

EVALUATION CRITERIA IN ONLINE COURSES:
STUDENT AND INSTRUCTOR PERCEPTIONS

By

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To the Faculty of Washington State University:

The members of the Committee appointed to examine the thesis of
XYANTHE NICOLE NEIDER find it satisfactory and recommend that it be accepted.

Chair

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Abstract

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This study examines how instructors facilitate critical thinking in online courses through the use of evaluation criteria. Through conducting and analyzing interviews it was shown that the student participants in this study work toward what they view as the instructor's expectations. Instructors in online environments communicate their expectations through interaction in online discussions and feedback to the students. When instructor participation is consistent and meaningful, the students work at higher levels because they see the instructor as being engaged and therefore as having higher expectations. Merely communicating expectations through the use of a tool such as Washington State University's Critical Thinking Rubric does not translate as high expectations to the students. Furthermore, instructors who make use of the rubric need to be sure that they are integrating it into their assignments and modeling critical thinking themselves. If the rubric is not fully integrated, instructors may find themselves teaching to the rubric rather than the course content. This disjointed type of teaching encourages students to build subject matter knowledge in a silo without linking new knowledge to what they already know or what they are learning.

Table of Contents

ACKNOWLEDGMENT	III
ABSTRACT	V
DEDICATION	VIII
CHAPTER 1.....	1
INTRODUCTION	1
Summary of Issue	1
Critical Thinking	4
The Purpose of This Study	7
The Basic Mechanics of This Study	8
Summary of Findings	8
Overview of Thesis	9
CHAPTER 2.....	11
REVIEW OF LITERATURE	11
Undergraduate Learning	11
Cognitive Construction of Knowledge – First Steps to Critical Thinking	13
Feedback Loops – As an Element of Critical Thinking	15
Online Environments and Asynchronous Communication	17
Critical Thinking and Assessment	20
Assessing Student Learning in Online Courses	22
Literature Review Conclusions	24
CHAPTER 3.....	26
RESEARCH DESIGN	26
Introduction – Goal of the Study	26
History of Study	26
Design of Study	27
Sampling Methods and Selection of Participants	28
Procedures	29
Data Analysis	30
Interviews	32
Threaded Discussions	33
Establishing Trustworthiness	34
Limitations of the Study	34
Section Summary	36
CHAPTER 4.....	37
DATA ANALYSIS	37
Instructor Interviews – Introduction	37
Instructor Interviews – Summary of the Findings	39
Instructor as Facilitator	39
Guiding Student Thinking and Learning	40
Evaluation	43
Using the Critical Thinking Rubric	47
Instructor Interview Summary	47
Student Interviews – Introduction	49
Student Interviews – Summary of the Findings	51
Self Directed Learning and Instructor Availability	51
Syllabus and Evaluation Criteria	52
Using the Critical Thinking Rubric	54

Threaded Discussions – Introduction	55
Threaded Discussions – Summary of the Findings	57
The Math Course	57
Use of the CT Rubric	62
The English Course	63
Use of the CT Rubric	70
The SHS Course	71
Use of the CT Rubric	82
Section Summary	84
CHAPTER 5	86
DISCUSSION OF CONCLUSIONS AND IMPLICATIONS	86
Summary of this Study	86
Instructor Methods and Student Perceptions	89
Implementation of Evaluation Criteria	92
Suggestions for Implementation of Evaluation Criteria	95
Recommendations for Further Research	98
Conclusion	99
REFERENCES CITED	101
APPENDICES	103
APPENDIX I	104
Description of Site and Courses	104
Site Number 1 – 100 Level Math Course	104
Site Number 2 – 300 Level English Course	104
Site Number 3 – 400 Level Speech and Hearing Sciences Course	105
APPENDIX II	106
The Washington State University Critical Thinking Rubric	106

Dedication

This thesis is dedicated to my children; Clayton and Sydney, without their patience and occasional back burner status I would not have been able to concentrate on my studies at times. They have sacrificed the most in order for me to complete this process. My parents; Les and Linda Lockrem; and my grandma; Jeanette Loehr; who have both inspired and challenged me over the years, deserve a large portion of the credit for me arriving at this point in my studies and life as well. My dad is solely responsible for teaching me to think critically. To my ex-husband, who has learned the importance and value of listening and supporting me through my journey.

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Chapter 1

Introduction

Summary of Issue

Producing critical thinking skills in students has long been a goal of educators in higher education. Within the last decade this goal has received wide spread attention. Investigators and stakeholders have decried how new graduates lack the level of critical thinking skills that they believe are necessary for success. Simultaneously, online education has become increasingly more prevalent in higher education systems. As online education has gained popularity in the mainstream, so have criticisms and complications. Bringing critical thinking into the online classroom has interesting pedagogical implications and outgrowths. As technology has become more complex and more widely used, instructors have begun to incorporate assignments that utilize the threaded discussion (asynchronous communication) tools within the online learning environment. The focus of this study is how faculty build elements of critical analysis into their online course content and how students use and perceive evaluation criteria.

Many universities, according to the Association of Governing Boards of Universities and Colleges (AGB) (2003) and Boehner and McKeon (2003), have raised tuitions an average of 12 percent annually to offset inflation and decreasing state support while the citizenry has called for greater accountability and more concrete forms of assessment. Rury (2002) posits that “Few events in education have been as important as the so called ‘*standards movement*’ of the 1990s” in the United States, becoming known as “*systemic reform*” standards rose to the fore on state’s agendas “at the urging of national political figures” (p. 220). According to Rury the idea is to tie curricula “with systems of assessment” in order to reliably measure learning outcomes (p. 220). Hinett and Knight (1996) argue that assessment should both fill “management and accountability

purposes” as well as “provide students with feedback to help them improve their learning” (p. 10). Donald (2001) asserts the idea that assessment should be an informative process, not only for those initiating the assessment, but also for those who function within the system being assessed – whether that is administrators, faculty, or students.

Critical thinking has also risen to the fore of public consciousness as being an important outcome of higher education (Shavelson, 2003). Employers want to hire people who can think critically, applying what they already know to new situations. As one result of these criticisms organizations such as the National Science Foundation and the Department of Education began funding critical thinking research. Many constituencies have developed definitions and rubrics to guide faculty facilitation and subsequent assessment of critical thinking within their courses. Without a clear definition of this abstract idea, it was difficult for those teaching courses to clearly articulate their expectations of critical thinking. Furthermore, many scholars are conducting research in online learning environments and finding that the asynchronous nature of online learning allows for increased higher order thinking to be practiced by students. This study examines how instructors implement the critical thinking elements within their online courses and how students perceive and address those elements.

In order to facilitate the feel of a face-to-face classroom experience, instructors of online courses integrate interactive activities and community building. Because students are not meeting face-to-face with the instructor of the course, communications become more complex between fellow students, as well as, student and instructor. Many of the communications that happen in a traditional classroom are not available in an online environment due to body language and facial expressions. Angelo and Cross (1993) state that having evaluation criteria within a course is necessary for students to engage in learning activities with one another. If

criteria are not embedded within the assignment and if there are multiple versions of the criteria, the learning process may become convoluted, thereby confusing the feedback loop from student to student and student to professor. Additionally, if students and instructors are unclear about course and assignment goals, evaluation data becomes unreliable. In order to provide useful and reliable data to the university community and to the larger society of scholars on the subject, one needs first to deconstruct a course in order to determine if and how evaluation criteria and assessment tools are being used. Evaluation criteria will not make an impact on the learning process if they are not used in a productive way.

Assessment of students' academic performance becomes more daunting when a course is taught online because of the potentially vast amount of student interaction and writing that takes place within these types of environments. Often, exams give way to written work in online courses. This written work tends to be a basis for interaction between students where they can revise their writing, ideas, or paper through a threaded discussion with their peers. Not only does the amount of written work quickly become unmanageable but the revision process also becomes difficult to track.

Potential problems exist in assessing student work in online courses. The sheer volume of student created materials is one issue. A second issue, and the purpose of this study, is how instructors implement evaluation criteria to facilitate critical thinking. How students perceive evaluation criteria is a third issue that complicates assessment of student thinking abilities and learning. Lastly, the alignment of instructor methods and student perceptions in using evaluation criteria is ambiguous and further complicates assessing student performance.

Critical Thinking

In Washington State, the Higher Education Coordinating Board (HECB) mandated four learning outcomes that all students at institutions of higher education within the state are expected to model. The four learning outcomes are not unlike what is mandated in all states in these times of accountability. In Washington, the four include enhancing critical thinking, quantitative reasoning, information literacy, and writing. In keeping in line with the HECB's mandate to improve students' critical thinking skills as well as instructors' ability to assess them, Washington State University's Writing Programs, Center for Teaching, Learning, and Technology (CTLT), and the General Education Department collaborated on a grant to develop the Critical Thinking Rubric. The CTLT works with faculty to develop and post explicit evaluation criteria gleaned from the rubric for their online courses that focus on key aspects of critical thinking.

The Critical Thinking Rubric (See Appendix II) was developed at Washington State University (WSU) in 1996 through a collaborative process between the Writing Programs, the Center for Teaching, Learning, and Technology (CTLT), and the General Education Program. The development of this tool was funded by the Higher Education Coordinating Board of Washington State in 1999 in an effort to develop "a process for improving and a means for measuring students' higher order thinking skills during the course of their college careers" (<http://wsuctproject.wsu.edu/>). Further funding came from The United States Department of Education Fund for the Improvement of Postsecondary Education (FIPSE) Comprehensive Programs. The rubric identifies seven elements of critical thinking – or higher order thinking skills – on a scale from "scant" to "substantially developed." A person reviewing written work uses this rubric to evaluate where along this continuum, a written work lies for each of the seven

elements. Students addressing a written assignment can use the rubric to challenge ideas or push their thinking skills to higher levels by using the criteria to guide their writing, analyzing, and thinking processes. One way the rubric has been used is to make evaluation criteria clear to the student at the beginning of an assignment. It is also another method that instructors can use in order to make the assessment process less ambiguous for themselves – less subjective to some degree.

Current research and reports on the use of the Critical Thinking Rubric (CT Rubric) have shown a marked improvement in students' critical thinking skills when measured along the continuum of the seven dimensions of the rubric (<http://www.wsuctproject.wsu.edu>). So far, studies conducted at WSU have focused on student learning rather than how instructors use the tool to foster critical thinking skills in online courses. Studies have also tended to focus on comparing the development of critical thinking skills in courses with and without imbedded criteria. Comparing instructors' methods of implementation with students' use and perceptions has not been the focus of a research study. The purpose of this study is to examine how instructors' methods of facilitating critical thinking in online courses align with students' use and perceptions of evaluation criteria or the CT Rubric, as well as instructor perceptions of assessing student work utilizing these criteria.

Because an assignment need not incorporate the CT Rubric but will usually have some sort of evaluation criteria, it is essential to delineate between the two for the purposes of this study. Evaluation criteria may at times be very different and separate from critical thinking skills or attributes as defined by the CT Rubric. Some assignment evaluation criteria may be partially derived from the CT Rubric or some may be totally derived from the rubric, while other assignments may not use any elements at all. For the purposes of this study these two terms,

evaluation criteria or criteria are used synonymously and refer to the specific criteria on which a specific assignment will be evaluated. CT Rubric or rubric is used when referring to the elements of the Critical Thinking Rubric. In this study the main focus is evaluation criteria, however, some assignments may use several elements of the rubric as evaluation criteria on any particular assignment. For example, one assignment may cull elements of the rubric and another assignment may utilize every element. In either case this study focuses on the specific criteria elements of the assignment being studied.

By using the rubric in online courses students are able to begin framing their postings and responses based upon the guidelines defined by the rubric. For example, students should be able to summarize a problem by presenting their own perspectives and opinion. In doing so, students should be able to consider the context of the issue/problem and identify the key assumptions. They should also be able to assess other salient perspectives and supporting data/information pertaining to the problem being discussed in order to draw an informed conclusion and support their position with evidence.

One of the primary means of communication in online courses is threaded, or asynchronous, discussions. The asynchronous framework allows students to post their assignments, respond to comments by the professor and other students, and reframe or restate their positions in an evolving process. Although this refinement of ideas helps students think critically, the instructor is faced with a complex series of interactions to evaluate student work. If instructors do not have a clear set of criteria by which to gauge these online conversations, the task can be overwhelming. When one assignment produces more than 50 pages of text, some instructors resort to an evaluation of engagement rather than critical thinking, such as counting the number of times a student responds to others. What instructors look for within a threaded

discussion becomes essential to assessing students' critical thinking and analysis of course content. An instructor needs to be able to envision if students understand the material that has been deemed necessary to develop the ideas within the discipline. One method by which instructors could view the threaded discussion is by outlining their learning goals for the class, providing the evaluation criteria, and analyzing each post. However, before an instructor can do this, they must first be aware of the methods they employ within their course and how they will evaluate student work – whether the criteria are derived by the CT Rubric or another fashion.

The rubric is but one tool that can be used to ease the pains of student assessment both for the students as well as for the instructors by providing a framework for assessment. Students also benefit from having explicitly stated assessment criteria within their courses because they have a guideline on which to base their work and performance within a particular course. Furthermore, the rubric clearly illustrates a definition of critical thinking while allowing programs, departments, and faculty to adapt it to their specific needs and still maintain the core of it. By addressing issues of critical thinking in the beginning of college student careers, the university – as a whole – is addressing accountability mandates and goals.

The Purpose of This Study

This study examines how instructors facilitate critical thinking in online courses through the use of evaluation criteria as well as how they are implementing the Critical Thinking rubric and evaluation criteria in their courses. The purpose of conducting a qualitative study which builds on the work of scholars discussed in the literature review portion of this thesis is to explain how the Critical Thinking Rubric or evaluation criteria are currently being used by instructors in online courses. This study is guided by the following questions: How can the use of evaluation criteria or the Critical Thinking Rubric help instructors facilitate critical thinking in

online classes? How are instructors implementing or working with the Critical Thinking Rubric in online classes?

The Basic Mechanics of This Study

Content analysis was used on three compiled threaded discussions in three online courses at WSU in order to explore the dynamics of how students address the assignment criteria.

Interviews were conducted with instructors and students in these courses who volunteered to participate, in order to discover the perceptions of how criteria are used and the perceived value of having criteria in course assignments. The courses selected for this research were a 100 level Math course, a 300 level English course, and a 400 level Speech and Hearing Sciences course.

See Appendix I for a description of the courses.

Summary of Findings

Feedback by both students and instructors played an important role in student performance in these online classes. Through feedback students were able to grapple with difficult course concepts and both utilize and develop critical thinking skills. Often times either the evaluation criteria or the elements of the CT Rubric were addressed, however, they were not addressed consistently by students. There was a disconnect between the course content and the critical thinking elements that students were asked to address in their assignments. Overall, the students appreciated having clearly stated course and assignment criteria within their courses. Instructors seemed to struggle with how best to assess student performance, although they continued to explore and employ alternative assessment methods with their students.

Theoretically, student perceptions aligned with instructor methods. Analysis of the data, however, showed that the mark was missed in the practice of how evaluation criteria and the CT Rubric were implemented and how students actually addressed them. This indicates a lack of

congruency, as posited by Shavelson and Huang (2003), between course content and critical thinking development.

Overview of Thesis

The literature review in the next section of the study is focused on undergraduate education and online educational assessment. Research conducted in an online environment and where that has taken the field of education in terms of research and practice are presented. The next segment of the literature review focuses on ambiguities in assignment criteria and feedback. The conclusion of the literature review explores the research of educational scholars in assessing critical thinking and student performance in online courses.

Following the review of literature is an outline of the study discussing the purpose and history. The design of the study explains how the data were analyzed. After discussion about the study methodology and selection of participants the study limitations are brought to bear.

The chapter on data analysis presents the analyzed data in three sections. Instructor interviews comprise the first section of data analysis. In this section the discussion centers on instructor as facilitator, guiding student thinking, and evaluation of student performance. Student interviews follow the instructor interview section and consist of how students view their own learning and evaluation criteria. The concluding data analysis section discusses the threaded discussion data from each course, bringing the data analysis full circle in explaining the use of evaluation criteria.

The final chapter summarizes the study, the data, and the conclusions. In this section each research question is explored in light of the conclusions drawn and specific conclusions are presented through the lens of the research questions. This section closes with recommendations

for further research in the field and practical solutions for faculty in working with evaluation criteria.

Chapter 2

Review of Literature

The review of the literature begins with an analysis of how Chickering and Gamson's (1987) work influences scholars who research online teaching practices, threaded discussion issues, as well as the influence their *Seven Principles of Good Practice* had on the development of the WSU Critical Thinking Rubric (CT Rubric). A foundational discussion about the origins of modern assessment ties into how students make meaning of course material. Current research related to asynchronous discussion is also part of the literature review. Assessment of critical thinking and assessment in online courses bring the literature review to the concluding discussion and summary which identifies holes in current research. Closing the loop of how ambiguous directions in online course work can be clarified, to ease the feedback and assessment process provides the content of the literature review summary. In short, the literature review is organized as follows: Undergraduate Learning, Cognitive Construction of Knowledge – First Steps to Critical Thinking, Feedback Loops – As an Element of Critical Thinking, Online Environments and Asynchronous Communication, Critical Thinking and Assessment, and Assessing Student Learning in Online Courses.

Undergraduate Learning

Chickering may be most notable for his research and theories on student development in the early 1970s (Evans, Forney, & Guido-DiBrito, 1998). Based on his research on student development, Chickering (1987) began to develop a theory involving good academic practices. These practices have helped to guide faculty members and university strategic planning efforts to articulate what an effective undergraduate education should require. Some outgrowths of the practices brought forth by Chickering and Gamson have led teaching and learning efforts at a

national level to define learning outcomes, examine assessment criteria, and guide further research in how to effectively apply the principles. The seven principles that Chickering and Gamson developed follow:

1. Encourages Contact Between Students and Faculty

Frequent student-faculty contact in and out of classes is the most important factor in student motivation and involvement. Faculty concern helps students get through rough times and keep on working. Knowing a few faculty members well enhances students' intellectual commitment and encourages them to think about their own values and future plans. (Chickering & Gamson, 1987, p. 12)

2. Develops Reciprocity and Cooperation Among Students

Learning is enhanced when it is more like a team effort than a solo race. Good learning, like good work, is collaborative and social, not competitive and isolated. Working with others often increases involvement in learning. Sharing one's own ideas and responding to others' reactions sharpens thinking and deepens understanding. (Chickering & Gamson, 1987, p.12)

3. Encourages Active Learning

Learning is not a spectator sport. Students do not learn much just by sitting in classes listening to teachers, memorizing pre-packaged assignments, and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences and apply it to their daily lives. They must make what they learn part of themselves. (Chickering & Gamson, 1987, p. 12)

4. Gives Prompt Feedback

Knowing what you know and don't know focuses learning. Students need appropriate feedback on performance to benefit from courses. When getting started, students need help in assessing existing knowledge and competence. In classes, students need frequent opportunities to perform and receive suggestions for improvement. At various points during college, and at the end, students need chances to reflect on what they have learned, what they still need to know, and how to assess themselves. (Chickering & Gamson, 1987, p. 12)

5. Emphasizes Time on Task

Time plus energy equals learning. There is no substitute for time on task. Learning to use one's time well is critical for students and professionals alike. Students need help in learning effective time management. Allocating realistic amounts of time means effective learning for students and effective teaching for faculty. How an institution defines time expectations for students, faculty, administrators, and other professional staff can establish the basis of high performance for all. (Chickering & Gamson, 1987, p. 12)

6. Communicates High Expectations

Expect more and you will get more. High expectations are important for everyone -- for the poorly prepared, for those unwilling to exert themselves, and for the bright and well motivated. Expecting students to perform well becomes a self-fulfilling prophecy when teachers and institutions hold high expectations for themselves and make extra efforts. (Chickering & Gamson, 1987, p. 12)

7. Respects Diverse Talents and Ways of Learning

There are many roads to learning. People bring different talents and styles of learning to college. Brilliant students in the seminar room may be all thumbs in the lab or art studio. Students rich in hands-on experience may not do so well with theory. Students need the opportunity to show their talents and learn in ways that work for them. Then they can be pushed to learn in new ways that do not come so easily. (Chickering & Gamson, 1987, p. 12)

The best practices for undergraduate learning are the basis of and catalyst for the development of the Washington State University Critical Thinking Rubric. The rubric is a tool used to assist students in making cognitive links to real world situations and experiences which incorporate Chickering's (1987) 7th principle for good practice. Furthermore, the rubric provides a continuum from scant to substantially developed critical thinking skills which stems out of the 6th principle of communicating high expectations. Active learning is the 3rd principle which the entire rubric infers. Finally, the 2nd principle is encouraging cooperation among students which is embedded within most threaded discussion assignment guidelines and again in the rubric. By utilizing these principles instructors facilitate increased higher order thinking among their students and students begin to direct their own critical thinking development.

Cognitive Construction of Knowledge – First Steps to Critical Thinking

Bereiter and Scardamalia (1987) are interested in the construction of knowledge and how to better prepare students to actively construct knowledge for themselves in a meaningful way. The focus of their research has been primarily the K-12 educational system; however, their research has implications for any educational setting. Their ideas about collaborative learning,

feedback, and reflective practice create links between Chickering and Gamson's (1987) work as well as recent inquiries about online education.

Bereiter and Scardamalia (1987) have conducted a significant amount of research on cognition and written composition. Accordingly, they claim that there are varying levels of cognition involved in compositional writing. For the underdeveloped writer, primarily children, the ability to stay on the assigned topic is one indicator of cognitive development. Through the development process, some students move from "knowledge telling" to "knowledge transforming" (1987, p. 8). Knowledge transforming is accomplished, according to Bereiter and Scardamalia, through re-writing, re-stating, and re-working their manuscripts. The younger or less experienced a student is, the less he or she sees the value in the revision process, instead believing that the text book and teacher are the experts and they and their peers possess little or no expert knowledge. Through the process of re-stating what they have written, students are able to begin thinking about and reflecting on their work. Students can re-think ideas and concepts, which leads to higher order thinking. This can be seen as the beginning stages of thinking critically through the guidance of instructor feedback.

Interaction becomes a means for re-thinking ideas. Children, according to Bereiter and Scardamalia (1987), use the "conversational interchange" to re-work their ideas. Through conversation children are able to form ideas, change ideas, and think about new concepts (p. 89). This is much the same method as that used in online courses through the threaded discussion component. Threaded discussion allows students to state an idea; provide feedback – peer review – to other students within the course, and restate their ideas. The ability to reflect on concepts and ideas is a common component of critical thinking. This "external cuing" through

conversation with others, peers, teachers, family, is an essential tool to re-working written ideas (p. 100).

Reflection as an essential element of critical thinking, which Bereiter and Scardamalia (1987) argue, must exist if students are to move beyond knowledge telling into knowledge transforming. The ability to reflect on processes and concepts allows one to begin to evaluate his or her own thinking, providing evidence of the construction of metacognitive knowledge. Where knowledge telling is merely restating what has been told, knowledge transforming is processing and developing knowledge based upon critical thought.

Feedback Loops – As an Element of Critical Thinking

A large part of Bereiter and Scardamalia's (1987) research posits that reflection occurs because of the interaction between students and between student and teacher. Although similar to Bereiter and Scardamalia, Angelo and Cross (1993) continue with the collaborative learning pedagogy through a different perspective. One aspect of quality teaching and learning that they talk about is feedback loops. A feedback loop can exist between student and student or student and instructor and is an element of collaborative learning. This is one of the elements in continuous and formative student assessment as well as a catalyst for academic reflection.

Cross became a leading scholar on the study of innovative teaching and learning practices as a result of the stand that Derek Bok, former Harvard University President, embraced on what higher education's goals should be in educating students (Lazerson, Wagener, & Shumanis, 2000). Bok enlisted the help of Richard Light to study and assess the learning environment of higher education institutions. Bok and Light formed a committee which Patricia Cross served on for several years. To build upon this experience, Cross continued her efforts in assessment and learning innovations after the committee dissolved.

Cross (1993) posits that in order for assessment to have any substantive meaning, changes need to be implemented that are informed by previous assessment; future assessments and change should occur. She argues that a continual feedback loop should exist between students, faculty, and administrators which has led many educators to investigate and implement such a system of assessment on college campuses. The results of this feedback loop should lead to change, should be timely, and should inform future process. A feedback loop is based upon continual communication and adjustment based upon what is learned through communications with other players. Cross and Angelo (1993) state that assessment based upon good practice should “be more systematic, more flexible, and more effective” (p. 7). This is an effort to get faculty, reflecting about their informal assessments of students, to become aware of the stereotypes they apply to particular students, and make a more objective assessment based upon empirical evidence.

These feedback loops are an element of critical thinking because online learning environments provide a format in which students can engage with each other and the material on their time. Because asynchronous discussions happen at the convenience of the participants, students have time to digest the content specific information and post thoughtful responses to one another. Dynamics of these online interactions allow students to challenge the ideas of classmates and revise their own ideas through thoughtful reflection. Furthermore, instructors can guide the thinking of students by posing questions and providing feedback which challenges ideas and positions held by students. Through this process one can begin to work with the feedback provided by peers and instructors to further develop their ideas and critically analyze the course concepts.

Online Environments and Asynchronous Communication

Gunawardena (1997) and colleagues have also incorporated Chickering's (1987) seven principles in their research on the social construction of knowledge. Much of Gunawardena's work involves a grounded theory approach to analyzing threaded or asynchronous discussions for evidence of the participants' constructing of group knowledge. The social construction of knowledge is something that is evidence for the 2nd principle, Gunawardena et. al. make significant connections to work by such scholars as Bereiter and Scardamalia (1987), and Baxter-Magolda (2001). The epistemology extends beyond traditional views of learning, rather the premise is that people build foundational knowledge of concepts that have been learned and fostered through communications with others and through life experiences. Gunawardena's work is based in social cognitive theories. By sharing these communications and experiences in a conversation with others, group knowledge begins to emerge. In the absence of group communications the construction of knowledge does not occur. Knowledge is created through a process of sharing ideas, refuting opinions, and challenging others' views. Utilizing a feedback loop process, the participants are able to revise ideas and challenge the ideas of others. Through this dialogue people are able to shape and build further knowledge for themselves and the communities they participate in; hence, the social construction of knowledge.

Although Gunawardena, Lowe, and Anderson (1997) do not set out to discuss issues of critical thinking, their research on analysis of knowledge construction in an online format sets the stage for more research to be conducted in the field. Basic quantitative approaches do not effectively measure participants' learning or how much they are learning in asynchronous communications. Gunawardena et.al.'s research was conducted in an online forum involving professionals in the field of distance education or graduate students conducting research in an

online debate. Some of the obstacles in developing a theoretical framework had to do with the asynchronous nature of online discussions and the fact that people are able to pose multiple view points. Through this model alone, it is difficult for the researchers to analyze the discussion for evidence of knowledge construction of any form. However, their research brings to light how complex online interactions can be. One idea about the complexity of assessing knowledge construction in online environments is whether people refrain or avoid debating difficult points because of the online nature and a need to appease other participants.

Building from the research conducted by Gunawardena and her colleagues, four other researchers conducted a similar study seven years later. Aviv, Erlich, Ravid, and Geva (2003) evaluate asynchronous communications using Social Interdependence Theory of Cooperative Learning. Aviv et. al. concluded “that a well-designed ALN [Asynchronous Learning Network] develops significant, distinct cohesion, and role and power structures lead the knowledge construction process to high phases of critical thinking” (p. 3). They further argue that knowledge is socially constructed, as additional support for the claims made by Bereiter and Scardamalia (1987) and Gunawardena and colleagues (1997). Aviv et al. did not look at how each participant builds their knowledge off of ideas presented by others, rather how the social dynamics of the group affects knowledge building and ultimately critical thinking.

Aviv et. al. (2003) state that it is the cliques that are formed through the community building of the course that affects the ability of the participants to think critically about the subject matter. This is most likely due to issues of trust and validity. Students may rely on peers whom they perceive as being more knowledgeable or well versed in the subject matter. If there is a lack of people willing to participate on a level that would demonstrate their knowledge or skills, students may be less likely to rely on each other or may think that statements made by

other students are invalid. The findings of this particular study may not go as far in depth in order to figure out what is truly responsible for the critical thinking or knowledge construction, however, it does lend another framework through which to assess threaded discussions.

Hara (2002) conducted a study using formal concept analysis as a visualizing methodology to describe the dynamics of asynchronous communications. Formal concept analysis has been used to research interactions in online environments and was the foundational basis by which online content analysis developed, a significant contribution to research in online environments. Hara discusses methodologies developed by other researchers to conduct content analyses of threaded discussions. Some of the researchers who have analyzed asynchronous communications have incorporated bits and pieces of methodologies of the various researchers. No single method has proven to be superior to any other measure to date. The argument put forth by Hara is that a formal concept analysis should be conducted on a thorough content analysis, preferably after three researchers have coded the material and reached a high inter-rater reliability. This is the one method that has been shown to be successful throughout all of the previous studies mentioned within this work.

In a second study, Hara teamed with Kling (2002) to analyze interviews, observations, and documents from one online course. The results of that study illuminate one of the pedagogical issues with online education. Essentially, through their research they notice that there is a large amount of research on pedagogical issues for face-to-face classes but a very limited amount for online classes. They also mention, as Bereiter and Scardamalia (1987), Angelo and Cross (1993), as well as others that instructor feedback was one of the key problems with the particular course they analyzed. Furthermore, Hara and Kling argue that ambiguous instructions for assignments are the single most significant factor of the feedback loop issue.

Feedback or a feedback loop exists when the lines of communication are open between the instructor and students within a course. Communications within a course allow informed and continuous evaluations to be made because the feedback between instructor and student is timely and constructive. Course evaluations of online courses almost unanimously indicate student dissatisfaction with the amount of feedback the instructor provided to students. Hara and Kling hypothesize that some reasons for these delays might have something to do with the asynchronous nature of the class, the lack of technological expertise of the instructor – as much of the confusion was due to technological issues, and an online course lacks body language which indicates to a student if they are on the right track in face-to-face classes. This instructor feedback, while guiding the development of critical thinking also provides evidence to students on how they will be assessed, which can challenge them to both achieve higher order thinking and address criteria more fully.

Critical Thinking and Assessment

Critical thinking has long been lauded as essential to education and a goal of educators. In the 1990s agencies with inroads to higher education, listening to popular media decry how higher education was failing to teach students how to think critically, began funding investigative efforts involving critical thinking. What does it mean to think critically? How is critical thinking defined? How can critical thinking be incorporated into teaching and learning endeavors? Research from this era is responsible for contributing to the development of rubrics to assess critical thinking in classrooms, providing definitions of critical thinking, and inquiry into cognitive and meta-cognitive processes involved in thinking critically.

Scholars argue about whether critical thinking is content specific or has a broad applicability. Hemming (2000) argues that the development of critical thinking skills and

content learning should occur simultaneously. Students need to draw upon what they already know and learn to evaluate the new knowledge being taught, all the while being aware of value judgments and assumptions within this newly acquired knowledge. If this does not happen, she states that the student may “acquire a variety of skills which can be practised in isolation but which are not integrated into the way he or she approaches a variety of issues” (p. 182).

Transference of knowledge then becomes one criteria of critical thinking however transference cannot happen unless the student is building upon prior knowledge.

A further argument about the debate between fostering critical thinking and gaining content knowledge is that “little or no onus is placed on the learner to either refer to a base of background knowledge about the topic or to reflect on the criteria used to make judgments” (p. 182). In teaching critical thinking skills, faculty are viewed by Hemming as not linking the critical thinking to the content or background knowledge in order for the student to construct new meaning from what is already known. Assessment of student learning then becomes problematic because the instructor is either teaching the content or critical thinking skills and therefore may be assessing for content knowledge when he or she is teaching to critical thinking skills development. This fracture between content and critical thinking needs to be conjoined in order for students to gain a greater benefit from their educational experiences and draw inferences in new contexts.

Shavelson and Huang (2003) state concurring beliefs about the split between content knowledge and abstract reasoning abilities in their paper on assessing learning in higher education. For them, there are three learning and assessing paradigms currently competing in higher education; “critical reasoning,” “factual and conceptual knowledge,” and “occupational success” (p. 13). According to Shavelson and Huang it is “only through extensive engagement,

practice, and feedback within a particular subject area does a learned knowledge become sufficiently decontextualized to enable it to transfer to the realm of enhanced reasoning, problem-solving, and decision-making skills exercised in broader or multiple domains” (p. 13). Again, transference of content specific knowledge and drawing greater generalizations is an essential focus to this team of scholars intertwining with Bereiter and Scardamalia’s (1987) idea of knowledge transforming.

A host of scholars and researchers conceptualize critical thinking to include a type of open mindedness that allows a student to analyze and investigate new perspectives and compare them to their own. Through that process they begin to understand the values laced within that perspective and compare it to their own long held ideas and knowledge that they have acquired during their experiences. Once the new perspective has been analyzed the student can then reject or synthesize all or part of the new idea into that of their own by providing evidences or concrete reasons to support their decision. Hemming (2000) draws upon the work of Lipman, Paul, Boyer, and Dewey, as well as other scholars to develop her definition of critical thinking; thus supporting the elements summarized by the Washington State University Critical Thinking Rubric (CT Rubric). The definition of critical thinking set forth by Hemming incorporates taking context into consideration, a logical analysis of the situation or the problem, looking at multiple perspectives, and an evaluation of what is known and what is being learned. The CT Rubric encompasses all of these elements.

Assessing Student Learning in Online Courses

Surveys of students indicate correlations between gender and age with preferences for the type of assessment being conducted within courses. Females typically prefer essay and short answer over multiple-choice and true-false exams while males typically prefer the multiple-

choice and true-false to essay and short answer (Kniveton, 1996). Due to several research studies that support these findings, educational leaders have been requesting more authentic forms of assessment. While multiple-choice and true-false exams test the content knowledge, it is thought that essays and short answer exams get at thinking abilities. Kniveton found that students preferred continuous assessment because they felt it was a fair process to judge their abilities and allowed them the opportunity to direct their own learning. Continuous and formative assessment are considered alternative forms for assessing student performance.

According to Benson (2003) there are three types of assessment. Diagnostic assessment determines the level of background knowledge a student has. Formative assessment is used to “improve teaching and learning, not to provide evidence for grading learning achievement” (Rovai, 2000 in Benson, 2003, p. 70). Finally, summative assessment is the final grade a student receives which summarizes the learning that he or she has accomplished during the term of the course. Assessment of social cognitive development and collaboration are considered alternative assessment methods for Benson. Tools used in assessing these forms of learning are group work, peer learning and evaluation, self-evaluations, portfolios, and online learning environments. Jaffee (2003) draws upon the work of Barab, Hay, and Duffy when he comments on the authentic assessment opportunities in online environments because the environment “allows active practice in authentic discipline-based tasks” (p. 229).

At the core of online learning is the interaction. The interaction possibilities in an online environment allow for each student to respond and, similar to a face-to-face classroom experience, “students can build their thoughts on the thoughts of others” (Benson, 2003, p. 71). Benson points to the development of critical thinking skills in online courses by examining how that particular learning environment allows students to think about course content and develop an

idea before sharing it with the class. Thoughtful reflection and grappling with course concepts support higher-level learning, or critical thinking. Benson makes another statement about assessing student learning in online courses drawing a connection between that environment of learning and rubrics. She states that use of a rubric in an online class “can direct students toward effective participation in, . . . , discussions and make assessing that participation much easier” (p. 74). There is no further discussion about rubrics, how to implement them, or how to use them for assessment, thus contributing to the lack of research in applying rubrics and evaluation criteria in assessing student performance in online courses.

Literature Review Conclusions

The majority of research reviewed here discusses aspects of critical thinking and connects with the seven principles of good practice as laid out by Chickering and Gamson (1987); however, little examination has been conducted on how to assess critical thinking skills. The research methodologies developed by Gunawardena et. al. and Hara, respectively, provide a framework for further research of online course tools and assessments of student learning. Many of the researchers who have investigated and explored the advantages of online learning environments concur about the strengths inherent in online courses for developing students’ critical thinking abilities. They also agree with many of the shortcomings that contribute to developing critical thinking skills, as well as, feedback and drawing connections between prior knowledge and critical thinking.

Although some of the research has indicated weakness in development of critical thinking abilities and the dynamics of online courses in assisting a student to develop these skills, none of the research investigated rubric implementation or evaluation criteria use and student perceptions. Some of the research points to a lack of linkage between critical thinking skills and

content knowledge and background knowledge. Furthermore, the reviewed research did not analyze online courses using a tool similar to the CT Rubric. This study fills in some of the gaps that currently exist in the literature. Methods used to carry out the research are explained in the following chapter.

Chapter 3

Research Design

Introduction – Goal of the Study

This qualitative analysis sought to explore how evaluation criteria, or the use of the Washington State University Critical Thinking Rubric (CT Rubric) as evaluation criteria, have been implemented in online courses and how instructors use them to foster critical thinking (<http://wsuctproject.wsu.edu>). Recent research conducted by the Writing Programs at Washington State University (WSU) indicates an increase in students' ability to think critically in their junior and senior years when their courses of study use the CT Rubric consistently (<http://wsuctproject.cltl.wsu.edu/rf.htm>). Research, however, has not explored if or how this tool is being utilized to facilitate critical thinking in online courses. Different instructors and departments have operationalized the CT Rubric to their specific goals and needs. To date, there have been no guidelines about how to use it to more adequately facilitate critical thinking skills and evaluate student performance. The research questions this study seeks to address are: How can the use of evaluation criteria or the Critical Thinking Rubric help instructors facilitate critical thinking in online classes? How are instructors implementing or working with the Critical Thinking Rubric in online classes?

History of Study

The current study developed out of a research project begun in the Center for Teaching, Learning, and Technology (CTLT) in the Summer of 2003. Three staff members of the CTLT compiled three threaded discussions from three different courses and analyzed them based upon the CT Rubric, using the seven elements of the rubric as the coding categories. After analyzing the data gathered for that project and reviewing the written reports I became curious about how

instructors and students used and perceived evaluation criteria and began to think of a way to examine this. The idea developed into a pilot project for an Introduction to Qualitative Methods course I was taking during the Fall of 2003. For the pilot project, two interviews were conducted; one with the instructor and one with a student from the same course, Speech and Hearing Sciences. Both of these interviews have been re-analyzed for this study.

Recently employed in the CTLT, I was beginning to learn the role and mission of the department in relation to the larger university community. At the time of the first instructor and student interview I was a staff member of the CTLT, while at the time of the remaining interviews I was a graduate staff assistant in the same department. The data from the first instructor and student interviews – both from the speech and hearing sciences course – were used for an introductory qualitative research methods course.

Spring semester 2004, I took an Advanced Qualitative Methods course. For this class I extended the study to include a threaded discussion, compiled during that semester in the Speech and Hearing Sciences course, and conducted more interviews. The data analyzed included instructor interviews from Math, English, and Speech and Hearing Sciences. These data have been re-analyzed for the purposes of this study. Although the threaded discussions were compiled during the Spring 2004 Semester they were not previously analyzed prior to Spring, 2005 for this study.

Design of Study

This descriptive study relies on a re-analysis of data generated for previous course projects, as mentioned above, about critical thinking in online environments. The study consists of the transcripts from interviews with seven students and three instructors, as well as a content analysis of three threaded discussions taken from the course content. Prior to commencement of

the collection of data, the required human subjects forms were filled out and approved by the Institutional Review Board (IRB) at Washington State University. All participants were given a Participant Consent form, which described the study and provided contact information for the IRB, to review and sign.

Each instructor (See Appendix I for a complete description of the courses) was contacted and asked if research could be conducted in their online course. Prior to the interview the instructor and I met and discussed the study, how to contact the students, adding me to the online course space, and how discussions would be chosen. After this initial meeting, I met with the manager of the Production Team at the CTLT and provided a copy of the instructor's letters of consent for research to be conducted in their course spaces in order to be added as a member to the forum. Once added to the forum, I did not interact with nor participate in any of the course discussions. The only role and purpose for my presence was to gather data, which did not begin until every student in the class was made aware of the study, provided an opportunity to participate or not to participate, and invited to participate in a voluntary interview.

Sampling Methods and Selection of Participants

The instructors of the courses were identified with assistance from staff members in the CTLT at Washington State University due to the instructors' affiliation with the CTLT. Some faculty utilize CTLT learning systems but do not participate in trainings or workshops, while others contribute to and participate in building a community of reflective educators. The instructors had taught online courses for a while, were receptive to research being conducted within their courses, and all employed some form of the Washington State University CT Rubric.

Procedures

Instructors were contacted after the Institutional Review Board had given approval for this study. The instructors were given a brief description of this study as it was still in development. Interviews were conducted in the instructor's offices, at a time during the day that was convenient for them. The interviews were conducted, audio taped, and transcribed by myself. A one hour time frame was allotted for the interviews; however, they lasted about 30 minutes longer than the original time. All three of the instructors signed a letter of consent, as per Human Subjects Guidelines.

One of the instructor's offices was located in the main university administration building on the ground floor. The door to his office remained open during the interview. The second participant's office was located in her departmental building in her office. Her door was closed due to a busy hallway. The third participant's office was located in the offices of the CTLT and his door remained closed during the interview.

After approval of the instructors, which was obtained at their interview times, students were notified via e-mail about research being conducted in their class. They were invited for an interview at that time. The letter of consent was included in the body of the e-mail and if a student responded affirmatively in a reply, consent was assumed as indicated by the introductory e-mail. In the instances where I met a student face-to-face to conduct the interview, they also signed a physical copy of the letter of consent. Where the interviews were conducted via e-mail, the letter of consent was in the body of the e-mail. In the two instances where the interviews were conducted over the telephone, earlier communications had taken place via e-mail and the letter of consent was considered to be the e-mail.

The first student interview was conducted in the CTLT main computer lab area with a student who was also a CTLT temporary, part-time employee. This first interview lasted one hour and was a pilot and question refining process. The second in-person interview was conducted in the student union building on campus in the afternoon. Although the building was busy with student activity, the location of the interview was in an area designated as a study area, so it was moderately quiet. The last in-person interview was conducted in one of the dining centers on campus during an off time. It was before the dining center opened for dinner and there was one other group of students in there shooting pool. The location was quiet and suitably private.

For the participants that were at a distance, interviews were conducted via alternative means. One student called my home from Switzerland. During the interview, I kept detailed notes of our conversation and wrote up the interview immediately following the phone call. A second telephone interview was conducted using the same methodology as the first. The complete interview protocol was e-mailed to one student who returned the completed questions within the week. The second e-mail interview consisted of me e-mailing one question at a time on a Friday evening. After the participant responded, I sent another question. This process took about two hours due to the dial-up internet connection that the participant was using at the time.

Data Analysis

Both the analyses from the interviews and the discussion transcripts were compared to one another in order to examine alignment between perceptions and the use of evaluation criteria. This further analysis may provide additional information about how the rubric can be implemented to assess student performance in online courses. Comparison of the data was conducted by reviewing the codes of the interviews in relation to the coded threaded discussions

using a systematic method as described by Strauss (1987). The method termed by Strauss is “selective coding” (p. 33). After core categories were identified by earlier coding methods, the data were systematically reviewed, guided, and subsequently coded only for those categories. Of importance to the study is how the rubric is being implemented by instructors and how students are making use of it in their assignments.

In this study the preassigned coding system was the assignment goals and evaluation criteria, including those criteria that were culled from the CT Rubric for the assignment of the specific discussion, a method established and employed by the Center for Teaching, Learning, and Technology at Washington State University. Analysis of compiled manuscripts followed conventions set forth by Bogdan and Biklen (2003) in their discussion on “preassigned coding systems” (p. 168). For example, if one assignment used only two criteria, those two criteria served as of the two codes for that particular assignment. If applicable, a code was only used one time per student in each thread to easily establish consistency. One threaded discussion was analyzed and coded by a colleague at the CTLT in unison with the researcher in order to establish inter-rater reliability.

Interviews

Student interviews were voluntary lasting thirty minutes in duration. Instructor interviews were also voluntary, lasting approximately ninety minutes. The primary goal of the instructor interviews was to develop an understanding of their pedagogical perspectives and how their implementation of the rubric guides their ability to teach the students critical thinking skills and assess student growth in critical thinking. All three instructors and seven students consented to interview. Of the seven student interviews conducted, 3 were in person, 2 were via e-mail, and 2 were via telephone. One threaded discussion and two of the interviews, one student and one instructor interview, were conducted the semester prior to the collection of the remaining data. Data were collected in Spring Semester 2004, with the exception of the aforementioned interviews and threaded discussion. Questions posed in the interviews were open ended and of a conversational nature in order to provide a holistic view of student and instructor perceptions. Pseudonyms were applied after transcription to replace the real student and instructor names. All transcripts have been stored on the hard drive of an IBM compatible laptop computer and backed up on CD-RW disks. A filing and naming convention was adopted for saving each interview in order to provide a clear audit trail.

Analysis of the interviews followed the conventions laid forth by Strauss (1987) in conversation about coding strategies. Through a cursory review using the open coding method, general themes emerged. After this initial coding, more specific categories were defined, at which time the axial coding method was employed to further define sub-categories within each category. Coding centered around one 'axis' category at a time to identify relationships between categories. In order to establish inter-rater reliability and ensure rigor and quality within the

coding schemata, one instructor and one student interview were shared with a colleague at the CTLT for analysis and coding in unison with the researcher.

The remaining instructor and student interviews were conducted during the following semester while I was a graduate staff assistant. Data from the instructor interviews were coded and analyzed for an advanced qualitative research methods course. These data were re-coded and analyzed for this project in relation to the specific research questions and in conjunction with the threaded discussions and remaining student interviews.

Threaded Discussions

The study utilizes a content analysis of three asynchronous communications (threaded discussions) compiled from each online course. The communications were chosen based upon order within the course. For example, one discussion was taken from the beginning, mid-point, and end of each course in order to analyze critical thinking growth throughout the semester. Prior to analysis all student names were removed and replaced with pseudonyms which parallel the pseudonyms applied to the interview materials.

Threaded discussions were chosen based upon the number of discussions in the course. Rather than choosing the first discussion, which is used for community building (a getting to know each other exercise), the second discussion was chosen in each course. The next discussion selected was based upon the number of assignments in the course. In two of the courses the second and third assignments were chosen because after the first assignment was disregarded these were the two that fell at the beginning of the course and as close to the mid-point as possible. The third discussion chosen was the final assignment in the course. In two of the courses this was a reflection of what the students felt they had learned in the course, looking back at the beginning of the semester and drawing conclusions about their development

throughout the course. In one of the classes the last discussion was the final project. All of the discussion had evaluation criteria.

Establishing Trustworthiness

Keeping with a method established by Guba and Lincoln (1981) inter-observer/inter-coder reliability was established as a method of category comparison. This reliability check utilized “a competent outside” person to review the analysis of the data (p. 186). Transcripts of an instructor and student interview as well as one threaded discussion were given to a colleague in the CTLT for qualitative coding. The staff member selected to conduct the qualitative analysis has over five years of educational qualitative research experience. Both sets of codes were compared for accurate interpretation. Inter-coder agreement provides a rough estimate of reliability based upon the percent agreement between coders, thus providing one more layer of rigor. Using this method assured that the codes assigned to the threaded discussions and interviews were on topic, and that the interpretation was one which a reasonable person would assume.

Limitations of the Study

All research has limitations, this study is no exception. The first limitation is that the data is based on a convenience sample. Accessibility and availability to information about online courses, the CT Rubric, and the course content was my personal reason in choosing to conduct this type of a study since, at the time of data collection I worked in the Center for Teaching, Learning, and Technology. Having the data and resources available on a daily basis provided unique opportunities to study this subject. The instructors knew that I worked in the CTLT and having that affiliation perhaps provided a higher level of credibility to myself and the study that may not have been as easily extended to another investigator by the instructor participants.

A second limitation is that during the course of the study I was employed in the CTLT. This unit is responsible for purchasing and maintaining the online learning software. One reason that I chose this particular line of inquiry was to become more familiar with the department and its role within the larger university context. The work that CTLT does was so unfamiliar to me, I thought this would be one way of learning more about the work and the department. Because of my being employed by the department, this study might be shaped by my close connection to the study topic and participants. I have worked to maintain a level of awareness about the strengths and weaknesses of online learning, evaluation criteria, and critical thinking while conducting this study.

The third limitation has to do with two of the students interviewed. The math student had dropped the class prior to being interviewed. I believe that the questions asked and the responses given are general enough that similar data would have been gathered had it been a student still enrolled in the class. Although the responses differ their answers are in line with the questions being asked. Also, one SHS student interviewed was enrolled in the face-to-face class the semester prior to my conducting the remainder of the interviews. Again, the questions were general enough that the data gleaned from this interview were relevant to the study.

Lastly, the instructors interviewed were all employed as lecturers, rather than tenure-track faculty. Two of the instructors were employed full-time on campus in positions related to the subject area that they taught but not in the department they taught for; one was employed only as an instructor. Because of their instructional roles in the academic hierarchy, their perspectives about teaching and learning, as well as focus on it, may vary significantly from tenured or tenure-track faculty members who have a wide variety of competing roles. The departments

where two of the instructors had full-time jobs were encouraging and supportive of their instructional roles.

Section Summary

This study is a re-analysis of a data set that includes: 1.) interviews with students and faculty in three online courses and 2.) compiled asynchronous communications. Data was analyzed using open and axial coding as well as content analysis. The Critical Thinking Rubric was used in analysis as it pertained to the assignment evaluation criteria in an effort to evaluate how it is being used. Too often, faculty and students assume critical thinking takes place without any real way of assessing the tools and methods that facilitate the development of critical thinking skills. This study will help identify methods used by instructors to develop critical thinking and how those align with student use and perceptions of evaluation criteria. Further, findings from this study, the subject of the next chapter, will illuminate how the CT Rubric and evaluation criteria can be implemented to foster greater student understanding and critical analysis of course content, specifically in online environments.

Chapter 4

Data Analysis

This introductory section describes the interview process and analysis, as well as the compilation of threaded discussions. Section two draws comparisons between instructor interviews, while section three compares student interviews. Both sections describe the participants, the context, as well as compares and contrasts the data. Section three outlines the compiled threaded discussions by course, with tables showing which criteria were addressed by the students in the respective conversations. The final section is a summary of the data in relation to the research question.

Instructor Interviews – Introduction

The math instructor grew up knowing that she wanted to teach. She taught for some time in the Physics Department at Washington State University before moving to another college in Washington State. Upon her return to Washington State University a few years later, she became employed in the Math Department because her position in physics was no longer available. At the time of the interview she had been teaching for over 20 years. The course involved in this study was an introductory calculus course which is a prerequisite to many of the medical and science degree programs.

The English instructor began teaching as a graduate student over ten years ago, having wanted to teach “for a very long time” before he began teaching. He began as a teaching assistant in the English Department. Extensive knowledge and experience with computer technologies soon led him into teaching the multi-media authoring course (the course studied) offered in the department. This course is a required component to a certificate in writing offered through the Distance Degree Programs and through the English Department on campus.

The speech and hearing sciences (SHS) instructor also had over 20 years experience teaching in one capacity or another at the time of the interview. He had facilitated workshops, taught study skills, and has a passion for the subject matter of the course being studied. He has been a Director at two Disability Resource Centers on two college campuses. Having been involved in issues pertaining to persons with disabilities for over 20 years, this instructor has become intimately aware of issues in higher education and society faced by persons with disabilities. The course studied for this project is a capstone humanities course teaching the issues surrounding disabilities and as a result many students have enrolled in this course every semester. During the tenure of this course, the instructor and chair of the SHS department have increased the number of offerings due to its popularity. They have also extended the distance offerings to include the nursing program at the Washington State University Spokane campus.

All of the instructors interviewed had over 10 years teaching experience at the time of the interviews. Having a passion for the subject matter of their courses and a level of comfort due to their experience, they all explore ways to adjust the courses that they teach if they find that the format is not working for that particular group of students. Themes that emerged, as relevant to this study, was the role that each instructor saw him or her self in, their attempts at guiding student learning and thinking, and their alternative assessment methods in evaluating student work.

Instructor Interviews – Summary of the Findings

Instructor as Facilitator

Perhaps the largest commonality between these three instructors is that they all see their role within their classrooms as that of facilitator rather than lecturer. The math instructor put it best when she said, “At this point in my career, I’d much rather prefer to be the “guide on the side”” rather than the “sage on the stage.” So too would the instructor of English. He described how he facilitates the learning of his students by saying,

The most important thing I can do to facilitate that is to give them a context through which to explore some of the ideas about multi-media authoring in the context of the World Wide Web. And then sort of step back and let them actually explore and make them responsible for exploring the ideas themselves rather than my telling them.

In the speech and hearing sciences (SHS) course the instructor designed the course in such a way as to permit “a lot of self learning” because of how the projects are set up. For the SHS course, this is partially accomplished through limiting enrollment.

One of the issues with the role of facilitator, as the math instructor commented, is that “it’s a very useful role as long as the students are willing to participate.” She was in a unique position as compared to the other two instructors, as her course was a hybrid course – meaning it met face-to-face and had an online component – and was a freshman level course. Her students were not as involved online as the students were in the English and SHS course.

Secondly the role of facilitator may mean that the instructors spend a considerable amount of time working with students in the online environment. One instructor stated, “you’re always asking yourself if you’re giving them enough despite the fact that you’re putting in, sometimes close to a 40 hour week just on the course itself.” While talking about the differences between his face-to-face and online course, another instructor mentioned the volume of material in a threaded discussion. For example, in the SHS course the students learn new terminology to

use when discussing disabilities and people with disabilities. In the face-to-face course the instructor takes points off of turned in work when insensitive terminology is used. When students see all of the points missed and see the comments by the instructor on their paper they have a visual representation of their work. The instructor might then provide the student a chance to increase the grade on that assignment by revising it. In the online environment, this is more complicated because the instructor has no way of “marking the paper up” to impact the student. Instead, he monitors the threaded discussions and comments on inappropriate terminology use such as, “confined to a wheelchair,” by saying, “watch the terminology.” Because of the volume of material in a threaded discussion this instructor “certainly doesn’t want to do all of this printing out” of the course materials in order to “mark it up,” besides the fact that the distance course he teaches has many students at a distance, it would be unfeasible to print out the material, mark it up, and get it to them in time to make a difference in how they approach their assignments.

Guiding Student Thinking and Learning

Another commonality between all three of the instructors is their commitment to student learning. Both the SHS and the math instructor allow their students to revise exams to improve their grade. By doing this they both feel that it gives the students a chance to see the material again, in a new light, and it guides what they are going back to the material for. In this aspect, these two instructors are maintaining their facilitator role – again, as long as the student chooses to participate. In the English course, there was no graded course work until the final product was turned in, which was a web page that stated and supported an argument. However, the site was something that the students and instructor built during the semester with critical and meaningful feedback, working out the technological bugs. A Virtual Facilitator was also present within the

space of the English course. A Virtual Facilitator (or VF) is equivalent to a teaching assistant in a face-to-face course. The VF for this class was well versed in technology issues, having been trained in the Center for Teaching, Learning, and Technology (CTLT) as a VF lead and Assistant Director for that program. He answered questions of technology complications, provided feedback, and when there was a lull in the online dialogue his role was to ask questions to keep the dialogue going or spark new ideas and ways of thinking about the content.

All of these instructors were comfortable making changes to the course in order to increase class interactions. In reviewing the online content of the math course, the instructor was observed several times asking questions, such as, “what can we do to finish up the semester?” She constantly struggled with getting the students to engage one another by creating assignments online where one student must post a summary of a part of a chapter and ask a question. Students needed to respond to one post, finding an answer for or working through the question asked. Her concern was that she did not see much interaction or dialogue between the students in this regard. In our interview, she hypothesized that it might be because students are socialized to believe that math has one answer to any given problem and there is no room for argument or debate. In order to help her students begin critiquing mathematical arguments, she decided to post math problems with the wrong answers and processes. For this assignment she asked the students to look at the problems and describe why it is wrong and where the solution process broke down. The instructor learned “a tremendous amount” from the students through this exercise. For example, she learned where misunderstandings were and perhaps what she needed to focus her next lecture on. “To get them to actually make those statements so you can understand where their misunderstandings lie has been incredibly informative to me. And I think that the students that take those activities seriously get a lot out of it.” Realizing that there is

much to be learned through a two way communication, she has worked at keeping the lines of communication open between herself and her students.

The English instructor commented that the ability and comfort level in making changes to a course comes with experience. He has “cultivated” this ability over the last eight years and found what works for him, in his role of facilitator. “Since my course is a distance course and since it relies so much on threaded discussion, the tuning that I do to the course is more in how I facilitate the conversation and threaded discussions.” Finding a balance between saying enough and not saying so much that the dialogue is shut down is something that this instructor has struggled with. Furthermore, he recognizes that each course is different. Some semesters he will have a course where the students want him to “weigh in because they want to know what the right answer is” while other groups of students are decidedly more self guided. By watching the course of the conversations and listening to the feedback of the students, he has been able to assess the level of engagement he must maintain in order to foster critical thinking skills within his students.

The SHS instructor was in a bit of a different situation as his course was designed by a campus-wide committee. He has modeled his online courses to that of his face-to-face course. Maintaining his presence in the course has much to do with the sensitive subject matter of disability and society’s view of people with disabilities; however, it also has been his way to guide his students through some of the difficult content. Through this engagement, he has been able to make the necessary “tweaks...to make them work with whatever practical things...that come up.”

The forms of teacher intervention that each instructor employed; presence in the online environment, making changes to the online environment, using an instructional assistant (the

Virtual Facilitator in the English class), as well as asking probing questions, “What can we do to finish up the semester?”, all contributed to the overall climate of the course. These interventions guided the students to construct their knowledge in ways that made sense for them.

Evaluation

Evaluating student learning is distinct in any course. Most teachers or professors have a core of material that they feel students need to know in order to successfully complete a particular course. Professors want to know that the students have learned class material and satisfactorily synthesized the material for a wider applicability to real world situations. In online courses the volume of material becomes overwhelming to make assessment quick or simple. Hybrid courses that employ an online learning element are also complex in evaluating student learning. The three instructors interviewed for this study approach this differently, yet there are points in which they agree.

The math and the SHS instructor were in agreement when they stated that they do not wish to count the number of posts by each student in the online environment. The math instructor has had to regress to this method of evaluation because of the lack of engagement of the students in the online element of her course. She was forced to readjust her goals. Continuing to encourage the students to express their mathematical process in words, she decided to use the counting method in the online portion of her class in order to determine if the students are following direction. She provided evaluation criteria for the threaded discussions, which included one original post and one response to an original post by every student. The instructor did not provide any feedback in the online discussions rather she addressed issues by creating a new discussion and encouraging students during the face-to-face portion of the class to review her posts, though few did. The thread depth in her course ranged from one to two deep,

meaning that there is a range from one post to one post and two responses. Some reasons for this might be the nature of a hybrid course. Since the students met face-to-face either they did not see the need to interact online or they were hesitant because anonymity is not possible when students meet face-to-face as well as online. Perhaps the developmental stage that the students in this freshman level course are in is another reason students were less engaged online as in the other courses observed.

Revising some of her goals for the course is what makes this class original. Having taught for as long as she has, she has been able to understand some of the learning processes of different age groups of students. Instead of teaching the mathematical operations only, she is working with the students to be able to evaluate each other's work as well as their own. In evaluating the assignments, she looks for the right answer and process but also the understanding that the student knows why this was the right process and how it worked. For her, "the right answer is only fifty-percent of the grade." When students can respond to their assignments by explaining why they chose the process that they did "it becomes very quickly clear who's mechanically adept and who has a better understanding of what is going on."

In SHS, which was a completely online distance course, the instructor monitored the threaded discussion and commented on the use of inappropriate or insensitive terminology. He mentioned the massive volume of printing out the threaded discussions and how that was unmanageable. Instead he employed a method of counting off on the number of original posts and responses. He then reviewed the original post as a whole and evaluated it much like he would a hard copy essay. This method has been a little problematic for him because it is a very subjective grading process. "If it looks like they are learning the stuff and they put some thought into it and they are doing their assignment, they get the points." On the other hand, "if it looks

like they really didn't do it very well, I just sort of arbitrarily give them less points." His cursory review of how well students were responding to one another within the context of assignments was that many of them were saying things like "good job" or "good post" rather than substantive comments and challenging one another to foster deeper learning. These types of comments would receive fewer points.

The method of evaluation that he utilized was formative and takes into account individual growth. With the essay type assignments the evaluation criteria play a role in making the evaluation of student learning. If the assignment asked the student to address "five evidences of privilege for non-disabled people" the question then becomes did the student show five evidences and change it from white or male to non-disabled? An instructor can count the number of evidences addressed in the assignment in order to evaluate a student.

The English instructor used a formative evaluation of student learning at the end of the course. Because the material and context of the course, multi-media authoring, was, for most, a new subject area, there was a huge learning curve. The bulk of the course was spent with the students beginning to understand what it meant to author an argument using multi-media. They accomplished this through evaluating web sites that posed arguments. While the students came to understand what it meant to critique a multi-media argument they were also learning web page software and how to put web pages on the internet. The interplay was somewhere between art, technology, and literature; so the students began to work with expressing a feeling or thought with colors and shapes as well as words.

The assignments did have evaluation criteria embedded within them and the CT Rubric was used within the course; however, the instructor was finding this a bit problematic. He was seeing the students addressing the criteria rather than the questions of the assignment. Also he

saw, what he termed “flame wars,” erupt between students who were challenging one another to address the evaluation criteria and starting an argument about how well they had addressed the criteria. Although the criteria are useful in guiding a student’s thinking about a particular subject, they seemed to be usurping the meaning of the assignment. Instead he used “the evaluation criteria to allow the students to set the tone for their own discussion but I don’t actually use it.” In fact, he was considering taking it out of his course all together. He found that the students he was teaching have a high level of responsibility in guiding their own learning. Many of his students in this distance course are non-traditional; they have families and jobs, and are older than the majority of students on the college campus.

The method of evaluation he used to assess student learning was unconventional. At the end of the semester he asked the students to reflect upon their learning in a public threaded discussion and then send him an e-mail stating the grade that they felt they had earned, providing evidence and justification as to why they deserve the grade that they stated. The final grade was a compilation of “participating on a consistent basis and..[being] a member of the class,” their final course project, and “their ability to articulate course concepts in a final paper.” In this process he looked for the students to “apply course concepts to new areas” that he hadn’t “overtly asked them to make” connections to.

Within this group of instructor’s formative assessment of student learning is a natural process. Each instructor has an interest in the learning of their students and the flexibility to allow the students in their classes to draw their own conclusions. These instructors, although interested in teaching the course content, were more invested in guiding their students into new ways of thinking about the course material. Helping students to develop into self-directed learners and critical thinkers is at the heart of their teaching and evaluation strategies.

Using the Critical Thinking Rubric

The Critical Thinking Rubric was used in each course. Both the English and the SHS course made explicit use of it by incorporating it into assignment criteria. There was no evidence to suggest that this was the case for the Math course. The rubric was identified with the syllabi for each course. Although two of the courses embedded the rubric within the assignments, as the English instructor had pointed out, students seemed to address either the key assignment elements or the rubric criteria, thus disjointing the content from the development of critical thinking as pointed out as one problem by Shavelson and Huang (2003).

The Critical Thinking Rubric is a part of life at Washington State University, many courses adopt its use in some way. The English instructor had the most active use of the rubric in his course; however, he clearly stated his concerns about students' use of the rubric. In following the norm of implementing the rubric he finds the use problematic because his students work with it like they are being taught to it rather than the content. Use of the rubric in the other two classes is passive. The rubric is there, is a part of the syllabus and elements are gleaned out for use on assignments. In the Math course, the rubric's use is seamlessly integrated through the type of questions that the instructor is posing to the students. Elements of the rubric guide the way she teaches her class rather than asking the students to address specific criteria.

Instructor Interview Summary

Although the three instructor participants said or indicated that they would prefer to be guides to content understanding within their courses, they all modeled this differently. Each instructor asked the students to work with the CT Rubric in varying ways. What was not clear from the instructor interviews was how the students utilized this tool. Were the ways in which

each instructor used the rubric to guide student learning useful or effective for the students and how did the students perceive the rubric or evaluation criteria?

Student Interviews – Introduction

Seven student interviews were conducted. Three interviews were conducted with students enrolled in the speech and hearing sciences (SHS) and three with students enrolled in the English class, while one was conducted with a student from the math class. The math student had previously dropped the math class and at the time of the interview was no longer enrolled in that course. The interview was conducted and strong information was gleaned about general study habits although not in relation to that course, it is the nature of that general information that is included in this analysis section. Of the remaining six interviews, four were non-traditional students. One of the interviews conducted with a student enrolled in the SHS course was conducted the semester prior to gathering the bulk of the data; furthermore, this student was enrolled in the face-to-face course. The general data about study habits are included in this data analysis.

The general profile of those interviewed is included here:

All of the students were serious about their academics. For the purposes of this study, a serious student is one who seeks outside resources and references to better learn the material, employs varied methods to revise and edit course work, and is cognizant of their contribution to their fellow classmates. The youngest student was employed in CTLT as a paraprofessional at the time of the interview. She worked with faculty and students in online course design and technological issues. At the time of the interview she was working toward a degree in Management Information Systems in the College of Business. She had previously changed her major.

The student who had dropped the math course had transferred into the university from a community college. She had taken some previous course work that utilized a commercial online

learning tool. Focused on her academics, she realized that this was a difficult semester for her, being her first at the university. Dropping the math class was a decision she made in order for her to concentrate on her other classes.

Another traditionally aged student was working toward an Engineering degree after changing his “major a couple of times.” He had taken three advanced placement courses while in high school in order to get a head start on his college degree. Technologically, he is self taught having used his family computer and having friends show him how to do things for years.

The other four students are all non-traditional. They were at a distance, most have a family, or have had a family, and have jobs. One student was in her 60s and had raised her children. Two of the others had children at home and spouses as well as full-time jobs. One student was abroad and did extensive research about extended degree programs. He liked the reputation of Washington State University and had been in the program long enough to remember the days of video courses by mail. A commonality between three of the four non-traditional students is that they had several beginnings into higher education. Taking a year off from school before going on to college, getting married part of the way through a degree program, then divorcing and going back to school, completing an Associate of Arts degree, and military service all describe the pathways that these students had taken toward their Bachelor’s degree. Another commonality between these students was that they taught themselves computer skills, some were still learning how to do things as the need arose, while others had to adapt to computer usage in their careers as well as school work. All these students had reached a point where they were comfortable with learning new software and skills relative to their needs.

Student Interviews – Summary of the Findings

Self Directed Learning and Instructor Availability

Every student acknowledged the need to be motivated when taking an online class. One student equated the motivation as a negative element of studying online – the down side to being able to do the work on your own time. Regardless of this implication, all of the students interviewed were high achieving students and took their academics seriously. Almost all of the students mentioned the main difference between an online class and a face-to-face class was the availability of the instructor. This was often mentioned in the same context as needing to be motivated in order to take and complete an online class. “If you don’t understand something, you can ask for clarification right there,” was one comment from a student. Perhaps staying motivated in an online class is directly related to the student’s perception of instructor engagement within the class.

Self directed learning is key for many of the students interviewed. Because more non-traditional students participated in the study, this self directed learning may be contributed to life experience. One student mentioned learning through her travels and reading, another student enrolled in the English class bought a book about the web page development software to assist him through the class even though this was not a suggested reading by the instructor. Taking responsibility for their own learning, the students who participated in this study all were students who would actively seek out further knowledge for clarification from a variety of sources if they were having trouble understanding the material. Some students preferred to work with the instructor of the course, some turned to peers, while others found resources outside of the classroom.

Students taking online classes “miss the visual part of traditional classroom work” and find instructor accessibility and availability to be an issue. Most of the students commented, in one fashion or another, about the instructor being available. Some of the comments included:

I e-mail the professor he gets right back to me in like a couple of days.

There is a response by the instructor for the SHS but not very often. ‘Women in Politics’ course, no response, but she will refer us to announcements pertinent to the course.

Yeah, I’m more of a lecture person overall just because of the interaction and motivation in class.

The students were expressing the need for timely feedback from the instructors in order to gauge whether they were on the right track. This is one of the elements that the instructors participating in this study struggled with, providing enough information, guiding without leading the students to specific conclusions. One student commented by saying, “the interactive and active listening as opposed to just reading and spacing off” was why she preferred the traditional style of classroom.

Syllabus and Evaluation Criteria

Course syllabi communicate course expectations and criteria for evaluation. When asked what an effective syllabus looks like, every student participant talked about how it should lay out the course week by week. Several students commented that an effective syllabus should be a “roadmap to the course.” A student should be able to look at the syllabus and know what to do, what is required to complete that assignment, and what reading needs to be done on a week by week basis. Most of the student participants “refer back” to the syllabus when they get lost or confused about what is expected in the class.

First assignments in courses are difficult for students to understand what is expected of them. All of the participants in this study put the most effort into their first assignments. From

there they gauged instructor expectations and used that to measure future assignments. They used assignment criteria as a guide to developing the assignment. One student stated, “I’ll usually look through it [the assignment] and if its telling me how many points are going towards what, I’ll usually pay more attention to the things with more points.” This same student commented on finding a balance between what he expects to get out of the assignment or course dictates how much time he puts into it.

Coinciding with the comparison that the SHS instructor commented on was the element of feedback and interaction that an instructor models when handing back hard copy assignments. A couple of the students commented on how some instructors attach sheets outlining the criteria of the assignment and assign points based upon that. Other instructors will make notes on the paper to help guide the students’ understanding of how they can improve their work in the future. In the cases where these methods are not employed some students have “gone and talked to somebody [the professor] and usually professors have to sit down with you and go over it, and tell you why you got the grade you did.” Thus returning to timely feedback and how critical that is to the students who are engaged with the course and are actively working toward a high grade or greater understanding and self improvement.

For these students, reaching an understanding of a key concept is one of the most important things in a class. Some of the students alluded to knowledge transference. One student stated, “When I’m quoting current media within a philosophy paper, that’s when I know the big picture is emerging.” Being able to tie course content into the real world and find application for that knowledge is one of the main components identified by Washington State University’s Critical Thinking Rubric. Other students prefer to look at the content of a course “from more than one angle” or they elicit peer feedback in order to provide an alternative

perspective that they may not have previously thought about when struggling with the content of the course. Looking for a wider applicability was an important commonality between this group of high achieving students.

Using the Critical Thinking Rubric

Although the students did not refer explicitly to the CT Rubric, they all saw having clear evaluation criteria to guide development of their assignment. They all preferred knowing how they would be evaluated and thought that they used this to address the course criteria. Students implied that there was little linkage between the course content and the evaluation criteria that were derived from the rubric. Implications came in the form of students commenting on having to look for the criteria in various locations. For some assignments, particularly in the SHS class, reference was made to another location within the course web space to evaluation criteria above and beyond those addressing the specific content of the assignment, again, a fracture between content and critical thinking expectations. Many of the students interviewed, however, applied some of the elements of the rubric easily to their course content by bringing in life experiences and seeking out alternative perspectives. It is not conclusive as to whether this has to do with the level of self direction this sample of student's exhibit or the actual use of the rubric.

What was not clear in either the instructor or student interviews was whether what both groups were saying was actually what they were doing in the course discussions. The instructors perceived their role as guides for students to develop their own knowledge. Students saw evaluation criteria as providing clarity about how to be successful within the context of the course. Were instructors guiding student knowledge in the online discussions and were students addressing all of the evaluation or rubric criteria for their assignments?

Threaded Discussions – Introduction

Sometimes intentions do not always come to fruition. The instructors for these online classes were clear in their statements about self perceptions in their facilitator roles. Students clearly identified having evaluation criteria for assignments was important for them, as well as instructor availability to clarify confusing concepts and help to maintain levels of motivation. One method of finding out if both parties were following through with their intentions and using the tools available to them was to conduct a content analysis of the threaded discussions.

According to Bereiter and Scardamalia's (1987) research on written composition and the construction of knowledge, students will build more critical knowledge through engagement with one another in a written context. In the online class, this interaction is most easily observed in the thread depth of conversations – the number of replies to an original post or comments in one discussion. Thread depth is also an indication of engagement with the content of the course and peers (Gunawardena et.al., 1997).

Counting the number of evaluation criteria addressed by each student is functional, in that an observer of an online discussion can begin to infer students' time on task. This can have implications about student confusion about the assignment, criteria, or the content. Observing the number of times students made off topic comments might also be an implication of assignment confusion or it might suggest that students were less engaged with the subject matter of the course.

Lastly, Chickering and Gamson (1987) as well as Angelo and Cross (1993), both state that instructor feedback and interaction are integral to student learning. Examining the threaded discussions for the amount of instructor intervention by counting the number of times the instructor comments to the students is one indication of that feedback and interaction. From this

the inference can be made about whether the instructor guided the students to deeper levels of knowledge construction

Taken all together; thread depth, number of evaluation criteria addressed, and the number of times the instructor commented within the discussion forum, these indicators begin to close the loop and provide a full picture. Earlier interviews with instructors and students indicated that both groups view themselves as being involved in the class learning environment, counts within the discussion show levels of involvement, thus giving credence to what they say they are doing and what they are actually doing in the context of the course discussions. For example, were instructors involved in ways that modeled how they viewed themselves as facilitators? And, were students following the evaluation criteria in assignment development?

In analyzing the threaded discussions I first reviewed the assignment to see if the students were asked to address specific questions or points. If they were to address specific details, these became evaluation criteria (presented in charts as “Assignment Evaluation Criteria”). I then reviewed the evaluation criteria for that assignment. Each criteria point became a number for coding simplicity. I was interested in whether students addressed that criteria element rather than how well they addressed what was required. When I began counting the number of students who addressed the specific criteria, I realized that I also wanted to be able to determine the number of original posts, responses, responses in the same thread by the original poster, and the number of times the instructor or teaching assistant responded. Level of engagement can be assumed based upon thread depth. Feedback was also a critical piece of information and something that was mentioned by both the instructors and the students as being important. I wanted to be able to see if the instructors were providing feedback and if students were providing feedback to one another. First is an overview of the threaded discussions chosen for each course.

Following each course discussion is an analysis of how the CT Rubric was applied within the assignments and utilized by the students.

Threaded Discussions – Summary of the Findings

The Math Course

Out of the three courses analyzed, the math course had the lowest level of student engagement in the online environment. Thread depth was also the lowest in this class. The original poster never responded back within any discussion and the instructor did not post within any of the threads analyzed. There was no teaching assistant in the course. For each assignment evaluation criteria there is evidence of the CT Rubric but its use is not explicitly stated. The nature of the questions posed by the instructor infers elements of critical thinking as defined by the rubric; however, the elements are not clearly stated by the instructor.

In this first assignment the students were to respond to some questions analyzing some of their current abilities and what they wanted to work on through the semester. Table 1 outlines the number of student comments addressing the specific evaluation criteria for the first discussion analyzed:

Table 1

Math Discussion 1

Assignment Evaluation Criteria	Number of Comments
Which of these goals do you feel you have a strong start on? Why?	15
Which of these goals do you feel you need more work on? Why?	15
Which of these goals is of the most interest to you? Why?	16
What other goals do you have for this course?	13
In each area, are you a successful student, an unsuccessful student or in between according to these guidelines?	14
Which qualification in each area is most like you and why?	12
Which area do you most want to work on? Why?	13
Which area are you strongest in already? Why do you think this is?	12

By the end of this course there were 13 students enrolled in the course. At the beginning of the project I did not take into account students who dropped the course at various points through the semester. Snapshots of student enrollment were not taken during the data gathering process. The class began with an enrollment of 41 students and ended with 13. This assignment was downloaded toward the end of the semester to ensure its completeness. Since there were 16 original posts and no double postings by any student, it was logical to assume that there were 16 students enrolled in the course at the time of this assignment. The first three criteria were more widely addressed and from there the attention to the assignment details seemed to wane. This discussion was assigned in the second week of the semester and was an exercise for both the instructor and the students to begin to understand mathematical strengths and weaknesses.

Students saw the utility of this math course. Some of the students commented that they needed to work on applying what they were learning in math to other courses they were taking or to their current jobs. Furthermore, they all seemed to be aware of how mathematical concepts build upon one another and that their future course work relied upon them learning the content of the present course. The functionality of this course for many of the students resided in the fact that they were going to be taking future higher level math courses, as well as, the skills they hoped to learn in this class would help them to develop quantitative skills to apply to their academic program core classes.

The second assignment downloaded from the course required more interaction from the students as they were asked to make one original post and respond to one original post. Students were supposed to choose a section of the chapter they were working on and provide a summary for that section. In this discussion there were 13 original posts and ten responses. The breakdown of evaluation criteria and number of student comments are listed Table 2, below:

Table 2

Math Discussion 2

Assignment Evaluation Criteria	Number of Comments
Identify and discuss EACH important idea in your section; discussing why it is important and how it can be used.	12
Pick one idea to present in more detail and do so.	9
Ask a question on the area that is least clear to you.	12

In responding to this second assignment, the students were to evaluate the original post (See Table 3). The evaluation was to provide “specific evidence” of the criteria used in

evaluating the summary. I analyzed the responses by using the criteria that the students were supposed to use for their peer evaluation as the criteria for the assignment.

Table 3

Math Discussion 2 - Responses 1

Assignment Evaluation Criteria	Number of Comments
Clarity	7
Accuracy of ideas	7
Depth of discussion	7
Incorporation of other useful material	7
Ability to help you learn	7
Completeness	7
Answer the question posed by the original poster	8

This was the first assignment the students had in evaluating one another. Due to the response rate – 10 out of 13 students participating in this section, with one student’s comments not addressing any of the criteria – it may be that they were grappling with how to critique one another while using words to explain mathematical operations. Although, the number of comments per criteria appeared to decline, it seemed clear that the students understood what was required of them.

This discussion did not go beyond what the instructor was asking the students to do. They broke-down and defined the mathematical terms and operations and in response to their peers their evaluations were “job well done” and a score for each element. Questions were posed by the original poster and answered in the evaluative response. This type of interaction shows little critical thinking and no feedback beyond what was required per the assignment.

In the final assignment, the instructor asked the students to review what they had written for the goals assignment and reflect back on what they learned and the progress they made through the semester. Only one student posted for this assignment and he only responded to two of the criteria (See Table 4).

Table 4

Math Discussion 3

Assignment Evaluation Criteria	Number of Comments
Which of these goals do you feel you made the most progress on? Why?	1
Which of these goals do you feel you still need more work on? Why?	1
How well did you meet the goal of most interest to you? Why?	0
How well did you meet the other goals you had for this course?	0
In each area, have you made progress toward the successful student characteristics compared to where you said you were when we started the semester? Explain how.	0
How did you work on the area you chose to work on most?	0

It is possible that students in this class did not know how to assess their progress relative to the course content and that their meta-cognitive abilities to think about their processes of learning the material were weak in this area. Since this was largely a freshman level course, the students may not have had the academic sophistication to think about how they learn complex material. This might account for the lack of student postings on this final assignment. A second possibility is that because of the face to face portion of the class that they ended up talking about these things in class rather than in the course online space.

Use of the CT Rubric

In reviewing the questions posed to students in each assignment analyzed elements of the rubric are evident. Use of the rubric in this class is not apparent; rather it is integrated seamlessly with the assignment criteria. The instructor incorporates it in the assignment she gives the students. In this effort the content of the course and the development of critical thinking abilities are joined so students do not have a choice in which criteria to address. The syllabus refers to the rubric and it is a document that students receive in this class. It is not always obvious how something like the CT Rubric is used. The students may not explicitly see the use of the CT Rubric within this course, but the seed is being planted which is important for first year students and will help them in their future studies.

The English Course

This course had the highest level of interaction compared to the other two courses analyzed. Interactions in this class included student to student responses, instructor or teaching assistant to student communications, and student to instructor or teaching assistant communications. More students revised their ideas in response to feedback from others and the original poster replied more often to responses made by other students. There were 31 students enrolled in the course at the beginning and end of the semester.

In the first discussion the students were to analyze the argument of a website of their choice – based upon the instructor’s selection of suitable sites. Some of the evaluation criteria were adapted from Washington State University’s Critical Thinking Rubric while others were the components of the assignment that the students needed to address. The first three criteria were directly pulled from the CT Rubric, while the last four criteria are content specific. Table 5 shows the criteria by the number of student comments addressing those specific criteria along with the inter-rater/coder reliability agreement:

Table 5

English Discussion 1

Assignment Evaluation Criteria	Number of Comments
Purpose: Identify and summarize the problem/question at issue	30
Position: Present own perspective and position as it is important to the analysis of the issue	21
Other Perspectives: Identify and consider other salient perspectives and positions	15
Compare to other relevant websites	11
Identify Tufte's principles that are addressed by the site you are evaluating	28
Discuss how the site constructs an argument	28
Discuss what it means to create an effective multi-media argument; talk about criteria and development	24

All of the students made an original post. There were 62 responses within the threads. Original posters replied to responses 31 times and revised their original ideas eight times. This discussion had the lowest level of instructor and Virtual Facilitator (VF) responses in all discussions analyzed from this course; one and three, respectively. Although this assignment was early in the semester (third week), it was the first assignment with substance that went beyond the introduction stage.

The students evaluated the websites they had chosen. They analyzed the layout, color scheme, artwork, and written text. In their discussions they weighed the evidence that the author of the website had presented against other credible sources of information. One of the students had reviewed a site that posed an argument about the United States criminal justice system. In the posting the student stated, "While I agree that there is room for reform and changes, and I

agree that there may be some people in the system that should not be, I do not feel that the system is a complete failure.” This student then goes on to present evidence as to why he or she felt that the system needed change but was not a complete failure. Responses posted by students to each other’s posts were insightful and probing. Questions were asked and answered. Evaluative statements did not stand alone often they were followed up with what worked in the student’s argument and what didn’t. Furthermore, the questions probed the original posting student for more information or deeper meaning of the site based upon course readings.

Lastly, the instructor was highly involved in these discussions between the students. In one response to a student’s post the instructor replied back by saying

An excellent analysis of the Memoirs of Hijiyama web site. I especially liked your critique of the navigation on the site. I, too, had a difficult time moving through the site. I wonder.. Do you think that the author's desire for aesthetic beauty actually got in the way of his argument? I just went to review the site and I find its very lovely, but I can't figure out how to use the site.

This is an example of how the instructor guided learning. He stated specifically what he liked about the student’s post and then went into some probing questions. Not only did he take the time to develop thoughtful questions for the student to consider but he also visited the site that the student had reviewed, showing that he too was involved in the class.

The second assignment analyzed was near the end of the semester and was one of the final assignments of the class. One of the evaluation criteria was not coded as it was the requirement that the students create three web pages. Again, this discussion had a high level of student and instructor engagement. For this assignment students were asked to “analyze and articulate a hypertext argument” while thinking about “how the associations and connections we make as authors/readers affect the meaning of a multimedia text.” The first three criteria were pulled directly from the CT Rubric while the remaining criteria are content specific. Following

is Table 6, showing the evaluation criteria with the number of student comments pertaining to each particular criterion:

Table 6

English Discussion 2

Assignment Evaluation Criteria	Number of Comments
Position: Present own perspective and position as it is important to the analysis of the issue	24
Other Perspectives: Identify and consider other salient perspectives and positions	20
Evidence: Identifies and assesses the quality of supporting data/evidence	18
Explore how you can use hypermedia to help your reader explore your topic in a way that helps them understand the message	20
Answer: What power do you hold as author? What will you empower your reader to do? How is this evidenced in your site? Support your decision with readings and examples.	28
RESPONSES: Consider the questions above and provide meaningful feedback based upon how you have evaluated their site. Suggest ways of reconciling differences between your response and the author's intentions.	53

Perhaps because this was the end of the semester some students may have been experiencing burn out and as a result did not address some of the criteria. There was some discussion amongst a couple of the students expressing confusion about whether to address or not address the criteria – in that instance they were talking about the criteria that were adapted from the CT Rubric.

There were 29 original posts in this discussion with 64 responses. These 64 responses include the 53 that were coded; however, this category also includes the “good job” or side

chatter that was not relevant to the assignment. Original posters replied to responses 47 times and revised their original ideas seven times. In this discussion the instructor and VF were extensively more involved in the conversation, making 13 and 21 responding posts respectively.

The students discussed ways in which they can weave their arguments in a way that will allow readers to develop an understanding of their sites and perspectives. Again, the students provided evidence from course readings about the reasons why they would develop their web sites in the ways they had mentioned. Perhaps because the instructor had modeled response etiquette early in the course, the student responses were nurturing in their critique of each other's sites and they were clear in what they liked and what they felt didn't work. Also, the instructor and Virtual Facilitator were actively engaged with the discussions, offering feedback by providing clear evidence about what worked and what didn't, and providing some ideas about how to build stronger arguments or revamp the site. The VF replied to one student saying "the content page is a little too confusing. I know the 3 phrases in red are related, but don't know why they're set up in columns. I guess I'm used to that strategy being used to set up more direct comparisons. In any case, I like your idea to break it up." Prior to this comment, he had asked some questions to help guide the student's thinking about their topic and how to relate it to an audience. It is easy to see that the guidance and facilitation of the instructor and VF were integral in students developing their thinking surrounding web site creation and in how they approached the assignments.

The final assignment that was analyzed was the final public discussion for the class. This assignment was one element of the final reflection and grade expectation that the instructor asked each student to do. At the end of the course the students had constructed a web site that made an argument for an issue that the individual student felt strongly about. Some of the shortcomings

of this analysis are that I did not have access to the “for the instructor’s eyes only” portion of the assignment and I did not review the websites. The criteria seemed to be aimed at those two elements of this assignment rather than the public discussion. This assignment utilizes all seven elements of the rubric and none that are content specific. Some data were gleaned and some observations made about this discussion will be expounded upon after reviewing Table 7.

Table 7

English Discussion 3

Assignment Evaluation Criteria	Number of Comments
Purpose: Identify and summarize the problem/question at issue	16
Position: Present own perspective and position as it is important to the analysis of the issue	19
Other Perspectives: Identify and consider other salient perspectives and positions	14
Assumptions: Identify and assess the key assumptions	11
Evidence: Identifies and assesses the quality of supporting data/evidence	9
Context: Identify and consider the influence of the context on the issue	11
Organization and Coherence: Identify and assess conclusions, implications and supporting logic	12

There were 18 original posts made and 15 responses. The original poster replied 13 times to responses and the VF made 8 postings. Although this may not have been the most evaluation criteria rich assignment to have analyzed, many of the students reflected back upon their feelings that they “might not make it through the semester” and the technological complications they had had with the web site software. Many of them overcame their technophobia. They seemed to

synthesize the learning from many aspects of the course and were very reflective about what they had learned throughout the class. The instructor commented on this final assignment in his interview by stating, “I gave more As this last semester than I ever have before. But yeah, it was an excellent course, stunningly excellent group of students.” The interview with the instructor was conducted after the class was finished and data gathered after that interview.

It was evident from the postings and responses that the students had learned throughout this course. They were able to internalize many of the elements of the rubric without being aware that they were doing it. One student stated:

I have had a great time in this class, and I am extremely glad I decided to take it. I did not know what exactly the class would entail when I began, but I feel that I have learned a lot about constructing an effective multimedia argument. From the onset, I kept merely constructing informational pieces that were not argumentative. Based on the feedback I received I was able to determine the differences between these two types of presentations, and how to transform my presentation into an argumentative piece. Once I learned how to question the presentation by asking myself “so what” as [name extracted] pointed out, I was able to realize the twist that needed to be added in order to move from an informative presentation to an argumentative presentation.

This reflection shows how important the feedback was for this student to internalize the content of the course and begin to struggle through the difficult concept of writing a multi-media argument. None of the students mentioned the evaluation criteria or the rubric. Student responses encapsulated how they felt about one another, “thank-you for being a leader in the class” and “its been a pleasure interacting with you this semester.”

Every student felt as if they had gained much from the class experience and this was evidenced in the deep thread depth and the quantity of evaluation criteria that was addressed in each assignment analyzed. Regardless of how painful the technological complications were in working in an online environment as well as developing their own web pages, they all felt a

sense of accomplishment from hanging in there with the course and each other. They relied on one another for the feedback and trusted the instructor's lead in guiding their thinking.

Use of the CT Rubric

While this course had the highest level of interaction among all three of the courses included in this study, the instructor saw the use of the rubric as problematic in his course. Analyses of the threaded discussions indicate that students did address a majority of the criteria supplied to them for construction of their assignments. Students appeared to either address the content specific criteria more often than the criteria gleaned from the CT Rubric or they addressed the rubric criteria more often than the content specific criteria. Overall, a majority of the students addressed both elements of assignment criteria. Perhaps seamlessly integrating the CT Rubric with assignment elements would alleviate this issue and students would be able to better focus on one set of criteria. The syllabus for this course referred to the rubric and it was supplied to the students at the beginning of the term. Use of the rubric was embedded in the ways in which the instructor and VF interacted with the students.

The SHS Course

There were 46 students enrolled in the distance SHS class. Thread depths were typically two or three deep and some original posts were not commented on by the other students in the class. Many of the longer discussions involved interplay of communication between the instructor and a student.

The first SHS assignment analyzed was asking about how we are socialized. The students were supposed to respond to the question, “Can we unlearn that which is a part of you and what are the implications?” In the analysis of this course, I added the category “terminology” because this was such a huge part of the class and something that the instructor commented on to the students and in my interview with him. The first four assignment evaluation criteria are directly from the CT Rubric while the last element is an implied criteria rather than a clearly stated one in the assignment by the instructor. Table 8 outlines the coding categories and number of student responses:

Table 8

SHS Discussion 1

Assignment Evaluation Criteria	Number of Comments
Identify and summarize the problem/question at issue	33
Present own perspective and position as it is important to the analysis of the issue	36
Identify and consider other salient perspectives and positions	30
Identify and assess conclusions, implications and consequences	31
Terminology	5
Off topic	12

Off topic comments were coded. For example, a student might have had an eloquent post but did not frame it toward the course subject matter. In cases of this nature, the student would get “credit” for addressing the evaluation criteria but was also coded as being “off topic.” I felt this was important to know and might illuminate problems within assignment construction. In this particular assignment, the instructor’s prompt gave an example of unlearning a nursery rhyme like “Mary Had a Little Lamb.” Many of students discussed the nursery rhyme rather than the misconceptions/stereotypes we become socialized to believe about persons with disabilities. This is problematic because it shows that the students understood how to use the evaluation criteria but may not have understood the assignment itself.

Student responses were also evaluated based upon criteria which are outlined in Table 9:

Table 9

SHS Discussion 1 - Responses 1

Evaluation Criteria	Number of Comments
Use the same criteria in your response to original posts	22
Make connections to specific examples in other’s posts for your discussion	22

Although students were not required to respond to a specific number of original posts, critical engagement was a large element of this class and responding to other’s posts was required. The first two assignments analyzed had a paragraph stating the dialogue specifics.

Finally, use the same evaluation criteria (above) in your discussion, to give feedback to other members of the class, to assess how well others have met these expectations in their post, and to suggest ideas for improvement: Also, make connections to specific examples in other classmate's posts that may help to build on, refine, and deepen your discussion. Remember this dialogue is a vital element of the class. The intention is for you to critically engage with this material in collaboration with the rest of the class. In your exchanges, demonstrate the ability and willingness to participate in constructive dialogue by clearly and convincingly

arguing your position, listening and questioning so as to understand differing viewpoints, and maintaining respect for others who have views you don't share.

There were 37 original posts and 27 responses. The original posting student replied to responses eight times and made two revisions to their previously stated ideas and perspectives. A teaching assistant was not present in the course. The instructor made 19 comments. There were eleven students who made their posts or responded to discussions two weeks or more after the first post to the discussion. One student said, "I guess I forgot to do posts on a couple of the first discussion topics early in the semester, I'm going to cover them now. Better late than never... I hope." Perhaps other students in the class also forgot to participate in early discussions and this accounts for the discrepancy between original student responses and the amount of students enrolled in the class.

Students used a variety of alternative perspectives rather than what was presented in the readings. Some of them sought outside academic sources while some of them drew on experience. One student stated what she felt persons with disabilities wanted and backed it up with an outside source. In this thread another student came back and said "I agree, and I would like to add to your argument" beginning to build upon what their classmate had stated with their own perspectives and evidences. At one point in this discussion the instructor responded by saying "watch your language. 'the disabled' and 'disabled people'." After which the student responded indicating that they didn't understand what the instructor was saying, this student felt that she had used proper terminology. The instructor followed up by recognizing that the student had just used proper terminology in their response. This was the only level of interaction from the instructor in this discussion. Students were engaged with one another, however, most of the

responses were evaluative rather than building upon ideas of each other or asking probing questions.

The second assignment analyzed asked the students to discuss the question, “Are we afraid of the unknown?” in relation to class readings about privilege and oppression. The four criteria used to evaluate the assignment were all directly pulled from the CT Rubric, there were no content specific criteria. The coding categories are the same as with the previous assignment and are presented in Table 10:

Table 10
SHS Discussion 2

Assignment Evaluation Criteria	Number of Comments
Identify and summarize the problem/question at issue	35
Present own perspective and position as it is important to the analysis of the issue	37
Identify and consider other salient perspectives and positions	36
Identify and assess conclusions, implications and consequences	34
Off Topic	19

Students received a code for being off topic when they made a post that did not address the subject matter of the class. Many students had well thought out postings; however, 19 of them were enough off topic that their post had little to do with the issues of disability. Perhaps this had to do with the wording of the question, or the sensitive and uncomfortable nature of discussing disability. Another idea as to why so many students were “off topic” that this discussion began relatively early in the semester, the second or third week of classes. Over 20 postings were done more than two weeks after the first posting of this assignment, some as late

as the week prior to finals week. These last postings in this discussion had fewer “off topic” threads, perhaps because the students had synthesized what they had learned through the semester.

The response evaluation criteria are also the same as in the previous assignment and are listed in Table 11:

Table 11

SHS Discussion 2 - Responses 1

Evaluation Criteria	Number of Comments
Use the same criteria in your response to original posts	12
Make connections to specific examples in other’s posts for your discussion	15

The instructor made five comments in this discussion. There were 39 original posts with 25 responses. An original poster replied five times to a response and revised their originally stated ideas two times. One original posting student, having commented on some students’ earlier posts, was in agreement with the post of another student, “even though it contradicts an opinion I had quite early on in this discussion – it made me reexamine my view!”

Many of the off topic posts were distant from the course content of people with disabilities. Students were trying to draw similarities between other groups and persons with disabilities. The goal was missed in many of the postings. One student responded to another by saying, “I’m not sure that you completed the assignment. You could take a look at the evaluation criteria.” In the posts that did address the assignment the students would often only refer to persons with disabilities in passing rather than stating a strong argument or comparison. This is problematic because it appears that they did not understand the goals of the assignment

clearly and were having a difficult time staying on topic. Again, instructor responses were mostly centered on terminology rather than guiding the students' learning or asking probing questions. Although some students commented on changing their perspective, this was the exception rather than the norm. The small thread depth is most likely contributable to the lack of instructor interaction. Because the instructor commented on few occasions with low critical engagement, the students did not know how to probe each other for deeper conversation or meaning. Many of these responses focused on agreement and had little critical engagement with the course content.

The final class assignment was a group project. Students were assigned by the instructor to pro and con groups for different issues that have an impact on people with disabilities. The groups were arranged around the topics of the Americans with Disabilities Act, humor, inclusion, and euthanasia. Students were required to debate the side of the argument which they were assigned. Each specific group had questions that they were to address within their argument which were considered elements of evaluation criteria. These group specific criteria ranged from six to eight. Elements of the CT Rubric were the criteria that every group needed to address within their posts. This was the first assignment where elements of the rubric were not solely used as evaluation criteria. In presenting the tables, each specific assignment evaluation criteria is shown first by group. Following that presentation the table of the CT Rubric criteria is presented, combining every group. Students had between 14 and 16 total criteria to address in their discussion. Unlike the first two assignments the only clear guideline or criteria for a response was that the responding student needed to ask a question relevant to what the original posting student was commenting on. The categories and number of student responses are listed

first by group and last by the criteria applicable to the entire assignment in Tables 12, 13, 14, 15, and 16.

Table 12

SHS Discussion 3 - ADA 1

Assignment Evaluation Criteria for the ADA Group	Number of Comments
Definition of disability: based on functional limitations? (ADA pro and con)	6
Reasonable accommodations: allows room for negotiation? (ADA pro and con)	2
Otherwise qualified: protects employees? (ADA pro and con)	5
Employment: Who must comply? (ADA pro and con)	2
Undue hardship or burden: protects small businesses? (ADA pro and con)	3
Cost of accommodations: most accommodations are low cost? (ADA pro and con)	6
Job interview restrictions: protects applicant? (ADA pro and con)	2
Essential job functions: protects employee and employers? (ADA pro and con)	3

Table 13

SHS Discussion 3 - Humor 1

Assignment Evaluation Criteria for the Humor Group	Number of Comments
Increase awareness (humor pro)	1
Personal: jokes and teasing (humor pro and con)	4
Media: movies and TV (humor pro and con)	2
Satire (humor pro)	1
“In group” and “Out group” humor (humor pro and con)	5
Teaching technique (humor pro)	2
Exploitation (humor con)	5
Stereotyping (humor con)	4
Motivation for using humor (humor con)	4

Table 14

SHS Discussion 3 - Inclusion 1

Assignment Evaluation Criteria for the Inclusion Group	Number of Comments
Acceptance (inclusion pro)	4
Opportunities (inclusion pro)	2
Socialization (inclusion pro and con)	6
Superior curriculum (inclusion pro)	1
Education of non-disabled students (inclusion pro and con)	1
Equity (inclusion pro)	3
Teasing (inclusion con)	2
Specialized teaching not available (inclusion con)	0
Superior curriculum in separate classroom (inclusion con)	0
Cost of accommodations (inclusion con)	0
Teachers have too much to do (inclusion con)	1

Table 15

SHS Discussion 3 - Euthanasia 1

Assignment Evaluation Criteria for the Euthanasia Group	Number of Comments
Definition of assistive suicide (euthanasia pro and con)	1
Definition of euthanasia (euthanasia pro and con)	3
Passive euthanasia (euthanasia pro and con)	3
Active euthanasia (euthanasia pro and con)	3
“Slipper slope” theory (euthanasia pro and con)	4
Who decides? (euthanasia pro and con)	6
Oregon’s law (euthanasia pro and con)	2
The Netherlands (euthanasia pro and con)	1

Table 16

SHS Discussion 3

Assignment Evaluation Criteria for all Groups	Number of Comments
Identify and summarize the problem/question at issue	28
Identify and consider other salient perspectives and positions	20
Identifies and assesses the quality of supporting data/evidence and provides additional data/evidence related to the issue	16
Identifies and assesses the key assumptions (identifying the paradigms)	18
Identifies and considers the influence of the context on the issue	15
Identify and assess conclusions, implications and consequences	25
One original source	27
Asked a question as a response to an original post	51

This assignment had 37 original posts. The original posting student replied to responses 13 times and revised their original ideas three times. There were 81 student and three instructor responses. It appears that fewer students addressed the bulk of the criteria which might be in relation to the number of criteria present for students to incorporate into their assignments.

This discussion area was set up for student presentations and this assignment shows the highest levels of student involvement. Students responded to the presentation by asking questions as a requirement of the assignment. Questions posed by students asked for deeper knowledge and understanding of the topic. Also, students drew inferences on the comments of others which added to their original argument. Again, the instructor was not an active participant

in the discussion his comments consisted of “watch the terminology.” In one response he commented on how he liked what the student had said and had a brief discussion with the student.

As the semester progressed the students became better at providing feedback to one another. The feedback they provided each other toward the end of the semester probed the deeper knowledge and helped them to stay on task. Although instructor comments were sparse, the students figured out how to contribute to one another’s learning in meaningful ways. Also, the depth of the discussion threads became deeper toward semester’s end, indicating an increase in student engagement with one another and the course content. Lastly, as evidenced by the revisions in the last assignment, students were grappling with and internalizing the comments and suggestions of their peers. This last observation is conducive with the research of Bereiter and Scardamalia (1987), suggesting that students at any academic level improve upon their written work and build deeper knowledge through their interactions with peers.

Use of the CT Rubric

Many students in this course were off topic in their discussions of course content. This indicates some confusion as to assignment goals, expectations, and perhaps criteria. In some cases the assignment criteria were quite extensive. The analysis of these discussions showed that the more criteria in an assignment, the fewer criteria a student would address. This supports the argument for a seamless integration of the CT Rubric with the assignment goals and expectations. Students seem to lose focus when they have several things to keep in mind when constructing their assignments. However, because so many students were off topic and in some cases did not address a variety of criteria elements, evaluation of course assignments might be another important study. These two issues of getting the students to respond and getting them to

respond given the sensitive material of the course have real implications for instructors teaching similar courses. In this course the students might have benefited and been able to better model critical thinking had the instructor modeled his expectations of communication for them. The lack of breadth and depth in the student communications allowed the students to go off topic more frequently and not address all the elements of the assignment evaluation criteria. Although the CT Rubric has been implemented in this course, the implementation was passive. Evidence of introduction to the rubric and explanation of how to use it was not witnessed. It is likely that by the time students have reached this point – 400 level coursework – they have been introduced to the CT Rubric at some earlier point in their studies. Students were not explicitly asked to draw on earlier acquired knowledge or make links between that knowledge and the content of the course, which might be one reason why many of the assignment evaluation criteria were not addressed and there were a number of off topic comments.

Section Summary

Feedback is at the heart of student performance in online classes. They want it and instructors struggle with how to provide adequate and meaningful feedback. As Angelo and Cross (1993) have pointed out, this is a critical element of student growth. The feedback should be two way; instructor to student and student to instructor, in order to foster critical thinking skills. Students feel like instructors care about them when he/she is engaged in classroom conversations, providing meaningful and respectful feedback. Absence of instructor presence in online dialogue leaves students wondering how to model ambiguous expectations. When confusion exists, students withdraw and do not push themselves academically.

Confusion is evident in the math class as this is very likely the first opportunity for many of the students to work in an online course environment. Also it is the first time many of them have been asked to verbalize their mathematical operations and provide justification as to why they approached certain problems the way that they did. Introduction to evaluation criteria and critical thinking exercises may be new to this group of students as well, but it is the introduction that is essential to building a foundation for future academics.

Students in the SHS course exhibited some confusion. When asked to draw conclusions about privilege and oppression of persons with disabilities, using the model that Allan Johnson (2001) created, and trading the terms 'white' or 'male' to those of 'non-disabled', students often did not address the assignment as required. More than half of the students responding to this assignment were off topic in their posting. Level or lack of instructor feedback might be one reason why students were off topic in this discussion. The instructor did comment frequently about the students being off topic but did not probe or ask critical questions in most cases. Students might have been confused about how to satisfactorily address assignment criteria.

This study identifies and supports evidences found by Shavelson and Huang (2003) that content knowledge and critical thinking are taught separately. Implementation of the Critical Thinking Rubric in these courses does not alleviate this problem. Methods that instructors employ in guiding the thinking of their students and feedback seem to be more important in the development of critical thinking skills. Use of the rubric is problematic when it is not embedded within the content of the course or assignment because students become confused about which criteria to address and how to apply the elements of the rubric into their work. The rubric is meant to guide thinking rather than be specific criteria that students need to address and as a result complicates what instructors are teaching and assessing. For example; if an instructor has a student address the elements of the rubric then assesses for content knowledge, it is logical that confusion exists among students about what to address. On the other hand, if the instructor is teaching to the content and assessing for elements of critical thinking, this creates problems for the instructor in his or her assessment of student performance as the students may not understand the depth of thinking that is required of them. The Math instructor stated that she can only evaluate the students on what they give her, as a result if she is not requiring them to access their higher order thinking abilities the students may not respond to unstated expectations. Chapter 5 summarizes the general themes from the analysis and offers suggestions for future research.

Chapter 5

Discussion of Conclusions and Implications

The purpose of this section is to explore and combine the three areas of research as well as address the research questions stated at the beginning of this thesis: How are instructors using evaluation criteria or the Critical Thinking Rubric to facilitate critical thinking in online courses? How are instructors implementing or working with the Critical Thinking Rubric in online courses?

The following sub-sections will summarize this study and draw conclusions in relation to the research questions, while the final section will make recommendations for further research.

Summary of this Study

Active instructor participation in the discussions helps to dispel misconceptions, motivate students to produce course work, and keep the students on task. CT Rubric elements, seamlessly integrated with course content, foster cohesion between the study of subject matter content and the building of critical thinking strengths. Interaction among all players in an online learning environment facilitate the feedback loops essential in constructing knowledge and as a result, critical thinking skills, through active engagement and learning.

Student/instructor interaction was mentioned by both the instructor and student interviewees as being important. It was clear, from the threaded discussions, that when the instructor was active within the online environment that the students were more focused on the assignment. The ways in which this interaction takes place is just as important as the interaction itself. When the instructors provided feedback by identifying specific strengths and weaknesses then asking questions, students were more actively engaged participants. Furthermore, when the instructor formulated questions in response to student work, as well as made comments, students

were better equipped to address rubric elements than when the rubric was an addition to the assignment.

Using elements of the CT Rubric as assignment evaluation criteria appeared to be only as useful as the instructor's interactions with the students. Merely being present within the course did not increase the level at which students addressed the criteria in the assignment. Instructor comments that were insightful and well thought out sparked greater adherence to the criteria of an assignment, while stand alone evaluative comments stopped conversation. For all three of the classes observed the rubric was present. In two of the classes parts of the rubric were used as assignment criteria. Two of the instructors' assignments were aligned with the rubric. The primary difference in how students worked with the criteria appears to be in the level of instructor interaction or participation in the discussions.

Although all of the instructors viewed themselves as facilitators or guides, only the English instructor actively practiced facilitation. The Math and SHS instructors designed assignments as a method of facilitation. Students clearly stated that an instructor's availability and accessibility helped them to be motivated within online classes. A strong theme throughout Chickering and Gamson's (1987) seven principles for undergraduate education is faculty-student contact. In order for the students to effectively address the assignment criteria the instructor who practiced active facilitation was able to re-direct students to the task of the assignment. He guided them through his feedback which both commented on and questioned their thinking, for the students this communication showed them what his expectations were. He also commended the students for building their knowledge in ways that made sense for them. By having a consistent presence within the online course space, the students were able to see what was expected of them in their interactions and model the instructor's behavior. The role of guide was

carried out in a manner paralleling that of an expedition or safari guide; showing the path, exploring the terrain, and challenging the participants to interact with their experience. In fact this is exactly how the English instructor viewed himself and that is precisely what he did within his course.

Feedback loops, as Angelo and Cross (1993) addressed in their work, facilitate greater levels of critical thinking. They are essential in guiding a student's thinking about a particular subject. Feedback loops also allow the students to reframe their responses and revise their work based upon the guidance given by the instructor or other attentive students (Bereiter & Scardamalia, 1987). Since interaction is at the heart of online courses (Gunawardena et. al., 1997; Hara & Kling, 2002; Hara, 2002) instructors must model the type of communication that they expect and show students how to critically think about the content.

As a tool to facilitate course discussion the CT Rubric is valuable, however, this value is directly linked to how the instructor chooses to work with it. Integration into assignments, theoretically, can assist the students in developing their ideas. When it is merely tagged on as an addendum to assignment evaluation criteria, it then becomes the thing that the students address rather than the course content. In this case, the instructor is teaching to the rubric rather than the content. Instructors and course designers need to ask what they want students to learn in the class, critical thinking or course content. Design of the assignments should facilitate critical thinking and the rubric can assist an instructor in questions to pose and requirements for the assignment. Ultimately, it is the instructor's responsibility to set the tone for the class that will direct students in how to work with the rubric or criteria.

Instructor Methods and Student Perceptions

Instructors participating in this study employed a variety of methods to encourage development of student critical thinking and analysis of course content. Their years of teaching experience enabled them to understand the ebb and flow of student interactions as well as make course changes based upon those needs. Interaction and feedback were considered an essential element of impacting students in thinking about an assignment, according to both the instructors and students involved in the study, supporting the work of Bereiter and Scardamalia (1987).

Students indicated that they wanted more interactive learning opportunities and instructors indicated a struggle with how to bring those projects into their online classes. Modeling timely feedback and interaction was one way that the English instructor assisted the students in progressing through his course. As he modeled what he wanted the students to do, how he wanted them to interact and provided meaningful feedback; so too, were the students able to establish a suitable feedback system within their online community. Critical thinking in this course was facilitated through the integration of Chickering and Gamson's (1987) principles of good practice in the instructor's method of teaching the course.

The issues in the math course seemed to center around the idea of feedback and interaction. Discussions were brief and did not extend beyond the assignment criteria, and in many instances did not fully address the requirements. Whether involvement of the instructor would have increased communications in this class, I can't be sure. Hybrid classes typically have declining levels of interaction amongst the students; however, the academic level of the students might have been one reason why interactions were restricted. Subject matter might have been another reason why students did not have deep discussions, debating mathematical concepts. Due to the lack of feedback loops within this course among the instructor and

students, the students were not made aware of changes being made by the instructor in assigned discussion areas and also were not encouraged to interact with each other at higher levels.

Angelo and Cross (1993), explicitly state that feedback loops are at the heart of communications while Gunawardena et. al. (1997), Hara (2002), and Hara and Kling (2002) show how communications in online environments help to socially construct knowledge. These ideas support more frequent guidance by the instructor in order for students to understand their misconceptions and begin to reframe their ideas.

The SHS course had the largest number of students and had a fair amount of interaction and feedback occurring within the discussions. Sensitive subject matter might have contributed to the moderate level of discussion within the course. Educational conditioning to withhold stating unpopular ideas because of inflammatory beliefs, may have kept some of the students from speaking their mind while for others who were expressing the more mainstream ideas, they were able to espouse their ideas and find agreement among their peers. Some students definitely had strong feelings about issues of disability and many students walked away from the course thinking more critically than in their initial discussions. The interchange of ideas in this course was infrequent, which contributed to the lack of breadth and depth in student comments. Since students were not challenging one another and the instructor infrequently provided more feedback than, “watch the terminology,” students were not reworking their ideas. As Bereiter and Scardamalia (1987) pointed out in their work, the “conversational interchange” allow students to build their ideas and knowledge (p. 89). Because the instructor did not model the type or level of communication that he wanted the students to have in this course, student comments suggest that they viewed his expectations as being low and addressed the assignments accordingly (Chickering & Gamson, 1987). Furthermore, the first two assignments in this class

made use of the rubric elements exclusively rather than defining alternative evaluation criteria for those assignments.

Although many of the students interviewed were considered self-directed learners many of the threaded discussions indicated that there may be a relationship between students being motivated in the course or assignment when the instructor is actively engaged in the online dialogue. Active involvement in online discussions by the instructor not only models what he/she wants students to be doing, it also prompts students to go more into depth with the assignment, think about the content in new ways, and begin to develop critical analysis skills appropriate for peer interactions. Furthermore, through the feedback from the instructor, students were able to gauge how well they understood the course material. Instructors, who guide students learning, can push students' development of critical thinking to higher levels and create an environment of peer-to-peer learning within their classrooms. This supports the work of Chickering and Gamson (1987), Gunawardena and colleagues (1987), Hara (2002), Hara and Kling (2002), as well as Benson (2003), and Shavelson and Huang (2003). In summary they all acknowledge that feedback is essential in constructing knowledge and critical thinking skills. Critical thinking can be guided through the feedback provided by an instructor (Angelo & Cross, 1993) so that students can revise their work and ideas in threaded discussions.

Online environments are a constant juggling act for instructors and for students. Interaction and monitoring conversations requires an enormous amount of time. However; interactions by the instructor are consistently rated as one of the biggest concerns for students enrolled in online courses (Hara & Kling, 2002). It is through this constant and consistent monitoring that the instructor can evaluate how well students are acquiring the requisite course

knowledge, which in the end makes formative assessment of student progress fairly simple (Benson, 2003).

By staying active within discussions, the instructor can monitor student progress and the students stay motivated to do the work. Evidence of this is the timing of postings in the SHS course as compared to the English course. Because the English instructor made comments to many of the students and was engaged in conversations, students took the lead and continued to respond to one another and post relevant material. In SHS several students did not post to the discussions in a timely fashion, many waited until the end of the semester. This is problematic because assignments build on each other, and when a student goes back several months later to post to a conversation, they are now approaching the assignment with knowledge that they have gained throughout the semester. It is difficult – if not impossible – to gauge how much a student has learned through the course of the semester, if ideas and views have changed, and if they have been able to take alternative perspectives and analyze them if they are not addressing the assignments until all the course content has been taught.

Implementation of Evaluation Criteria

One issue in the SHS class that was mentioned by a student was the location of course elements. Some of the elements were located in the course space while others were linked to a separate web page. When a student approached an assignment they had to look in a variety of places to get the full information needed to complete the assignment. The assignments in both math and English had all of the elements embedded within the specific assignment, so the students did not need to go anywhere else to acquire further information for them to complete the work. Having the assignment elements and criteria in one spot for easy access is an advantage to the students.

Scholars discussed in the literature review section of this thesis all point to some form of feedback and active learning as essential components to facilitate critical thinking. The online environment is ripe with active learning possibilities and opportunities for high levels of interaction, as exhibited in the English course (Benson, 2003). Deliberately implementing the rubric as separate from assignment evaluation criteria can be accomplished successfully. Communication between instructor and student is key in making this happen and allows for authentic assessment of student learning (Jaffee, 2003).

A seamless integration of CT Rubric elements into the evaluation criteria was clear in the Math class; however, little content engagement was witnessed. Although, the rubric elements were separate from the assignment evaluation criteria in the English class, the guidance of the instructor was instrumental in showing students how to work with the rubric. The SHS assignment's used CT Rubric elements as the only evaluation criteria, but little guidance from the instructor in how to work with those elements was a critical component to the low levels of student engagement and critical thinking. Again, feedback was the key component in successfully implementing the rubric into course assignments among all of these classes. Rubric use in the Math course was passive, while use of the rubric in the English and SHS course was overt.

In implementing elements of the CT Rubric, the English instructor modeled what he asked of the students. This implementation was deliberate and active, in the sense that the rubric was there, he modeled how to use the rubric to guide thinking about the content, and it was referred back to by the Virtual Facilitator in the course. He provided critical feedback and in turn listened to the students, building a feedback loop as an element of collaborative learning posited by Angelo and Cross (1993). Instructor feedback helped the students to create a

reciprocal and cooperative environment in which they were able to engage one another and challenge each other's ideas, an essential piece of Chickering and Gamson's (1987) principles of good practice. The way that this class was designed allowed for the simultaneous development of critical thinking skills and content learning as argued by Hemming (2000). Instead of teaching to the CT Rubric, this instructor avoided that method by being engaged with the discussions and guiding the students to build knowledge and critically analyze aspects of the content. Building on background knowledge was encouraged and students were able to draw upon this to formulate conclusions about what they were learning in the class, another key argument stated by Hemming (2000).

Passive use of the rubric as assignment evaluation criteria did not encourage or support the simultaneous development of critical thinking skills and content knowledge. Furthermore, "extensive engagement, practice, and feedback" in the English course along with the active use of the rubric enabled students' transference of content specific knowledge in a broad domain (Hemming, 2000, p. 13). The ability to find links between prior knowledge and future knowledge is the over arching goal of teaching critical thinking. Implementation of critical thinking components, when tied to the assignment in an integrative fashion, allows the instructor to teach the course content while encouraging critical thought. This is accomplished best when instructors remain active within the dialogue of the course, consequently one of the main concerns of students in Hara and Kling's (2002) study and commented on by students in this study.

Although only Benson (2003) mentioned rubrics, none of the reviewed scholars talked about how to implement a rubric within a course to foster increased levels of understanding among the students. The primary correlation between the literature reviewed on critical thinking

and this study shows that critical thinking and course content need not be separate. In fact, when they are separate, the instructor is more likely to teach to the critical thinking piece rather than subject matter specifics and assess for the subject matter specifics. Two of the courses, due to the split in critical thinking elements and evaluation criteria appeared to be doing just that, which accounts for some of the off topic comments, not addressing evaluation criteria elements, and lack of breadth and depth in the discussions.

Suggestions for Implementation of Evaluation Criteria

Lastly, many students did not address all of the assignment criteria. In fact some criteria in some assignments went unaddressed by every student. Perhaps students have a difficult time focusing on several criteria, indicating that the instructor might need to merge the assignment criteria with evaluation criteria. If an assignment has three elements that need to be addressed and then also states that three elements of the CT Rubric need to be used, students tend to overlook some elements. Either they address the assignment elements or the CT Rubric elements, much like the English instructor had commented on in his interview. In assignments where CT Rubric criteria were built into the assignment elements, students responded to more of the criteria than in assignments where these were split into two categories. These observations support what Hemming (2000) stated about not linking the critical thinking piece to the content of the course, students treat these two elements as being separate and become confused as to what criteria to address and how to address them. For ease of student evaluation the two elements need to be merged.

A more deliberate and integrative method of using the rubric needs to be employed by instructors. Simultaneously teaching the course content and critical thinking elements can be better addressed when use of the rubric is deliberate (Hemming, 2000). Through timely

feedback (Chickering & Gamson, 1987) students will learn what is expected of them and begin to model their interactions after those of the instructor. High levels of interaction among the students and among the instructor and students fosters critical thinking when questions are posed and ideas are challenged (Bereiter and Scardamalia, 1987). This interaction is at the heart of building critical thinking skills in students who enroll in online courses. The environment supports active learning through this interaction among the participants and there is much that students can gain through communicating with one another (Benson, 2003). Communication in online courses allows students to build their ideas on the ideas of others within the classroom, creating a revision process through the typed word (Bereiter & Scardamalia, 1987; Benson, 2003).

The strongest indications from the study: instructor feedback, volume of evaluation criteria, and imbedding the Critical Thinking Rubric, provide the foundation for practical suggestions. To fully integrate the CT Rubric into the course, the instructor needs to model the level and type of critical thinking he/she expects and have the criteria embedded within the assignment. Full integration the CT Rubric with assignment criteria may help to alleviate student confusion, off topic discussions, and level of engagement with course content while guiding the development of critical thinking skills and providing an easier framework through which instructors can assess student performance. By maintaining the level of fragmentation between the rubric and assignment criteria, instructors are continuing to support a disjointed development of thinking abilities with content specific expertise. Joining the two as seamlessly as possible will contribute to developing these skills in unison as Benson (2003) and Hemming (2000) state in their articles.

Addressing the integration of the rubric with assignment criteria will also alleviate the number of criteria students need to respond to and address. Assignment elements should emulate the CT rubric rather than make specific reference to it. Faculty and course designers making specific use of the rubric in creating course assignments and guiding their own interactions with students would witness a greater benefit. Confusion as to what needs to be addressed and at what levels of engagement with course content was stated by students and witnessed through analysis of threaded discussions. Fewer criteria will allow students to meaningfully focus on the content that the instructor deems necessary to the course and encourage time on task. Furthermore, this will guide students to see the interconnectedness of course concepts with real world application.

Feedback is at the heart of teaching critical thinking. Angelo and Cross (1993) point out the importance of feedback loops in guiding student development of thinking abilities. In the English course the instructor and Virtual Facilitator both provided meaningful feedback, probing student ideas and positions. This type of feedback challenges students and pushes their thinking beyond what they are comfortable with while dispelling misconceptions and guiding the conversations. A critical element of higher order thinking, feedback is essential to helping students develop their critical analysis abilities. When course criteria are clear and clearly tied to the assignment and when instructors ‘coach’ students in how they want them to learn, instructors are better able to facilitate critical thinking. Furthermore, when students can see examples of critical thinking and how to interact, they will view this as an instructor’s expectations and model that behavior. It becomes clear to the students what is expected of them in an online class. Faculty can pose questions that draw from the principles of the rubric as a form of guidance and to facilitate further discussion.

Recommendations for Further Research

This study investigated how instructors are implementing the CT rubric or evaluation criteria in online courses. Further research is needed to determine the level of instructor interaction and the role that plays in student motivation and engagement with the course content. Conclusions from this study indicate a potential correlation between these two dynamics and it would be pertinent to determine if that correlation exists and at what level instructors need to interact to facilitate higher order thinking, engagement, and motivation.

In furthering this research some issues to analyze might be: instructor critical feedback, redirection to the topic of the assignment, and how an instructor challenges students to think critically. Feedback, according to Angelo and Cross (1993), is essential in establishing classroom community and contributes to the overall education of the student; however, research has not been conducted on what methods or depth of feedback foster greater levels of interaction and critical thinking among students. Future research in this arena would explore the type of instructor feedback that facilitates the greatest critical thinking among students in a classroom.

How an instructor approaches redirecting student conversations may also play a role in how students synthesize course concepts. As shown by the threaded discussions in the SHS course, the students were off topic frequently. The instructor of that class attempted to redirect students to stay on topic, few students revised their posts to address the topic of the assignment. Future research needs to explore the varied methods of interaction in an online environment and how it contributes to the overall growth of critical thinking skills in students.

Challenging students to think beyond the course content is tied to feedback and redirection. Instructors often challenge students by presenting the content of the course. Questions are posed to the students to get them thinking about the content in new ways. Certain

types of questions will certainly either stop a conversation while others will probe the students' cognitive abilities. How instructors use these different types of questions to foster critical thinking and increase interactions within their online courses would coalesce easily with instructor feedback and redirection. Future research about the types of interactions and communications that happen in online learning environments is needed to understand which methods foster greater levels of critical thinking.

Conclusion

This study examined how instructors were facilitating critical thinking in online courses through the use of evaluation criteria. A second aspect of the study was student perceptions of evaluation criteria and how those perceptions align with instructor methods. Through analyzing the interviews it was shown that the student participants in this study work toward what they view as the instructor's expectations. Instructors in online environments communicate their expectations through interaction in online discussions and feedback to the students. When levels of instructor comments are high and meaningful, the students work at higher levels because they see the instructor as being engaged and therefore as having higher expectations. Merely communicating expectations through the use of a tool such as Washington State University's Critical Thinking Rubric does not translate as high expectations to the students. Furthermore, instructors who make use of the rubric need to be sure that they are integrating it into their assignments and modeling critical thinking themselves. If the rubric is not fully integrated, instructors may find themselves teaching to the rubric rather than the course content. As Hemming (2000) pointed out, content and critical thinking should be taught simultaneously, but often times they are taught separately. This disjointed type of teaching encourages students to

build subject matter knowledge in a silo without linking new knowledge to what they already know or what they are learning.

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Appendices

Appendix I

Description of Site and Courses

This research is based on data gathered at Washington State University. A convenience sample was used to gather data which is not representative of the University as a whole; rather it will provide preliminary research in an area that can be further explored at a later date. Courses identified by the teaching and learning center's staff will constitute the sites of data collection. The researcher has been in contact with the proposed instructors of the courses, having conducted similar research for the CTLT as well as discussed ideas for this study with them.

Site Number 1 – 100 Level Math Course

The first course is a 100 level math course. This course is a prerequisite for math majors and students going into sciences such as physics. It is taught each semester by the same professor who conducts a face-to-face portion and integrates an online Learning Management System (e.g., WebCT or the Bridge) into her course. Before teaching math, she was a faculty member in the Physics Department at the same university; due to relocation she left the Physics Department. Upon returning to the area a short time later, her job in Physics was no longer there, so she went to the Math Department. Many of her students are on campus, are traditionally aged, and this is often their first math course at the university level.

Site Number 2 – 300 Level English Course

The second course is a 300 level English course. This course is an elective and is taught completely online. Many of the students for this course are non-traditional, with families and full-time jobs, and typically do not live near campus. The instructor has been teaching this course for a number of years and the subject matter of the course integrates technology with the discipline. The instructor is a staff member of the teaching and learning center at the institution and has a variety of roles within the center. One of those roles involves writing computer

programs while another involves creating databases in Microsoft SQL (Structured Query Language) Server©. He was also one of the people who developed and wrote the code for the Learning Management System he chooses to use for teaching this course, the Bridge (<http://bridge.wsu.edu>). This instructor is extremely comfortable with the use of technology in the classroom and teaching courses that are offered completely online.

Site Number 3 – 400 Level Speech and Hearing Sciences Course

The third site is a 400 level speech and hearing sciences course. This course fulfills the diversity requirement that all students at the university must have in order to graduate. The course was created over 13 years ago to fill a need and because of the assistance of the Chair of the Speech and Hearing Sciences (SHS) Department, the course remains in that department. Development of the course was a collaborative effort between the instructor, who has been teaching this course since its inception at the institution, the Chair of the SHS Department, and CTLT. The instructor for this course is the Americans with Disabilities Act Coordinator at the university.

Appendix II

The Washington State University Critical Thinking Rubric

1) Identifies and summarizes the problem/question at issue (and/or the source's position).	
Scant	Substantially Developed
Does not identify and summarize the problem, is confused or identifies a different and inappropriate problem. Does not identify or is confused by the issue, or represents the issue inaccurately.	Identifies the main problem and subsidiary, embedded, or implicit aspects of the problem, and identifies them clearly, addressing their relationships to each other. Identifies not only the basics of the issue, but recognizes nuances of the issue.
2) Identifies and presents the STUDENT'S OWN perspective and position as it is important to the analysis of the issue.	
Scant	Substantially Developed
Addresses a single source or view of the argument and fails to clarify the established or presented position relative to one's own. Fails to establish other critical distinctions.	Identifies, appropriately, one's own position on the issue, drawing support from experience, and information not available from assigned sources.
3) Identifies and considers OTHER salient perspectives and positions that are important to the analysis of the issue.	
Scant	Substantially Developed
Deals only with a single perspective and fails to discuss other possible perspectives, especially those salient to the issue.	Addresses perspectives noted previously, and additional diverse perspectives drawn from outside information.
4) Identifies and assesses the key assumptions .	
Scant	Substantially Developed
Does not surface the assumptions and ethical issues that underlie the issue, or does so superficially.	Identifies and questions the validity of the assumptions and addresses the ethical dimensions that underlie the issue.
5) Identifies and assesses the quality of supporting data/evidence and provides additional data/evidence related to the issue.	
Scant	Substantially Developed
Merely repeats information provided, taking it as truth, or denies evidence without adequate justification. Confuses associations and correlations with cause and effect.	Examines the evidence and source of evidence; questions its accuracy, precision, relevance, completeness.

Does not distinguish between fact, opinion, and value judgments.	<p>Observes cause and effect and addresses existing or potential consequences.</p> <p>Clearly distinguishes between fact, opinion, & acknowledges value judgments.</p>
6) Identifies and considers the influence of the context * on the issue.	
Scant	Substantially Developed
<p>Discusses the problem only in egocentric or sociocentric terms.</p> <p>Does not present the problem as having connections to other contexts-cultural, political, etc.</p>	<p>Analyzes the issue with a clear sense of scope and context, including an assessment of the audience of the analysis.</p> <p>Considers other pertinent contexts.</p>
7) Identifies and assesses conclusions, implications and consequences.	
Scant	Substantially Developed
<p>Fails to identify conclusions, implications, and consequences of the issue or the key relationships between the other elements of the problem, such as context, implications, assumptions, or data and evidence.</p>	<p>Identifies and discusses conclusions, implications, and consequences considering context, assumptions, data, and evidence.</p> <p>Objectively reflects upon the their own assertions.</p>