tap into

the complexity involved in the broad context, the survey approach is considered a more proper method than a textual analysis.

Participants' ratings of the potential influence of the APR process can be explained by how precisely each element is related to subsequent revisions. The participants reached a fairly strong consensus that peer commentary and the guiding questions predominated during the revising process. Possibly, the two elements working in concert cling directly to the problem-solving process, make sense to the writers, and epitomize multiple readers behind the writing. In particular, the guiding questions worked to elicit content-based commentary and to give reviewers a prod to avoid error-hunting. In the eyes of the writers, peer commentary can stem from a personal concern specifically for each essay to help writers probe the content while weighting it against the goals, i.e., the guiding questions. Some reviewers perhaps identify incoherent areas, and some reviewers suggest viable strategies for the writers to reach the goals that were implied in the guiding questions. Upon sensing the good intensions of their audience, writers may redevelop their content by taking up the suggestive commentary that affords them with straightforward tips (Hayes, 1996). The social exchange through the side-commentary approach appears to give rise to considerable revising endeavors.

APR engages three reviewers in critiquing one essay and peer commentary becomes one of the most determinants of revising decisions. One dispute over multiple reviewers is that the diverse range of comments took writers along different directions. Faced with conflicting commentary from three reviewers, a few participants did consult the researcher on the matter and were advised to make their

best judgment deliberately to make their choices. Seemingly, accepting or rejecting peer commentary turned out to be a problem that students strove to solve, but they appeared to handle it well. As the proverb goes, "Two heads are better than one." Three peers may be even superior to one expert in exposing writers to an array of advices, challenging their viewpoints from different perspectives, and raising their awareness of multiple reader reactions to their arguments (Cho, 2004; Lockhart & Ng, 1993).

In a few episodes, writers had trouble incorporating peer commentary simply because they did not see anything valuable in it. Several participants did not have a high tolerance for criticisms and sometimes interpreted negative forms of peer commentary as personal attacks. They also blamed irresponsible reviewers and manifested a denial of brief/negative peer commentary. After all, such cases were negligible in this study.

The other experiences did not lend themselves directly to the revising process, so they were not rated as important as the guiding questions and peer commentary. The three factors— peer essays, the reviewer role, and the self assessment—were cited as being more important than the two elements—the exemplar essays and the teacher-modeled responses. Playing the reviewer role opens a window for students to glimpse the essays written by peers and to see how and what their peers argue. Without reviewing the artifacts of their fellows, students have no clue how their work stands in comparison with their peers. Moreover, writing reviews is also a problem-solving process—solving others' problems—conducive for the development of evaluative skills and revising strategies (Singh-Gupta & Troutt-Ervin, 1996; White &

Kirby, 2005). In turn, they notice the same mistakes they made in their writing while critiquing peers' papers. The teacher modeled responses and the exemplar essays were rated as the bottom two least useful partially because the two elements were intended for calibration. Even so, some participants clearly pointed out that the teacher's responses set examples for them to mimic the instructor's way of outlining constructive commentary. Since the teacher's modeled responses were bonded with the exemplar essays and both were used for the calibration purpose, it makes sense that the participants got very little inspiration out of the calibration materials for their subsequent revision.

The finding of peer commentary as the major source for textual changes is consistent with Peterson (2003) and Shaw (2002), but not with Goldberg, Roswell, and Michaels (1995/1996). The different results are possibly due to the age factor—the participants in Goldberg et al. (1995/1996) were too young to give substantial commentary or revise while the participants in this study and in Shaw (2002) and Peterson (2003) were mature enough to take their responsibility seriously.

In sum, the emphasis of the present study is on the application of a theory-inspired activity to transform leaning in the context of real instructional practice. The primary purpose is to construct social practice to affect the problem-solving processes which resemble the methodological principles upheld by sociocultural theorists and cognitive theorists (Bakhtin, 1986; Flower & Hayes, 1986; Hayes, 1996; Vygotsky, 1981). This study occurs naturally, adapting well to an existing curriculum in a technology-based course. The major strength of a nonlaboratory study is that the validity of conclusions is scarcely damaged, and the present study happens to be held

in a non-controlled environment. Laboratory studies are internally valid, but the external validity is unquestionably lacking. The most frequent criticism of laboratory studies lies in the inherent artificiality. In a controlled situation, a researcher's expectancy is likely to cause participants to react in a manner consistent with the researcher's hypothesis, and such a setting may subconsciously mislead participants to respond to their perceptions of the experimental goals rather than to the manipulated substance. These threats possibly exist in most studies. By the same token, there is no exception for this study because the participants gave their informed consent and were fully aware of their participation all along the line. Given that the participants barely developed pleasure out of their participation, expectancy effects were possible but low in the present study (Every participant was required to answer 30 questions in the Calibration Stage, to provide detailed written explanations for 30 questions in the Peer-Review Stage, to answer 10 questions for the Self Assessment, and to revise the initial draft in the end.). The bottom line is that the present study is theory-based, methodologically commonsensical, and pedagogically meaningful. A logical and meaningful study generates sound internal validity and external validity. By analogy, the results of this classroom-based study very possibly arise from the experimental manipulation and are generalizable to the real world.

Delimitations

There are three delimitations in this study. First, the participants came from a convenient source, and this study was conducted with previously intact classes. Second, due to the non-purposive sampling strategy, the gender variable or age

differences were excluded from consideration. Third, the outcomes should be generalizable to written arguments only.

Limitations

Like other research studies, the present study is limited in several aspects. The limitations are concerned with the use of intact groups, the type of genre assessed in this study, the guiding questions, and the characteristics of the participants. Each limitation will be addressed in turn in the following:

1. This study suffers from a limitation resulting from the experimental design. To accommodate to the reality, this classroom-based research study employed a quasi-experimental design with intact groups without random assignment of the participants to the treatment condition. Given that the research method is logical, casual inferences with the same degree of confidence are not permitted in a research design without random assignment of participants. Without question, the internal validity is somewhat sacrificed.
2. The second limitation is related to the kind of writing assessed. Because argumentative writing demands that writers shape the text by means of argument, the textual structure differs from expository writing, narration, stories, or poems. Therefore, the findings should not be extrapolated to genres other than argumentative essays.
3. The third limitation originates from the guiding questions. As peer commentary was very much cued by the guiding questions, any textual changes could have represented indirect responses to the guiding questions. Additionally, the participants maintained that they gave serious consideration

to the guiding questions during the revising process. The number of question items to guide peer review could have limited the results.

4. The fourth limitation is associated with the participants of this study. All the participants except for one were native English speakers majoring in education. Obviously, it is not appropriate to generate the results of this study to speakers of a different tongue or population of the scientific discipline. Because of the participant factor, the study's external validity is constrained to some extent.

Implications for Future Research

Revision was claimed the least investigated, least understood, and least examined of the writing subprocesses (Murray, 1978, p. 85; Sommers, 1980). Though our understanding of this topic has expanded considerably over the last two decades, it is never enough. Part of what makes the revising process complicated is the ongoing dynamics evolving from the task environment. Future researchers should still persist on making inquiries into this subject.

Drawing on the limitations of the present study, researchers may want to strengthen the robustness of the research design (i.e., the internal and external validity) by taking random assignment of participants into account, exploring the effect of APR on a genre other than argumentative writing, adapting new research methods to structure peer review, or recruiting non-native speakers to take part in the experiment. Each implication will be addressed in the following in turn:

1. Researchers should conduct a study with a randomized, true experimental design to increase the internal validity. That is, participants are to be randomly

assigned to treatment conditions. Casual inferences with the same degree of confidence are permitted in a true experimental study. With random assignment of participants to treatment conditions, the internal validity is no longer sacrificed.

2. In the future researchers may examine the effect of APR on the production and revision of stories, poems, narrative or expository compositional frames. Beyond a doubt, researching the effects of APR on an array of genres will provide additional information to bridge the knowledge gap in this line of research.
3. Researchers may employ more precise or extensive guiding questions to draw students' attention to incongruities or flaws in their writing. At issue is determining what and how many guiding questions fit the goal of a writing genre.
4. The approach outlined in the present study should be replicated in multiple ways. The replication could be exact, i.e., the exact research method of the present study replicated with a different population. The replication could be conceptual, i.e., the main research question of this study explored with a different measure, sampling procedures, or data-analytic techniques. The replication could be constructive, i.e., the same hypothesis tested in conjunction with new variables which are likely to change the observed relationship. Replication studies are just as vital as this original study because they corroborate/disconfirm the reliability of the findings as well as validate/invalidate the external validity of this study.

Pedagogical Implications for Educators

The use of a peer-review pedagogy to secure writing quality has been controversial in writing research. The controversy centers on whether students are capable of playing the reviewer role adequately as expected to pinpoint the strengths and weaknesses of an essay. Some instructors shun the practice because they are a bit wary that learners of approximate cognitive levels are equipped with the scholarship to articulate textual problems clearly and proffer sound tips for repair. Due to all sorts of uncertainties, the activity of peer review is illustrated by analogy with an episode of the blind leading the blind. Interestingly, the findings of this study disconfirm the illustration by demonstrating that university students indeed are trustworthy reviewers who can encourage their peers to improve their endeavors by means of asynchronous collaboration. A lack of oral interaction even reinforces students' impression on the importance of written communication skills for asynchronous social exchange.

The asynchronous mode of interaction is one of the unique features of social technology. Sometimes it makes learning more comfortable without the necessity to deal with collaborators face-to-face. The flexibility underlying asynchronous interaction allows students to reflect in depth on the substance rather than on the surface, and the personal connectedness to the process of working in concert at an individual pace leads to more engaged learning.

Asynchronous social interaction holds great promise for student engagement by way of calibrating students to shape the substance of argumentative writing, but it takes planning and training. This tutorial-based, structured activity exemplified in the present study is dissimilar to unorganized, oral-response groups in which students are

free to make random commentary under the laissez-faire attitudes. Just like the dance pattern within a tango, APR consists of three major steps--training, reviewing, and revising. To gather the Herculean efforts of the students, the instructor must formulate the goals and convince students that APR is a means to achieve success. Students should also be taught to frame their commentary in an encouraging manner so that the reviewees will not be hurt psychologically and be willing to make the best of the reviews to develop their writing and not just taking a passing glance. After all, few writers like reviewers confronting him/her with an allegation that the writing is poor. Reviewers should be conscious that negative commentary only causes the reviewee's rejection, and that their peers will resent the lack of critical reading and appropriate commentary when problems are ambiguously articulated. After realizing the efforts they themselves invest in playing the reviewer role, students may start to appreciate the true values behind peer commentary. Reviewing peers' writing is far more complex than they imagine on the grounds that it demands critical reading and requires tact to deploy honest commentary without making the writer deny the truth—the more so when it is expressed in writing asynchronously/anonymously.

The built-in features of CPR surely make it a user-friendly platform requiring minimum teacher intervention, but it should be noted that APR is pedagogically viable and replicable without such a technological device. There is much room for the instructor and the students to maneuver to secure effectiveness. Prior to the APR activity, the instructor may prepare three essays of different quality (*good*, *average*, and *poor*) along with a list of guiding questions to calibrate students. Students turn in three hardcopies of their first drafts and use their school identification numbers to

replace their names. Upon collecting the drafts, the instructor assigns three different drafts out to each student at random for them to review in an asynchronous/anonymous fashion. Students should be encouraged to reply to the guiding questions with tactful opinions and to maintain a constructive tone in their reviews. Finally, the instructor collects and forwards the peer reviews to the reviewees and tells them to make use of the commentary to polish the final versions of their essays. As long as the instructor does the work for CPR, the CPR-free version of APR may still be pedagogically feasible. However, the instruction effect of technology-free APR still requires research investigation.

Summary

What can be done to influence university students who are not particularly keen on or prepared to work for academic excellence in the area of written communication? APR appears to be an effectual intervention which is likely to bring forth measurable positive results even in the short term and in a naturalistic setting. It is unknown whether the participants were familiar with the process-based approach to writing previously. Nevertheless, they adapt to the intervention quite well during the experimental period. The gains in the experimental context indicate that revising behaviors as well as the improvement in writing quality and in the primary traits are possibly due to the treatment. In contrast, the less frequent revising behaviors and the small progress in the comparison context make it clear that cognitive development hardly happens in a short time when external support runs short. There is no blinking the fact that revising decisions are under the influence of the subprocesses taking place in the treatment, all of which add to the participants' revising decisions at

different degrees. It definitely proves labor-intensive for students to finish a process-oriented assignment in this way. But as the saying goes—no pains, no gains. APR opens the door through which university students can make their entrance into polishing their argumentative essays just as expert writers do.

The present study adds to the body of literature investigating the pedagogical practice of peer review intervened in postdraft revision of argumentative writing. One of the important findings of the present study is that university students are willing to engage in asynchronous social dialogue. Unlike unstructured face-to-face interaction, the APR process is complicated by the inclusion of a computer device for social exchange to take place step by step. Statistical analyses manifest that scaffolding seems to serving as a vital cognitive support on which students draw to solve problems for the purpose of reaching higher goals that they fail to attain alone. This study implies that APR creates a unique opportunity for university students to learn to compose effective arguments. The avenue for peer collaboration should be further explored in practice and future research.

Appendix 1

Informed Consent Form

Project Title	The Effects of Asynchronous Peer Review on University Students' Argumentative Writing
Age Statement	I state that I am 18 years of age or older, in good physical health, and wish to participate in a program of research being conducted by Dr. Wayne Slater in the Department of Curriculum and Instruction at the University of Maryland, College Park.
Statement of Purpose of Project	The present study will investigate the effects of computer-supported peer review on argumentative writing.
Procedures	You will be asked to write three essays about topics related to technology as a part of your class requirements. These three essays will serve as data for this study. I want to share a sample writing prompt with you: We use e-tools to communicate every day: email, messenger, cell phone, etc. Do those tools increase or decrease interpersonal communication? Write to Mrs. Jones (in your case study) to encourage her to use these tools or dissuade her from relying on them. You should include a statement of your position, reasons for your position, examples or supporting data for each reason, reasons why she might disagree with you, and why she is wrong. For one of your three essays, you will participate in a computer-supported anonymous peer review process to help you revise your first draft. For the other two essays, you will complete the class writing assignments as you normally do. Code numbers (not linked to your identity) will mask your identity on all the data produced by you to guarantee anonymity. The researcher and two raters will have access to the data to analyze the effects of computer-supported peer review on argumentative writing. All data collected for this study will be stored at the University of Maryland for five years. After five years, all data will be shredded.
Confidentiality	All information collected in this study is confidential to the extent permitted by law. I understand that the data I provide will be grouped with data others provide for reporting and presentation and that my name will not be used.
Risks	I understand that there are no foreseeable personal risks associated with my participation.
Benefits	I understand that my participation in this study may improve my writing. My participation is voluntary and will have no effect on my grade. I will receive 3 extra points toward my course grade under the condition that I complete all the components included in the study. Class members who choose not to participate will be given an alternative assignment that when completed will allow them to earn 3 extra points.
Freedom to withdraw and to ask questions	I understand that I am free to ask questions and/or withdraw from participation at any time without penalty.
Contact information of investigator(s)	Wayne H. Slater (Principle Investigator) & Ya-Chin Tsai Department of Curriculum and Instruction 2311 Benjamin Building University of Maryland College Park, MD 20742-1175 Phone: 301-405-3128 or 301-405-3324 (voice mail), Fax: 301-314-9055 Email: wslater@umd.edu, tsai@umd.edu
Contact information of Institutional Review Board	If you have questions about your rights as a research subject or wish to report a research-related injury, please contact: Institutional Review Board Office, University of Maryland, College Park, MD 20742; (e-mail) irb@deans.umd.edu; (telephone) 301-405-4212
Please add name, signature, and date lines to the final page of your consent form	Name of Participant _____ Signature of Participant _____ Date _____

Appendix 2

Writing Prompts

I. Scenario: Mrs. Jones is a teacher at Greater Maryland Middle School, and you are a student teacher. Today she plans to install the school's only copy of an atlas software program for a single user license on the 22 computers in the lab. On one hand, she wants to get everyone on the same playing field. On the other hand, she feels that she should teach students to respect other people's intellectual property.

Respond to this question:

> What is your position on software duplication/piracy that breaks copyright laws? Write an essay to persuade Mrs. Jones to agree with you. Your essay should include a clear thesis statement, clear reasons explaining your position, and examples or data that support those reasons. Your essay should also address reasons why Ms. Jones disagrees with you. Counter those reasons by explaining why they are incorrect. Use examples or data to support your counter-argumentation.

II. Scenario: We use e-tools in everyday communication: we check e-mail, chat via Instant Message, we text message one another on cell phones. Some people say these tools increase our ability to connect with other people by allowing instant, affordable contact that is accessible everywhere. Others say they widen the gulf between people by avoiding face-to-face communication.

Respond to this question:
Do the e-tools increase or decrease personal communication? Write an essay to persuade Mrs. Jones to agree with you. Your essay should include a clear thesis statement, clear reasons explaining your position, and examples or data that support those reasons. Your essay should also address reasons why Ms. Jones disagrees with you. Counter those reasons by explaining why they are incorrect. Use examples or data to support your counter-argumentation.

III. Scenario: Increasingly, computer technology is making its way into classrooms as a staple component of coursework. Some say the use of electronic resources expands our learning experiences. Others say there are many issues arising from the use computer technology.

Respond to this question:
Is technology advantageous or disadvantageous to instruction/learning? Write an essay to persuade Mrs. Jones of the benefits. Your essay should include a clear thesis statement, clear reasons explaining your position, and examples or data that support those reasons. Your essay should also address reasons why Ms. Jones disagrees with you. Counter those reasons by explaining why they are incorrect. Use examples or data to support your counter-argumentation.

Appendix 3

Student Handout (i)

Basic Information

http://cpr.molsci.ucla.edu/cpr/cpr/login.asp

Getting Started with CPR:

- You need a browser (Netscape Navigator v. 4/later or Internet Explorer v. 4/later) and an Internet connection (Bruin Online, EarthLink, etc.).
- You will need to know your CPR Username and your password to access the CPR program. If you have already accessed the program in a previous term and have forgotten your login information, then you can retrieve this information by connecting to the CPR login page (see URL above) and selecting "Users: forgot your login information?" If you are a new user and do not know your CPR ID , then your must complete the account profile. **All New Users MUST complete their account profile.**

  To complete an account profile:
  1. Go to the following URL: http://cpr.molsci.ucla.edu/cpr/cpr/login.asp
  2. Select "New Users: first time logging in?"
  3. Select **YOUR SCHOOL** from the pull down menu and enter your Student ID. (Your instructor may have given you this ID.)
  4. Next, you will select a password. You will also need to enter a challenge question and answer. If you forget your login information, this challenge question will be asked of you to confirm your identity, so choose a question/answer that you will not forget and that others do not know.
  5. Next, there is a field to enter your email address; this is optional.
  6. Upon completion of your account profile, you will be given your unique **CPR username**. Make sure that you save your **CPR username**. You will need it every time you access CPR.

Before starting your first CPR assignment:

- After entering your CPR username and password, you will be directed to take a 10-minute tour.
- Click on the "CPR Guided Tour" link and then the "Taking an Assignment" link.
- Take the short PreTest for new users.

  All information necessary to complete the PreTest can be found in the CPR Tour: "Taking an Assignment." You must take this tour prior to taking the PreTest.

Assignment Structure – Both stages are required to complete the assignment.

There are two parts to a CPR assignment:

Stage 1: <Assignment Start Time: _____>

During this stage you will

a) explore source material about the assignment topic.

b) write about the topic.

Appendix 3

Student Handout (ii)

SUGGESTION: Save your text to your local computer or to a floppy disk before submitting it. This will serve as a backup should a problem occur during the submission process.

<Text Entry End Time: _____>

Stage 2: <begins with Text Entry End Time>

During this stage you will evaluate

a) example texts written specifically for this assignment. These evaluations are called **"calibrations."**

b) three texts written by your classmates. This stage is called **"reviews."**

c) your own text. This stage is called the **"self-assessment."**

<Assignment End Time _____>

After the assignment ends:

You can now check your assignment results.

To access CPR technical support:

1) Check with your instructor.

2) Send email to _____.

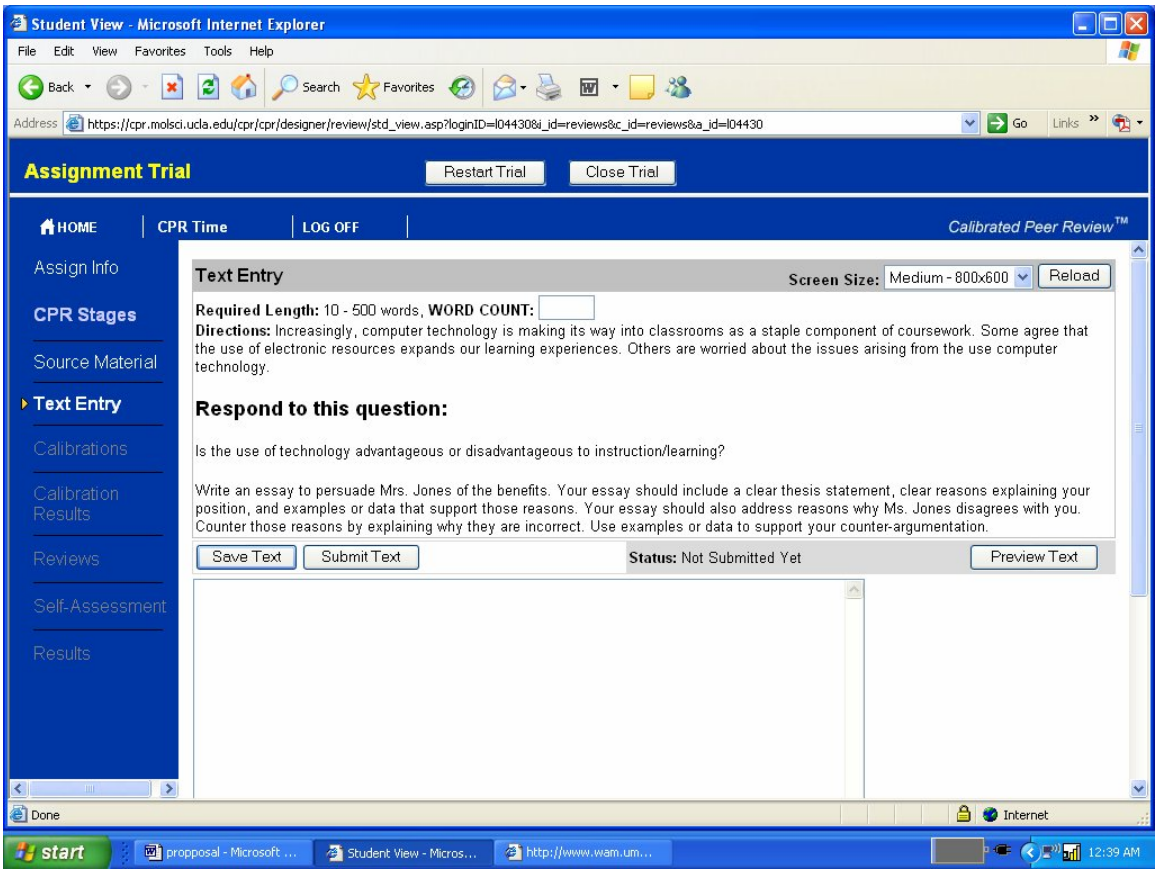
If you are a student, include your CPR username, instructor's name, and course.

Important Points:

- CPR uses a centralized UCLA time and does **NOT** use the time on a local computer (i.e. your home computer). You can check the CPR time by clicking on the "CPR Time" link on the top of the assignment screens.
- CPR depends on **ALL students** finishing assignments. Problems should be reported immediately to your **INSTRUCTOR** to insure the highest possible completion rate by students.
- **Always** save your text entry on the local computer, a separate computer, and/or a floppy disk before submitting it to CPR.
- Most Internet Service Providers (ISP's, like Bruin On-Line, Earthlink, and MSN) terminate Internet connections that have not been used for more than 15 - 20 minutes. If a connection is terminated and you try to submit work, it will be **LOST**.
- CPR does **NOT** work with the AOL browser. Make your internet connection with AOL, then switch to the Internet Explorer (4.x or 5.x) or the Netscape (4.7x) browsers.

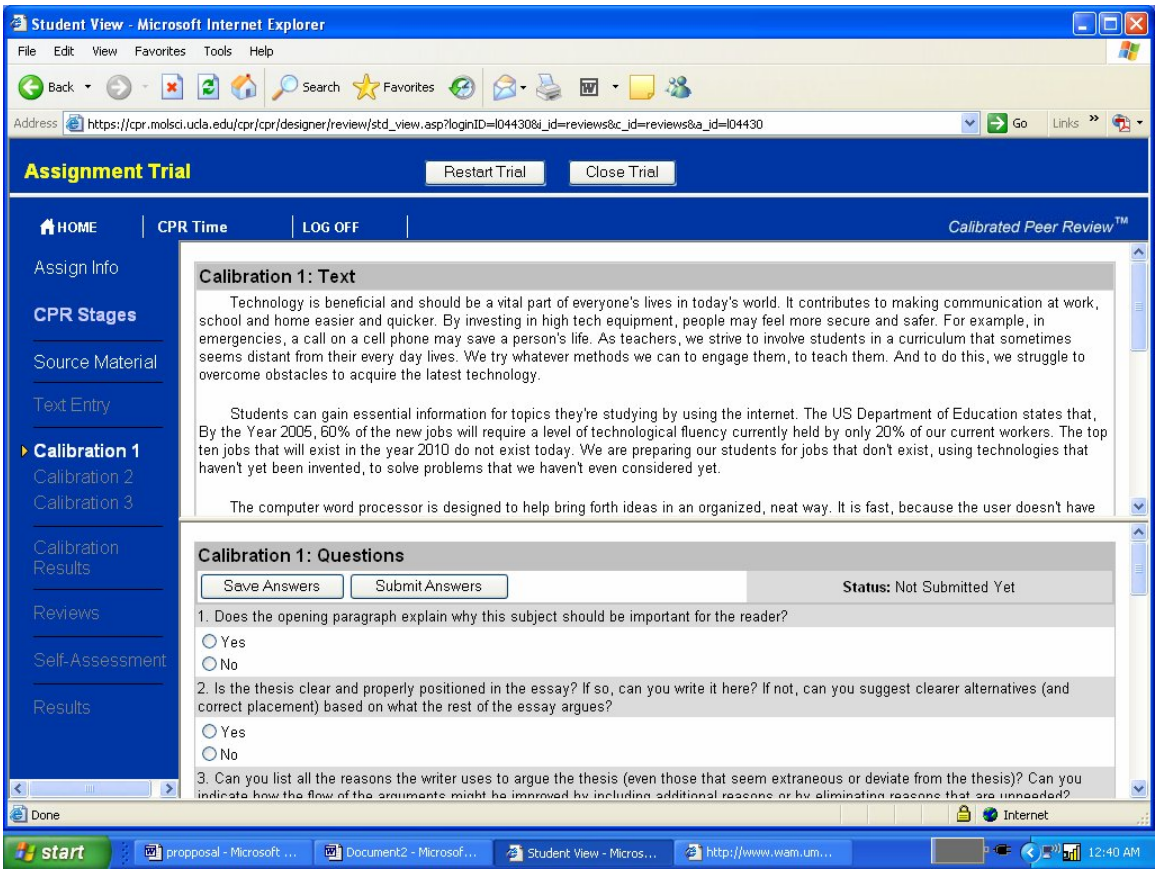
Appendix 4

Text Entry



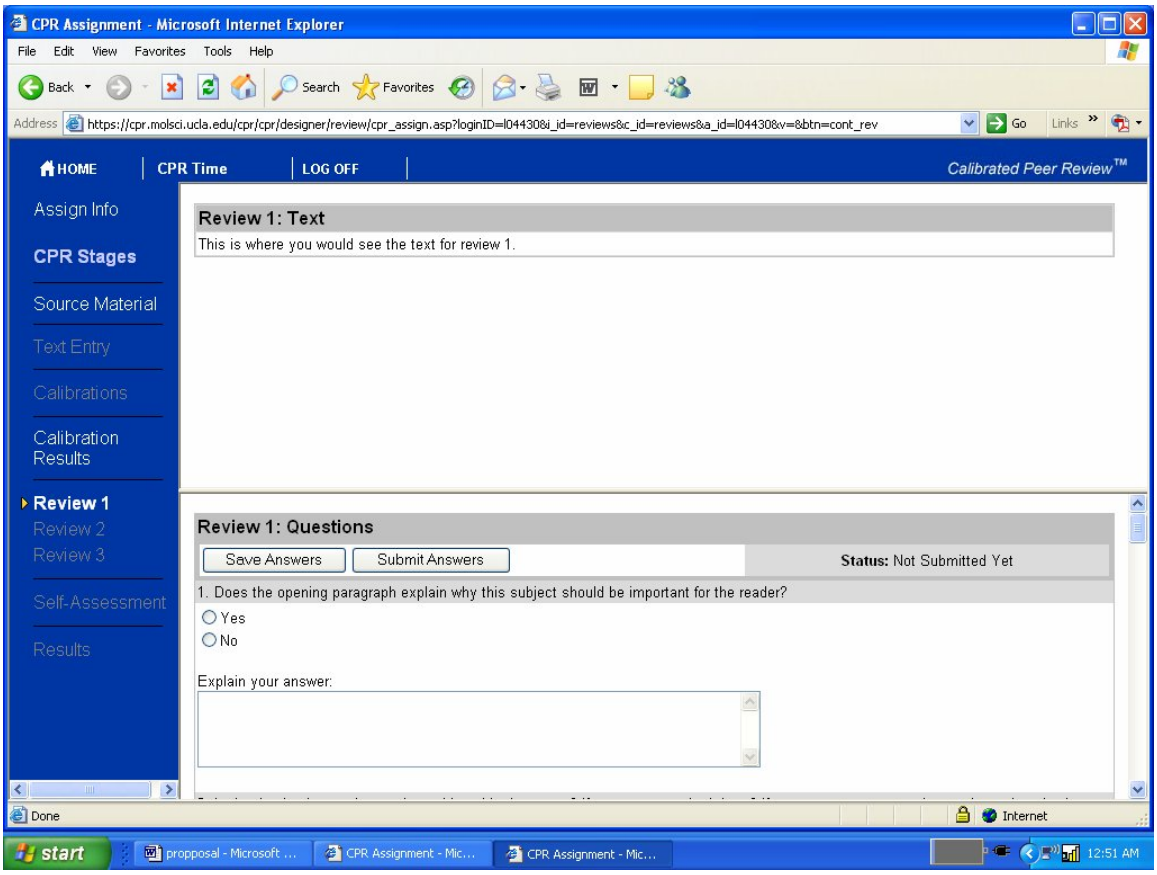
Appendix 5

Calibration



Appendix 6

Peer Review and Self Assessment



Appendix 7

Exemplar Essays, Peer Review Questions, and Teacher-Modeled Responses

Topic: E-Tools for Communication

Calibrations and Answer Keys

High Quality Calibration

Whether modern e-tools increase or decrease interpersonal communication is at dispute. Though the e-tools appear to increase our ability to connect with other people by allowing instant contact, it is said that they may widen the gulf between people by replacing face-to-face communication. However, I would like to share with you a few reasons why the use of the e-tools should be a "low investment/high return" strategy for enhancing and maintaining one-to-one contact with people.

I have this position of supporting electronic tools for communication because of my experiences. I believe all the tools provide us with easier and more efficient ways to communicate. Let me tell you a story. One of my three brothers was deployed to Iraq last year. During his deployment he was not able to reveal to anyone his where-abouts. We had no way of getting a hold of him, except by e-email and cell phones. If it were not for the modern communication system, I would not have been able to speak to my brother for a year! It was because of email and cell phones that we were able to feel any sense of closeness from him during this extremely hard time in all of our lives.

Another reason why electronic communication tools are good is because you can get in touch with people even if you do not have their phone number or contact information. Many business and other industries are can only be contacted through email, phone numbers are sometimes not easily available. Other advantages to electronic communication are speed of transmission, versatility (you can send a message to people using a variety of different tools), accuracy and feedback exchange (computerized telecommunications allow for a virtually simultaneous exchange of information and responses). All of these reasons are why I support the use of electronic communication tools.

People might disagree with my position on the grounds that using electronic communication tools are not the same as talking to people in person therefore is less effective and impersonal. In response to that concern I would say that, talking to people in person is still the best way but when it is impossible to communicate with them in person there is nothing wrong with electronic communication. Electronic communication is efficient when your addressees are not in a close proximity to you. Although using these tools does loose some of the qualities as talking person to person, they are still effective and easily accessible.

It is quite understandable for us to conceive that contacting someone via email or instant messenger is not as personal as contacting them over the phone or writing a letter. In some cases this may be true, but in other scenarios it is really nice to have the immediate and easy fallback if you need to contact someone in a pinch. For example, if you were to apply for a job and you would like to contact the person in charge of hiring, email can even be an appropriate form of communication. Email would allow you to formulate your thoughts and ideas without having the pressure of knowing that someone else listening to you in person. Besides, you can even include a digital video in your email. It allows you to see your interlocutors over your monitor. An important note to remember is that using e-tools such as email does not take away from the option of undertaking face-to-face interaction or writing a personal letter or card. It is just an alternative form of communication that is very quick and efficient. I hope that after reading my opinions you are more comfortable with using e-tools in your life.

1. Does the opening paragraph explain why this subject should be important for the reader?

◉ Yes

○ No

Answer: Yes

Feedback : Intro does cover what the exigence is fairly well.

2. Is the thesis clear and properly positioned in the essay? If so, can you write it here? If not, can you suggest clearer alternatives (and correct placement) based on what the rest of the essay argues?

◉ Yes

○ No

Answer: Yes

Feedback : The thesis is on the 1st paragraph-I would like to share with you a few reasons why the use of the e-tools should be a "low investment/high return" strategy for enhancing and maintaining one-to-one contact with people.

3. Can you list all the reasons the writer uses to argue the thesis (even those that seem extraneous or deviate from the thesis)? Can you indicate how the flow of the arguments might be improved by including additional reasons or by eliminating reasons that are unneeded?

◉ Yes

○ No

Answer: Yes

Feedback : The writer provides 2 supporting reasons, at lease. On the 2nd paragraph, the writer spelled out the reason," I have this position of supporting electronic tools for communication because of my experiences." The argument (staying in touch) is fair.

On the 3rd paragraph, " Another reason why electronic communication tools are good

is because you can get in touch with people even if you do not have their phone number or contact information...All of these reasons are why I support the use of electronic communication tools." The argument (finding contact info) is fine.

4. Does the author address why the audience might disagree? If so, how does the author overcome the audience's resistance? If not, can you suggest clearer reasons for disagreement and how they might best be addressed?

◉ Yes

○ No

Answer: Yes

Feedback : The reason for disagreement is proper-People might disagree with my position on the grounds that using electronic communication tools are not the same as talking to people in person therefore is less effective and impersonal (4th paragraph). The author overcomes the audience's resistance by presenting logic reasoning-In response to that concern I would say that, talking to people in person is still the best way but when it is impossible to communicate with them in person there is nothing wrong with electronic communication.

5. Does the author clearly support his/her position in the essay? If so, can you indicate the three most convincing examples of supporting information, and why they work to convince the audience? If not, can you indicate information the writer might find useful?

◉ Yes

○ No

Answer: Yes

Feedback : The writer supports his/her position with 2 arguments and counterarguments.

6. Is the conclusion effective? If so, can you indicate why? If not, can you make suggestions to enhance its effectiveness?

◉ Yes

○ No

Answer: Yes

Feedback : Though the conclusion is effective, the writer may write a stronger topic sentence to emphasize his position and encourage the intended audience to take action. For instance: I support the use of e-tools for interpersonal communication. They are cost-effective ways to get in tough with people. The advantages definitely outweigh the disadvantages, and I hope you will realize the efficiency and usefulness of these tools and use them to increase interpersonal communication.

7. Does each paragraph begin with a clear topic sentence? If so, can you list them here? If not, can you provide suggestions to clarify unclear or nonspecific topic sentences?

◉ Yes

○ No

Answer: Yes

Feedback : Topic sentences are there and clear, easy to follow.

8. How many grammatical and spelling errors do you find in it?

○ None

◉ Some (1 or 2)

○ Many (more than 2)

Answer: Some (1 or 2)

Feedback : I found one. There is a noun agreement (someone vs. them) in this sentence: It is quite understandable for us to conceive that contacting someone via email or instant messenger is not as personal as contacting them over the phone or writing a letter.

9. Can you list three specific areas that the author should improve? You may make local (small, specific) suggestions about individual sentences or ideas. You may focus on global (larger, broader) concerns, such as organization.

◉ Yes

○ No

Answer: Yes

Feedback : 1. A strong thesis should be repeated in the conclusion.
2. Stress the importance of the original thesis and major claims of the argument in the conclusion. To accomplish the goal, the writer should summarize the main points of the paper using different language than that in which those points were originally presented.
3. Read aloud to correct grammatical errors.

10. How would you rate this text?

○ 10 Highest

◉ 9

○ 8

○ 7

○ 6

○ 5

○ 4

○ 3

○ 2

○ 1 Lowest

Rating: 9

Feedback : Good argument. I suggest the writer come up with a strong conclusion.

Mid Quality Calibration

E-communication tools have become the major form of communication in this era. We rely heavily on these tools to gather information and keep in touch with friends, family and co-workers. While we have the capability to never talk to an actual person due to email, we also have the ability to speak with anyone we with at anytime with cell phones available. I believe that these new forms of communication increase the amount of time people interact with each other. If Ms. Jones wishes to keep-up in this world she needs to use these tools to communicate with co-workers, friends and family.

For the work force emails are a way to keep the office, or department, connected and interacting with each other at a moments notice. Email can be used for family members to keep in touch, whether they live near or far from each other. For families they can send pictures of new family additions, or important times in their lives. By being able to send these moments over the internet it makes families feel just a little bit closer to each other and this valuable information can be received virtually instantly.

Chat rooms provide friends and family to talk in a group without needing to be in the same place. They can keep in touch even with oceans between them and talk as if they are in the same room. Cell phones and messengers are very similar; they provide individuals with the time to talk anywhere and anytime. A comfort for those in a new area, or those fresh off to college and feeling a little home sick. Cell phones make it possible also for co-workers to be working on one project in different places.

I understand that some of these tools have the potential to reduce personal contact with other people. Sometimes it is nice to be able to just talk to someone on the phone the power of hearing someones voice while you are upset is so comforting. Being able instantly have a conversation with messenger, or through email connects families in wonderful ways and keeps them closer than they have been previously able to.

Companies use email so their employees can work together on the same project and share ideas while being on separate computers or even in different cities, states, or even countries. Companies can send updates on services to their customers so they are constantly aware of what they are paying for and getting from the company.

Some of these technologies can cost money that some people do not have they can leave families and companies with a whole to fill. But if they have an internet they may have the ability to communicate with others via email or instant messages until they are able to afford all of the technologies their company needs. Sometimes for families it is much cheaper to keep in contact with other members of the family via email which lowers the phone bill they may have by reducing long distance phone

calls and of traditional mail which cost is only rising and costs more the heavier the item is.

One minor interruption in face to face contact does not out weight the multiple benefits of these e-communication tools. Families can keep in touch for less money and in a much easier way. Cell phones, emails and instant messages provide these families with multiple opportunities to keep in contact with each other. Companies can have their employees working together on one project in multiple places and time zones. Electronic technologies provide many people with the opportunity to keep in contact with many more people that with out them. There is a greater ability to communicate with others with these technologies that with out them on a personal basis.

1. Does the opening paragraph explain why this subject should be important for the reader?

Yes
No
Answer: Yes
Feedback : The writer conveys the importance, usefulness, timeliness, or interest of this subject for its particular audience. Exigence is clear: If Mrs. Jones wishes to keep-up with this world she needs to use these tools to communicate with co-workers, friends, and family." But I suggest the writer elaborate.
2. Is the thesis clear and properly positioned in the essay? If so, can you write it here? If not, can you suggest clearer alternatives (and correct placement) based on what the rest of the essay argues?

Yes
No
Answer: Yes
Feedback : The thesis is clear (I believe that these new forms of communication increase the amount of time people interact with each other.) , but it is not well positioned. Why not make it a topic sentence?
3. Can you list all the reasons the writer uses to argue the thesis (even those that seem extraneous or deviate from the thesis)? Can you indicate how the flow of the arguments might be improved by including additional reasons or by eliminating reasons that are unneeded?

Yes
No
Answer: Yes
Feedback : I prefer the writer to give clear signals for the reasons. The reasons are implicitly states. The reason in the 2nd paragraph is that e-tools enable people to interact at a moments' notice. The reason in the 3rd paragraph is that e-tools are off-limit to space. However, the reasons do not seem to support the thesis very well.

4. Does the author address why the audience might disagree? If so, how does the author overcome the audience's resistance? If not, can you suggest clearer reasons for disagreement and how they might best be addressed?

Yes
No
Answer: Yes
Feedback : Yes. The writer addresses the audience's concern in Paragraph 4, but the writer does not overcome the audience's resistance very well.
5. Does the author clearly support his/her position in the essay? If so, can you indicate the three most convincing examples of supporting information, and why they work to convince the audience? If not, can you indicate information the writer might find useful?

Yes
No
Answer: Yes
Feedback : The writer tries to support his/her position but he/she should come up with stronger reasons.
6. Is the conclusion effective? If so, can you indicate why? If not, can you make suggestions to enhance its effectiveness?

Yes
No
Answer: No
Feedback : The writer tries to emphasize the importance of e-tools, but he should come up with a stronger conclusion. He should repeat his position and repeat his supporting reasons in the last paragraph.
7. Does each paragraph begin with a clear topic sentence? If so, can you list them here? If not, can you provide suggestions to clarify unclear or nonspecific topic sentences?

Yes
No
Answer: No
Feedback : Body paragraphs do not have topic sentences that are coherent with what the paragraphs are about. I suggest the writer to write a topic sentence for each paragraph.
8. How many grammatical and spelling errors do you find in it?
None
Some (1 or 2)
Many (more than 2)
Answer: Many (more than 2)
Feedback : Numerous spelling/grammatical errors and sentence structure errors. An obvious error: the 2nd sentence in Paragraph 1. This writer should read out loud and get extra help with this writing.

9. Can you list three specific areas that the author should improve? You may make local (small, specific) suggestions about individual sentences or ideas. You may focus on global (larger, broader) concerns, such as organization.

Yes
No
Answer: Yes
Feedback : (1) Introduction: In Paragraph 1, establish an exigence. When the intended audiences find that they have something at stake in a particular argument, issue, or decision, they will read on. In the first several sentences, it is essential to pull your reader in with a brief and clear picture of how your topic is relevant to her experience or self-interest. (2) Restructure the whole text: The writer should unfolds meaning from sentence to sentence so that the reader does not have to make an effort to see how each segment builds on what went before or how it leads into what flows. Make it a coherent text, so it will be easy to follow. (3) Conclusion: Point to larger implications of the argument. The writer might consider the impact your argument would have on the audience or even include a call to action.
10. How would you rate this text?
10 Highest
9
8
7
6
5
4
3
2
1 Lowest
Rating: 6
Feedback : Make your introduction as a preview paragraph and make a strong conclusion. Try to make clear transitions between paragraphs.

Low Quality Calibration

The invention of e-communication tools has contributed to connecting our ideas to others in an efficient and quick way. They are used by individuals, families and businesses. Within minutes, messages can be received thousands of miles away from the sender. There are a few reasons for considering these tools to purchase. Humans are social beings, so relationships form the foundation of our lives. We develop our relationships with others through communication, and at the same time, those relationships frame our communication with others. Most people in our society use e-communicative tools everyday such as email, chat rooms, cell phones, and discussion boards etc. These new technologies decrease interpersonal communication because they provide an easier accessibility of reaching people without being face-to-face with others.

Employees in large businesses, that contain many offices, can communicate with each other with e-mail or messenger faster than walking over to each others desks or using the phone. Also, people may be talking on the phone when another tries to call them, but can easily access the e-mail message. These networks connect you to the real world opportunities that can help you achieve your goals and realize your dreams. Whether you're thinking about a new job, new career, a new city or a new direction.

You are against chatrooms, because people do not know who they are conversing with, and there have been cases where people have actually met criminals this way and have been killed. People who are easily persuaded by others can incorporate perverse ideas in their thoughts and act on them. While chatrooms usually involve people conversing about a subject they are interested in, if people do not agree to meet with another person, they will not become a victim of criminal intent.

I feel that cell phones are a necessary device for emergencies. They are small enough to carry anywhere and a call to 911 may save a persons life. If a person needs to use one while on the road, they should pull into a parking lot or off the road. Business people change their agendas often, and by investing in a cell phone, you may save time when a meeting is cancelled or changed at the last minute.

The information super-highway has been paved and has allowed its passengers to travel far distances which have never been attempted till now. Email, Instant Messenger, Chat rooms, and Cell Phones allow us to stay in touch with friends, relatives, and even the brave soldiers fighting the war in Iraq. These luxuries are at our finger tips and have made life much easier for its users. Communication devices such as these increase personal communications for purposes such as helping businesses, staying in touch with loved ones, and increasing speeds of communication. Life before these technologies do not exist in todays information generation.

We have spoken to each other several times about e-communication tools and you have disagreed with me on the use of cell phones, because you feel that regular phones can be utilized while at home or in the office. Many people have been involved in car accidents while talking on their cell phones while driving.

I believe that e-mail is essential to everyone, because it saves time, messages pertaining to business can be relayed easily and it costs less than a phone bill.

1. Does the opening paragraph explain why this subject should be important for the reader?

Yes
No
Answer: No
Feedback : 1. The open paragraph does not explain why this subject is important for the reader. The writer should set the tone for the entire argument. An effective introduction should states the main argument that the writer will address throughout

the paper. Without explaining the importance of the subject, reader are likely to become bored as a result of pointless writing. Try to provide background and contextual information.

2. Is the thesis clear and properly positioned in the essay? If so, can you write it here? If not, can you suggest clearer alternatives (and correct placement) based on what the rest of the essay argues?

Yes
No
Answer: No
Feedback : Argument in Paragraph 1 seems contradict itself. I can't find the thesis statement. The writer should clearly state the main argument that he will address throughout the paper. The writer should include an identifiable thesis statement in the introduction. The writer can also write multi-paragraph introductions. The first paragraph should provide background information while the second paragraph contains an explicit thesis, or vice versa.

3. Can you list all the reasons the writer uses to argue the thesis (even those that seem extraneous or deviate from the thesis)? Can you indicate how the flow of the arguments might be improved by including additional reasons or by eliminating reasons that are unneeded?

Yes
No
Answer: No
Feedback : Basically, the paper is off-topic. The writer should come up with reasons to support his thesis, though he/she needs to provide a clear thesis statement in Paragraph 1.

4. Does the author address why the audience might disagree? If so, how does the author overcome the audience's resistance? If not, can you suggest clearer reasons for disagreement and how they might best be addressed?

Yes
No
Answer: Yes
Feedback : The writer tries to address the audience's objection in Paragraph 3, but is unsuccessful. He/She should state why the audience disagrees and explain in detail. He/She should rewrite to make meaning unfold from sentence to sentence so that the reader does not have to make an effort to see how each sentence builds on what went before, or how it leads into what follows.

5. Does the author clearly support his/her position in the essay? If so, can you indicate the three most convincing examples of supporting information, and why they work to convince the audience? If not, can you indicate information the writer might find useful?

Yes
No

Answer: No
Feedback : The author does not take a position or support his position. In the introduction, he should try to put down a thesis statement and include a preview of the major reasons he intends to make in support of the thesis. In the 2nd and 3rd paragraphs, he/she can offer elaborate each reason.
6. Is the conclusion effective? If so, can you indicate why? If not, can you make suggestions to enhance its effectiveness?

Yes
No
Answer: No
Feedback : The conclusion does not conclude the argument. The writer should not bring up new ideas in the final paragraph. He/She should reflect on the implications of the argument and give a memorable fact related to the argument to reinforce the main thesis. Alternatively, he/she may create an emotional response in the reader.
7. Does each paragraph begin with a clear topic sentence? If so, can you list them here? If not, can you provide suggestions to clarify unclear or nonspecific topic sentences?

Yes
No
Answer: No
Feedback : A good topic sentence represents the main idea of a paragraph and is usually the first sentence in the paragraph. The writer needs to come up with clear topic sentences for all the paragraphs.
8. How many grammatical and spelling errors do you find in it?
None
Some (1 or 2)
Many (more than 2)
Answer: Some (1 or 2)
Feedback : The writer should read aloud or run spelling check to correct errors.
9. Can you list three specific areas that the author should improve? You may make local (small, specific) suggestions about individual sentences or ideas. You may focus on global (larger, broader) concerns, such as organization.

Yes
No
Answer: Yes
Feedback : (1) The writer should rewrite and restructure the whole to make it coherent and united. In the introduction, present your position and provide your reader with detailed context to identify the topic under discussion. In Paragraph 2, write down the supporting reasons as your topic sentences and elaborate them. In paragraph 3, address the counterargument. In Paragraph 4, and try to refute it. In the conclusion, summarize the main points of the argument or remind the reader of the importance of the topic. (2) Coherence: The writer should make the writing more

coherent. Rewrite the whole text to get your reader to recognize the connections. (3) Try to narrow down the issue and support your position with appropriate argument.

10. How would you rate this text?

10 Highest
9
8
7
6
5
4
3
2
1 Lowest

Rating: 2

Feedback : The whole text is incoherent and needs to be revised globally.

Topic: Technology in Classroom

High Quality Calibration

Over the past couple of years technology in the education world has vastly increased. In almost every school and classroom teachers and students have access to computers, Internet and all sorts of other educational toold. I feel as though these tools are extremely helpful to both students and educators and open up a world of opportunities in the classroom. Having access to advanced technology in the classroom has proved to be a huge benefit to everyone.

Through the use of the internet, students are able to read government documents, look up information in encyclopedias, browse the internet, and explore different countries, without even leaving the classroom. Resources from all over the world are suddenly at a students fingertips. With the use of internet today students have access to government documents which would never have been available to them beforehand. For example, a History teacher has the ability to assign his/her students tasks which would require them to look into life during the 16th century. Under normal circumstances it would be difficult for a student to find copies of things such as the Declaration of Independence, newspapers dated from around that time, and any other documents which would help their project. However, with the use computers, students simply have to sit down and gather all the information they need from the internet.

Another huge benefit to using this sort of technology in the classroom is the availability of assistive technology for students with disabilities. Often times students in your classroom will need some sort of accommodation for them to be able to keep up in a regular education classroom. Some examples of this sort of technology can be something as simple as a tool which can magnify the notes placed on the board through a projector. Another thing which may help students with disabilities in classroom is a turn taking computer software program. This program allows students to work on their turn taking conversation skills through recorded conversations between the student and the computer. While these are only a few of the types of assistive technology available to students there are many many more. With the use of computers students can engage in all sort of interactions which they would not have been able to have before.

While all these programs seem to be extremely beneficial to students, I understand that you may have some concerns regarding the use of technology in the classroom. First of all the students reliance on the internet may be some cause of worry. Even though the internet is a wonderful tool, filled with reliable information, because there is no restriction on what can be posted on the Internet. As a result of this, often times false information can be found on the Internet. While this may be a problem in some cases, once students learn how to judge the reliability of a website, there will be no problem with them using the internet as a research tool. There are some small steps which teachers can teach students which will allow them to make the decision on their own as to whether or not an internet source is reliable.

Another reason why you might be reluctant to use technology is that it may encourage students to rely on internet sources and rarely ever written materials such as encyclopedias and printed books. Often times as a result of the availability of documents through the internet, students no longer have the need to use the library. They have access to documents through the Internet that they probably would not even have if they would go to their local library. While students are able to access many forms of information through the internet, it does not mean that the use of printed works have become obsolete. Often times archives of old newspapers and magazines can only be found in the library. There are many things such as journals and books which students still need to use as reference that can not be found on the internet. So while in some instances a student may be able to use the internet at research, it is not always a sufficient tool. We have not yet come to the point in technology where we no longer have to rely on printed works. Therefore while it is of some small concern that students would no longer go out to find information, that will not always be the case.

The benefits of having technology in the classroom are tremendous. Both students and teachers are able to explore so many different options as a result of classroom technology. For this reason I highly suggest that you incorporate the use of modern technology within your classroom. And while it many be overwhelming at first, there are just as many programs out there that are able to help teachers become comfortable with technology use in the classroom. I hope that this has helped you change your mind regarding technology use.

1. Does the opening paragraph explain why this subject should be important for the reader?

Yes
No
Answer: Yes
Feedback : Yes, the opening paragraph explains the exigence of the topic - technology is pervasive and its use had increased, and it can benefit teachers and students in the classroom. Ideally, I would expand the introduction just a little bit to include more background as to why the topic is being written about.
2. Is the thesis clear and properly positioned in the essay? If so, can you write it here? If not, can you suggest clearer alternatives (and correct placement) based on what the rest of the essay argues?

Yes
No
Answer: Yes
Feedback : Thesis (..I feel as though... has proved to be a huge benefit to everyone) is clear and properly positioned. It could be strengthened by making sure it mentions the main topics of support that will be covered, such as document retrieval and help for disabled students.

3. Can you list all the reasons the writer uses to argue the thesis (even those that seem extraneous or deviate from the thesis)? Can you indicate how the flow of the arguments might be improved by including additional reasons or by eliminating reasons that are unneeded?

Yes
No
Answer: Yes
Feedback : The argument is clear with support (The ease of finding resources and benefits for disabled students). Again, these should be explicitly mentioned in the thesis. Perhaps another paragraph of support would strengthen the essay. There should be stronger transitions between the second and third paragraphs and into the refutation section. Logical flow of second aragraph could be strengthened -- it goes from 16th Century to the Declaration on Independence, which seems jarring.
4. Does the author address why the audience might disagree? If so, how does the author overcome the audience's resistance? If not, can you suggest clearer reasons for disagreement and how they might best be addressed?

Yes
No
Answer: Yes
Feedback : Refutation section is relevant and covers the most pertinent issues fairly well. The support used in the refutation section is presented a bit too easily and is not quite convincing - it belittles large concerns and is not detailed and sensitive enough to the audience's concerns.
5. Does the author clearly support his/her position in the essay? If so, can you indicate the three most convincing examples of supporting information, and why they work to convince the audience? If not, can you indicate information the writer might find useful?

Yes
No
Answer: Yes
Feedback : Yes. The author clearly supports her position. Two examples are: Increased access to materials, and help for students with disabilities. I would recommend another paragraph of support - perhaps about how students will be using technology in the work world and this is good experience for them. What is there is convincing and clear.
6. Is the conclusion effective? If so, can you indicate why? If not, can you make suggestions to enhance its effectiveness?

Yes
No
Answer: Yes
Feedback : Conclusion is effective. Could be strengthened by being less vague and reminding the reader of the supporting points specifically. Good idea to bring in the

use of help tools for teachers as well. Last sentence could be more confident and effective.

7. Does each paragraph begin with a clear topic sentence? If so, can you list them here? If not, can you provide suggestions to clarify unclear or nonspecific topic sentences?

Yes
No
Answer: Yes
Feedback : Yes, there are clear topic sentences, however, as mentioned, the paragraph about disabled students does not seem coherent as it is not mentioned in the thesis: Over the past..., Through the use of..., Another huge benefit..., While all these programs seem..., Another reason why you might be reluctant..., The benefits of having...

8. How many grammatical and spelling errors do you find in it?
None
Some (1 or 2)
Many (more than 2)
Answer: Many (more than 2)
Feedback : Author leaves out apostrophes, some commas missing, some words missing.

9. Can you list three specific areas that the author should improve? You may make local (small, specific) suggestions about individual sentences or ideas. You may focus on global (larger, broader) concerns, such as organization.

Yes
No
Answer: Yes
Feedback : Overall coherence needs to be strengthened by including all supporting reasons in the thesis and perhaps adding another reason for support. Refutation could be a bit more convincing (seems a bit STRAW MAN at this point). Proofreading errors.

10. How would you rate this text?
10 Highest
9
8
7
6
5
4
3
2
1 Lowest
Rating: 8

Feedback : Tips: First paragraph has a third person voice which then switches to second person in the third paragraph. Student should be more consistent with the voice and how familiar she wants it to be in the letter.

Mid Quality Calibration

In the classroom there is a limited amount of time where computers can be used in the classroom, however, when there is the opportunity computers can provide an array of learning opportunities for students. When students use computers they can extend their knowledge on a subject or create a knowledge base for other information. Through web-quests or web-based activities students are learning independently or in groups with minimal guidance from the teacher. Some computer technologies provide students with opportunities to learn they may not be able to receive other places. For instance there are assistive technologies that can benefit many children.

Teachers now have the ability to create web-quests or web-based lessons for their students. They can create activities that directly relate to current topic in the lesson, or they can use them as an introduction to an upcoming lesson or project. Students using these can explore topics in groups and/or individually. Instead of relying on activities the semi fit into your lesson or altering many activities to fit in to the teachers plan they can create their own activity in web-quests or web-based activities for their students.

With assistive technology students with learning disabilities, physical limitations or writing difficulties can use the computers with more ease. There are programs that can type what a student I saying in to a microphone, so students who have difficulty writing or typing can still be able to use the computers to write papers. There are devises which you can attach to the computer to enable students with physical limitations to still use the computers. By using these adapters all students will be able to participate in classroom activities without the assistance from other students or teachers.

Many of the activities that a teacher will create for her students will undoubtedly take up some of their time to create. One major drawback since teachers are already pressed for time as it is. But we as teachers have a responsibility to give our students the best opportunities to learn in ways that are the most beneficial to them, if it takes some of our time that is a small price to pay when our students learn and benefit greatly from the computer based activities.

Most of the counties in the area have computers in the classroom, at least one. How can all students gain the benefits from using the computers if the classroom only has one. A challenge for many teachers is creating a plan to ensure all students have the opportunity to use the computers during class time. There are generally computer labs in schools so if arranging your classroom to have all students uses the computer then the lab is a great resource. Also there can be a time table made so that students can work in pairs through out the course of a week so everyone gets to use the computer for a lesson or even recreational time.

Most students in this day and age have an array of knowledge on computers and how to use them. We as teachers need to provide students with multiple opportunities to learn and express their abilities. Computers provide a wonderful place for students to learn, whether it is through web-quests or a web-based activity students are learning in a new way. Students, as do adults, enjoy variety in learning and computers are a great way to accomplish this variety. Assistive technologies give all students opportunities to be a part of the classroom and to use the technology our society has made a necessity for all to use and have access to. Teachers need to provide their students with the time to learn how to thrive in the world around them and using computers and their technology in our classrooms is a great way to ready our students.

1. Does the opening paragraph explain why this subject should be important for the reader?

Yes
No
Answer: No
Feedback : Exigence is not clear in introduction (it begins to be discussed in the conclusion -- thriving in the world around them, using a variety of learning techniques). There needs to be more background for the essay in the introduction.
2. Is the thesis clear and properly positioned in the essay? If so, can you write it here? If not, can you suggest clearer alternatives (and correct placement) based on what the rest of the essay argues?

Yes
No
Answer: No
Feedback : Thesis is the last four or five sentences in the introduction. It needs to be condensed into one or two sentences at the end of the paragraph and streamlined. The first idea of students using technology to [expand](student uses wrong word here) their knowledge is not explicitly discussed in the essay. The other two topics of web-quests and assistive programs are covered, but the thesis could be better written. For example: Technology provides an array of learning tools that are beneficial to both teacher and student, such as web-quests and assistive technology, because they allow the student to learn independently and provide opportunities that would otherwise be unavailable.
3. Can you list all the reasons the writer uses to argue the thesis (even those that seem extraneous or deviate from the thesis)? Can you indicate how the flow of the arguments might be improved by including additional reasons or by eliminating reasons that are unneeded?

Yes
No
Answer: Yes

Feedback : The argument is passably clear. Support is working individually with web-based lessons and assistive programs. There should be another topic of support, ideally, and there are no transitions between topics. Topics should flow from the thesis, which has been discussed.

4. Does the author address why the audience might disagree? If so, how does the author overcome the audience's resistance? If not, can you suggest clearer reasons for disagreement and how they might best be addressed?

Yes
No

Answer: No

Feedback : Refutation section is weak and covers reasons that seem much less relevant than in the first essay. The author discusses the time issue related to created a computer-supported course and the computer inventory in each classroom. The two paragraphs appear to be counterargument. But I do not see transitions for the two reasons and the two issues. The writer should have made a transition from his argument to his counterargument.

5. Does the author clearly support his/her position in the essay? If so, can you indicate the three most convincing examples of supporting information, and why they work to convince the audience? If not, can you indicate information the writer might find useful?

Yes
No

Answer: Yes

Feedback : (1) The supporting ideas are on target and convincing, although the expression of them is problematic as they are full of proofreading, grammar, and sentence structure errors. (2) Generally speaking, the writer acknowledges the advantages of computer-assisted learning and provided 2 reasons to support the thesis. One reason is the advantage of WEB-BASED learning experience and the other is the benefits for students with LD. The first reason is supported by an WebQuest example and the 2nd reason is supported by the integration of assistive technology in classrooms.

6. Is the conclusion effective? If so, can you indicate why? If not, can you make suggestions to enhance its effectiveness?

Yes
No

Answer: No

Feedback : Conclusion brings in new information and reasoning to the essay that is not discussed previously. It should stick to the topics already discussed, or bring the new reasoning into the essay (learning styles and relevance to the outside world - both good points that could be used in the body of the essay).

7. Does each paragraph begin with a clear topic sentence? If so, can you list them here? If not, can you provide suggestions to clarify unclear or nonspecific topic sentences?

Yes
No
Answer: Yes
Feedback : Yes and NO. Topic sentences for the supporting paragraphs are passable and refer back to the thesis. Topic sentences for the refutation section are out of the blue and thus confusing for the reader. Transitions would help this problem, as well as coming up with disagreement issues that are more relevant to the essay as a whole.
8. How many grammatical and spelling errors do you find in it?
None
Some (1 or 2)
Many (more than 2)
Answer: Many (more than 2)
Feedback : There are numerous grammar/proofreading/punctuation errors throughout.
9. Can you list three specific areas that the author should improve? You may make local (small, specific) suggestions about individual sentences or ideas. You may focus on global (larger, broader) concerns, such as organization.

Yes
No
Answer: Yes
Feedback : The areas most in need of improvement are the thesis and exigence, the refutation logic, and the expression.
10. How would you rate this text?
10 Highest
9
8
7
6
5
4
3
2
1 Lowest
Rating: 6
Feedback : The writer should revise this text globally.

Low Quality Calibration

Technology is beneficial and should be a vital part of everyone's lives in today's world. It contributes to making communication at work, school and home easier and quicker. By investing in high tech equipment, people may feel more secure and safer. For example, in emergencies, a call on a cell phone may save a person's life. As teachers, we strive to involve students in a curriculum that sometimes seems distant from their every day lives. We try whatever methods we can to engage them, to teach

them. And to do this, we struggle to overcome obstacles to acquire the latest technology.

Students can gain essential information for topics they're studying by using the internet. The US Department of Education states that, By the Year 2005, 60% of the new jobs will require a level of technological fluency currently held by only 20% of our current workers. The top ten jobs that will exist in the year 2010 do not exist today. We are preparing our students for jobs that don't exist, using technologies that haven't yet been invented, to solve problems that we haven't even considered yet.

The computer word processor is designed to help bring forth ideas in an organized, neat way. It is fast, because the user doesn't have to hand write the thoughts they are trying to convey, although they will have to learn to type. The word processor also contains features like spell checker, table creation and clip art. Not only does the word processor save time in writing, a document can also be easily edited.

Cell phones are good for communicating in emergencies. For example, if a family member needs to reach a teacher or student right away about a medical emergency or other family crisis, the cell phone is a good device to invest in.

Cell phones have caused many problems in your classroom. Some of the students have talked on the phone while you were trying to teach a lesson. Other students have left them on and let their classmates listen to what was being said in the classroom. Also, some cell phones have features that enable students to cheat. They write down answers they believe will be on the tests.

Students are goofing off while in computer labs. They write messages to each other on with e-mail about other students and what activities they're engaging in after school. While searching the internet, some students are looking at subjects not related to the what's being taught.

Writing is an important part of your class and you feel that the students need to practice their penmanship. This can also be done along with using the word processor. Longer projects that may need editing can be typed on the word processor, and short writing assignments can be hand written.

Teachers can make a rule that cell phones need to be kept in a certain area of the room. Every hour the students will be allowed to check them in order to see if they have messages. A phone call back can only take a couple of minutes. If students think that there's an emergency at home and can't reach their family, they can go to the school office to call them. The students will have to utilize various high tech equipment in higher grades, and learning with this equipment now will enable them to succeed in higher grades.

1. Does the opening paragraph explain why this subject should be important for the reader?

Yes
No
Answer: Yes
Feedback : The first two sentences of the introduction carry some exigence as to why one would teach with technology. However, the rest of the introduction is about technology, but not necessarily how it relates to teaching.
2. Is the thesis clear and properly positioned in the essay? If so, can you write it here? If not, can you suggest clearer alternatives (and correct placement) based on what the rest of the essay argues?

Yes
No
Answer: No
Feedback : The thesis is not clear. The topics in the paper seem irrelevant. The student needs to return to outlining the paper with a clear thesis that has several supporting points that get discussed in order in the paper.
3. Can you list all the reasons the writer uses to argue the thesis (even those that seem extraneous or deviate from the thesis)? Can you indicate how the flow of the arguments might be improved by including additional reasons or by eliminating reasons that are unneeded?

Yes
No
Answer: Yes
Feedback : This question is hard to answer. The writer talks about word processors, the Internet, and cell phones. Three reasons are supported with ineffective examples. I don't think the reasons supported the thesis. The letter is not organized in a logical manner.
4. Does the author address why the audience might disagree? If so, how does the author overcome the audience's resistance? If not, can you suggest clearer reasons for disagreement and how they might best be addressed?

Yes
No
Answer: No
Feedback : the writer talks about cell phone problems in classrooms, problems in computer labs, and a lack of penmanship. I assume those represent Ms. Jones' objections. However, there is no clear transitions that signal the writer's anticipations of Ms. Jones reluctance. Without reading the direction of this writing assignment, I would have no clue what the writing is about.
5. Does the author clearly support his/her position in the essay? If so, can you indicate the three most convincing examples of supporting information, and why

they work to convince the audience? If not, can you indicate information the writer might find useful?

Yes
No
Answer: No
Feedback : The paper is off-topic and needs to be re-structured and thought out.
6. Is the conclusion effective? If so, can you indicate why? If not, can you make suggestions to enhance its effectiveness?

Yes
No
Answer: No
Feedback : Conclusion, like the rest of the paper, is off-topic.The last paragraph is about cell phone in classroom, not a conclusion. The writer needs to write a conclusion to conclude his argument.
7. Does each paragraph begin with a clear topic sentence? If so, can you list them here? If not, can you provide suggestions to clarify unclear or nonspecific topic sentences?

Yes
No
Answer: No
Feedback : (1) Confused with his argument. No clear topic sentences, the logic of the paper is unclear, as well as the structure and organization. The writer should have seriously discuss the advantages of technology in classroom settings. The whole section about cell phone does not appear advantageous to instruction. The writer should've talked about how students benefit from engaging in PowerPoint, WebQuest, WebCT, etc. (2) Suggestions: The writer should address the disadvantages of technology in classroom. By presenting two sides of an issue, he presents a balanced argument. He needs to invest more efforts in this aspect.
8. How many grammatical and spelling errors do you find in it?
None
Some (1 or 2)
Many (more than 2)
Answer: Some (1 or 2)
Feedback : The writer may not want to use contractions in a formal letter. The writing often sounds too casual and conversational.
9. Can you list three specific areas that the author should improve? You may make local (small, specific) suggestions about individual sentences or ideas. You may focus on global (larger, broader) concerns, such as organization.

Yes
No
Answer: Yes

Feedback : Basically, the writer should rewrite the whole letter. He should come up with new ideas to make the content more interesting and developed. (1) Idea & Content: The letter should be rewritten to show cohesion, coherence, unity, and development. The writer should narrow down this topic, find out what information important to Ms. Jones, and discuss with specific details to explore the theme. (2) organizations: The writer can organize his argument in a logical way. He should express his position clearly as the topic sentence of the first paragraph and orient his reader what is to come in the introduction. The introductory paragraph should hook up with Ms. Jones' interest right from the beginning. In the 2nd paragraph, he should discuss his reasons for his position and elaborate to support them. In the 3rd paragraph, he can anticipate Ms. Jones' objections and elaborate. In the 4th paragraph, he can present his refutation to Ms. Jones. In the 5th paragraph, the best way to wrap up his argument is to reiterate his position and to persuade the reader to incorporate technology into classrooms. (3) voice: The writer should give the reader an impression that he is talking directly to the audience. The most important move is to discuss both sides of an issue. When anticipating the questions that Ms. Jones may raise, he appears to take the reader into account. (4) word choice: Barry should make his style lively, interesting, and appropriate to Ms. Jones and the topic. He should select words to make his argument concise. Check the thesaurus or dictionary for powerful words. (5) sentence fluency: Barry should construct and vary his sentences to improve the flow.

10. How would you rate this text?

10 Highest
9
8
7
6
5
4
3
2
1 Lowest

Rating: 3

Feedback : The writer should rewrite the whole letter. Thesis needs to be concise and on-topic and include the areas of support to follow. Paper needs topics sentences and supporting paragraphs that follow from the thesis.

Appendix 8

Instruction for Student Raters to Rank Essays

Your name:

This package contains 3 position papers on "E-Tools for Communication" (the Writing Prompt below). These numbered papers (1, 2, 3) are at three quality levels: Good, Average, and Poor. Please read all three of them. Then rank them below by writing the paper number after Good, or Average, or Poor.

Writing Prompt:

We use e-tools in everyday communication: we check e-mail, chat via Instant Message, we text message one another on cell phones. Some people say these tools increase our ability to connect with other people by allowing instant, affordable contact that is accessible everywhere. Others say they widen the gulf between people by replacing face-to-face communication.

Do the e-tools increase or decrease personal communication? Write an essay to persuade Mrs. Jones to agree with you. Your essay should include a clear thesis statement, clear reasons explaining your position, and examples or data that support those reasons. Your essay should also address reasons why Ms. Jones disagrees with you. Counter those reasons by explaining why they are incorrect. Use examples or data to support your counter-argumentation.

Good:

Average:

Poor:

Thank you.

Appendix 9

Survey

CPR is a Web-Based instructional tool that enables students to learn by writing about important topics in a course. After going through the activity, you should be able to submit the best final products to your instructor. Explain your answers to the following questions:

1. In the calibration stage, reading the three exemplar essays gave me ideas to revise my paper.
a. strongly disagree b. somewhat disagree c. neutral d. somewhat agree e. strongly agree Explain:

2. The questions attached to each essay gave me ideas to revise my essay.
a. strongly disagree b. somewhat disagree c. neutral d. somewhat agree e. strongly agree Explain:

3. After finishing the three exemplar essays, I was able to see how well I did with the three exemplar essays. In the Calibration Results, I read the detailed responses to see the explanations for the answers, which gave me ideas to revise my writing .
a. strongly disagree b. somewhat disagree c. neutral d. somewhat agree e. strongly agree Explain:

4. When I reviewed my peers' writing, their essays inspired me to revise my own writing.
a. strongly disagree b. somewhat disagree c. neutral d. somewhat agree e. strongly agree Explain:

5. The reviewer role that I had played inspired me to revise my paper.
a. strongly disagree b. somewhat disagree c. neutral d. somewhat agree e. strongly agree Explain:

6. Peer commentary helped me revise my paper.
a. strongly disagree b. somewhat disagree c. neutral d. somewhat agree e. strongly agree Explain:

7. Self-assessment helped me improve my paper.
a. strongly disagree b. somewhat disagree c. neutral d. somewhat agree e. strongly agree Explain:

Appendix 10

Holistic Scoring

6 Excellent Response

- Takes a clear position and supports it consistently with well-chosen reasons and/or examples; may use persuasive strategy to convey an argument.
- Is focused and well organized, with effective use of transitions.
- Consistently exhibits variety in sentence structure and precision in word choice.
- Errors in grammar, spelling, and punctuation are few and do not interfere with understanding.

5 Skillful Response

- Takes a clear position and supports it with pertinent reasons and/or examples through much of the response.
- Is well organized, but may lack some transitions.
- Exhibit some variety in sentence structure and uses good word choice; occasionally, words may be used inaccurately.
- Errors in grammar, spelling, and punctuation do not interfere with understanding.

4 Sufficient Response

- Takes a clear position and supports it with some pertinent reasons and/or examples; there is some development.
- Is generally organized, but has few or no transitions among parts.
- Sentence structure may be simple and unvaried; word choice is mostly accurate.
- Errors in grammar, spelling, and punctuation do not interfere with understanding.

3 Uneven Response

- Takes a clear position and provides uneven support; may lack development in parts or be repetitive OR response is no more than a well-written beginning.
- Is organized in parts of the response; other parts are disjointed and/or lack transitions.
- Exhibits uneven control over sentence boundaries and sentence structure; may exhibit some inaccurate word choices.
- Errors in grammar, spelling, and punctuation sometimes interfere with understanding.

2 Insufficient Response (may be characterized by one or more of the following)

- Takes a position but response is very underdeveloped.
- Is disorganized or unfocused in much of the response OR clear but very brief.
- Minimal control over sentence boundaries and sentence structure; word choice may often be inaccurate.
- Errors in grammar, spelling, and punctuation interfere with understanding in much of the response.

1 Unsatisfactory Response

- Attempts to take a position (addresses topic) but, position is very unclear OR takes a position, but provides minimal or no support; may only paraphrase the task.
- Exhibits little or no apparent organization.
- Minimal or no control over sentence boundaries and sentence structure; word choice may be inaccurate in much or all of the response.
- Errors in grammar, spelling and punctuation severely impede understanding across the response.

Appendix 11

Primary Traits: Scoring guide for Toulmin's Criteria for Argumentation

Claim

6 Clear, complete generalizations related to the proposition are stated.

4 The reader must infer the writer's intent from information given by the writer, but enough information is given so that generalizations are related to the proposition or topic.

2 The writer's assertions are unclear and lack specificity although the generalizations are related to the proposition or topic.

0 There is no claim related to the proposition or topic.

Data

6 The writer gives supporting data that is complete, accurate, and related to the proposition.

4 The writer gives supporting data that is related to the proposition, but not complete. The reader must infer much from the data.

2 The writer offers weak, inaccurate, or incomplete data.

0 The writer either offers no data or offers data having no relevance to the claim.

Opposition

6 There is a systematic identification of the opposition.

4 There is an identification of opposing arguments, but these arguments are not specific.

2 There is some offering of opposition, but it is not specific.

0 There is no recognition of opposition offered.

Refutation

6 There is systematic identification of the opposition and the opposing arguments.

4 Counterarguments are present, but the reader must provide the link between the counterarguments and the specific opposition.

2 There is a vague reference to implied opposition or a weak denial of opposition claims.

0 There is no offering of response to counter arguments.

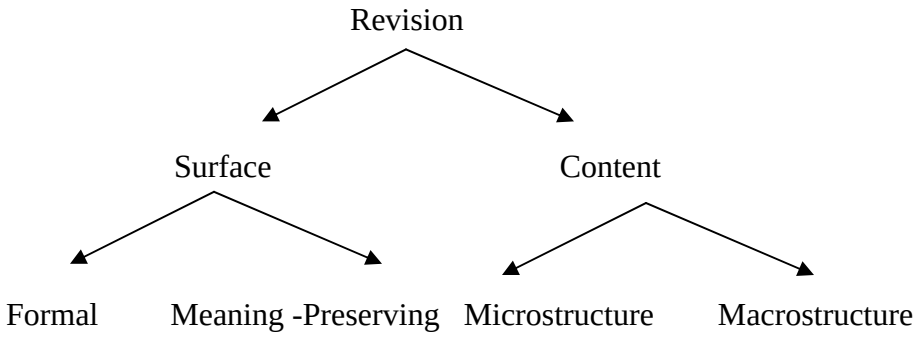
Qualifier

1 Qualifier explicitly stated

0 No qualifier explicitly stated

Appendix 12

Revised Diagram of Faigley and Witte (1981)



Spelling	Addition	Addition	Addition
Tense	Deletion	Deletion	Deletion
Number	Substitute	Substitute	Substitute
Modality	Permutation	Permutation	Permutation
Abbreviation	Distribution	Distribution	Distribution
Punctuation	Consolidation	Consolidation	Consolidation

References

Academic Senate. (2002). Academic literacy: A statement of competencies expected of students entering California's public colleges and universities. Retrieved May 7, 2003, from http://www.academicsenate.cc.ca.us/Publications/Papers/AcademicLiteracy/main.htm

Alba, J. W., & Hasher, L. (1983). Is memory schematic? *Psychological Bulletin, 93*, 203-231.

Allal, L., Chanquoy, L., & Largy, P. (Eds.). (2004). *Revision: Cognitive and instructional processes*. Boston: Kluwer Academic Publishers.

Ampadu, L. M. (1999). *The effects of instruction in the imitation of repetition on college students' persuasive writing style.* Unpublished doctoral dissertation, University of Maryland, College Park.

Anderson, D. (2003). Web-based peer review: An opportunity for conversation. In J. Galin, C. P. Hariland & J. P. Johnson (Eds.), *Teaching/Writing in the late age of print.* (pp. 185-198). Cresskill, NJ: Hampton Press Inc.

Anderson, R. C., & Pearson, P. D. (1984). A schema-theoretic view of basic processes in reading comprehension. In P. D. Pearson (Ed.), *Handbook of reading research* (pp. 255-291). New York: Longman.

Atwell, N. (1991). *Side by side: Essays on teaching to learn*. Portsmouth, NH: Heinemann.

Bachman, L. F. (1990). *Fundamental considerations in language testing*. Oxford: Oxford University Press.

Bakhtin, M. M. (1981). The dialogic imagination: Four essays by M. M. Bakhtin (C. E. M. Holquist, Trans.). In M. Holquist (Ed.), *The dialogueic*. Austin: University of Texas.

Bakhtin, M. M. (1986). *Speech genres and other late essays*. Austin: University of Texas Press.

Bakhtin, M. M., & Volosinov, V. N. (1973). *Maxism and the philosophy of language* (L. M. I. R. Titunik, Trans.). Cambridge, MA: Harvard University Press.

Bakunas, B. V. (1994). *The role of text structure knowledge in the writing of expert and novice writers.* Unpublished doctoral dissertation, University of Illinois, Chicago.

Bakunas, B. V. (1996). Prompting idea production by novice writers through the use of discourse-related prompts. *Applied Psycholinguistics, 17*, 385-400.

Barile, A. L. (1998). *Computer-mediated communication in collaborative writing.* Unpublished doctoral dissertation, The University of Oklahoma.

Barile, A. L., & Durso, F. T. (2002). Computer-mediated communication in collaborative writing. *Computers in Human behavior, 18,* 173-190.

Bartlett, E. J. (1981). *Learning to write: some cognitive and linguistic components.* Washington, DC: Center for Applied Linguistics.

Beal, C. R. (1996). The role of comprehension monitoring in children's revision. *Educational Psychology Review, 3,* 219-238.

Bereiter, C., & Scardamalia, M. (1987). *The psychology of written composition*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Berg, E. C. (1999). The effects of trained peer response on ESL students' revision types and writing quality. *Journal of Second Language Writing, 8,* 215-241.

Berninger, V., Whitaker, D., Feng, Y., Swanson, H. L., & Abbott, R. D. (1996). Assessment of planning, translating, and revising in junior high writers. *Journal of School Psychology, 34,* 23-52.

Bizzell, P. (1988). Arguing about literacy. *College English, 50*, 141-153.

Braaksma, M. A. H., van den Bergh, H., & Couzijn, M. (2001). Effective learning activities in observation tasks when learning to write and read argumentative texts. *European Journal of Psychology of Education, XVI*, 33-48.

Braddock, R., Lloyd-Jones, R., & Schoer, L. (1963). *Research in written composition*. Champaign: NCTE.

Breetvelt, I., van den Berg, H., & Rijlaarsdam, G. (1994). Relations between writing processes and text quality: When and how? *Cognition and Instruction, 12*, 103-123.

Breuch, L.-A. J. (2004). *Virtual peer review: Teaching and learning about writing in online environments*. New York: State University of New York.

Bruffee, K. A. (1984). Conversation of mankind. *College English, 46*, 635-652.

Bruffee, K. A. (1986). Social construction, language, and the authority of knowledge: A bibliographic essay. *College English, 48*, 773-790.

Bruffee, K. A. (1993). *Collaborative learning: Higher education, interdependence, and the authority of knowledge*. Baltimore: The Johns Hopkins University Press.

Bruffee, K. A. (1996). Academic castes, academic authority, and the educational centrality of writing. *College Composition and Communication, 47*, 414-416.

Burkhalter, N. (1995). A Vygotsky-based curriculum for teaching persuasive writing in the elementary grades. *Language Arts, 72*, 192-199.

Butterfield, E. C., Hacker, D. J., & Albertson, L. R. (1996). Envrionmental, cognitive, and metacognitive influences on text reision: Assessing the evidence. *Educational Psychology Review, 8*, 239-297.

Butterfield, E. C., Hacker, D. J., & Plumb, C. (1994). Topic knowledge, linguistic knowledge, and revision processes as determinants of text revision. In J. S. Carlson & E. C. Butterfield (Eds.), *Advances in cognition and educational practice: Vol. 2: Children's writing: Toward a process theory of the development of skilled writing* (pp. 83-143). Greenwich, CT: JAI Press.

Calkins, L. M. (1994). *The art of teaching writing*. Portsmouth, NH: Heinemann.

Cameron, C. A., Edmunds, G., Wigmore, B., Hunt, A. K., & Linton, M. J. (1997). Children's revision of textual flaws. *International Journal of Behavioral Development, 20*, 667-680.

Campbell, L. (1994). Argument. In A. C. Puves, L. Papa & S. Jordan (Eds.), *Encyclopedia of English studies and language arts : A project of the National Council of Teachers of English* (Vol. 1, pp. 63-67). New York: Scholastic.

Carvalho, J. B. (2002). Developing audience awareness in writing. *Journal of Research in Reading, 25*, 271-282.

Chanquoy, L. (2001). How to make it easier for children to revise their writing: A study of text revision from 3rd to 5th grades. *British Journal of Educational Psychology, 71*, 15-41.

Chapman, O. L., & Fiore, M. A. (2000). Calibrated Peer Review. *Journal of Interactive Instruction Development, 12*(3), 11-15.

Cho, K. (2004). *When multi-peers give better advice than an expert: The type and impact of feedback given by students and an expert on student writing.* Unpublished doctoral dissertation, University Of Pittsburgh.

Clauss, P. (2002). Stephen Toulmin's The Uses of Argument: A Contextual Re-Reading. 2002, from http://trevor.butler.edu/~dissertation/contents.html

Coirier, P., & Golder, C. (1993). Writing argumentative text: A developmental study of the acquisition of supporting structures. *European Journal of Psychology of Education, VIII*, 169-181.

Connor, U. (1990). Linguistic/Rhetorical measures for international persuasive student writing. *Research in the Teaching of English, 24*, 68-87.

Connor, U., & Asenavage, K. (1994). Peer response groups in ESL writing classes: How much impact on revision. *Journal of Second Language Writing, 3*, 257-276.

Crammond, J. (1998). The uses and complexity of argument structures in expert and student persuasive writing. *Written Communication, 15*, 230-268.

Crank, V. (2002). Asynchronous electronic peer response in a hybrid basic writing classroom. *Teaching English in the Two-Year College;, 30*(2), 145-155.

Crowhurst, M. (1991). Interrelationships between reading and writing persuasive discourse. *Research in the Teaching of English, 25*, 314-338.

Crusius, T. W., & Channell, C. E. (2002). *The aims of argument: A test and reader* (4th ed.). Boston: McGraw Hill.

DiGiovanni, E., & Nagawami, G. (2001). Online peer review: an alternative to face-to-face? *ELT Journal, 55*(3), 263-272.

Droge, E. F., Jr. (1991). *How college students revise in response to written peer review exclusive of oral components.* Unpublished doctoral dissertation, Harvard University.

Elbow, P. (1973). *Writing without teachers.* New York: Oxford University Press.

Elbow, P. (1981). *Writing with power: Techniques for mastering the writing process.* New York: Oxford University Press.

Emig, J. (1971). *The composing processes of twelfth graders (Research monograph no. 13).* Urbana, Il: National Council of Teachers of English.

Fahnestock, J. (1991). Teaching argumentation in the junior-level course. In K. H. Adams & J. L. Adams (Eds.), *Teaching advanced composition: Why and how* (pp. 179-193). Portsmouth, NH: Boynton.

Faigley, L., & Setzer, J. (2003). *Good reasons: Designing and writing effective arguments* (2nd ed.). New York: Longman.

Fairbanks, A. H. (1993). The pedagogical failure of Toulmin's logic. *The Writing Instructor, 12*, 103-114.

Felton, M. K., & Herko, S. (2004). From dialogue to two-sided argument: Scaffolding adolescents' persuasive writing. *Journal of Adolescent & Adult Literacy, 47*(8), 672-683.

Ferretti, R. P., MacArthur, C. A., & Dowdy, N. S. (2000). The effects of an elaborated goal on the persuasive writing of students with learning disabilities and their normally achieving peers. *Journal of Educational Psychology, 92*, 694-702.

Fitzgerald, J. (1987). Research on revision in writing. *Review of Education Research, 57*, 481-506.

Fitzgerald, J. (1992). *Towards knowledge in writing: Illustrations from revision studies*. New York: Springer-Verlag Publishing.

Fitzgerald, J. (1994). Revision. In A. C. Puves, L. Papa & S. Jordan (Eds.), *Encyclopedia of English studies and language arts: A project of the National Council of Teachers of English* (Vol. 2, pp. 1045-1047). New York: Scholastic.

Fitzgerald, J., & Markham, L. R. (1987). Teaching children about revision in writing. *Cognition and Instruction, 4*, 3-24.

Flower, L. (1979). Writer-based prose: A cognitive basis for problems in writing. *College English, 41*, 19-37.

Flower, L. (1989). Cognition, context, and theory building. *College Composition and Communication, 40*, 282-311.

Flower, L. (1996a). Negotiating the meaning of difference. *Written Communication, 13*, 44-92.

Flower, L. (1996b). Literate action. In L. Z. Bloom, D. A. Daiker & E. M. White (Eds.), *Composition in the twenty-first century: Crisis and change* (pp. 249-260). Carbondale: Southern Illinois University Press.

Flower, L., & Hayes, J. (1981). A cognitive process theory of writing. *College Composition and Communication, 32*, 365-387.

Flower, L., Hayes, J., Carey, L., Schriver, K., & Stratman, J. (1986). Detection, diagnosis, and the strategies of revision. *College Composition and Communication, 37*, 16-55.

Flower, L., Wallace, D., Norris, L., & Burnett, R. (Eds.). (1994). *Making thinking visible: Writing, collaborative planning and classroom inquiry*. Urbana, Ill: National Council of Teachers of English.

Freedman, S. W. (1994). *Exchanging writing, exchanging cultures: Lessons in school reform from the United States and Great Britain*. Urbana, IL: National Council of Teachers of English.

Freshman Writing Program. (2004-2005). *English 101: Introduction to academic writing*. Boston: Pearson Custom Publishing.

Fulkerson, R. (1996). The Toulmin model of argument and the teaching of composition. In B. Emmel, P. Resch & T. D. (Eds.), *Argument revisited: Argument redefined*. Thousand Oaks, CA: Sage.

Gage, J. T. (2001). *The shape of reason: argumentative writing in college* (3rd ed.). Boston: Allyn and Bacon.

Gehringer, E. F. (2000). *Strategies and mechanisms for electronic peer review.* Paper presented at the 30th ASEE/IEEE Frontiers in Education Conference, Kansas City, MO.

Gelat, M. (2003). Taking others' perspectives in a peer interactional setting while preparing for a written argument. *Language and Education, 17*, 332-354.

Gere, A. (1987). *Writing groups: History, theory, and implications*. Carbondale, IL: Southern Illinois University Press.

Gere, A., & Stevens, R. (1985). The language of writing groups: How oral response shapes revision. In S. W. Freedman (Ed.), *The acquisition of written langauge: Response and revision* (pp. 85-105). Norwood, NJ: Ablex.

Gleason, B. (2001). Teaching at the crossroads: Choices and challenges in college composition. *The Writing Instructor* Retrieved Dec. 16, 2004, from http://www.writinginstructor.com/reflections/gleason.html

Gleason, M. M. (1999). The role of evidence in argumentative writing. *Reading & Writing Quarterly, 14*, 81-106.

Glenn, C., Goldthwaite, M. A., & Connors, R. (2003). *The St. Martin's guide to teaching writing* (5th ed.). Boston: Bedford/St. Martin's.

Goldberg, G. L., Roswell, B. S., & Michaels, H. (1995/1996). Can assessment mirror instruction? A look at peer response and revision in a large-scale writing test. *Educational Assessment, 3*, 287-314.

Golder, C., & Coirier, P. (1994). Argumentative text writing: Developmental trends. *Discourse Processes, 18*, 187-210.

Goldstein, L. M. (2005). *Teacher written commentary in second language writing classroom*. Ann Arbor, Michigan: The University of Michigan Press.

Grande, M. (2003). *The effectiveness of the 6 traits of writing analytic scoring guide for economically disadvantaged fourth grade students in an urban setting.* Unpublished doctoral dissertation, State University of New York, Buffalo.

Graves, D. H. (1973). *Children's writing: Research directions on hypotheses based upon an examination of the writing process of seven-year-old children.* Unpublished Unpublished doctoral dissertation, State University of New York, Buffalo.

Graves, D. H. (1975). An examination of the writing processes of seven year old children. *Research in the Teaching of English, 9*, 227-241.

Graves, D. H. (1983). *Writing: Teachers and children at work*. Exeter, NH: Heinemann.

Hacker, D. J., Plumb, C., Butterfield, E. C., Quathamer, D., & Heineken, E. (1994). Text revision: Detection and correction of errors. *Journal of Educational Psychology, 86*, 65-78.

Hairston, M. (1982). The winds of change: Thomas Kuhn and the revolution in the teaching of writing. *College Composition and Communication, 33*, 76-88.

Hanley, G. L. (2004). Multimedia Educational Resource for Learning and Online Teaching (MERLOT). In A. Kovalchick & K. Dawson (Eds.), *Education and Technology: An encyclopedia* (Vol. 1). Santa Barbara, CA: ABC Clio.

Hatch, E., & Lazaraton, A. (1991). *The research manual: Design and statistics for applied linguistics*. Boston: Heinle & Heinle Publishers.

Hayes, J., & Flower, L. (1980). Identifying the organization of writing processes. In L. W. Gregg & E. R. Steinberg (Eds.), *Cognitive processes in writing* (pp. 31-50). Hillsdale, NJ: Lawrence Erlbaum Associates.

Hayes, J., & Nash, J. G. (1996). On the nature of planning in writing. In C. M. Levy & S. Ransdell (Eds.), *The Science of writing: Theories, methods, individual differences and applications* (pp. 29-55). Mahwah, NJ: Lawrence Erlbaum.

Hayes, J. R. (1996). A new framework for understanding cognition and affect in writing. In C. M. Levy & S. Ransdell (Eds.), *The science of writing: Theories, methods, individual differences and applicaitons* (pp. 1-27). Hillsdale, NJ: Erlhaum.

Hayes, J. R. (2004). What triggers revision? In L. Allal, L. Chanquoy & P. Largy (Eds.), *Revision: Cognitive and instructional processes* (pp. 9-20). Boston: Kluwer Academic Publishers.

Hewett, B. L. (2000). Characteristics of interactive oral and computer-mediated peer group talk and its influence on revision. *Computers and Composition, 17*, 265-288.

Hewett, B. L., & Ehmann, C. (2004). *Preparing educators for online writing instruction: Principles and processes*. Urbana, Illinois: National Council of Teachers of English.

Hillocks, G. (1986). *Research on written composition: New directions for teaching*. Urbana, IL: ERIC Clearinghouse on Reading and Communication Skills.

Hoel, T. L. (1997). Voices from the classroom. *Teaching and Teacher Education, 13*, 5-16.

Hughes, C. E. (2000). *A comparative study of teaching critical thinking through persuasive writing to average, gifted and students with learning disabilities.* Unpublished doctoral dissertation, The College of William and Mary.

Inch, E. S., & Warnick, B. (2002). *Critical thinking and communication: The use of reason in argument* (4th ed.). Boston: Allyn and Bacon.

Kardash, C. A. M., & Scholes, R. J. (1996). Effects of pre-existing beliefs and repeated readings on belief change, comprehension, and recall of persuasive text. *Contemporary Educational Psychology, 20*, 201-221.

Kellogg, R. T. (1994). *The psychology of writing*. New York: Oxford University Press.

Kemp, F. (1998). Computer-mediated communication: Making nets work for writing instruction. In J. R. Galin & J. Latchaw (Eds.), *The dialogic classroom: Teachers integrating computer technology, pedagogy, and research* (pp. 133-150). Urbana, IL: NCTE.

Kinneavy, J. (1994). Persuasive writing. In A. C. Puves, L. Papa & S. Jordan (Eds.), *Encyclopedia of English studies and language arts : A project of the National Council of Teachers of English* (Vol. 2, pp. 912-914). New York: Scholastic.

Knudson, R. E. (1991). Effects of instructional strategies, grade, and sex on students' persuasive writing. *The Journal of Experimental Education, 59*, 141-152.

Knudson, R. E. (1992). The development of written argumentation: An analysis and comparison of argumentative writing at four grade levels. *Child Study Journal, 22*, 167-184.

Knudson, R. E. (1994). An analysis of persuasive discourse: Learning how to take a stand. *Discourse Processes, 18*, 211-230.

Lamm, R. L. (1994). *Primary trait scales, revision, and models: The effects of eight-week foci of instruction on the quality of argumentative essays written by first-year college composition students.* Unpublished doctoral dissertation, University of Oklahoma.

Lin, S.-Y. (2003). *The effects of computer-based concept mapping as a prewriting strategy on the persuasive writing of eighth-graders at a middle school in southeastern Idaho.* Unpublished doctoral dissertation, Idaho State University.

Lindemann, E. (2001). *Rhetoric for writing teachers* (4th ed.). New York: Oxford University Press.

Liu, J., & Sadler, R. W. (2003). The Effect and Affect of Peer Review in Electronic versus Traditional Modes on L2 Writing. *Journal of English for Academic Purposes, 2*(3), 193-227.

Lockhart, C., & Ng, P. (1993). How Useful Is Peer Response? *Perspectives, 5*(1), 17.

Long, E., Flower, L., Fleming, D., & Wojahn, P. (1995). Negotiating competing voices to construct claims and evidence: Urban American teenagers rivaling anti-drug literature. In S. Mitchell & P. Costello (Eds.), *Competing and consensual voices* (pp. 172-183). London: Multilingual Matters.

Lunsford, K. J. (2002). Contextualizing Toulmin's model in the writing classroom: A case study. *Written Communication, 19*, 109-174.

Matsumura, L. C., Patthey-Chavez, G. G., Valdés, R., & Garnier, H. (2002). Teacher feedback, writing assignment quality, and third-grad students' revision in lower- and higher-achieving urban schools. *The Elementary School Journal, 103*, 3-25.

McCann, T. M. (1989). Student argumentative writing knowledge and ability at three grade levels. *Research in the Teaching of English, 23*, 62-76.

McCann, T. M. (1995). *Argumentative writing at three grade levels: The effects of age, prior knowledge, available information, and instruction.* Unpublished doctoral dissertation, The University of Chicago, Chicago.

McCutchen, D. (1996). A capacity theory of writing: Working memory in composition. *Educational Psychology Review, 8*, 299-325.

McCutchen, D. (2000). Special issue: Writing development: The role of cognitive, motivational, and social/contextual factors. *Educational Psychologist, 35*, 13-23.

McCutchen, D., Francis, M., & Kerr, S. (1997). Revising for meaning: Effects of knowledge and strategy. *Journal of Educational Psychology, 89*, 667-676.

Measures, E., Quell, C., & Wells, G. (1997). A sociocultural perspective on classroom discourse. In B. Davies & D. Corson (Eds.), *Encyclopedia of Language and Education* (Vol. 3, pp. 21-29). Dordrecht, the Netherlands: Kluwer Academic Publishers.

Mendonça, C. O., & Johnson, K. E. (1994). Peer review negotiations: Revision activities in ESL writing instruction. *TESOL Quarterly, 28*, 745-769.

Miller, K. L. (2002). *The effect of epistemological beliefs on the revision process.* Unpublished doctoral dissertation, University of Missouri, Columbia.

Mitchell, S. (1997). Teaching, learning and assessing argument. In L. van Lier & D. Corson (Eds.), *Encyclopedia of language and education: Knowledge about language* (Vol. 6th, pp. 205-213). Dordrecht, the Netherlands: Kluwer Academic Publishers.

Moll, L. C. (2001). Through the mediation of others: Vygotskian research on teaching. In V. Richardson (Ed.), *Handbook of Research on Teaching* (pp. 111-129). Washington, DC: American Educational Research Association.

Monahan, M. E. (2001). *Raising voices: How sixth graders construct authority and knowledge in argumentative essays.* Unpublished doctoral dissertation, Rutgers the State University of New Jersey-New Brunswick, New Brunswick.

Morson, G. S. (Ed.). (1986). *Bakhtin, essays and dialogues on his work*. Chicago: University of Chicago Press.

Multimedia Educational Resource for Learning and Online Teaching. (2001). Peer review of Calibrated Peer Review. Retrieved April, 30, 2004, from http://www.merlot.org/artifact/PeerReviewDetail.po?rOid=101000000000013 3607

Murray, D. M. (1978). Internal revision: A process of discovery. In C. R. Cooper & L. Odell (Eds.), *Research on composing: Points of departure* (pp. 85-103). Urbana, IL: National Council of Teachers of English.

Murray, D. M. (1984). Teach writing as process not product. In R. L. Graves (Ed.), *Rhetoric and composition:A sourcebook for teachers and writers* (pp. 89-92). Upper Montclair, NJ: Boynton/Cook.

Nystrand, M., & Graff, N. (2001). Report in Argument's clothing: An ecological perspective on writing instruction in a seventh-grade classroom. *The Elementary School Journal, 101*, 479-493.

Nystrand, M., & Graff, N. (2001). Report in Argument's clothing: An ecological perspective on writing instruction in a seventh-grade classroom. *The Elementary School Journal, 101*, 479-493.

Ogede, O. (Ed.). (2002). *Teacher commentary on student papers: Conventions, beliefs, and practices.* Westport, Connecticut: Bergin & Garvey.

Peck, W. C., Flower, L., & Higgins, L. (1995). Community literacy. *College Composition and Communication;, 46,* 199-222.

Pelaez, N. J. (2002). Problem-based writing with peer review improves academic performance in physiology. *Advances in Physiology Education, 26*, 174-184.

Peled, E. R. (2003). *Filling in the blanks: Urban high school students and the persuasive essay task.* Unpublished doctoral dissertation, Harvard University.

Perelman, C. (1982). *The realm of rhetoric* (W. Kluback, Trans.). Notre Dame, IN: University of Notre Dame Press.

Perelman, C., & Olbrechts-Tyteca, L. (1971). *The new rhetoric: A treatise on argumentation* (J. Wilkinson & P. Weaver, Trans.). Notre Dame, IN: University of Notre Dame Press (Originally published as La Nouvelle Rhetorique: Traité de l'Argumentation. Presses Universitaires de France, 1958).

Perl, S. (1979). The composing process of unskilled college writers. *Research in the Teaching of English, 13*, 317-336.

Peterson, S. (2003). Peer response and students' revisions of their narrative writing. *L1-Educational Studies in Language and Literature, 3,* 239-272.

Peterson, S. S. (2006). Sixth-grade teachers' written comments on student writing. *Written Communication, 23*, 36-62.

Piaget, J. (1955). *The language and thought of the child* (J. Gabain, Trans.). Cleveland, OH: Meridian-World.

Pianko, S. (1979). A description of the composing processes of college freshmen writers. *Research in the Teaching of English, 13,* 5-22.

Plumb, C., Butterfield, E. C., & Hacker, D. J. (1994). Error correction in text: Testing the processing-deficit and knowledge-devidient hypotheses. *Reading and Writing, 6*, 347-360.

Poulsen, B. G. (1997). *The relationship between Piagetian developmental levels and the persuasive writing ability of third, fourth, and fifth graders.* Unpublished doctoral dissertation, University of North Texas.

Rafoth, B. A., & Rubin, D. L. (1984). The impact of content and mechanics on judements of writing quality. *Written Communication, 1*, 446-458.

Ramage, J. D., & Bean, J. C. (1997). *Writing arguments: A rhetoric with readings, brief edition* (2nd ed.). Boston: Allyn & Bacon.

Read, B., & Francis, B. (2001). 'Playing Safe': undergraduate essay writing and the presentation of the student 'voice'. *British Journal of Sociology of Education, 22*, 387-399.

Redd-Boyd, T. M., & Slater, W. H. (1989). The effects of audience specification on undergraduates' attitudes, strategies, and writing. *Research in the Teaching of English, 23*, 77-108.

Rottenberg, A. T. (2003). *Elements of argument: A text and reader* (7th ed.). Boston: Bedford Books of St. Martin's Press.

Rumelhart, D. E. (1980). Schemata: The building blocks of cognition. In R. J. Spiro, B. C. Bruce & W. F. Brewer (Eds.), *Theoretical issues in reading comprehension: Perspectives from cognitive psychology, linguistics, artificial intelligence, and education* (pp. 33-58). Hillsdale, NJ: Lawrence Erlbaum.

Sailor, S. H. (1996). *The effect of peer response groups on writing apprehension, writing achievement, and revision decisions of adult community college composition students.* Unpublished doctoral dissertation, University of Florida.

Santos, C. M. M., & Santos, S. L. (1999). Good argument, content and contextual dimensions. In J. Andriessen & P. Coirier (Eds.), *Foundations of argumentative text processing* (pp. 75-95). Amsterdam: Amsterdam Univerity Press.

Scardamalia, M., & Bereiter, C. (1983). The development of evaluative, diagnostic and remedial capabilities in children's composing. In M. Martlew (Ed.), *The psychology of written language: Developmental and educational perspectives* (pp. 67-95). New York: Wiley.

Scardamalia, M., & Bereiter, C. (1991). Literate expertise. In A. K. Anderson & J. Smith (Eds.), *Toward a general theory of expertise: Prospects and limits* (pp. 172-194). Cambridge: Cambridge University Press.

Schiver, K. (1992). Teaching writers to anticipate readers' needs: A classroom-evaluated pedagogy. *Written Communication, 9*, 179-208.

Schroeder, C. (1997). Knowledge and Power, Logic and Rhetoric, and Other Reflections in the Toulmin Mirror: A Critical Consideration of Stephen Toulmin's Contributions to Composition. *Journal of Advanced Composition, 17*, 95-107.

Shaw, V. N. (2002). Peer Review as a Motivating Device in the Training of Writing Skills for College Students. *Journal of College Reading and Learning, 33*(1), 68-76.

Singh-Gupta, V., & Troutt-Ervin, E. D. (1996). Preparing students for teamwork through collaborative writing and peer review techniques. *Teaching English in the Two-Year College, 23*, 127-136.

Slater, W. H. (1998). The effects of eleventh-graders' opinions on their interpretation of conflicting arguments. *National Reading Conference Yearbook, 47*, 157-166.

Smith, K. J. (1995). *The developmental influences of content knowledge and linguistic knowledge on experts' and novices' construction of expository text.* Unpublished doctoral dissertation, Columbia University, New York.

Sommers, N. (1980). Revision strategies of student writers and experienced adult writers. *College Composition and Communication, 31*, 378-388.

Spencer, C. A. (2002). *Improving the skills of remedial-writing students with strategies for revising.* Unpublished doctoral dissertation, The Pennsylvania State University.

Sperling, M., & Freedman, S. W. (2001). Research on writing. In V. Richardson (Ed.), *Handbook of Research on Teaching* (pp. 370-389). Washington, DC: American Educational Research Association.

Spurgin, S. D. W. (1993). *The power to persuade: A rhetoric and reader for argumentative writing*. Englewood Cliffs, NJ: Prentice Hall Inc.

Standish, L. G. (2005). *The effects of collaborative strategic reading and direct instruction in persuasion on sixth-grade students' persuasive writing and attitudes.* Unpublished doctoral dissertation, University of Maryland, College Park.

Staub, R. (1996). The concept of control in teacher response: Defining the varieties of "directive" and "facilitative" commentary. *College Composition and Communication, 47*, 223-251.

Staub, R. (2000). The student, the text, and the classroom context: A case study of teacher response. *Assessing Writing, 7*, 23-55.

Stay, B. L. (1995). *A guide to Argumentative Writing*. San Diego, CA: Greenhaven Press.

Stern, L. A., & Solomon, A. (2006). Effective faculty feedback: The road less traveled. *Assessing Writing*.

Stiko, B. (1994). Composing processes. In A. C. Puves, L. Papa & S. Jordan (Eds.), *Encyclopedia of English studies and language arts: A project of the National Council of Teachers of English* (Vol. 1, pp. 229-233). New York: Scholastic.

Sullivan, D., Brown, C. E., & Nielson, N. L. (1998). Computer-mediated peer review of student papers. *Journal of Education for Business, 74*(2), 117-121.

Tannacito, T. (2001). Teaching professional writing online with electronic peer response. *Kairos, 6*(2). Retrieve May 7, 2003, from http://english.ttu.edu/kairos/6.2/coverweb/de/tannacito/Index.htm

Thadani, V. (2000). *What makes writing well-written: A comparison of strong and weak writers' knowledge about text.* Unpublished doctoral dissertation, University of California, Los Angeles.

Toulmin, S. (1958). *The use of argument*. New York: Cambridge University Press.

Toulmin, S., Rieke, R., & Janik, A. (1984). *An introduction to reasoning*. New York: Macmillan.

Tuzi, F. (2004). The impact of e-feedback on the revisions of L2 writers in an academic writing course. *Computers and Composition, 21*, 217-235.

van den Berg, I., Admiraal, W., & Pilot, A. (2006). Peer assessment in university teaching: Evaluating seven course designs. *Assessment & Evaluation in Higher Education, 31,* 19-36.

van der Geest, T., & Remmers, T. (1994). The computer as means of communication for peer-review groups. *Computers and Composition, 11*(3), 237-250.

van Waes, L., & Schellens, P. J. (2003). Writing Profiles: The effect of the writing mode on pausing and revision patterns of experienced writers. *Journal of Pragmatics, 35*, 829-853.

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

Vygotsky, L. S. (1986). *Thought and language*. Cambridge, MA: MIT P.

Wallace, D., & Hayes, J. (1991). Redefining revision for freshmen. *Research in the Teaching of English, 25*, 54-66.

Wallace, D. L., Hayes, J. R., Hatch, J. A., Miller, W., & Silk, C. M. (1996). Better revision in eight minutes? Prompting first-year college writers to revise globally. *Journal of Educational Psychology, 88*, 682-688.

Wallace, S. P. (1992). *A study of argumentative/persuasive writing related to a model of critical thinking in grades nine and eleven (ninth-grade, eleventh-grade).* Unpublished doctoral dissertation, University of South Carolina.

Weiss, D. M., & Sachs, J. (1991). Persuasive strategies used by preschool children. *Discourse Processes, 14*, 55-72.

White, T., & Kirby, B. (2005). Tis Better to Give Than to Receive: An Undergraduate Peer Review Project. *Teaching of Psychology, 32*, 259-261.

Williams, J. D. (1998). *Preparing to teach writing: Research, theory, and practice* (2nd ed.). Mahawh, NJ: Lawrence Erlbaum Associates.

Witte, S. P. (1985). Revising, composing theory, and research design. In S. W. Freedman (Ed.), *The acquisition of written language: Response and revision* (pp. 250-284). Norwood, NJ: Ablex.

Wood, N. V. (2001). *Writing argumentative essays* (2nd ed.). Upper Saddle River: Prince Hall.

Yarrow, F., & Topping, K. J. (2001). Collaborative writing: The effects of metacognitive prompting and structured peer interaction. *British Journal of Educational Psychology, 71*, 261-282.

Yeh, S. S. (1998a). Empowering education: Teaching argumentative writing to cultural minority middle-school students. *Research in the Teaching of English, 33*, 49-83.

Yeh, S. S. (1998b). Validation of a scheme for assessing argumentative writing of middle school students. *Assessing Writing, 5*, 123-150.

Young, K. (2001). *Learning genre from examples: The effects of number of examples and scaffolding on student understanding and writing.* Unpublished doctural dissertation, University of Pittsburgh, Pittsburgh, PA.

Zhu, W. (1995). Effects of training for peer response on students' comments and interaction. *Written Communication, 12*(4), 492-528.