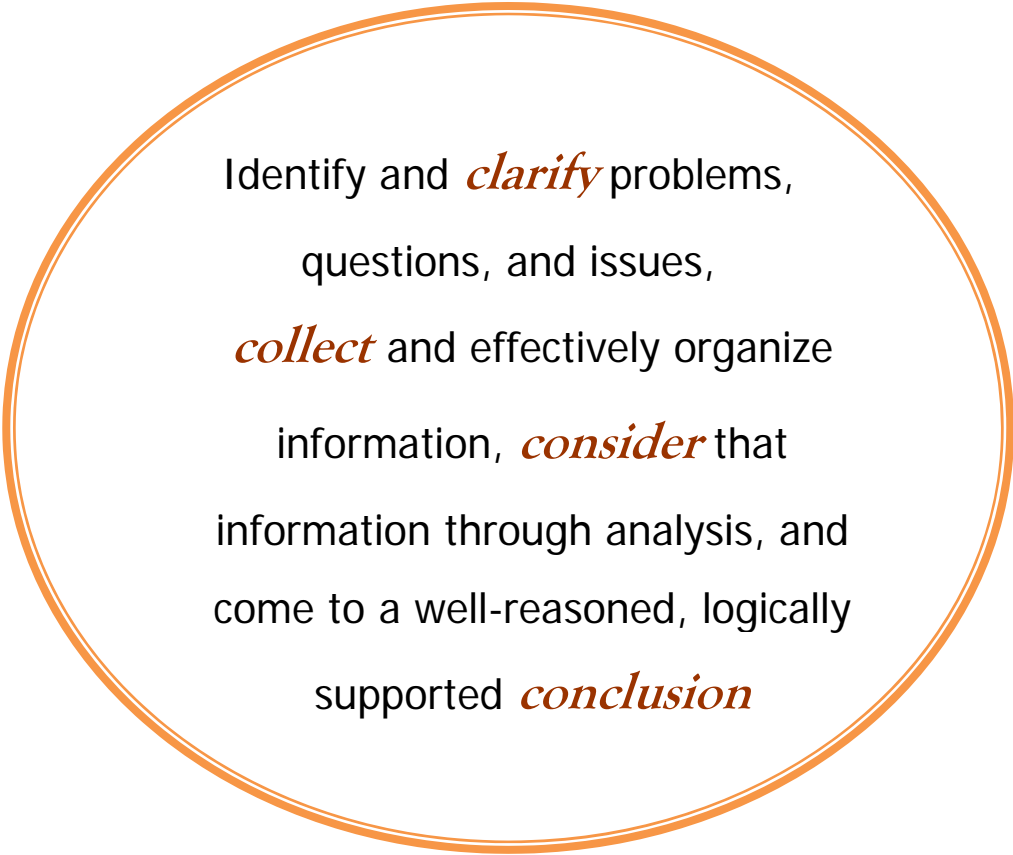


C⁴: Clarify, Collect, Consider, Conclude

Enhancing Critical Thinking



Identify and *clarify* problems,
questions, and issues,
collect and effectively organize
information, *consider* that
information through analysis, and
come to a well-reasoned, logically
supported *conclusion*

The University of Texas of the Permian Basin
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C4: Enhancing Critical Thinking

I. Executive Summary

The University of Texas of the Permian Basin (UT Permian Basin) Quality Enhancement Plan (QEP), *C⁴: Enhancing Critical Thinking*, describes a setting in which students can improve their skills in critical thinking. In order to have an early and sustained impact on entering students' skills the general education writing composition courses, English 1301 and 1302, have been chosen to be that setting. The definition of critical thinking used to focus the University's efforts within the larger field of critical thinking comes from Donald Hatcher and L. Anne Spencer who state, "*Critical thinking is thinking that attempts to arrive at a decision or judgment only after honestly evaluating alternatives with respect to available evidence and arguments*" (21).

The overall purpose of the QEP is to improve the critical thinking skills of students. At the end of the two required composition courses in which critical thinking is explicitly taught, students will demonstrate the following critical thinking skills:

Student Learning Outcome 1: *Students will be able to clearly identify and clarify problems, questions, and issues.*

Measurement: Students will have an overall satisfactory score on the course-embedded assessment(s) of *Clarity* as measured by the finalized critical thinking rubric(s).

Student Learning Outcome 2: *Students will collect and/or effectively organize information.*

Measurement: Students will have an overall satisfactory score on the course-embedded assessment(s) for *Collection/Organization of Information* as measured by the finalized critical thinking rubric(s).

Student Learning Outcome 3: *Students will carefully consider, analyze, and evaluate information in terms of its support for conclusions.*

Measurement: Students will have an overall satisfactory score on the course-embedded assessment(s) for *Analysis and Evaluation* as measured by the finalized critical thinking rubric(s).

Student Learning Outcome 4: *Students will draw well-reasoned, logically supported conclusions from information.*

Measurement: Students will have an overall satisfactory score on the course-embedded assessment(s) for *Logical Conclusions* as measured by the finalized critical thinking rubric(s).

Student Learning Outcome 5: *Students who take the two-semester ENGL 1301 and 1302 sequence in which critical thinking skills have been explicitly taught will show greater improvement in critical thinking than comparable students in*

ENGL 1301 and 1302 classes in which critical thinking skills have not been emphasized.

Measurement: Students in the C⁴ sections of ENGL 1301 and 1302 will have higher critical thinking scores on the Criticalthinking Assessment Test (CAT) than comparable students in ENGL 1301 and 1302 who have not been exposed to the explicit teaching of critical thinking skills.

Student Learning Outcome 6: *At the end of the ENGL 1301 and 1302 two-course sequence, students in the C⁴ classes will demonstrate improvement in their critical thinking scores over their performance at entry in ENGL 1301. Scores for students in the non-C⁴ courses, will be unchanged.*

Measurement: The CAT will be administered to all participating students upon entry to ENGL 1301 and exit from ENGL 1302. Each student's entry and exit score will be compared to determine whether the score has changed.

Assessments will consist of course-embedded and global assessments. The course-embedded assessments will be conducted within the two courses. The global assessment instrument is the CAT, which will be administered twice. The CAT will be taken by students in the ENGL 1301 courses at the beginning of the fall semester and by the ENGL 1302 students at the end of the subsequent spring semester.

II. Development of the QEP

A. Institutional Context

The 61st Texas Legislature authorized the establishment of UT Permian Basin as an upper level and graduate institution in 1969. It offered its first classes in 1973 and has been accredited by the Southern Association of Colleges and Schools since 1975. In 1991, the Texas Legislature authorized the offering of lower-division courses and the admission of freshmen. The first freshmen students enrolled that same fall. Since the change to four-year status, the number of undergraduate degrees conferred has grown to 627 in the academic year 2008.

UT Permian Basin is a general academic university of The University of Texas System. It is the smallest institution in The University of Texas System with a total enrollment in fall, 2009, of 3,546 students. As a public, comprehensive regional, master's granting institution located in the center of the Permian Basin in West Texas, the University is in one of the richest mineral producing regions of the world. The constituency in the focus area served by UT Permian Basin constitutes a unique demographic, highly influenced by the petroleum industry. This area is a seventeen county region of West Texas and Eastern New Mexico. In the fall of 2009, 78 percent of enrolled students came from within the institution's focus area. Students also came from another 110 Texas counties, 27 states, and 20 foreign countries. The rates of college attendance in the focus area served by UT Permian Basin are below both the state and national averages.

Graduate students comprise 23 percent of the total enrollment, and 78 percent of them are part-time. Undergraduate students comprise 77 percent of the total enrollment, and 70 percent are full time. Eighteen (18) percent of undergraduates and 34 percent of freshmen live on-campus. Many students have families, jobs, and responsibilities beyond the classroom. Fifty-one (51) percent of the student body is White, non-Hispanic and another 39 percent of the student body is Hispanic, earning the University a designation as an Hispanic Serving Institution (HSI) by the U.S. Department of Education.

New undergraduate admissions standards were implemented in fall 2009. The new freshmen class in fall 2009 had an ACT Composite of 21 and an SAT Composite of 1005. Thirty-eight (38) percent of the fall 2009 freshman class was in developmental mathematics courses and five percent were in a developmental writing course. Forty-seven percent of the University's student body receives some form of need-based financial aid (UT Permian Basin, *Common Dataset 2009-10*). Retention from the freshman to the sophomore year was 61 percent in 2008-2009 (UT Permian Basin, *2009 Quick Facts*).

Since the fall of 2000, the institution has grown by 56 percent (*UT Permian Basin, Fact Book 2*). Student enrollment is distributed among 33 undergraduate programs and 20 graduate programs (UT Permian Basin, *2009 Quick Facts*). All academic programs, while focused regionally, work to ensure that graduates are competitive both locally and globally.

B. Mission

The mission of The University of Texas of the Permian Basin is as follows:

The University of Texas of the Permian Basin is a general academic university of The University of Texas System. The University of Texas System is committed to pursue high-quality education opportunities for the enhancement of the human resources of Texas, the nation, and the world through intellectual and personal growth.

The mission of The University of Texas of the Permian Basin is to provide quality education to all qualified students in a supportive educational environment; to promote excellence in teaching, research, and service; and to serve as a resource for the intellectual, social, economic, and technological advancement of the diverse constituency in Texas and the region.

Faculty and staff members are deeply committed to student success, and it is in that spirit that UT Permian Basin offers a quality enhancement plan (QEP) focused on critical thinking skills. The QEP grew out of a sincere and broadly based effort to make a transformational difference in students' learning experiences. The critical thinking topic is in line with the criteria identified in Core Requirement 2.12. The topic was identified through a broad-based institutional process and it is a key issue emerging from student performance on the Collegiate Learning Assessment (CLA) performance task. The plan focuses on enhancing students' critical thinking abilities as demonstrated through clearly defined student learning outcomes that are aligned with the mission of the University.

The Quality Enhancement Plan focuses on strengthening the nature and quality of student thinking. The intention is to provide a platform of knowledge and experience that allows critical thinking skills to form a strong foundation that can enhance students' educational experience throughout their academic careers. The plan will use the English Composition sequence to provide a repeated and explicit exposure to critical thinking with faculty members who are trained to teach critical thinking with expertise and intention. It is our belief that students who are competent critical thinkers will experience an education that will continue to be of value to them after graduation, as they become active and productive citizens.

III. Identification of the Topic

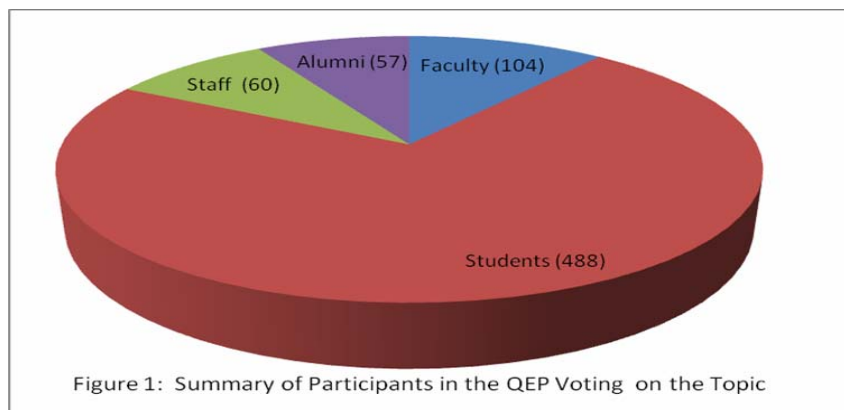
A. *Assessing the Learning Needs of UT Permian Basin Students*

Formed in the spring of 2007, the Quality Enhancement Plan (QEP) Team was charged with designing a plan with the potential to result in significant, long-term improvements in student learning. The QEP Team focused on three primary activities:

- Generating broad-based involvement in identification of a topic
- Ensuring a thorough review of the literature and campus assessment results
- Constructing a viable plan

Between the spring of 2007 and the spring of 2010, the University worked to identify the topic and design the QEP. The process used to identify the topic was broadly participatory. An initial series of open meetings was conducted to introduce the concept of developing a QEP and to solicit ideas. Attendance varied, but ranged from 15 to 40 participants. Meetings were also held with each school and the College, the Faculty Senate, and the directors in non-instructional areas. A meeting was held with the Student Senate and an open meeting with students in which pizza was provided was held in the Student Union. A Web site was also opened to allow any member of the University community an opportunity to submit a topic. Seventy-two topics were suggested. A Web survey allowed individuals to vote for and/or comment on each topic. From that round of voting, four topics emerged: (1) improvement in students' core skills; (2) improvement in remedial and developmental studies; (3) changes to the Freshman Seminar that would increase the semester credit hours and block schedule it with a general education course; and (4) improvement in students' abilities to apply critical thinking skills. The improvement to remedial and developmental studies was eliminated as a topic by discussions in the Texas Legislature about the possible elimination of remedial and developmental education at the university level. The final round of voting on the three remaining topics was conducted primarily using a Web survey, although alumni were sent a letter that allowed them to vote either on paper ballots or through the Web survey. At the end of the voting, 104 (46%) of the 224 faculty members; 488 (14%) of the students; 60 staff members, and 57 alumni voted. Improvements to critical thinking skills narrowly edged out improvements in students' core skills to become the QEP topic.

As illustrated in Figure 1, there was broad-based involvement in the process of defining the quality enhancement plan.



B. Timeline of Development for the QEP

Table 1 gives a chronological account of the events in the selection and development of the Quality Enhancement Plan.

Table 1.
Timeline of Key Events in the Development of the QEP Spring 2007 to Spring 2010

Spring 2007
The QEP co-chairs met with the newly appointed Leadership Team chair, and the institution's SACS Liaison to identify students, staff, faculty members, and administrators who were potential members of the QEP Team
Fall 2007
A series of meetings with groups of faculty, staff, students, alumni, and community leaders introduced the reaffirmation process and gathered topics for the QEP.
Analysis of the Collegiate Learning Assessment (CLA) and the National Survey of Student Engagement (NSSE) data indicated critical thinking as a possible area for improvement in a Quality Enhancement Plan.
Following the initial round of topic selection meetings, an e-mail and letter campaign to faculty, staff, students, and alumni again explained the role of the QEP in the reaffirmation process and requested their participation in identifying a topic that would increase student learning.
Spring 2008
QEP Team analyzed the 72 topics generated and narrowed them to the 16 most commonly identified topics through a process of theme analysis.
University community commented and voted on the topics. Four ideas emerged at the top of the rankings (core academic skills, critical thinking, developmental studies/remediation, and Freshman Seminar). A Web survey was used to select the final topic.
Critical thinking was identified as the QEP topic.
QEP Team began identification of a focus within critical thinking in order to develop measurable student learning outcomes.
Summer 2008
Four QEP Team members attended summer institutes to become more informed about instruction and assessment in critical thinking.
Subcommittees were named from the QEP Team and subcommittee chairs invited participation from throughout the University.
Fall 2008
The QEP calendar for 2008-2009 and 2009-2010 was revised.
Faculty members who attended critical thinking institutes during the summer delivered reports.
CLA in the Classroom was administered to 150 students. In addition, 200 students and 70 faculty members took a survey on the perceived level of students' critical thinking skills.

Spring 2009
Reviewed CLA in the Classroom and survey data and narrowed the focus of the QEP to specific measurable critical thinking behaviors: problem or issue identification and clarification; gathering and organizing information; analysis; evaluation; and drawing logical conclusions.
Conducted focus groups with faculty, staff, students, alumni, and community groups to raise awareness of the QEP topic; further refine the focus; and choose a title.
Addressed the Faculty Assembly at the beginning and end of each semester to share information and progress and invite involvement in the QEP development.
Dr. Barbara Jones served as a consultant on the QEP development process.
Subcommittee membership was revised to more completely represent the University's College and schools, and add representatives from student services.
The subcommittees continued to design the QEP.
Summer 2009
Dr. Susan Wolcott conducted a workshop open to all interested faculty and staff, on the Wolcott and Lynch adaptation of the King and Kitchener model of Reflective Judgment in critical thinking.
Dr Pedro Reyes, Associate Vice Chancellor for Academic Planning and Assessment for the UT System Board of Regents, reviewed and commented on the QEP
Dr. Rudy Jackson, Vice President with the SACS Commission on Colleges, conducted a campus advisory visit
Continued designing, drafting, seeking feedback, and editing the QEP
Fall 2009
Community Awareness Subcommittee held activities to heighten knowledge of the QEP topic among students, staff, and faculty.
Dr. Gerald Nosich conducted a workshop open to faculty and staff on the use of the Paul and Elder framework in teaching and assessing critical thinking.
In December, the plan was posted on the University website for public comment.
Revisions were made to the plan in December and it was sent to the Leadership Team for review
Spring 2010
Final revisions submitted to Leadership Team in early February

C. Identification of Key Issues from Institutional Assessment and Other Sources

Critical thinking is an important foundational skill. In its 1992 report, The National Education Goals Panel suggested that undergraduate education be linked to outcomes such as critical thinking, problem solving, and effective communication. Similarly, The Wingspread Report, published in 1994, urged that students should be able to utilize critical thinking skills to analyze information and solve problems. Higher education professionals also recognize the importance of critical thinking although many university educators are unable to define the concept (Paul, Elder, and Bartell).

The Texas Education Agency (TEA), which oversees public school education, and the Texas Higher Education Coordinating Board (THECB), which oversees postsecondary education at the state level, adopted the Texas College and Career Readiness Standards (Texas CCRS) in January 2008. The Texas CCRS establishes policy that guides what skills students should be able to perform to succeed in entry-level college courses. One primary goal of the Texas CCRS is to improve critical thinking skills in students across disciplines. Specifically, instructors are expected to develop coursework that teaches students to apply new knowledge and skills in a variety of situations and contexts. Critical thinking is identified as a basic, cross-disciplinary skill in the THECB guidelines for core curricula in Texas' public colleges and universities.

“The core curriculum guidelines described here are predicated on the judgment that a series of basic intellectual competencies -- reading, writing, speaking, listening, critical thinking, and computer literacy -- are essential to the learning process in any discipline and thus should inform any core curriculum.” (THECB “Core Curriculum”).

In the faculty, staff, and student discussion forums of possible QEP topics, there was widespread concern that college students have access to a rapidly growing body of web-based information resources, but are not equipped to distinguish good information sources from poor ones. It is important that students learn the skills involved in determining the validity of a source and analyzing the information presented in order to reach a well-reasoned conclusion. Students also need the ability to carefully analyze situations and select between alternatives in order to make informed choices in both their personal and professional lives. Universities are expected to develop individuals with the skills necessary to solve complex problems that go beyond their specific discipline.

D. Collegiate Learning Assessment (CLA)

As a part of the assessment initiatives of The University of Texas System, UT Permian Basin participated in the use of the Collegiate Learning Assessment for the last four years. The CLA, developed by the Council for Aid to Education, assesses writing, some critical thinking skills, reasoning, and problem-solving skills without focusing on knowledge acquired in a specific discipline. At UT Permian Basin, a sample made up of freshmen and graduating seniors is recruited each year to take the test. Shown below are results from the 2007-2008 administration of the CLA. The assessment uses Scholastic Aptitude Test (SAT) scores to predict the performance of students on the assessment. Actual CLA scores above those predicted indicate the degree to which a college or university has added value to a student's skills. The data in Table 2 illustrates that the sample of UT Permian Basin test participants performed at the predicted level when mean SAT scores were considered.

Table 2: Collegiate Learning Assessment (CLA) Score Outcomes 2007-2008

	Freshmen Tested Fall 2007	Seniors Tested Spring 2008
Mean SAT Composite Score	962.03	1018
*Expected CLA Total Score	1006	1131
Actual CLA Score	991	1123
Difference Actual score minus expected score	-15	-8
Deviation Score ** quantify the difference between actual and expected scores in standard error	-0.4	-0.2
Performance level (Well above, Above, At, Below, Well below)	At	At

•Information source: UT Permian Basin Office of Institutional Research, Planning and Effectiveness

*Expected CLA score based on information provided by CLA Institutional Report Technical Appendices

** Deviation score provided by CLA Institutional Report

Table 3, below, reveals UT Permian Basin students' achievement on the CLA performance task. The performance test requires that students use higher order thinking skills and written communication skills to respond to written prompts about an imaginary, but not unrealistic situation. A number of documents are provided to students, some of the documents are useful to completing the task, and some are of relatively little value. Students must make decisions about the value of each of the documents and use the pertinent material to come to a reasonable conclusion in response to each prompt. In the analytical writing tasks, students must either take a position or critique another's position in response to written prompts. The positions students take must be supported by analysis and must contain relevant reasons and examples. The UT Permian Basin freshmen scored "Above" and "Well Above" the predicted values on the analytic writing task and the critique-an-argument task. Seniors scored below predicted values on identical tasks. These results suggest that both the task of analytic writing and critiquing an argument may require more focus. The freshman level English Composition classes, 1301 and 1302, collectively, are a natural place to begin this process since these two skills are central to the objectives of the two composition courses.

Table 3: UT Permian Basin Students' Performance on CLA Task Types

	Freshmen Tested Fall 2007		Seniors Tested Spring 2008	
	*Deviation Score	Performance level	Deviation Score	Performance level
Performance Task	-1.3	Below	0.4	At
Analytic Writing Task	0.5	Above	-0.8	Below
Make-an-Argument	-0.2	At	-0.5	At
Critique-an-Argument	1.3	Well Above	-1.3	Below
Total CLA Score	-0.4	At	-0.2	At

* Information source: UT of the Permian Basin Office of Institutional Research, Planning, and Effectiveness. *Deviation scores provided by CLA Institutional Report

Table 4 shows UT Permian Basin value added scores, which are based on the average SAT scores of freshmen and senior examinees. The difference in scores between the seniors and the freshmen is an estimate of the extent to which the university experience has added value to students' higher order thinking and writing skills. Table 3 also demonstrates that UT Permian Basin students score predominantly "At" or "Below" expected performance levels on the CLA.

Table 4: Value-added Estimates based upon CLA scores

	Deviation Difference Score	Performance level
Performance Task	1.7	Well Above
Analytic Writing Task	-1.3	Below
Make-an-Argument	-0.3	At
Critique-an-Argument	-2.6	Well Below
Total CLA Score	0.2	At

* Information source: UT Permian Basin Office of Institutional Research, Planning, and Effectiveness. *Deviation scores provided by CLA Institutional Report

Based on the freshmen and senior students who participated in CLA testing, it is feasible to expect that the University can implement programs to increase the value added score. There are two caveats that affect the results of the test: (1) small sample size and (2) a lack of randomness in student selection may not reflect average University freshman and seniors.

In order to better understand the critical thinking skills of individual UT Permian Basin students, the QEP Team administered the CLA in the Classroom, an instrument developed by the Council on Aid to Education as a classroom based assessment of higher order thinking skills, in a number of freshman and senior level classes in the fall of 2008. Unlike the CLA, the CLA in the Classroom is designed specifically for the classroom setting. The CLA in the Classroom focuses on higher order thinking skills such as analysis, problem solving, and critical thinking. An examination of student scores by the QEP Team indicated the results were in agreement with those of the CLA. Collectively, the CLA and CLA in the Classroom data strongly suggest that focusing the QEP on enhancing critical thinking skills has the potential to have a broad impact upon UT Permian Basin students.

E. National Survey of Student Engagement (NSSE)

The NSSE is questionnaire administered annually to randomly selected students at participating institutions of higher education nationwide. Like the CLA, the NSSE is part of the effectiveness assessment conducted by The University of Texas System. The primary objective of the NSSE is to understand how undergraduate students use the opportunities presented to them in higher education through understanding how they spend their time and perceive their college experience. Table 5 shows the results from questions focused on higher order thinking skills in the most recent administration of the NSSE.

Table 5: UT Permian Basin Student Responses to Selected NSSE Items

NSSE item	UTPB		Peers	
	Freshmen (%)	Seniors (%)	Freshmen (%)	Seniors (%)
Integrating ideas or information from various sources	31	41	38	54
Analyzing the basic elements of an idea, experience, or theory	42	37	34	45
Synthesizing and organizing ideas, information or experiences into new, more complex interpretations and relationships	37	35	26	37
Making judgments about the value of information, arguments or methods	37	32	26	50
Applying theories/concepts to practical problems or in new situations	53	41	30	44

*Information source: UT of the Permian Basin Office of Institutional Research, Planning, and Effectiveness. * Data based upon NSSE report for the 2008 test administration.

The results suggest that UT Permian Basin freshmen, when compared to peers, perceive they are similarly involved in activities related to critical thinking. In contrast, UT Permian Basin seniors do not perceive as much involvement in critical thinking activities in their coursework as seniors at peer institutions.

IV. Purpose of Desired Student Learning Outcomes

In its *Handbook for Reaffirmation of Accreditation*, SACS describes the purpose of the QEP as “a carefully designed and focused course of action that addresses a well-defined topic or issue(s) related to enhancing student learning” (21). The purpose of the QEP at The University of Texas of the Permian Basin is to improve the critical thinking skills of students. Student learning outcomes are shown below:

Student Learning Outcome 1: *Students will be able to clearly identify and clarify problems, questions, and issues.*

Measurement: Students will have an overall satisfactory score on the course-embedded assessment(s) for *Clarity* as measured by the finalized critical thinking rubric(s).

Student Learning Outcome 2: *Students will collect and/or effectively organize information.*

Measurement: Students will have an overall satisfactory score on the course-embedded assessment(s) for *Collection/Organization of Information* as measured by the finalized critical thinking rubric(s).

Student Learning Outcome 3: *Students will carefully consider, analyze, and evaluate information in terms of its support for conclusions.*

Measurement: Students will have an overall satisfactory score on the course-embedded assessment(s) for *Analysis and Evaluation* as measured by the finalized critical thinking rubric(s).

Student Learning Outcome 4: *Students will draw well-reasoned, logically supported conclusions from information.*

Measurement: Students will have an overall satisfactory score on the course-embedded assessment(s) for *Logical Conclusions* as measured by the finalized critical thinking rubric(s).

Student Learning Outcome 5: *Students who take the two-semester ENGL 1301 and 1302 sequence in which critical thinking skills have been explicitly taught will show greater improvement in critical thinking than comparable students in ENGL 1301 and 1302 classes in which critical thinking skills have not been emphasized.*

Measurement: Students in the C⁴ sections of ENGL 1301 and 1302 will have higher critical thinking scores on the Criticalthinking Assessment Test (CAT) than comparable students in ENGL 1301 and 1302 who have not been exposed to the explicit teaching of critical thinking skills.

Student Learning Outcome 6: *At the end of the ENGL 1301 and 1302 two-course sequence, students in the C⁴ classes will demonstrate improvement in their*

critical thinking scores over their performance at entry in ENGL 1301. Scores for students in the non-C⁴ courses, will be unchanged.

Measurement: The CAT will be administered to all participating students upon entry to ENGL 1301 and exit from ENGL 1302. Each student's entry and exit score will be compared to determine whether the score has changed.

V. Literature Review and Best Practices

A. Critical Thinking Models

There have been many definitions of critical thinking proposed. The definition by Donald L. Hatcher and L. Anne Spencer is one that appears to fit closely with what we have identified as our quality enhancement plan on critical thinking, they write that, “*Critical thinking is thinking that attempts to arrive at a decision or judgment only after honestly evaluating alternatives with respect to available evidence and arguments*” (21).

Several models of the acquisition and development of critical thinking skills exist in the literature from the second half of the twentieth century. Bloom’s Taxonomy, later revised by L. W. Anderson and D. R. Krathwohl, describes six levels within the cognitive domain, each of which is related to a different level of cognitive ability. The hierarchy of levels represents thought processes from simplistic knowledge at the lowest level to complex knowledge at the highest level. The lower levels require fewer critical thinking skills, while the upper levels require more complex and sophisticated thinking skills. Instruction that provides opportunities for students to engage in activities that require skills in the upper levels of the taxonomy is more likely to elicit higher order thinking skills from students. Since its development in the 1950s, Bloom’s Taxonomy has been widely used as a framework for instructional innovation to enhance students’ critical thinking skills. However, there are limitations associated with this model. For instance, both Richard Paul in his 1993 book *Critical Thinking: What Every Person Needs to Survive in a Rapidly Changing World*, and then later, Edward Furst in his 1994 article “Psychological Perspectives,” suggest that Bloom’s Taxonomy cannot be value neutral, since it contains terms that convey value judgments. One example of this is the sort of thinking that illustrates the “Evaluation” stage, in “Making judgments based on criteria and standards through checking and critiquing” (Anderson & Krathwohl 21). Additionally, Paul argues that Bloom’s Taxonomy conveys the author’s belief in sequential, hierarchical links between the six levels in the cognitive domain, but fails to recognize the interdependence of the levels (276).

Other models of the cognitive development of critical thinking that were explored for the current plan come from William Perry’s book *Forms of Intellectual and Ethical Development in the College Years: A Scheme*, Patricia King’s and Karen Kitchener’s book *Developing Reflective Judgment*, and Richard Paul’s and Linda Elder’s book *Critical Thinking: How to Prepare Students for a Rapidly Changing World*. Perry’s model focuses on the intellectual development of college-aged students. The model describes a sequence of nine positions of development, organized into four categories. King and Kitchener’s Reflective Judgment Model is similar to Perry’s with respect to containing elements of his first two stages. King and Kitchener base their model on the use of evidence and rules of inquiry. Their focus is on sequential events that affect the way students justify their beliefs. The authors of both models indicate that most students entering college are unable to use higher order thinking skills effectively. Research that formed the foundation for the Perry model involved a homogenous group of Caucasian males at Harvard University. The Reflective Judgment Model, employed by King and Kitchener, was developed on data from high school and college students who demonstrated unusually high academic aptitude scores. It is not clear whether either model would generalize to a more diverse student population such as that found at UT Permian Basin.

Richard Paul, the architect of the critical thinking framework we are utilizing, envisioned critical thinking as:

[T]hat mode of thinking – about any subject, content, or problem - in which the thinker improves the quality of his or her thinking by skillfully analyzing, assessing, and reconstructing it. Critical thinking is self-directed, self-disciplined, self-monitored, and self-corrective thinking. It presupposes assent to rigorous standards of excellence and mindful command of their use. It entails effective communication and problem solving abilities, as well as a commitment to overcome our native egocentrism and sociocentrism. (*Learn the Tools*)

There are many areas of concern in instruction, not just critical thinking, but also content knowledge, best practices in pedagogy, communication skills, problem solving, creative thinking, collaborative learning, self-esteem, and so forth. Teachers and leaders, both, must deal with the full array of these concerns. Instruction in critical thinking should not be seen as being in conflict with other essential concerns. Paul envisions it this way:

Everything essential to education supports everything else essential to education. It is only when good things in education are viewed superficially and wrongly that they seem disconnected, a bunch of separate goals, a conglomeration of separate problems, like so many bee-bees in a bag. In fact, any well-conceived program in critical thinking requires the integration of all of the skills and abilities ... mentioned above. Hence, critical thinking is not a set of skills separable from excellence in communication, problem solving, creative thinking, or collaborative learning, nor is it indifferent to one's sense of self-worth. (Interview, *Think Mag.*)

Implementing critical thinking instruction involves incorporating a series of steps in one's thinking about issues of content, management, and pedagogy that are addressed in a classroom or school setting, and doing so repeatedly until this becomes usual practice. Additionally, to effectively model critical thinking skills for students, faculty must first effectively model behaviors in the affective domain that are fitting to the cognitive critical thinking skills being demonstrated.

Among content, management, and pedagogy, the concern most likely to be expressed by university faculty has been content coverage if they add the teaching of critical thinking into a course. One of three major findings that emerged from a study at the community college level addresses this concern. Jennifer Reed and Jeffrey Kromrey found that students' abilities to think historically and to think critically improved in a single semester, that integration of critical thinking abilities did not negatively affect students' development of knowledge of history content, and that age and gender did not significantly affect the development of critical thinking abilities. Reed and Kromrey concluded that "If one of the expected outcomes for students in college courses is an increased ability to think with greater expertise within the context of the discipline, then integrating Paul's model into course content appears to be an effective approach to achieving this objective" (141).

The Paul and Elder framework has three components including intellectual standards, elements of thought, and intellectual traits. In their 1997 report, "Study of 38 Public Universities and 28 Private Universities to Determine Faculty Emphasis on Critical

Thinking in Instruction,” Paul and Elder propose that students need to master the elements of thinking. Critical thinkers are able to identify these aspects or “parts” of thinking and access them during the reasoning process. Critical thinking done well will meet high intellectual standards. Dr. Gerald Nosich, a Fellow at the Foundation for Critical Thinking, explains in his book *Learning to Think Things Through*, that the elements of reasoning are not presented in a specific and concrete order, but function interactively during the critical thinking process (50). The elements of thinking are:

- identification of the purpose or goal of thinking
 - clarification of the question at hand
 - acquisition of information
 - identification of one’s assumptions about the concepts
 - acknowledgment of the point of view within which the problem is being framed
 - identification of the implications and consequences that logically follow the result
 - determination of interpretations and inferences in order to come to a conclusion
- (Paul and Elder, “Basic Theory” 8-10)

Repeated use of the elements allows the development of intellectual traits (Paul and Elder, “Our Concept”). The intellectual traits are hallmarks of an effective thinker. Paul and Elder explain their concept of a framework of critical thinking on the website for the Foundation for Critical Thinking (Paul and Elder, “Where to Begin”).

In sum, the elements or structures of thought enable us to “take our thinking apart” and analyze it. The intellectual standards are used to assess and evaluate the elements. The intellectual traits are dispositions of mind, which embody the fair-minded critical thinker. To cultivate the mind, we need command of these essential dimensions, and we need to apply them consistently as we think through the many problems and issues in our lives. When addressing the issue of “Why the analysis of thinking is important,” Paul and Elder have come to this conclusion:

Everyone thinks; it is our nature to do so. But much of our thinking, left to itself, is biased, distorted, partial, uninformed, or downright prejudiced. Yet the quality of our life and of what we produce, make, or build depends precisely on the quality of our thought. Shoddy thinking is costly, both in money and in quality of life. If you want to think well, you must understand at least the rudiments of thought, the most basic structures out of which all thinking is made. You must learn how to take thinking apart. (“Our Concept”)

Paul and Elder’s Intellectual Standards, listed here, are the framework needed to construct critical thought:

Standard: Accuracy: free from errors or distortions, true

How could we check on that? How could we find out if that is true? How could we verify or test that?

Standard: Breadth: encompassing multiple viewpoints

Do we need to look at this from another perspective? Do we need to consider another point of view? Do we need to look at this in other ways?

Standard: Clarity: understandable, the meaning can be grasped

Could you elaborate further? Could you give me an example? Could you illustrate what you mean?

Standard: Depth: containing complexities and multiple interrelationships

What factors make this a difficult problem? What are some of the complexities of this question? What are some of the difficulties we need to deal with?

Standard: Fairness: Justifiable, not self-serving or one-sided

Do I have any vested interest in this issue? Am I sympathetically representing the viewpoints of others?

Standard: Logic: the parts make sense together, no contradictions

Does all this make sense together? Does your first paragraph fit in with your last? Does what you say follow from the evidence?

Standard: Precision: exact to the necessary level of detail

Could you be more specific? Could you give me more details? Could you be more exact?

Standard: Relevance: relating to the matter at hand

How does that relate to the problem? How does that bear on the question? How does that help us with the issue?

Standard: Significance: focusing on the important, not trivial

Is this the most important problem to consider? Is this the central idea to focus on? Which of these facts are most important?

(Paul and Elder, "To Analyze Thinking")

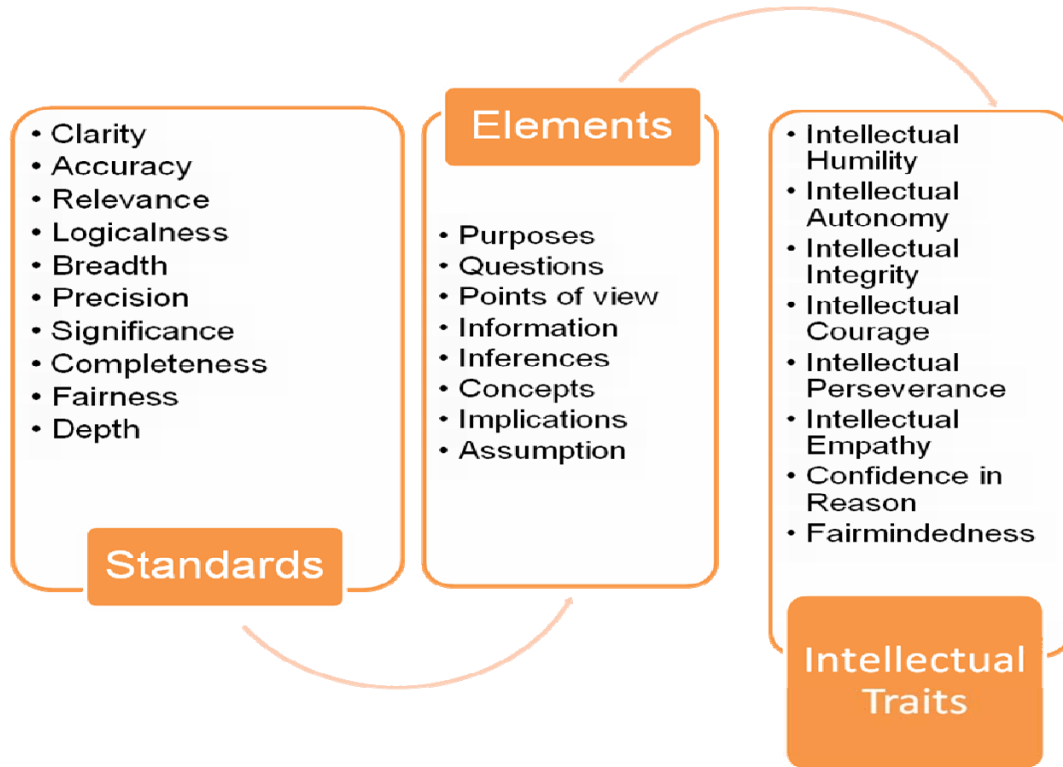
The Elements and the Intellectual Standards of the Paul and Elder framework align well with the four skills within critical thinking that UT Permian Basin has chosen to focus on. Table 6, below, illustrates this.

Table 6: Alignment of UTPB Critical Thinking Skills, the Elements, and Standards

UTPB Critical Thinking Skills	Elements of Thought	Intellectual Standards
Identify and clarify questions, problems and issues	identification of the purpose or goal of thinking, clarification of the question at hand	Clarity, Significance,
collect and organize information	acquisition of information	Depth, Logic, Relevance
consider that information through analysis	identification of one's <u>assumptions</u> about the <u>concepts</u> ,	Accuracy
come to a well-reasoned, logically supported conclusion	identification of the <u>implications</u> and consequences that logically follow the result, and determination of interpretations and <u>inferences</u> in order to come to a conclusion	Breadth, Precision, Fairness

The relationship between the Elements, the Intellectual Standards, and the Intellectual Traits is illustrated below in Figure 2.

Figure 2: The Paul and Elder Framework of Critical Thinking



(Figure 2 is information taken from Paul and Elder's *The Miniature Guide to Critical Thinking* 19)

The Paul and Elder Framework of Critical Thinking was developed based on earlier research by Richard Paul and research that is more recent by Paul and Linda Elder, among other researchers. One pertinent study involved 38 public and 28 private universities in the state of California and therefore may be more broadly relevant to the student population at UT Permian Basin (Paul, Elder, and Bartell).

The Paul-Elder Framework of Critical Thinking is a rigorous structure, well suited for infusing critical thinking concepts into general education English Composition courses. In contrast to the Reflective Judgment Model or Perry's Model, which are built primarily on the work of Piaget, the Paul-Elder Critical Thinking Framework is built on concepts from several theorists, and it uses general language, which is easily understood across disciplines. The standard concepts are applicable in diverse settings, either educational or non-educational, and the model does not have rules, procedures, or steps to follow like other models (Moseley et al. 169).

Currently, the Paul-Elder Critical Thinking Framework is being used to develop critical thinking skills in students at all educational levels including the college and university level. Its adaptability to a variety of education settings is demonstrated by its use at the Thompson School District in Loveland, Colorado; the University of Louisville; Eastern Kentucky University; and Surry Community College to enhance critical thinking skills of

students (Foundation for Critical Thinking). The Paul-Elder Critical Thinking Framework will provide the University with both a shared paradigm and a collective language that can be used in instruction and discussion both inside and outside the classroom. A universal framework provides a context in which university faculty can enhance their skills to develop students' critical thinking abilities. A common language and framework provide context in which students can strengthen their abilities to apply critical thinking skills across a variety of issues and problems in different situations.

How educators understand critical thinking will determine how they use it and how well they use it in their own teaching. Results of a 1995 study of current teaching practices and knowledge of critical thinking among faculty from Education and Arts and Science subject areas teaching in teacher preparation programs in California universities, indicated that a significant percentage of the sampled faculty (and, if representative, most faculty) could not provide plausible examples of how they fostered critical thinking in the classroom. Additionally, they inadvertently confused the active involvement of students in classroom activities with critical thinking in those activities. They could not name specific critical thinking skills they thought were important for students to learn, and were not able to plausibly explain how to reconcile covering content with fostering critical thinking. Researchers found that it was rare that faculty mentioned the importance of students demonstrating the ability to clarify questions; gather relevant data; reason to logical or valid conclusions; identify key assumptions; trace significant implications; or enter without distortion into alternative points of view (Paul, Elder, and Bartell).

B. Implementing Critical Thinking in General Education

In Texas, colleges and universities develop core curricula using the guidelines developed by the Texas Higher Education Coordinating Board (THECB). The result is that every student who receives a baccalaureate degree from a Texas public institution has been required to complete a general education core curriculum as part of his or her degree requirements regardless of discipline. Additionally, within the THECB guidelines and the expectations of the Board of Regents of The University of Texas System, critical thinking has been identified as an important basic skill that underlies the acquisition of knowledge across the university curriculum. Since critical thinking supports knowledge acquisition in a variety of disciplines, it is desirable to reach students early in their college education. Courses within the general education curriculum appear to be the most appropriate choices in which to begin the teaching of such skills.

This premise that critical thinking should be introduced and developed in general education courses is one that is supported by research (Halpern "Assessing"). Distinguishing features of critical thinking activity within classrooms include the frequent use of questions, student participation in active learning, the maintenance of a developmental tension within the classroom, and a development of fascination with the contingency of conclusions (Browne & Freeman 301). These are appropriate instructional techniques within general education classrooms.

Guy Altieri and Patricia Marvelli Cygnar have cited Washtenaw Community College in Ann Arbor, Michigan as an example of the effectiveness of implementing elements of critical thinking in the general education curriculum (4). Before the reform in which instruction in critical thinking was implemented, the three general education courses

focused on three core general education “elements,” which did not include critical thinking. After implementation of the reforms, 17 faculty members teaching in the general education curriculum provided instruction in critical thinking, addressing 24 general education elements, including critical thinking (17).

Another example of implementing critical thinking in a general education course highlights the use of the Paul and Elder framework of critical thinking (Reed & Kromrey). The History course in this study met for three hours per week for fifteen weeks. After the pre-test was administered, students in the experimental group were explicitly taught to use the Paul and Elder framework to analyze historical documents. Instructional activities included individual, small group, and total class components. After the introduction and opportunities to practice the critical thinking skills, the instructor distributed worksheets. The Paul and Elder framework was encouraged and modeled in class and implemented as part of the discussions and written assignments. Students in the experimental group received 90 minutes of explicit instruction in critical thinking over the semester. They also received several opportunities, written and oral, collaboratively and individually, to practice critical thinking. Students in the control group read the same primary source materials and the same primary documents as students in the experimental group, but were only assigned to respond to questions at the end of the reading, rather than receiving the worksheets. The students in the control group also did not receive the explicit instruction on how to apply the Paul and Elder framework of critical thinking for document analysis. Once the post-test was administered, students in the experimental group who were asked to provide critical reflections scored higher than students in the control group on critical thinking skills, although historical content knowledge was similar in both groups (Reed and Kromrey 205).

C. Implementing Critical Thinking in College English Courses

Within the core curriculum, English composition classrooms are typical arenas for developing writing skills. College students write papers following conventions of Standard American English and develop skills that will help them become better communicators. Integrating critical thinking skills into the English composition courses seems to be a good fit to the faculty at the UT Permian Basin as well as to other educators. Johannessen asked the question, “How can we design writing instruction to help students develop the tools they need to solve complex, unfamiliar problems; think for themselves; act independently and with others; discern the proper course of action in situations that are ambiguous; and understand a variety of perspectives?” (38).

He argued his point philosophically by pointing out the need to develop a curriculum that focuses on problem solving and moves from concrete to abstract terms, activities, and tasks. In his research, Johannessen documented examples of activities for teaching composition using the following strategies: introducing argument, building on the initial activity, and follow-up writing practice. He found that students need to be actively engaged in independent writing activities in order to transform writing classrooms.

Using a procedural framework for developing critical thinking skills is not new to the writing classroom. In 1991, Bacig, Evans, and Larouth discussed computer-assisted instruction in critical thinking and writing. Their process/model approach measured the efficacy of a pedagogical approach that compared traditional paper-and-pencil writing activities with computer-assisted versions. The process/model approach is metonymic,

moving from parts to whole and simple to more complex (Arrington, as qtd. in Bacig, Evans, and Larouth 372). Using archival data from student work at The University of Minnesota-Duluth, four sets of writing samples were analyzed: one paper-and-pencil set from “traditional” sections; one paper-and-pencil set from sections using the process/model approach; and two sets from sections using the process/model approach using computer-aided instruction. The researchers made the following observations:

Three empirical measures are used in the study: a frequency count of linguistic markers of argumentation and comparison/contrast based on previous work by Odell [. . .] a measure of the number of arguments, and a measure of their logical integrity. All significant differences favored students in the experimental (computer-assisted) sections, who used more markers, made more arguments and made stronger arguments . . . These results suggest that it may be possible to attain a post-process paradigm for teaching writing and thinking that transcends the dialectic that places process and product in opposition to each other. (Bacig, Evans, and Larouth 365)

Stephen Brookfield did another research study of critical thinking in English courses. In his book *The Skillful Teacher*, Brookfield explains how he incorporated the critical incident questionnaire (CIQ) as a means for teaching critical thinking. The questionnaire was made part of the Southwestern Oklahoma State University Library's instructional curriculum for an English Composition class over the course of two semesters. Coursework included student reflections, which proved to be key in understanding how students were learning, searching for information, and evaluating their resources. Building on Brookfield's study, Donald Gilstrap and Jason Dupree incorporated the CIQ “as a quantitative instrument to assess the [. . .] Literacy Competency Standards for Higher Education in one library's instructional curriculum” (407). Insights from their research included the importance of explicitly teaching reflection and critical thinking in the classroom to increase students' confidence, in addition, the overall learning experience in the library were also reported.

In 2006, Stephen Scanlan ran a study which described the results of incorporating Richard Paul's "Elements and Standards of Reasoning" into a twelfth-grade Rhetoric and Composition class curriculum which included persuasive essays on the topics of child abuse, language, gender and culture, and the value of life. Students were identified as high-range, mid-range, low-range achievers, or English Language Learner (ELL). The progress of each group was measured through a progressive series of rubric assessments of their writing, examining five key areas important in rhetorical composition: clarity of writing, analysis of author's argument, use of supporting information, organization, and grammar and syntax. Through the introduction of this focused, critical thinking training, student composition was found to improve dramatically in all of the five key areas, among all the groups.

Instructors teaching the sequenced English Composition courses need to engage in the kind of critical thinking that they hope to introduce and develop in their own courses. In his article “Formative Assessment in Higher Education,” Mantz Yorke speculates that formative assessment is a way to open the discussion on developing a theoretical framework. He argues that instructors need to take note of “disciplinary epistemology, theories of intellectual and moral development, students' stages of intellectual development, and the psychology of giving and receiving feedback” (477). Periodically

each semester, faculty members will carry out rubric-based formative assessments of student critical thinking skills. The QEP Director and faculty involved in the C⁴ courses will examine the assignments and results of the rubrics and as appropriate, modify the learning and assessment activities and/or rubrics for the next term of the C⁴ project.

D. Sequencing College English Courses

Use of English Composition 1301 and 1302 as courses in which to embed critical thinking instruction and assessment will allow instructors to directly measure the impact of explicit instruction in critical thinking through students' writing. Sequencing the two courses will allow more ordered exposures and more practice for critical thinking instruction across the two long semesters.

In her text, *Assessing Academic Programs in Higher Education*, noted assessment consultant, Mary Allen made the following suggestions relative to the argument of assessing the effectiveness of courses. In terms of program assessment and the role that faculty play, Allen stated, "Program assessment is an on-going process designed to monitor and improve student learning" (Allen 5). In designing our Quality Enhancement Plan, we saw the merit of applying this concept to the sequencing of two freshman level English Composition courses and assessing the effectiveness of that sequencing. Sequencing English 1301 and 1302 provides a forum for faculty to engage in the instructional and assessment behaviors listed in Allen's work.

Faculty are to be expected to engage in the following behaviors to support assessing students' performance in relation to the student learning outcomes that have been defined for a selected course (or sequence of courses), such as English:

1. develop explicit statements of what students should learn
2. verify that the program is designed to foster this learning
3. collect empirical data that indicate student attainment
4. use these data to improve student learning

(Allen 10)

In their book, *Instruction: A Model Approach*, Mary Alice Gunter, Thomas H. Estes, and Susan L. Mintz make the following point:

New learning should be based on previous learning. Even when that is assured, it is important to provide connections to help the learner identify how the new learning fits into what is already known. In short, there should be a logical order for the sequence and obvious connections between the parts to be learned and those already known by the students. How the breadth and depth of content is determined and how it is focused and sequenced are significant teacher decisions that directly affect instructional planning. (34)

A conclusion can be made then, that implementing critical thinking skills and assessing them in sequenced college courses is a valid curricular and instructional design. Embedding instruction in critical thinking into two sequenced courses offered during the freshman year will provide an initial exposure to critical thinking skills in the fall of the

freshman year of college, and an immediate second exposure that will provide practice and feedback, to reinforce and develop critical thinking skills early in a student's college career. This instructional design strategy is supported by research identified previously.

E. Best Practices for Explicit Instruction in Critical Thinking

For teachers to foster critical thinking, it is essential for them to have at least baseline knowledge of the concept of critical thinking. Paul and Elder address the issue for teachers:

Those who teach ... must be sufficiently well-informed about critical thinking not only to be able to explain it in a general way to their students, they must also regularly model instruction for critical thinking in their own classroom procedures and policies. The design of their classes must reflect an explicit critical thinking orientation, so that students not only systematically think through the content of their courses, but also come to see how the design of a course can require and cultivate critical thinking and thoughtfulness--or fail to do so. (*Critical Thinking: Basic Theory*, B-11)

Students should know at the beginning what the learning activities will be within the course, how assessments will be conducted and what they will consist of, and what their learning goals should be.

Paul and Elder propose that instructional design involves a teacher thinking about instruction in terms of two deeply interrelated parts: structures and tactics. Structures involve the course content; information, questions, concepts, or problems central to the course, requirements, the point of view students need to learn to reason within in order to succeed in the course, among other things. Tactics involve how one would teach to make the structures work, to encourage students to develop essential insights, understandings, knowledge, and ability to reasonably reach the answers to questions in the field (*Critical Thinking: Basic Theory*).

Recent research has shown strong support for explicit teaching and the implicit modeling by instructors in impacting student learning of critical thinking skills in order to overcome the habitual student expectation of passively sitting in a lecture, and to clarify to students the thinking skills that they will be utilizing within a course of study. Carrie Myers, in her 2008 article "Divergence in Learning Goal Priorities between College Students and Their Faculty," found, among a sample of 751 undergraduate students and 85 faculty, a divergence in learning goal priorities. Results showed that "students placed significantly more importance on career preparation, scientific reasoning, personal development, and art and cultural appreciation, and that faculty placed significantly more importance on critical thinking and mastery of discipline content" (53).

Notwithstanding the apparent attitudes of students, instructors must be committed to modeling the value of critical thinking skills for their students. This commitment must be an overt demonstration through best practices in teaching in order to impact the cognitive and affective domains of their learners. Therefore, training instructors on how to implement critical thinking strategies is crucial. Paul and Elder make the following observation:

One of the most important goals in instruction is to teach in such a way that students take ownership of the most basic principles and concepts of the subject. Therefore, it is important to design instruction so that students learn to think their way through content. This means that instructors need daily structures and strategies that engage the intellect of the student. ("Strategies" 32)

Borrowing from the work of cognitive science, Tim Van Gelder describes the tenets that instructors can use with students to increase critical thinking skills. These connections include:

- 1) critical thinking is hard;
- 2) practice makes perfect;
- 3) practice for transfer;
- 4) make theory practical;
- 5) map it out; and
- 6) belief preservation (42-6)

Given this insight, instructors have an added responsibility to incorporate these principles into their curriculum design and implementation if student-learning outcomes are to reflect the development of critical thinking skills. In fact, a central focus of the faculty training for instruction in the C⁴ courses will be to determine how to incorporate these principles into the C⁴ courses.

In order to better understand the impact instructors can have on teaching critical thinking to students, researchers recognize there are *dispositions* that instructors need to model as evidence of the value placed on developing critical thinking skills. Stacia Stribling found that instructional strategies need to be explicit when seeking to develop dispositions for critical thinking among students (37). The success of the strategy influences the success of developing critical thinking dispositions, which in turn promotes critical thinking skills. Moreover, the skills and attitudes that faculty encourage have been found to be the ones that college students develop (Browne & Meuti 162).

One of the purposes of students developing critical thinking skills and taking more ownership of their own learning is for them to transfer these skills into their professional lives after graduation. Graceland College initiated a program that exemplifies this concept, where nursing students and faculty have committed to the attainment of a number of learning objectives including critical thinking.

The Learning Skills Program at Graceland includes the following elements: 1) stress management, 2) time management, 3) study skills/test-taking skills, 4) communication skills, 5) *problem-solving/critical thinking skills* [emphasis added], and 6) re-emphasis of specific course content for individual students. At the end of the full implementation of the Learning Skills program, the NCLEX-RN first-time pass rate for Graceland students increased from 62% to 100%. (Parkes & Kirkpatrick 331)

Browne and Freeman have suggested, "When teachers and students are aligned in pursuit of improved critical thinking, cognitive magic is possible. Reasoning improves without the encumbrance of the automatic animosity that can ruin the atmosphere for

prospective critical thinking [...] All that is needed, according to these researchers, is [...] the willingness of both teacher and student to engage in the hard work necessary to realize that exciting aspiration” (308).

In her article “Fostering Critical Thinking Through Effective Pedagogy,” Lisa Tsui confirmed the effect of faculty enthusiasm for teaching, belief in students’ abilities and potential to develop critical thinking skills, and faculty perception of teaching as a process of mutual learning as contributing to the development of critical thinking skills in students. Correspondingly, low faculty confidence in students’ abilities and potential were not value-neutral, but were identified as a serious impediment to critical thinking development efforts.

Self-assessed growth in critical thinking is positively related to such instructional factors as having paper critiques by an instructor, conducting independent research, working on a group project, giving a class presentation, and taking essay exams; negatively related to this outcome is taking multiple-choice exams. In a study of campus culture and critical thinking, successful development of students’ critical thinking skills was linked to an emphasis on cooperative exploration of knowledge and divergent thinking (Tsui 742).

A comparative analysis of instructional differences at four universities indicated a number of effective factors and revealed how the influence of one factor may vary according to the presence or absence of certain other elements within a learning environment (Tsui 741). The elements of writing and class discussion were found to be effective and are commonplace in university classrooms. Tsui suggested that instructional change is more likely to occur if it involves altering these commonplace teaching techniques rather than radically replacing them (754).

Regarding writing, both the amount of writing and the nature of the writing assignment were found to be important. Critical thinking is fostered through multiple writing assignments. These should demand such critical thinking skills as analysis rather than description, synthesis of material, evaluation of arguments, and deductive conclusions. Feedback on the writing appeared to further facilitate critical thinking, especially if it involves rewriting the assignment because such revision leads a student to take another step in critical thinking by utilizing the feedback to refine his or her work. Effective feedback can come from the instructor, classmates, tutor, or teaching assistant (Tsui 754).

Class discussion can enhance critical thinking if faculty members rely less on lecturing, “which is the most commonly employed method of instruction in undergraduate education” (Tsui 755), and instead, guide discussion and facilitate student participation; “knowing when to interject, and when not to, how to pose thought-provoking questions, and what to do when students too readily reach consensus” (756).

Tsui also found that for class discussion to be effective, students must feel that they are contributing to the class process rather than disrupting the flow of a lecture. Tactics used by faculty to raise students’ confidence in their abilities to contribute to the class include a circular arrangement of seats, grading on student participation in order to assign participation weight in the course, e-mailing students questions to consider for future discussions, asking students to address their questions to the class rather than solely to the instructor, and by using small group assignments and class presentations.

Class discussion actions facilitative of student critical thinking skills included instructors and students asking more questions in class, having students respond to peers' questions, having more students participate, motivating students to pose questions or challenges to what was said, complementing students on their contributions, and encouraging students to offer unsolicited remarks rather than waiting to be called upon (Tsui 754). This is in accord with a 1996 study in which Nunn found that student participation in class discussions was positively influenced by praising students, asking questions, probing for elaboration of student contributions, accepting answers, repeating answers, using student names, and correcting wrong answers (Nunn qtd. in Tsui 758).

This research and recommendations for instructional design for the development of critical thinking skills indicate a number of strategies that involve active student learning rather than passive absorption of information, and a safe emotional state in which to stretch ones cognitive comfort zone, and try new critical thinking behaviors. This is the context within which faculty and students at UT Permian Basin will work to increase the success of the critical thinking instructional strategies during the two semesters of the English Composition courses implemented in the C⁴ plan.

VI. Actions to be Implemented

All UT Permian Basin students must pass ENGL 1301 and ENGL 1302, unless those courses have been transferred in from another institution. In a freshman class of roughly 350, there are typically ten (10) sections of ENGL 1301 in the fall semester, with enrollment capped at 24 students per class. Thus, 240 students (or 69% of the freshman class) typically enroll in ENGL 1301 in the fall semester. The remaining 31% either complete the English requirement as Dual Credit or Advanced Placement high school students, as community college students, or take it in the spring semester. Dual enrollment high school students and students taking the on-line section of ENGL 1301 and 1302 will not be included in the C⁴ project, in the interest of keeping the possible confounding factors of maturity and differing pedagogy to a minimum.

Half of the remaining ENGL 1301 sections will be taught as C⁴ classes, with the other half of regular face-to-face sections serving as the control group. Experienced faculty will teach both C⁴ treatment sections and control sections. There will be a balance of experienced and less-experienced faculty members in both the C⁴ treatment sections and the control sections, but the same faculty member will not teach in both. Once a faculty member begins teaching a course with critical thinking as an integrated component, it would be extremely difficult to teach other concurrent sections without this component.

The C⁴ project will consist of two cohorts of freshmen. The first year of implementation will be in the fall of 2011, with a second cohort beginning in fall, 2012. Students enrolled in ENGL 1301 in fall 2011 will be given the Criticalthinking Assessment Test (CAT) during class time within the first two weeks of class, and will be re-tested with the CAT at the end of ENGL 1302 in the spring semester. Students enrolled in ENGL 1301 will be pre-advised and pre-registered during the fall semester for ENGL 1302 in the spring.

A. Stage One

Stage One will encompass the period from the time the on-site visiting team leaves the campus in April 2010 through spring 2011. Adjustments to the plan based on the suggestions the SACS-COC visiting team will be evaluated and decisions on implementation will be made. Personnel will be hired as necessary. Rubrics that are under development will be refined. Consultants for the next academic year will be selected to conduct presentations on critical thinking and conduct training sessions for C⁴ faculty members and other interested individuals. Participants in the faculty training will be invited to form a Faculty Learning Community (FLC) on critical thinking.

B. Stage Two

Stage Two will encompass the implementation phase of the plan, beginning in summer 2011 and extending through the completion of spring 2013. During May and August 2011, training sessions will be conducted for C⁴ faculty members, CAT readers, and other interested individuals. Participants in this and subsequent training sessions will be invited to join the Faculty Learning Community. In fall 2011 and fall 2012, students participating in either the C⁴ or control sections of ENGL 1301 will be administered the CAT and a class-based critical thinking assignment to be graded using the UTPB C⁴ rubric. Faculty members teaching the C⁴ ENGL 1301 and 1302 courses and control

ENGL 1301 and 1302 courses will teach as appropriate for their role in the C⁴ project. In November, when advising for spring registration is conducted, students from the C⁴ treatment group will be registered for C⁴ ENGL 1302 classes, and those students in the control group will be registered for ENGL 1302 control group classes. At the conclusion of each semester, the UTPB C⁴ rubric will be used to evaluate critical thinking skills in the designated writing exercise in all classes and will be scored to provide information regarding the student learning outcomes (SLOs). All students in the participating classes (treatment and control) will also take the CAT at the end of the spring semester. Critical thinking consultants will be selected for the upcoming presentations to the University community, and to conduct training related to critical thinking instruction and assessment.

1. Faculty Development during 2011 and 2012

Critical thinking instruction and assessment development will be conducted in the summer of 2011 and 2012. All faculty development will be open to all faculty and staff who desire to learn more about teaching and assessing critical thinking. These sessions will assist faculty to use a common language explicitly from the Paul and Elder framework to teach and assess critical thinking within their content area. Throughout the project, the C⁴ Director, Assessment Analyst, and C⁴ Committee will assist the faculty in course redesign and delivery, in order to increase the amount of explicit instruction and assessment of critical thinking skills. The C⁴ Committee will consist of the C⁴ Director, Assessment Analyst, and faculty who teach or have taught C⁴-designated courses.

C. Stage Three

Stage Three will begin in summer of 2013 and encompass the 2013-2015 academic years. An analysis of the year two data will be conducted and combined with that from year one. A final analysis of the C⁴ project will be conducted and shared. This will involve an analysis of all assessment instruments, training, program materials, and information on the impact of the project on the students who completed critical thinking intensive classes.

We will use results of the analysis for the purposes of the Five-Year Impact Report to SACS-COC, which will be written at this time. We will share it with the University community across campus, with alumni, community members, and submit it to SACS-COC. Decisions about whether to extend the project to other areas of the curriculum will be made and needed plans will be developed.

VII. Implementation Timeline

Table 7: C⁴ Implementation / Task Timeline

Task	F'09, Sp'10	Spring 2011	Summer 2011	Fall 2011	Spring 2012	Summer 2012	Fall 2012	Spring 2013	Summer 2013	Fall 2013	Spring 2014	Summer 2014
Hire Staff		X										
Complete assessment strategies		X	X									
Implement C ⁴ in ENGL 1301, 1302 courses				X	X		X	X				
C ⁴ Committee meets				X	X		X	X				
C ⁴ committee and Director evaluate C ⁴ Program and submit report to Provost						X			X			
C ⁴ Director and committee develop C ⁴ publicity materials and C ⁴ web site	X	X	X	X	X	X	X	X				
C ⁴ Director reviews assessment results and recommends program modifications as necessary		X			X							
C ⁴ Director provides in service training		X		X	X		X					
C ⁴ faculty development workshop by external facilitators		X			X			X				
Purchase resources to enhance critical thinking skills		X	X	X	X	X	X	X				
C ⁴ Director attends yearly development meetings			X			X						
C ⁴ Committee administer direct and indirect assessments				X	X		X	X				
C ⁴ Director, and C ⁴ Committee, draft and complete Interim Report to SACS										X	X	X

VIII. Organizational Structure

Figure 3, below, depicts the C⁴ Project's organizational structure. The C⁴ Director will oversee the project. The C⁴ Director will supervise the Assessment Analyst, and the administrative assistant. Job descriptions for these positions are in appendix D.

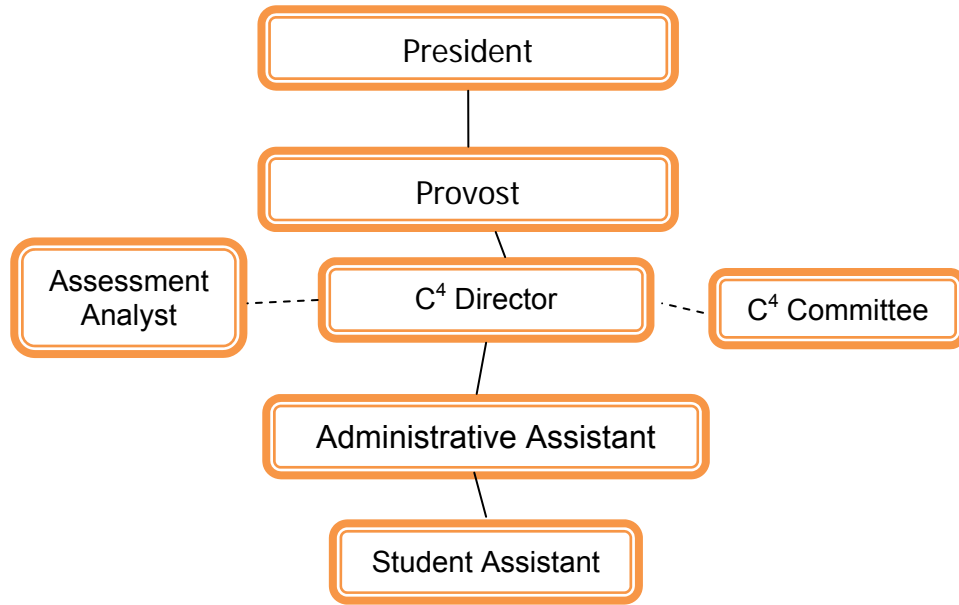
The C⁴ Committee will be responsible for instructional development and advising the C⁴ Director. The Committee will explore additional ways to promote the QEP initiative, disseminate information about the implementation of the C⁴ Program to the campus community each semester, and assist in the development of the SACS-COC Fifth-Year Report. The C⁴ Committee will consist of faculty, the C⁴ Director, and the Assessment Analyst.

The C⁴ Committee will be charged with mentoring faculty and providing continuous internal support during the semesters between external presenters on critical thinking instruction. During the initial year, this internal support will come from the C⁴ Director. The faculty development conducted by external experts in critical thinking during this time will play a vital role since UT Permian Basin faculty will be in the initial development stages of mastering teaching and assessing critical thinking. Once faculty members have successfully completed their initial year teaching C⁴ courses, they will help mentor faculty members who are new to the explicit teaching of critical thinking. The support activities hosted by the C⁴ Committee will include regularly scheduled meetings to discuss problems and successes encountered in teaching critical thinking.

At the completion of the C⁴ project, the C⁴ Committee will continue to assist the C⁴ Director in the development of institution-wide instruction in critical thinking. During this time, external presenters will continue to provide information about the theory, instruction, and assessment of critical thinking to the University community.

There will be written materials and e-materials on critical thinking available through the C⁴ website. The C⁴ website will be an electronic meeting site for discussion of critical thinking instruction and implementation of the C⁴ project. Faculty, staff, and students will find critical thinking topic discussions, resources, and links to relevant literature on the web site. The C⁴ Director and Committee will work with the University Webmaster to develop and maintain the C⁴ website.

Figure 3: QEP Organizational Structure



IX. Resources

There will be substantial support for the C⁴ program. Approximately one hundred thousand dollars annually has been budgeted for the development and support of the C⁴ Program. Major portions of these funds have been identified as an investment into the C⁴ Program designed to enhance the critical thinking skills of the university's students. Summary budget is shown here, Table 8 below, and a detailed budget is available in Appendix A.

Table 8: Summary Budget

	2010-11	2011-12	2012-13	2013-14	2014-15
Personnel	\$77,016	\$69,516	\$69,516	\$62,220	\$62,220
Assessment	\$10,650	\$7,600	\$7,600	0	0
Faculty Training / Consultants / Course Development	\$16,000	\$8,000	0	0	0
Supplies and Expenses	\$9,038	\$9,038	\$9,038	\$4,419	\$4,419
Travel	\$9,200	\$9,200	\$9,200	\$4,600	0
Totals	\$121,904	\$103,354	\$95,354	\$71,239	\$66,639

X. Assessment

A. *Assessment Issues in Critical Thinking*

As the need to improve students' critical thinking abilities continues to take center stage in both the political and educational domains, efforts to construct reliable methods of assessment have increased, Standardized assessments of critical thinking, and various local assessments based upon rubrics have been developed. For the assessment of critical thinking at UT Permian Basin, we have chosen to use both of these types of assessment tools.

Several critical thinking assessments are available, most using multiple-choice formats. The two most commonly used alternatives are the California Critical Thinking Skills Test, College Level (CCTST), and the Watson-Glaser Critical Thinking Appraisal (WGCTA) (Walsh and Seldomridge 217). While multiple-choice tests may be appropriate to assess specific aspects of classical or formal logic, i.e., inference, deductive/inductive logic, analysis, interpretation, etc., and their availability, relatively low cost, and ease of scoring make them popular options, they are generally seen as limited in their ability to assess the range of skills inherent in critical thinking, and thus lack comprehensiveness as assessments (Ennis 184; Brookfield, "Assessing" 97).

Within the last 10-15 years, assessment of critical thinking has evolved toward more open-ended assessment formats using consideration of solutions to everyday, real world scenarios. The open-ended assessments include the Collegiate Learning Assessment (CLA), (an instrument favored by the Spellings Commission in their final report), the Criticalthinking Assessment Test (CAT), the Ennis-Weir Critical Thinking Essay Test, the Critical Thinking Interview, the Tasks in Critical Thinking (TCT) from ETS, and the ICAT Critical Thinking Essay Examination (US Dept. of Ed.). The Measure of Academic Proficiency and Progress (MAPP) is a multiple-choice test with an optional essay module. The open-ended assessments:

[I]nclude the addition of justification requests to multiple-choice items, essay testing with varying degrees of structure, and performance assessment. [Most] are considerably more expensive than multiple-choice testing when used on a large scale, but on a small scale, they offer a feasible alternative in terms of validity and expense. However, grading them does take more time than grading a prepackaged multiple-choice test. (Ennis 186)

Though other unstructured tests have been constructed, it has been found that either their use has been limited or they have only a partial focus on critical thinking; also, they offer little if any technical information regarding reliability and validity, and were, therefore, not chosen for assessment of critical thinking at UT Permian Basin.

Rubrics are used in various educational settings, from primary to post-secondary environments. There are several reasons for this current trend of assessment within education. Evidence suggests rubrics are useful assessment tools in education that can promote student learning (Marcotte 4). Additionally, they can accurately assess the outcomes of problem-based or inquiry-based assignments. For example, engineering programs across the nation are adopting rubrics that have been shown to reliably and

accurately reflect higher-order thinking skills that now make-up a portion of Science-Technology-Engineering-Math (STEM) undergraduate courses (McMartin et al. 13c1-11). More than just an assignment grade, rubrics provide students with informative feedback about their strengths and weaknesses on an assignment (Andrade 15).

Rubrics are used by faculty across disciplines to conduct formative assessment of outcomes on assignments that involve critical thinking or problem solving skills. There are two types of rubrics that are used in an academic setting, holistic and analytical (Marcotte 6). The holistic rubric provides a single score based upon an overall impression of a student's performance on a task. An analytical rubric provides students with more feedback than a single score, and the feedback is specific to chosen criteria for task performance. The advantage of the analytical rubric is that students receive detailed feedback on the relative strengths and weaknesses of their performance on an assignment.

Rubrics are also described in terms of their breadth. They are general or task specific. A general rubric contains criteria that are general across tasks. The advantage of this type is that it can be used across different assignments. Task specific rubrics can only be applied to a particular task (Marcotte 5). The University rubrics that will be used in the C⁴ project are under development and will be finalized by the summer of 2011, prior to the implementation of the project that fall.

B. Global Assessment Instruments Investigated for Use in the C⁴ Project

The Collegiate Learning Assessment (CLA) and the Criticalthinking Assessment Test (CAT) were the two global instruments closely investigated for use in this project.

1. Collegiate Learning Assessment (CLA)

The CLA was constructed and is published by the Rand Corporation, in conjunction with the Council for Aid to Education. To help explain the reasoning behind developing such a tool, we are told:

The CLA's main goal is to provide information that will help colleges and universities determine how much their students are improving and whether that improvement is in line with the gains of comparable students at other institutions [and] to provide a summative assessment of the *value added* by the school's instructional and other programs (taken as a whole). (Klein et al. 4)

The CLA is composed of three types of assessments, a Performance task and two Analytic Writing tasks, which are intended to measure "students' critical thinking, analytic reasoning, problem solving, and written communication skills" (Klein et al. 4).

The Performance task (90 min.) is constructed to represent a real-world job assignment, in which the student must "think critically and analytically about the information they are given and communicate their [...] judgments, or recommendations clearly" (Klein et al. 4). The Analytic Writing tasks are composed of "Make-an-Argument" (45 min.) and "Break-an-Argument" (30 min.) assignments. Thus, the time required for students to complete the entire CLA is 2 hours and 45 minutes.

a. Results Reported

The unit of analysis is the institution rather than the student (Klein et al. 4). Subsequently, results are reported in terms of the school's total score, percentile ranks for the school's total score, each aggregated task, and "in terms of whether an institution's students are doing better, worse or about the same as would be expected given the level of their entering competencies" (Klein et al. 9). The CLA does this by "aggregating individual student scores up to the school level" (Klein et al. 15). This *value-added* approach also allows schools to determine whether the progress their students are making is comparable to that of other institutions.

b. Types of Analysis

Different levels of analysis are offered, ranging from a simple cross-sectional analysis of freshmen vs. seniors, to analyses of differences between students in different programs or different demographic characteristics, to a fully longitudinal analysis. The cross-sectional analysis requires a sample of at least 100 students; analysis of subgroups requires a minimum of 100 students per subgroup, and includes *either* the Performance task *or* the Analytic Writing tasks. The longitudinal analysis requires the tracking of a minimum of an institutional cohort of 300 students, and includes all three tasks.

c. Technical Information and Scoring

The Performance task is human scored with proprietary rubrics, and inter-rater reliability is reported to be .80 (Klein et al. 14). No technical information is offered regarding validity. The Analytic Writing tasks are machine scored, also with proprietary rubrics. The CLA does not publish the details of their scoring procedures. Although their rubrics include sections for evaluation of evidence, analysis and synthesis of evidence, drawing conclusions, and acknowledging alternative explanations/viewpoints, these elements are not scored. "All the assessments are delivered on an interactive internet platform that produces a paperless, electronic administration, and online scoring and reporting of results" (Klein et al. 4).

d. Cost

The cost of the cross-sectional analysis is \$6,500 for an institutional sample of 100 freshmen and 100 seniors, plus \$25/student over the institutional sample. UT System pays for this analysis for its component institutions. This analysis gives the results described above, and it is what we have now. This cross-sectional analysis is appropriate for analyzing global changes in student skills over the course of a college education.

The cost of the longitudinal analysis is \$28,000 for an institutional cohort of 300 students, assessed three times from entering freshman to graduating senior, plus \$35/student over the institutional sample.

e. CLA Summary

The CLA offers valuable assessment data at the institutional level. It is a very global measure, appropriate for comparisons between institutions, but it does not appear useful for assessing specific learning outcomes or objectives. According to its own informational materials, it is “but one of many important indicators of student learning. Ideally, it will be used in conjunction with other direct measures of learning outcomes” (3).

2. Criticalthinking Assessment Test (CAT)

Tennessee Technical University (TTU) publishes the Criticalthinking Assessment Test (CAT). It was developed partially with support provided by the National Science Foundation’s CCLI Program, over the course of six years with input from faculty from eight colleges and universities throughout the country. It is primarily a short-answer essay test that the majority of students complete in one hour or less. The unit of analysis is the student and small groups of students, rather than the overall institution.

“The CAT instrument was designed to measure those components of critical thinking and problem solving that faculty across disciplines think are most important” (TTU, “CAT Technical Information”). These components were then used to construct a real-world problem, for which students must use critical thinking skills to solve. The CAT project is currently working on the construction of an alternate form of the test to allow it to be given more than three times to the same student.

a. Results Reported

The CAT issues an Institutional Report, which includes the overall score and standard deviation of the test group, along with a histogram of the scores. Demographic variables of gender, class standing, and age are also reported. Item results include the percent of test-takers who received full credit, partial credit (if applicable), or no credit for each item. An overall score for each item is reported, with national norms provided for comparison.

Hypothesis tests are carried out for each item score and its corresponding norm. Significant differences are reported along with the effect size. Where pre-post testing is used, significant pre-post differences are also reported. Additional analyses are available from the CAT office upon request.

With the results reported by the CAT office, UT Permian Basin can customize our assessment of each learning outcome/objective as we see fit.

b. Types of Analysis

The CAT asks fifteen questions about the scenario described in the test. The skills assessed by these questions are:

- 1) Summarize the pattern of results in a graph without making inappropriate inferences.
- 2) Evaluate how strongly correlational-type data supports a hypothesis.
- 3) Provide alternative explanations for a pattern of results that has many possible causes.

- 4) Identify additional information needed to evaluate a hypothesis.
- 5) Evaluate whether spurious information strongly supports a hypothesis.
- 6) Provide alternative explanations for spurious associations.
- 7) Identify additional information needed to evaluate a hypothesis.
- 8) Determine whether an invited inference is supported by specific information.
- 9) Provide relevant alternative interpretations for a specific set of results.
- 10) Separate relevant from irrelevant information when solving a real-world problem.
- 11) Use and apply relevant information to evaluate a problem.
- 12) Use basic mathematical skills to help solve a real-world problem.
- 13) Identify suitable solutions for a real-world problem using relevant information.
- 14) Identify and explain the best solution for a real-world problem using relevant information.
- 15) Explain how changes in a real-world problem situation might affect the solution.

How these skills align with the C⁴ student learning outcomes (SLO) is shown in Table 9.

Table 9: Alignment of C⁴ Project Student Learning Outcomes to CAT items

Student Learning Outcome	CAT item(s)	Skill Assessed by Item
1 (identify and clarify)	10	Demonstrate the ability to separate relevant from irrelevant information
2 (collect/organize information)	4, 7, 10	Identify additional necessary information, separate relevant from irrelevant information
3 (analyze and evaluate)	2, 3, 5, 6, 9, 11	Evaluate how well data supports a hypothesis, provide alternative explanations, apply relevant information to evaluate a problem
4 (come to logical conclusion)	8, 13, 14	Determine reasonableness of inferences, Identify suitable solution(s)

While the CLA incorporates many of these skills in their scoring rubrics, the CAT reports scores for each item and the national norm associated with it. The CLA does not.

c. Technical Information and Scoring

A variety of reliability measures have been investigated. Test-retest reliability for the most recent version of the CAT (4.0) is greater than 0.80. Internal consistency of the 15 CAT items is $\alpha = .69$, which is good considering that the “instrument is designed to assess more than one component of critical thinking” (TTU, “CAT Technical Information”). Inter-rater reliability is $r = .82$ between the first and second scorers, with disagreements sent to a third scorer.

Criterion validity data has been gathered by comparisons between the CAT and several general measures of academic performance, and with other measures of critical thinking. The following tables (Tables 10 and 11 below) are taken directly from the CAT

Instrument Technical Information (TTU, “CAT Technical Information”). There is remarkable consistency between the correlations between the CAT and the ACT, SAT, and the Academic Profile. The correlation between the CAT and GPA is also significant.

Table 10: General Measures of Academic Performance

	ACT	SAT	Academic Profile	Grade Point Average
CAT	0.599*	0.527*	0.558*	0.345*

*correlations significant at $p < .01$

Table 11: Other Measures of Critical Thinking

	CCTST (California Critical Thinking Skills Test)	CAAP (Critical Thinking Module)
CAT	0.645*	0.691*

*correlations significant at $p < .01$

Scoring of the CAT is carried out by the faculty, following training in the use of the scoring rubric. Two to three faculty members attend a Train-the-Trainer Workshop held by the CAT project in various parts of the country. These faculty then train other faculty scorers at their institution. New scorers typically can score between 8-10 tests/day; with experience that number increases to 12-16. Once the tests are scored, the machine-ready score sheets are returned to the CAT assessment office where statistical results are computed and returned to the institution. Faculty who score the CAT will be paid a small stipend.

d. Cost

The cost of the CAT is \$200/year, plus \$5.00 per test taken, and a \$300/faculty fee for training faculty scorers. The total cost will depend on how many students are tested, on a per student basis.

e. CAT Summary

The CAT offers valuable assessment data at the student and group level. The results reported to the institution drill down to the item level, with corresponding national norms. Its overall score provides a global, overall measure of critical thinking, while its item scores allow a more finely grained assessment of individual learning outcomes. Therefore, the CAT appears to be the most useful global assessment instrument for the C⁴ project.

C. Assessment Activities for the C⁴ Project

Two types of assessments will be used to evaluate the program: 1.) locally designed University Rubrics will be embedded in the C⁴ program courses, 2.) the global assessment of critical thinking. The Criticalthinking Assessment Test (CAT) will give an estimate of the extent of the critical thinking skills acquired by students at the more global level.

For assessment of Student Learning Outcomes 1 to 4 faculty members will use the University Critical Thinking Rubrics in order to provide data for comparison of changes in critical thinking skills across the semester and the academic year.

Assessment of Student Learning Outcomes 5 and 6 will include the administration of the CAT to all students enrolled in the C⁴ ENGL 1301 courses. The CAT will be administered again at the end of ENGL 1302 in the C⁴ classes, as shown in Table 12 below. The CAT assessment office provides the statistical results.

Table 12: Timeline of Assessment Activities

Term / Year	Criticalthinking Assessment Test (CAT)	University Common Rubric
Fall 2011	All Freshmen enrolled in f2f ENGL 1301	All students enrolled in f2f ENGL 1301
Spring 2012	Completers of f2f ENGL 1302	All students enrolled in f2f ENGL 1302
Fall 2012	All Freshmen enrolled in f2f ENGL 1301	All students enrolled in f2f ENGL 1301
Spring 2013	Completers of f2f ENGL 1302	All students enrolled in f2f ENGL 1302

XI. Future Directions

The QEP uses the C⁴ concept in two freshman composition courses. As the QEP is implemented, effective instructional and assessment techniques will be communicated across the campus to inform possible curriculum improvements. Future expansion of C⁴ courses across the general education program and within the various major programs is considered a viable longer-term goal of the project.

While it is beyond the scope of the QEP as currently envisioned, it should be possible to apply information and techniques learned from the Composition courses in the QEP to the larger campus offerings by recruiting faculty volunteers to modify courses in the general education curriculum, particularly those courses for which there are no alternatives such as HIST 1301 and 1302, COMM 1315, PLSC 2305, 2306, and perhaps the Freshman Seminar. Since students must take the courses, they will provide an appropriate venue for the continued practice of critical thinking skills.

Because the UT Permian Basin has a great many transfer students who arrive with some or all of the general education courses completed, it would be important to offer C⁴ courses within the major programs and in interdisciplinary capstone courses.

During the two years of the C⁴ program and immediately following, the University will lay the foundation for the growth of C⁴ courses by welcoming all interested faculty into the training sessions and encouraging them to explicitly integrate critical thinking skills into their courses and join the C⁴ Faculty Learning Community (FLC). The C⁴ FLC, C⁴ Director, and C⁴ Committee would provide continuity and experience to an expanded C⁴ program through their on-going support and training of faculty and staff. Faculty who wish to do so might be able to earn a C⁴ designation for one or more courses by creating a course that meets the “Best Practices for critical thinking” identified by the QEP. A C⁴ degree designation might also be placed on students’ transcripts.

As the C⁴ program spreads, training of our student tutors and mentors might also be possible so that students taking C⁴ courses could continue to develop their skills with content-area tutoring, targeting the critical thinking aspects of assignments. Continued faculty development in critical thinking using the framework of the QEP would assist faculty members to develop more and better assignments with higher expectations for students. Eventually it might be possible to examine student records of critical thinking performance through C⁴-designated courses at each academic level of a students’ university career and demonstrate their growth in critical thinking skills so that the student body as a whole might benefit from the QEP experience.

XII. Appendices

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A. Budget

C⁴: Clarify, Collect, Consider, Conclude - Enhancing Critical Thinking – Five-Year QEP Budget

	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
<u>Personnel</u> ¹					
Program Director	\$40,000.00	\$40,000.00	\$40,000.00	\$40,000.00	\$40,000.00
Assessment Analyst	\$17,500.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
Administrative Assistant II	\$12,220.00	\$12,220.00	\$12,220.00	\$12,220.00	\$12,220.00
Student Wages (19 hrs. week)	\$7,296.00	\$7,296.00	\$7,296.00		
Subtotal Salaries, Wages	\$77,016.00	\$69,516.00	\$69,516.00	\$62,220.00	\$62,220.00
<u>Assessment</u>					
Instrument (CAT) & Pre-test	\$650.00	\$3,600.00	\$3,600.00		
Travel	\$6,000.00				
Faculty Grader Stipends	\$4,000.00	\$4,000.00	\$4,000.00		
Subtotal Assessment	\$10,650.00	\$7,600.00	\$7,600.00	\$0.00	\$0.00
<u>Faculty Training/ Consultants/ Development</u>					
Training Consultants	\$8,000.00	\$8,000.00			
Course dev. --2 courses @ \$4,000 each	\$8,000.00				
Subtotal Faculty Training/Development	\$16,000.00	\$8,000.00			
<u>Supply and Expense</u> ²					
Maintenance & Operations	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00
Office Supplies	\$6,838.00	\$6,838.00	\$6,838.00	\$3,419.00	\$3,419.00
Reference Materials	\$1,000.00	\$1,000.00	\$1,000.00		
Other	\$200.00	\$200.00	\$200.00		
Subtotal Management & Operations	\$9,038.00	\$9,038.00	\$9,038.00	\$4,419.00	\$4,419.00
<u>Travel</u>	\$9,200.00	\$9,200.00	\$9,200.00	\$4,600.00	
Totals	\$121,904.00	\$103,354.00	\$95,354.00	\$71,239.00	\$66,639.00

Note: This budget does not contain an inflation factor. ¹ QEP personnel will receive appropriate salary increases. ²Equipment (\$13,300) purchased in prior budget year for use in the beginning of spring 2011.

B. 2008-2009 Committees

Leadership Team

Douglas Hale, Associate Provost, Professor of Mathematics and Computer Science, Chair
David Watts, President
William Fannin, Provost and Vice President for Academic Affairs
Christopher Forrest, Vice President for Business Affairs
Kay Ketzenberger, Associate Professor of Social Work, Co-Chair, QEP Team
Susan Lara, Vice President for Student Services
Patricia Sherblom, Associate Professor of Kinesiology, Co-Chair, QEP Team
Karen Smith, Interim Assistant Vice President for Graduate Studies and Research, Chair, Compliance Team
Keith Yarbrough, Assistant Vice President for Information Resource Division, Staff Advisory Council Chair
Denise Watts, Director of Institutional Research, Planning, and Effectiveness and SACS-COC Liaison

QEP Steering Committee

Kay Ketzenberger, Associate Professor of Social Work, Co-Chair, QEP Team
Patricia Sherblom, Associate Professor of Kinesiology, Co-Chair, QEP Team
Lanita Akins, Lecturer in History
Matt Cottrell, Student
Shirley Davenport, Associate Professor of Accounting.
Becky Gardener, Student
Tracie Gibson, Assistant Professor of Biology.
Jessica Martinez, Director of Student Life
Maureen Page, Lecturer in English
Kay Kolb, Lecturer in English
Sylvia Rede, Representative from the Staff Advisory Committee
Denise Watts, Director of Institutional Research, Planning, and Effectiveness and SACS-COC Liaison
Douglas Hale, Associate Provost, Professor of Mathematics and Computer Science, Leadership Team Chair, ex officio
William Fannin, Provost and Vice President for Academic Affairs, ex officio
Christopher Forrest, Vice President for Business Affairs, ex officio

Design Team

Donald M. Allen, Professor of Biology
Rachel Juarez-Torres, Assistant Professor of Education
Kay Ketzenberger, Associate Professor of Social Work, Co-Chair QEP Team
James Olson, Professor of Psychology
Todd Richardson, Assistant Professor of English
Barbara Scofield, Associate Professor of Accounting
Teresa Sewell, Associate Vice President of Student Engagement and Dean of Students
Patricia Sherblom, Associate Professor of Kinesiology, Co-Chair QEP Team
Roland Spickermann, Associate Professor of History
Douglas Hale, Associate Provost, Professor of Mathematics and Computer Science, Leadership Team Chair, ex officio

Best Practices Team

Tracie Gibson, Assistant Professor of Biology
Patricia Sherblom, Associate Professor of Kinesiology, Co-Chair QEP Team
Rachel Juarez-Torres, Assistant Professor of Education

Assessment Team

Kay Ketzenberger, Associate Professor of Social Work, Co-Chair QEP Team
Rachel Juarez-Torres, Assistant Professor of Education
James Olson, Professor of Psychology

Community Awareness Team

Lanita Akins, Lecturer in History
Matt Cottrell, Student
Becky Gardener, Student
Jessica Martinez, Director of Student Life
Anshu Saran, Assistant Professor of Marketing
Laura Serviere, Assistant Professor of Marketing

C. Participation in the Choice of Critical Thinking as the QEP Topic

In the fall of 2007, a series of focus group sessions with faculty, students, staff, alumni, and community leaders was conducted. The first step was to introduce the idea of a Quality Enhancement Plan (QEP) to the university community; it began with an invitation to the on-campus community via blanket emails and posters put up around the campus. The first three sessions on campus were October 15, 16, and 17. These meetings were open to all, and attracted mixed audiences including faculty, staff, and students. Subsequently, meetings with groups were held including the School of Business faculty, School of Education faculty, three multi-department faculty meetings in the College of Arts and Sciences, Vice President of Business Affairs (VPBA) staff, Vice President of Student Services (VPSS) staff, Provost and Vice President of Academic Affairs (VPAA) non-faculty staff, Faculty Senate, Student Senate, and student-housing residents. Alumni were contacted via the alumni newsletter and an informational email. People were offered the opportunity to suggest topics at all of these meetings.

A QEP Topic Proposal form was distributed electronically to students, faculty, and staff, requesting a brief description of a possible topic or topics for the QEP. A web-based survey was also taken utilizing *Survey Monkey* asking for topics in a similar fashion to which students, faculty, staff, alumni, and area residents were invited to respond. By the end of the semester, the number of suggested topics had risen to 73.

At the beginning of the spring 2008 semester, the topics were grouped into 16 QEP-appropriate topics and these were posted in another *Survey Monkey* survey for comment. The results of that survey were used to narrow the field down to four possible topics for our QEP. At that point, an individual who had supported the central idea in one of the four was asked to submit a more complete proposal for consideration of that topic. These four proposals were:

Idea #1: Better remedial/developmental facilities

Background:

- As UTPB grows, we are admitting more and more students who are not prepared for college-level work.
- Most faculty would say we do not do a very good job with remedial and developmental work in reading (almost no one is found deficient, even though the reading level may be as low as fourth grade) and in writing (few are found deficient even though most faculty would say the students do not know how to write well) – the difficulty here may be in identification as well as program practices.
- On the other hand, well in excess of half of our entering freshmen are placed into pre-college mathematics courses.
- Virtually all of our pre-college instruction in mathematics is algebra-based and taught in the same way, more or less, as the subject is taught in public schools. This may work for developmental purposes, but seems on the face of it doomed to failure as an approach to remedial students. Is the same true of the writing instruction?

- Our placement tools are deficient in the sense that they are too large-grained and are not diagnostic. That is, they are not set up to determine the specifics of a particular student's deficiency.
- There are some important differences between developmental (never been exposed to) and remedial (were exposed to, but either did not get it the first time around, or have forgotten it with the passage of time) – do we know which students are in which boat, and do we take that into consideration when deciding how to deal with a student's deficiencies?
- We have some wonderful folks working in the various centers charged with providing help to students not prepared for college-level work. However, few, if any, of these are truly remedial/developmental professionals, in the sense of training concerning best practices for the improvement of these students' position, vis-à-vis college-level course work.
- The success (graduation and retention) rates for those who enter one or more of our pre-college courses are abysmal. This seems to contradict our view that students can be brought up to a level of knowledge and skills that will allow them to succeed at UT Permian Basin. That is what we imply when we admit them, so we are obliged to do something to allow the students a change at success.
- The State is in the process of establishing a new set of standards for college-level readiness and these will be more rigorous and broader than what we have been working with to date.

It was proposed that we devote our QEP efforts to the improvement of our ability to deal with under-prepared entering students. The goal is to improve the retention and graduation rates of students entering UT Permian Basin with deficiencies in the basic knowledge and skills necessary for success in college. This should be taken to include the basic subject areas (mathematics, language arts, reading, social and natural sciences) and the overarching skills, such as work and student habits, attitudes about learning, and so on.

Idea #2: Critical Thinking

A focus on critical thinking emphasizes improving students' abilities to apply higher order thinking skills in ways that are both structured and analytical. In "Charting the Future of U.S. Higher Education," the Commission on the Future of Higher Education indicated that "Employers report repeatedly that many new graduates they hire are not prepared to work, lacking critical thinking, writing, and problem-solving skills needed in today's workplaces" (US Dept of Ed. Sec. 1:3). In "Core Curriculum Assumptions Defining Characteristics," the Texas Higher Education Coordinating Board (THECB) identified critical thinking as one of the six basic intellectual competencies that "are essential to the learning process in any discipline." Defining critical thinking has been more challenging than recognizing its importance. Michael Scriven and Richard Paul have defined critical thinking as "the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action" ("Defining Critical Thinking"). Unfortunately, as psychologist Diane Halpern has pointed out, "Critical thinking does not automatically result as a by-product of standard instruction in a content area" ("Thought" 13). There is evidence,

however, that critical thinking can be taught and that its use generalizes beyond the classroom.

A Quality Enhancement Plan (QEP), focused on critical thinking, acknowledges that the ability to think well should be a major outcome of a university education and that it must be taught consciously and deliberately. A critical thinking program would involve, first, a university-wide conversation, and then a discussion on how that should happen, eventually becoming a discourse on what elements of critical thinking would be incorporated into the curriculum and extra-curriculum. The program would then be conceptualized, and the faculty and student affairs staff given an opportunity to develop activities and pedagogical skills. The institution should probably begin with a pilot program that would develop best practices to disseminate to others. An example of a critical thinking program might include initiation in the freshman seminar and the general education curriculum with a series of activities designed to teach students such skills as how to evaluate information, conceptualize an issue, recognize semantic slanting and guilt by association in presentation of information, seek out contradictory evidence, generate a reasoned method for selecting among possible courses of action, give reasons for choices, and relate new knowledge to previously learned material (or some other list of thinking skills) (Halpern, "Thought" 14-5). It would also allow review and practice of critical thinking skills. Content specific courses in each College and School would present increasingly more difficult skills to reinforce patterns of critical thinking in a variety of contexts. For instance, more advanced courses might teach students about using numerical information, understanding research principles, synthesizing information from a variety of sources and determining credibility (Halpern, "Thought" 14-5). In extra-curricular activities, the emphasis could be on good decision-making, evaluating consequences and/or problem solving. Within the academic program, it might also include a culminating paper or project, undergraduate research experience and/or capstone experience of sufficient complexity to allow students to demonstrate their critical thinking skills.

Assessment of such a program would include such instruments as the Collegiate Learning Assessment (CLA) in which scores for seniors should climb from current levels and the difference between freshman and senior scores should grow larger as students develop better thinking skills. A number of other critical thinking skills assessments currently exist including the rubric from the Washington State University Critical Thinking Project, the California Critical Thinking Disposition Inventory, the International Critical Thinking Essay Tests, the New Jersey Test of Reasoning Skills, the Cornell Critical Thinking Skills Test: College Level, among others and could be evaluated for inclusion in the assessment program. At a minimum, assessments would be scheduled at the time that a student enters the University and at the conclusion of a student's program in the context of the culminating experience.

Idea #3: Core Skills Set

For the purposes of this program, the "core skills set" can be identified as reading, writing, mathematics, technical literacy, and critical thinking, with emphasis on the latter. The core skills are those that are applicable on a cross-discipline basis and incorporate competencies that not only can be applied to the college curriculum but to a fulfilling, productive life as a citizen after graduation. In order to implement the teaching/learning of the core skills within the existing curriculum at UTPB, it is necessary that they be

taught and learned within the context of a subject area; i.e., such skills are taught and learned as tools for advanced learning and not as an end unto themselves, separate and isolated from subject content. The core skills are best taught and learned contextually.

For UT Permian Basin students to acquire the advantages that competence in the core skills can offer, at least three points of academic intervention are recommended.

First, in the developmental stages, during which students are oriented to college-level basic study requirements in their freshman or transfer year, it is necessary that they have a sound grounding in the basic tools involving reading, writing, mathematics, technical literacy, and critical thinking. Of those competencies, critical thinking is the embodiment of the other skills and is paramount. This can be realized through the design, development, and implementation of an introductory infused curriculum that is incremental and sequential in specific courses required of all incoming UT Permian Basin students.

Second, subsequent courses in the programs of study for each major offered at UT Permian Basin can be identified and revised to provide reinforcement and enrichment of those same core skills sets identified by the faculty as necessary for success as contemporary college students and future productive citizens.

Third, specific capstone courses in each program of study for each major can be identified and revised to require demonstrated competency in the core skills and measurable outcomes of the effort to instill the acquisition of core skills of all UT Permian Basin students.

Idea #4: Freshman Experience

It is recommended that the following general principles be observed when changing the freshman program:

- First-year students should all have a comprehensive “hands-on” learning experience.
- Academic rigor must be maintained, but improved methods for teaching freshman subjects in a more integrative way should be pursued.
- The faculty and administration should create a program that blends core subjects and project-based learning experiences.

Prior to integrating the recommended changes as outlined further below, the following will need to be implemented:

- Develop and publicize an institutional strategy for the freshman year
- Define and improve freshman year curriculum
- Sanction experimental freshman mini-courses
- Sanction an experimental freshman mission
- Sanction trial laboratory subjects freshmen
- Establish a process or routine review and maintenance of the general education requirements
- Make educational assessment an Institutional priority

The Freshman Experience will be designed as a 4-credit course. It would combine Freshman Seminar with a freshman level GenEd course (i.e., HIST 1301 or ENGL 1301).

Each of these four items was placed in a *Web Monkey* Survey with the question:
How do you rank Idea #3?

1. I believe this is the best
2. I believe this is the second best
3. I believe this is the third best
4. I believe this is the fourth best

Comments:

Following the survey, it was decided that the proposal on developmental/remedial improvement (Idea #1) could move forward without waiting for the QEP and so was dropped from the short list. For the remaining three topics the distribution of responses by category of respondent was:

Alumni	59
Faculty	100
Other	30
Staff	67
Student	762
Total	1018

The results were remarkably evenly split, though the Freshman Experience was a clear third choice. Critical Thinking was slightly preferred to Core Skills and so was chosen as the topic for our QEP. In retrospect, given the final form of the QEP, the core skills needed in composition will be addressed as well as Critical Thinking.

D. Staffing of the C⁴ Project

a. C⁴ Program Director

Duties: Provides coordination and oversight to all aspects of the C⁴ Program to ensure its successful implementation. Specific duties would include:

- Serves as the budget head for the C⁴ program.
- Serves as an Ex Officio member and staff support for the C⁴ Committee.
- Provides training opportunities and programs for the C⁴ teaching faculty on critical thinking concepts and methods.
- Works with the C⁴ teaching faculty on developing best practices learned through the project within the C⁴ teaching faculty and with the University's faculty as a whole.
- Provides training opportunities and programs for University faculty on C⁴ concepts, methods, and ways to extend those concepts beyond the project courses.
- Works with the Assessment Specialist and C⁴ Committee on the development of rubrics for assessment; recruitment and training of CAT readers and other assessment staffing; and scheduling and administration of C⁴ assessment activities.
- Promotes the C⁴ Project and the use of critical thinking skills throughout the University.
- Maintains all records and data on the project and coordinates the production of the annual and fifth-year report.
- Develops presentations and papers on lessons learned from the C⁴ Project for dissemination to the academic community inside and outside of UT Permian Basin.
- Monitors SACS QEP standards and ensures UT Permian Basin is in compliance.

Qualifications: Full-time tenured faculty member with a knowledge and interest in critical thinking and the development of critical thinking skills. Director must have a passion for critical thinking education, excellent interpersonal, organizational, and communication skills.

Compensation: 50% time for 12 months. This will be translated into two course releases in each long semester, and support equal to a 50% course release each summer beginning summer 2011.

Approximate Budget: Assuming a faculty salary of \$60,000 this results in a budgeted salary of approximately \$40,000 per fiscal year (\$30,000 as 50% of \$60,000 estimated salary and \$10,000 one-sixth of academic rate for summer support).

b. Assessment Specialist

Duties: Conduct the statistical analyses for the C⁴ Project and prepare reports on the results of the assessments. Specific duties include:

- Works with the C⁴ Committee and C⁴ Program Director in the selection and review of assessment instruments including rubrics and methods to ensure alignment for statistical analysis.
- Works with the Office of Institutional Research, Planning, and Effectiveness; Information Resources Division; and the University Registrar to obtain secondary data to be included in the analyses.
- Builds a database appropriate for the analyses and instruments used in the Project.
- Performs statistical analyses of assessment results pertinent to the student learning outcomes of the C⁴ Program.
- Prepares reports and presentations with the C⁴ Program Director for presentation to on-campus and off-campus groups.

Qualifications: Strong understanding of social science research -and statistical methods.

Compensation: A course release for one semester during the first year to work on assessment instrument selection and database construction, and support each summer at the rate of 50% or two summer course equivalents for the data analysis and preparation of the reports.

Budget Estimate: Salary is estimated on an academic rate of \$60,000. The first fiscal year would also include \$7,500 for a single course release during one of the long-term semesters, and \$10,000 for the summer session at a two-course equivalent. This will result in a salary of \$17,500 for the first year. For each succeeding year of the project, the salary would be \$10,000 a year in summer support.

c. Administrative Assistant I

Duties: Serve as the administrative assistant for the C⁴ Program Director and the program in general within the University's job description for a standard Administrative Assistant I

Qualifications: Standard for the Administrative Assistant I. No special qualifications are needed.

Compensation: 50% of the standard salary for the Administrative Assistant I. The position may be shared with another office, so the individual could be full-time.

Budget: Budgeted at 50% of the normal annual salary, \$12,000 for the year.

Budget Note

To show full costs, estimates for fringes should be made at 28% of all salaries and stipends. Since fringe benefits are covered through a budget process different from state appropriations, it is assumed these positions will not need a fringe benefit line in the program's printed budget.

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F. Examples of Rubrics

As discussed in Stage One of “Actions to Be Implemented” (27), the university is looking at a number of rubrics for assessment of critical thinking via the four Student Learning Outcomes (SLOs) that have been identified (C⁴). The goal is for the university community to be able to apply a common framework and language for critical thinking.

The *Assessment of Critical Thinking Skills* rubrics communicate critical thinking as a set of teachable skills framed as student learning outcomes (SLOs). These rubrics identify and assess the four SLOs relative to a completed product (i.e. student work). As we move forward on the design of the rubric(s) for the QEP we will examine the relative strengths and purposes of analytic versus holistic, and general versus task specific, in order to develop the most effective assessment.

What follows are two examples of rubrics for assessment that the QEP Steering Committee are reviewing. The first is specifically applying the student learning outcomes (SLOs) within English Composition courses. The second is a holistic rubric that may be used across disciplines. Both of these will be refined during the process of implementation of the QEP.

Example of Critical Thinking Rubric Within ENGL 1301/1302

This is an example of a possible rubric that may be used within Freshman Composition within Stage One of the plan. A possible holistic rubric follows.

	Clarify		Collect		Consider	Conclude
Score Level	Thesis / Focus: a) Originality	Thesis / Focus: b) Clarity	Use of Sources / Documentation	Organization	Support / Reasoning: a) Ideas	Support / Reasoning: b) Details
4. Accomplished	Develops fresh insight that challenges the reader's thinking	Thesis and purpose are clear to the reader; closely matches the writing task	Uses sources to support, extend, & inform, but not substitute writer's own development of ideas. Combines material from a variety of sources, incl. personal observation, scientific data, and authoritative testimony. Does not over use quotes.	Fully and imaginatively supports thesis and purpose. Sequence of ideas is effective. Transitions are effective.	Substantial, logical, and concrete development of ideas. Assumptions are made explicit	Details are germane, original, and convincingly interpreted.

3. Competent	Thesis is somewhat original	Thesis and purpose are fairly clear and match the writing task	Organization supports thesis and purpose. Transitions are mostly appropriate. Sequence of ideas could be improved.	Offers solid but less original reasoning. Assumptions are not always recognized or made explicit.	Contains some appropriate details or examples.	Uses sources to support, extend, & inform, but not substitute writer's own development of ideas. Does not over use quotes, but may not always conform to required style manual.
2. Developing	Thesis may be obvious or not imaginative	Thesis and purpose are somewhat vague OR only loosely related to the writing task	Some signs of logical organization. May have abrupt or illogical shifts and ineffective flow of ideas	Offers somewhat obvious support that may be too broad.	Details are too general, not interpreted, irrelevant to thesis, or inappropriately repetitive	Uses relevant sources but lacks in variety of sources and/or the skillful combination of sources. Quotations & paraphrases may be too long and/or inconsistently referenced
1. Unacceptable	Thesis is missing	Reader cannot determine thesis & purpose OR thesis has no relation to the writing task	Unclear organization OR organizational plan is not appropriate to thesis. No transitions.	Offers simplistic, underdeveloped, or cryptic support for the ideas.	Inappropriate or off-topic generalizations, faulty assumptions, errors, or facts.	Neglects important sources. Overuse of quotations or paraphrase to substitute for writer's own ideas. (Possible uses of source material without acknowledgement)

Assessment of Critical Thinking Skills—Holistic Rubric

Directions: Student learning outcomes are listed in the far left-hand column. This holistic rubric is to be used as a reference for explaining the overall performance levels of students' critical thinking skills. Given the following descriptions, use the holistic rubric to score student work as a direct measure of levels of critical thinking skills. Mark the level in the far right-hand column.

Student Learning Outcomes	Not Present (0)	Unacceptable (1)	Weak (2)	Satisfactory (3)	Target (4)	Performance Level
<p>1. Clarify <i>Identify and clarify problems and issues</i></p>	Does not identify and clarify problem or issue to any situation.	Problem/ issue is relevant to a different situation is stated.	Problem/ issue is relevant to situation with the context identified using <2 supports	Problem/ issue is relevant to situation is stated and <u>described with 2+ supports.</u>	Problem/ issue identified is relevant to the situation, in context, is clearly stated, with 3 or more	<input type="checkbox"/> 0- Not Present <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3- Acceptable <input type="checkbox"/> 4- Target
<p>2. Collect <i>Collect and effectively organize relevant information</i></p>	Does not collect and effectively organize relevant information	Collects and organizes information with <u>little or no clarity</u>	Collects and organizes <u>relevant information with little or no clarity</u>	Collects and <u>organizes relevant information with little clarity</u>	Collects and <u>effectively organizes relevant information with based on clarity of problem identification</u>	<input type="checkbox"/> 0- Not Present <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3- Acceptable <input type="checkbox"/> 4 - Target
<p>3. Consider <i>Carefully considers, analyzes and evaluates information/evidence relevant to the issue</i></p>	Does not carefully consider, analyze, and evaluate information/ evidence relevant to the issue	Does consider, analyze, and evaluate information/evidence <u>making multiple errors</u> in distinguishing relevant information	Does consider, analyze, and evaluate information/evidence <u>showing some confusion</u> regarding relevant information	Does carefully consider, analyze, and evaluate information/evidence <u>showing little or no confusion</u> regarding relevant information	Does carefully consider, analyze, and evaluate information/evidence <u>showing no confusion based on clarity of problem identification, collection of relevant information</u>	<input type="checkbox"/> Not Present <input type="checkbox"/> Emerging <input type="checkbox"/> Developing <input type="checkbox"/> Proficient <input type="checkbox"/> Exemplary
<p>4. Conclude <i>Comes to well-reasoned, logically supported conclusions</i></p>	Does not conclude with reason or logic	Does conclude with <u>little or no reason and logic and bias</u>	Does conclude with <u>little reason and logic and bias</u>	Does come to a <u>well-reasoned, logically supported conclusion without bias</u>	Does come to a <u>well-reasoned, logically supported conclusion without bias based on clarity of problem identification, collection of relevant information, and careful consideration of relevant information</u>	<input type="checkbox"/> Not Present <input type="checkbox"/> Emerging <input type="checkbox"/> Developing <input type="checkbox"/> Proficient <input type="checkbox"/> Exemplary

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