University of North Texas Health Science Center

Building Higher Order Thinking Skills in Tomorrow's Health Care Professionals

A Quality Enhancement Plan

**Prepared for Submission to the
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I. Executive Summary

Building Higher Order Thinking Skills in Tomorrow's Health Care Professionals (the "HOT" plan) is the University of North Texas Health Science Center's (UNTHSC's) Quality Enhancement Plan (QEP), designed to take student learning to the next level. The overall learning goal of UNTHSC's QEP is to improve students' higher order thinking skills, which are essential to helping students meet the needs of the state of Texas and the nation with regard to critical health care and research.

The goal of the QEP is consistent with the UNTHSC's mission statement, vision, five-year strategic plan, and 2010 tactical initiatives. The selected topic of **improving UNTHSC students' critical thinking skills through improved faculty teaching** is the result of a broadly inclusive and collaborative two-year process of planning and development with representative stakeholders.

UNTHSC has initiated a data-driven approach to establish a baseline profile of students' learning styles, critical thinking skills, and disposition to critical thinking. Standardized test scores documenting current student performance in higher order thinking prior to the implementation of UNTHSC's QEP curriculum changes are fully instituted.

The goals of the HOT plan are as follows:

- Goal 1: Improve and evaluate students' higher order thinking skills.

- Goal 2: Improve and evaluate faculty knowledge and skills in implementing instructional strategies and assessment tools that cultivate students' higher order thinking skills.

Using one set of unifying goals and outcomes, faculty from each school have developed an action plan for improving student learning outcomes and building higher order thinking skills.

Using the higher order learning levels identified in Bloom's Taxonomy, faculty in ten courses across the four UNTHSC schools will introduce changes in curriculum, andragogy, and assessment methods focused on improving students' higher order thinking skills. Hence, faculty development will be an important component in the implementation phase of UNTHSC's QEP. The faculty teaching the selected courses will participate in a series of faculty development activities designed to improve andragogy and assessment of higher order thinking skills.

The QEP is organized under the direction of the QEP Director who reports to the Provost and Executive Vice President of the Health Science Center. The QEP is further supported by the creation of the QEP Executive Committee and a newly organized QEP Advisory Council. Adequate financial resources have been allocated by UNTHSC to fund the QEP.

An assessment plan will evaluate the accomplishment of each of the goals and outcomes of the QEP to determine the impact of the QEP on student learning. Continuous assessments using both quantitative and qualitative measures will be employed through a multi-phase process to ensure the implementation of activities, measurement of intervention results, and subsequent use of those results for ongoing revisions and improvements.

The institutional plan to enhance student learning and **higher order thinking** skills will play an essential role in improving student learning outcomes. **Hence, UNTHSC's QEP is a HOT plan.**

II. Process Used for QEP Topic Identification and Plan Development

A. BROAD-BASED INVOLVEMENT OF INSTITUTIONAL STAKEHOLDERS

The UNT Health Science Center began the process of developing the QEP for submission to the Southern Association of Colleges and Schools-Commission on Colleges (SACS-COC) in December 2007 with the naming of the QEP Planning Team by President Scott Ransom. The seventeen-member team, charged with helping identify the topic and recommend proposals for final development, included faculty, staff, students, and alumni with administrative support from the Office of Strategy and Measurement. (Details about the QEP Planning Team and other QEP support committees are provided in Section VII, Organizational Structure.)

The multistep process used to identify a topic for the QEP included a set of activities designed to be broadly inclusive while ensuring 1) full participation of all appropriate campus stakeholders and 2) identification of significant topics consistent with the UNT Health Science Center's mission, vision, five-year strategic plan and 2010 tactical initiatives (Appendix I).

1. Identification of the QEP Topic

To develop the initial focus for the QEP, the QEP Planning Team conducted an institution-wide survey asking UNTHSC faculty, staff, and students to identify QEP themes that would improve student learning outcomes. Members of the QEP Planning Team met with student representatives from the various student associations, faculty and staff throughout the institution, and administrative groups such as the Executive Team, Leadership Team, Council of Deans, and Department Chairs to ensure broad stakeholder participation in identifying the QEP topic. Announcements asking faculty, staff, and students to identify topics for the QEP were published in the UNTHSC Daily News and distributed via e-mail. For convenience, individuals submitted theme suggestions electronically to an e-mail address, QEP@hsc.unt.edu.

The QEP Planning Team received and reviewed thirty-six suggestions. A list of the suggested themes is provided in Appendix II. The QEP Planning Team then condensed the thirty-six suggestions into seven macro themes. The themes centered around enhancing the following areas: 1) faculty development for academic teaching and learning; 2) student retention; 3) student leadership skills; 4) critical thinking through the use of evidence-based knowledge in research, education, and clinical practice; 5) research competencies in all curricula; 6) teaching and learning through the use of technology; and 7) student informatics skills.

Through direct e-mail and published announcements in two regularly issued UNTHSC news sources, the Daily News and Campus Connection, the QEP Planning Team subsequently invited all faculty, staff, and students to rank the macro themes. Theme rankings were collected using Checkbox, an electronic survey tool. Nearly 300 students, faculty, and staff submitted individual rankings. As illustrated in Figure 1, the QEP Planning Team compiled the submitted rankings and identified both **critical thinking** and **faculty teaching** as the key topics for the QEP. (For ranking of the QEP themes by each constituent group—faculty, staff, and students—see Appendix III.)

Figure1. Ranking of QEP Themes by All Respondents
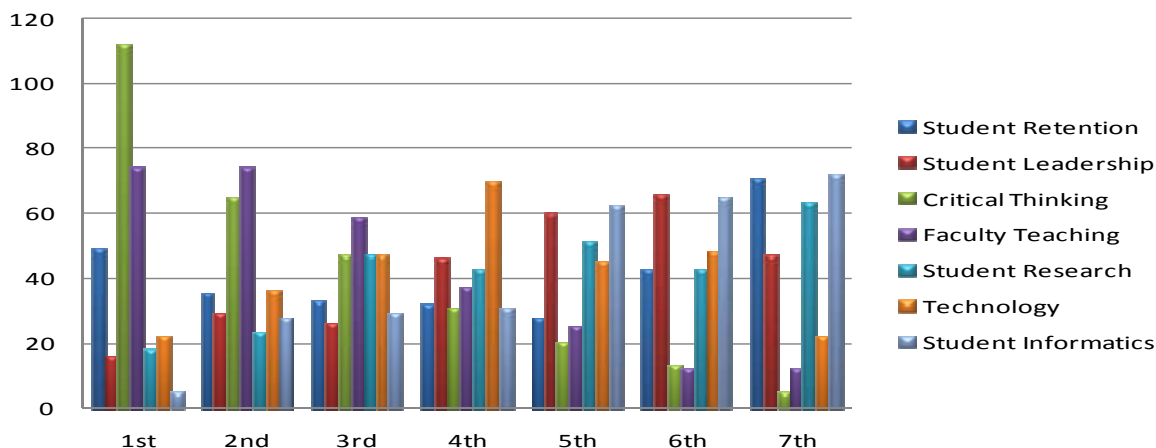
2. QEP Development Process

Moving from Topic to Proposal

The QEP Planning Team then developed a multi-tiered process to ensure broad-based participation in developing the topics into proposals for consideration for the QEP.

First, the QEP Planning Team developed a QEP Request for Applications (RFA) for pre-proposals (Appendix IV). The RFA ensured broad-based participation by requiring 1) the involvement of multiple UNTHSC faculty, staff, and/or students and 2) that the merits of the project be presented and discussed in several venues, such as department meetings, committee meetings, and faculty meetings. Submissions of pre-proposals that were multidisciplinary, involved several co-investigators, and cut across academic programs were strongly encouraged. Hence, any group of UNTHSC faculty, staff, or students was eligible to submit a pre-proposal with the stipulation that the principal investigator must be faculty or staff.

Second, using direct e-mail to faculty, students, and staff, the QEP Planning Team publicized the RFA process for the QEP. Additionally, the QEP Planning Team promoted the QEP through posters and announcements in the Daily News, a campus-wide electronic publication. All UNTHSC faculty, staff, and students received the RFA for pre-proposals in April 2008, and all pre-proposals were due at the end of May 2008.

Third, the QEP Planning Team received nine pre-proposals (Appendix V) and evaluated them using a rubric (Appendix VI). Five of the nine multidisciplinary pre-proposals that were submitted emerged as most promising in meeting the SACS-mandated criteria for QEPs. The QEP Planning Team recommended that three of the top five pre-proposal teams join forces and submit one joint proposal, resulting in three proposals for final consideration. A list of the pre-proposal topics and investigators selected to submit full proposals is provided in Appendix VII.

Next, the guidelines for full proposals were developed and sent to the three teams, who submitted proposals to the QEP Planning Team. The QEP Planning Team then met to evaluate the three full proposals, ranking each one using a five-level scale to indicate how successfully the proposal met the guidelines (Appendix VIII). The QEP Planning Team also invited Dr. Phil Turner, who served as a principal in the development and implementation of the University of North Texas at Denton's QEP, to participate in the

final selection of the top proposal(s) to send to the Executive Team. The Executive Team, comprising the President, Provost and Executive Vice President for Academic Affairs, Vice Presidents, Deans, and the Chief of Staff, then decided which proposal to select for development into the QEP. **In December 2008, the Executive Team announced the selection of the proposal entitled Technological and other Education Advances for Curricula in Health-Health Science Center (TEACH-HSC).**

After the selection of the TEACH-HSC proposal, the chair of the TEACH-HSC committee met with the UNTHSC Provost and Executive Vice President for Academic Affairs and established a budget of $150,000 for project preparation during the 2009 fiscal year. Upon subsequent review of the TEACH-HSC project, the Provost developed a budget with the Executive Team and allocated $400,000 in the fiscal year 2010 budget for the QEP.

Dr. Richard Kurz (School of Public Health) led the TEACH-HSC Committee. The committee members included Daniel Burgard (Gibson D. Lewis Library), Robert Wright (Biomedical Communications), Hank Lemke (Physician Assistant Studies Program), Robert Woelfel (Systems and Programming), and Drs. Jerry Alexander (Academic Information Services), Warren Anderson (School of Health Professions), Bruce Dubin (Texas College of Osteopathic Medicine), and Patricia Gwirtz (Graduate School of Biomedical Sciences).

Proposal to QEP Development

In December 2008, following selection of the winning QEP proposal, the QEP Planning Team met with the writers of the TEACH-HSC proposal to provide feedback from the Executive Team, offer initial guidance, and to share the timeline for developing the proposal into a QEP for submission to SACS-COC. The QEP Planning Team then met monthly with the TEACH-HSC Committee to provide continued support and oversight during the development phase.

The TEACH-HSC Committee began meeting weekly to refine its proposal for submission to the SACS-COC. The TEACH-HSC Committee invited the QEP Planning Team to participate in TEACH-HSC Committee meetings to broaden input into proposal development. As it began the refinement process, the committee returned to the SACS' document "The Quality Enhancement Plan (QEP)" as a guide for developing content and formatting the proposal. In addition, the committee reviewed several QEP documents from other universities for scope, content, and format guidance. As the development process progressed, the TEACH-HSC Committee was expanded and renamed the QEP Development Committee. In addition, a QEP Advisory Council and QEP Executive Committee were established, and QEP School Team Directors were named to support the implementation and evaluation of the QEP. Members of each of these committees are listed in Appendix IX along with members of the UNTHSC Executive Team and Board of Visitors.

In the fall of 2009, a preliminary draft of the proposal was completed and shared with students, faculty, staff, alumni, and with external constituents serving on the Board of Visitors. The Board of Visitors comprises individuals who consult with the president, the administration, and the deans of the schools and colleges on specific projects such as the QEP. In addition, the preliminary draft was shared with two external consultants.

The results of the development process include a QEP plan that is narrower in focus and the **renaming of the plan from TEACH-HSC to Building *Higher Order Thinking* Skills in Tomorrow's Health Care Professionals (the "*HOT*" plan).** Key events in the QEP topic identification and plan development process are summarized in Table 1.

Table 1. QEP Development Timeline and Key Events

Timeline	Key Event
December 2007	President Ransom names QEP Planning Team
	QEP Planning Team develops process to involve campus stakeholders
January–February 2008	QEP Planning Team develops timeline, collects topic suggestions, and merges topics into macro themes
February–March 2008	Campus stake holders submit rankings of QEP macro themes
	Campus chooses student critical thinking and faculty teaching as themes for QEP
	QEP Planning Team requests pre-proposals based on one or both of the selected QEP themes
April–May 2008	QEP Planning Team collects pre-proposals
June–July 2008	QEP Planning Team reviews pre-proposals and develops guidelines for full proposal submission
August 2008–October 2008	Selected teams develop pre-proposal submissions into full proposals for QEP consideration
November 2008	QEP Planning Team reviews submitted proposals and makes recommendation to Executive Team
	Executive Team selects TEACH-HSC proposal for development into the QEP
December 2008	QEP Planning Team meets with TEACH-HSC Committee
January–April 2009	TEACH-HSC Committee begins proposal development as the QEP External Consultant makes an onsite visit
	Search for QEP Director is conducted
May 2009	Campus stake holders and external consultant review draft of TEACH-HSC proposal
	QEP Director is hired
June 2009	External consultant reviews QEP draft
	TEACH-HSC proposal is refocused from critical thinking to higher order thinking
July 2009	QEP leaders participate in SACS-COC Summer Institute
	QEP plan is renamed from TEACH-HSC to Building *Higher Order Thinking* Skills in Tomorrow's Health Care Professionals (the "*HOT*" plan)
	Phone consultation with External Consultant is held to review recommendations
August–September 2009	Overview of QEP is presented to students, faculty, staff, and administration
	QEP Faculty Retreat is held
	Baseline data are collected on students' higher order thinking skills
October 2009	Draft of QEP is disseminated to all stake holders for review
November–December 2009	Final draft of QEP is prepared
	Draft is reviewed with consultant
January 2010	Final draft is disseminated and reviewed with faculty, students, staff, and other key stakeholders
	QEP is submitted to SACS-COC

B. ASSESSMENT OF INSTITUTIONAL DATA

The central purpose of the HOT plan is to develop and improve UNTHSC students' higher order thinking skills to enhance their learning in courses and their subsequent professional performance upon graduation. To establish a baseline profile of UNTHSC students' learning styles, critical thinking skills, and disposition to critical thinking, UNTHSC used a data-driven approach based on standardized test results. The purpose of collecting the baseline data was to document current student performance in higher order thinking prior to implementing UNTHSC's HOT plan curriculum modification. Moreover, establishing a baseline profile will help us understand more fully the change in student performance over time. The assessment of UNTHSC students from each school also informs faculty about the strengths and weaknesses of entering student cohorts and provides faculty with individual student performance information for advising purposes. In addition, the data will allow us to compare the performance of UNTHSC students in higher order thinking with that of their peers nationwide.

1. Selected Measures

During the summer of 2009, the QEP Director researched available test instruments for assessing UNTHSC students' learning styles and measures for assessing higher order thinking skills appropriate for medical and graduate students in health science programs. Subsequent discussions with the staff at the UNTHSC Center for Academic Performance and review of available tests by faculty and the QEP Committee resulted in the selection of three instruments: 1) Learning and Study Strategies Inventory (LASSI), 2) California Critical Thinking Skills Test (CCTST), and 3) California Critical Thinking Disposition Inventory (CCTDI). Following are descriptions of these instruments, including the purpose and rationale for selecting each one.

Learning and Study Strategies Inventory

The purpose of the LASSI is to assess "students' awareness about and use of learning and study strategies related to skill, will, and self-regulation components of strategic learning." The LASSI consists of 80 items presented in ten scales that provide an assessment of "both covert and overt thoughts, behaviors, attitudes, and beliefs that relate to successful learning and that can be altered through educational interventions" (Weinstein and Palmer 2002).

Three of the ten scales reflect the strategic learning skills component of the LASSI—the Information Processing Scale **(INP)**, the Selected Main Idea Scale **(SMI)**, and the Test Strategies Scale **(TST)**. These three scales were examined for the purpose of understanding students' learning styles as they pertain to the HOT plan. "These scales examine students' learning strategies, skills, and thought processes related to identifying, acquiring, and constructing meaning for important new information, ideas, and procedures. In addition, these three scales also examine how students prepare for and demonstrate their new knowledge on tests or other evaluative procedures" (Weinstein and Palmer 2002).

The **INP** scale assesses how well students use reasoning skills to connect what they already know with what they are seeking to learn and remember, all of which are central in knowledge acquisition, retention, and future application. The **SMI** scale assesses students' skills at identifying important information for mastery from among less important details, which requires the use of evaluation. The **TST** scale assesses

students' ability to prepare for and complete course and program assessments so they are effectively able to demonstrate their knowledge of the subject matter.

California Critical Thinking Disposition Inventory

The purpose of the CCTDI is to measure a person's overall disposition to use higher order thinking (critical thinking) skills as an approach to analyzing and resolving high-stakes, time-limited, or novel problem situations. The CCTDI results, as related to the HOT plan, provide information on students' willingness to think critically, which is a precondition that affects higher order thinking ability. The CCTDI gives eight scores, which include an overall test score and scores on the following seven scales: **Truth-seeking, Open-mindedness, Analyticity, Systematicity, Critical Thinking Self-Confidence, Inquisitiveness, and Maturity of Judgment**. The measure(s) for each of these scales is provided in Table 2 below.

Table 2. California Critical Thinking Disposition Inventory Scales and Measures

Scale	Measure
Truth Seeking	Identifies thinkers who are eager to seek the truth even if results do not support one's own interests or preconceived opinions
Open Mindedness	Highlights disposition of being open-minded and tolerant of divergent views with sensitivity to possibility of one's own bias
Analyticity	Targets disposition of being alert to potentially problematic situations, anticipating possible results or consequences, and using reasoning and the use of evidence even if the problem proves to be challenging
Systematicity	Targets the disposition of being organized, orderly, focused, and diligent in seeking information
Critical Thinking Self- Confidence	Refers to the level of trust one places in one's own reasoning process
Inquisitiveness	Refers to innate curiosity about a wide range of issues, concern for being well informed, and values learning
Maturity of Judgment	Targets disposition of making reflective judgments and is characterized by approaching problems, inquiry, and decision-making with the understanding that some situations have more than one plausible option and some decision-making can occur without the benefit of having all of the relevant information about the situation

Source: Baseline Report on UNTHSC Higher Order Thinking Skills and Habits of Mind: Prepared by Insight Assessment, November 2009

High overall scores on the CCTDI indicate that the valuation of critical thinking as an approach to analyzing and resolving complex, novel, high-stakes problems is a habit of mind. Low overall scores indicate that the test taker probably has none of the attitudes or attributes associated with the strong critical thinker. CCTDI overall scores above 350 reflect general strength in the Scale Scores and indicate across-the-board strength in the disposition toward critical/higher order thinking. Overall scores between 240 and 350 are indicative of a person expressing inconsistent attitudes toward or ambiguous valuation of higher order thinking.

The recommended cut score for each of the seven scales is 40, and the suggested target score for each scale is 50. Persons who score above 50 on a scale are strong in that dispositional aspect. A scale score between 30 and 40 indicates ambivalence toward that particular dispositional aspect. Any score below 40 is the result of a person

responding to some items negatively and is viewed as an area for improvement. Persons who score below 30 on a given scale are negatively disposed in that dispositional aspect. Scoring below 30 indicates that, on average, the person responds in opposition to the dispositional aspect measured by the given scale. Just as a score of less than 40 shows weakness, an overall CCTDI total score of less than 280 can be a cutoff indicator of overall deficiency in the disposition toward critical thinking.

California Critical Thinking Skills Test

The CCTST assesses overall critical thinking skills and serves as a useful measure when the purpose is to compare individual students with national performance standards. Moreover, it informs faculty of UNTHSC students' strengths and weaknesses in the area of higher order thinking, hence making it a useful measure for the HOT plan.

The CCTST is composed of the **Analysis, Evaluation, and Inference scales**. Together, these scales represent core critical thinking skills, with the understanding that the meta-cognitive self-regulation that is exercised when a person is taking the CCTST cannot be readily accessed apart from the operation of these other skills. The total CCTST score consists of the three scales of Analysis, Inference, and Evaluation as well as the sub-scales of Induction and Deduction, as shown in Table 3.

Table 3. California Critical Thinking Skills Test Scales, Subscales, and Measures

Scale	Measure
Analysis	1) Comprehend and express the meaning or significance of a wide variety of experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures, or criteria (includes the sub-skills of categorization, decoding significance, and clarifying meaning).
	2) Identify the intended and actual inferential relationships among statements, questions, concepts, descriptions, or other forms of representation intended to express beliefs, judgments, experiences, reasons, information, or opinions (includes sub-skills of examining ideas, detecting arguments, and analyzing arguments into their component elements).
Evaluation	1) Assess the credibility of statements and logical or other representations which are descriptions of a person's perception, experience, situation, judgment, belief, or opinion; and assess the logical strength of the actual or intended inferential relationships among statements, descriptions, questions, or other forms of representations (includes sub-skills of assessing claims and arguments).
	2) State the results of one's reasoning; justify that reasoning in terms of the evidential, conceptual, methodological, criterion-logical, and contextual considerations upon which one's results were based; and present one's reasoning in the form of cogent arguments (includes sub-skills of stating results, justifying procedures, and presenting arguments).
Inference	Identify and secure elements needed to draw reasonable conclusions; form conjectures and hypotheses; consider relevant information; and deduce the consequences flowing from data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other forms of representation (includes the sub-skills of querying evidence, conjecturing alternatives, and drawing conclusions).

Table 3. (cont.)

Subscale	Measure
Deductive Reasoning	Assumed truth of the premises purportedly necessitates the truth of the conclusion.
Inductive Reasoning	Argument's conclusion may purportedly be warranted, but not necessitated by the assumed truth of its premises. Scientific confirmation, experimental disconfirmation, and statistical inferences are examples of inductive reasoning.

Source: Baseline Report on UNTHSC Higher Order Thinking Skills and Habits of Mind: Prepared by Insight Assessment, November 2009

2. Methodology

Sample Selection

First year students for fall 2009 within each of the four schools completed the Learning and Study Strategies Inventory (LASSI). The descriptive data of the entering students for the fall 2009 semester are detailed within Table 4. First and second year students completed the California Critical Thinking Skills Test (CCTST) and the California Critical Thinking Disposition Inventory (CCTDI). The inventory data provided a baseline of students' learning and study styles, critical thinking skills and indices of their predisposition or willingness to think critically for the HOT plan.

Table 4. UNTHSC Entering Students Class Profile, 2009 (N=329)

School	Entering Class Size	Entering GPA (4.0 scale)	Entering Mean Age	Gender	
				Male	Female
Texas College of Osteopathic Medicine	169	3.57	25	101	85
Graduate School of Biomedical Sciences	52	3.18	24	24	28
School of Public Health	52	3.40	26	16	36
School of Health Professions	56	3.46	27	12	44

Source: UNTHSC School Admissions Offices
Note: GPA = Grade point average

Sample Description

Learning and Study Strategies Inventory. The sample population for baseline data collection using the LASSI was first year students in the fall 2009 semester. Of this total sample population, 261 students completed the LASSI and were included in the data analysis.

California Critical Thinking Disposition Inventory and California Critical Thinking Skills Test. The sample population for baseline data collection using the CCTDI and CCTST was composed of 472 students enrolled during the fall of 2009 in the 10 QEP-selected courses, inclusive of first- and second-year students. Students involved in the testing received verbal and written instructions from the QEP Director. The assessments were available to test takers from August 20 through October 1 of 2009. All tests included in the analysis were tests on which the test taker responded to at least 60

percent of the items, and analyses of the data included only those items that were fully completed by students.

The overall number of test takers available for analysis was 314. They ranged in age from 21 to 59 years of age, with nine test takers electing not to provide age-related information. Fifty percent of the sample was between the ages of 21 and 25.

There were 151 females and 161 males, with two test takers electing not to provide gender information. Test takers described themselves as White/Caucasian/Anglo American (n=165; 52.5%), Asian/Asian American/Pacific Islander (n=78, 24.8%), Black/African American (n=19, 6.1%), or Hispanic/Latino/ Mexican American (n=27, 8.6%). Eleven test takers chose not to respond, and eleven indicated that their ethnicity was other than one of the above descriptors. Table 5 displays the number of test takers in each of the schools and the percentage of the school's total available sample that the test takers represent.

Table 5. Fall 2009 Assessment Sample for the California Critical Thinking Disposition Inventory and California Critical Thinking Skills Test

School/Degree Program	Total QEP Course Enrollment N=472	CCTDI/CCTST Total Sample N=314	Percent of School's Eligible Sample N=314
Texas College of Osteopathic Medicine Doctor of Osteopathic Medicine (DO)	279	154	55
Graduate School of Biomedical Sciences Master of Science (MS)	106	99	93
School of Public Health Master of Public Health (MPH)/ Master of Health Administration (MHA)	35	24	69
School of Health Professions Master of Physician Assistant Studies (MPAS)	43	37	86

Source: Baseline Report on UNTHSC Higher Order Thinking Skills and Habits of Mind: Prepared by Insight Assessment, November 2009

Baseline Data Collection

Learning and Study Strategies Inventory. The staff of the UNTHSC Center for Academic Performance (CAP) administered the paper and pencil version of the LASSI to the incoming students participating in the 2009 summer orientation programs in each of the four schools.

California Critical Thinking Disposition Inventory and California Critical Thinking Skills Test. The QEP Director, in collaboration with the QEP committee and representatives of each school, considered the advantages of electronic testing versus paper and pencil testing for the CCTDI and CCTST and determined the best way to collect the data for the baseline assessment was to use electronic testing using the Insight Assessment online testing system.

The Insight Assessment system is an Internet-enabled, password-protected vehicle. The students logged into the system, entered demographic information, and completed the assigned testing instruments. The first inventory administered, the CCTDI, was

completed in 15 to 20 minutes and was followed by the CCTST, which was completed in approximately 45 minutes. Test takers were able to view their test results as they completed the tests and could print the results for future reference.

The use of multiple testing batteries permitted an overall baseline analysis of the participating UNTHSC students with regard to scale differentiation. Additionally, the use of the CCTDI and the CCTST instruments allowed the potential for longitudinal data analysis with the linking of test scores for individuals as well as the potential for group comparisons.

3. Results

Learning and Study Strategies Inventory Results

Table 6 reports the UNTHSC performance results on the INP, SMI and TST scales of the LASSI for the students entering the fall 2009 class by school. The range of class scores fall between the 50th and 75th percentile. This indicates that although UNTHSC students enter with grade point averages well over 3.0 (on a 4.0 scale), they can benefit from interventions that assist them in remembering and understanding intensive amounts of information that they will need to apply, analyze, evaluate, and create in order to build their higher order thinking skills.

Table 6. Learning and Study Strategies Inventory Selected Scale Scores, Fall 2009 (N=261)

School/Degree Program	Number of Students	Percentiles		
		Information Processing (INP)	Selecting Main Idea (SMI)	Test Strategies (TST)
Texas College of Osteopathic Medicine Doctor of Osteopathic Medicine (DO)	104	59	63	65
Graduate School of Biomedical Sciences Master of Science (MS)	92	58	56	57
School of Public Health Master of Health Administration (MHA)	14	70	60	61
School of Health Professions Master of Physician Assistant Studies (MPAS)	51	60	57	65
ALL STUDENTS	**261**	**59**	**59**	**62**

Source: UNTHSC Center for Academic Performance, 2009

California Critical Thinking Disposition Inventory Results

As seen in Table 7, **the overall total mean score for UNTHSC students on the CCTDI is 310.** This score indicates that the UNTHSC students are strong in critical thinking disposition when compared to national samples of entering graduate students. **UNTHSC students scored above the mean score of 40 in all critical thinking scales except on the Truth-seeking scale.** The Truth-seeking scale targets the disposition of being able to willingly reconsider and revise one's views where honest reflection suggests that

change is appropriate, even if the findings do not support one's interests or preconceived ideas.

The majority of overall scores in this sample fall in the mid range categorically. Overall, this is a strong test taker group for critical thinking disposition when compared to national samples of entering graduate students (Baseline Report on UNTHSC Higher Order Thinking Skills and Habits of Mind: Prepared by Insight Assessment, November 2009).

Table 7. California Critical Thinking Disposition Inventory Overall Score (N=314)

Scale	Mean	Median	Standard Deviation	Minimum	Maximum
Truth-seeking	38	38	58	227	56
Open-mindedness	44	44	5.6	26	60
Analyticity	47	47	4.8	32	60
Systematicity	43	44	6.2	18	58
Critical Thinking Self-confidence	46	47	5.8	24	60
Inquisitiveness	49	50	5.4	29	60
Maturity of Judgment	44	44	5.4	27	59

Source: Baseline Report on UNTHSC Higher Order Thinking Skills and Habits of Mind: Prepared by Insight Assessment, November 2009

As seen in Table 8, there are few test takers with scores in the very low ranges (averse or hostile to critical thinking). The majority of UNTHSC students scored in the positive or strong range for Open-mindedness, Analyticity, Systematicity, Critical Thinking Self-confidence, Inquisitiveness, and Maturity of Judgment. Truth-seeking is a focus for curricular emphasis.

Table 8. California Critical Thinking Disposition Inventory Scale Scores (N=312)

Scale	Strong scores		Positive scores		Ambivalent scores		Low scores	
	n	%	n	%	n	%	n	%
Truth-seeking	11	3	120	39	159	51	22	7
Open-mindedness	42	14	204	66	62	20	4	1
Analyticity	82	26	210	67	20	6	0	0
Systematicity	50	16	175	56	82	26	5	1
Critical Thinking Self-confidence	88	28	189	61	32	10	3	1
Inquisitiveness	157	50.3	140	44.9	14	4	1	0.3
Maturity of Judgment	44	14.1	196	62.9	70	22	2	0.6

Source: Baseline Report on UNTHSC Higher Order Thinking Skills and Habits of Mind: Prepared by Insight Assessment, November 2009

California Critical Thinking Skills Test Results

The average CCTST total score for the overall UNTHSC sample for entering students in 2009 is 20.8, as seen in Table 9. When compared to the national norm score of 19.0., the range indicates that the CCTST is well matched to the UNTHSC testing group in terms of variance in scores (Baseline Report on UNTHSC Higher Order Thinking Skills and Habits of Mind: Prepared by Insight Assessment, November 2009).

No ceiling effect (too many test takers scoring at the top of the instrument) was observed in the data, assuring that the same instrument could capture gains in this test taker group at a later time. The scale-score measures are indicators of each skill description and will prove useful for guiding HOT plan implementation in terms of redesigning curricula and faculty development.

**Table 9. California Critical Thinking Skills Test
Overall Scale Scores for Entering Students, 2009 (N=307)**

Scale	Mean	Median	Standard Deviation	Minimum	Maximum
Analysis	5	5	1.2	0	7
Inference	10	10	2.8	1	16
Evaluation	6	6	2.0	0	10
Inductive Reasoning	11	11	2.4	1	17
Deductive Reasoning	10	10	3.0	1	16

Source: Baseline Report on UNTHSC Higher Order Thinking Skills and Habits of Mind: Prepared by Insight Assessment, November 2009

Scores at or above 25 indicate relative strength in overall critical thinking skills. Scores in the mid range (12–24) are satisfactory and are associated with demonstrated competence in critical thinking in most situations. CCTST test scores between 0 and 11 indicate serious deficiencies in critical thinking skills.

Test takers with mid-range scores are more inconsistent in their **valuation** of using critical thinking to address high-stakes problems. Moreover, this level of skill performance characterizes students who would benefit strongly from the educational and staff development programs proposed in the HOT plan. These individuals should be capable of integrating specialized content knowledge with problem-based learning demands. Thus, improvement is an expectation with the implementation of a plan to build critical/higher order thinking skills.

Student performance was weakest in Evaluation, which is considered a more advanced skill. Also notable is the relative strength of Inductive Reasoning over Deductive Reasoning scores. These scores suggest that the cohort may be more skilled in making probabilistic responses in uncertain contexts than in recognizing inferences when the data provided requires the judgment to be made with certainty.

Table 10. Categorical CCTST Performance Range Percentages (N=307)

Scale	% Weak Scores	% Satisfactory Scores	% Strong Scores
Analysis	3	24	73
Inference	6	60	34
Evaluation	14	68	18
Induction	2	49	49
Deduction	9	63	29

Source: Baseline Report on UNTHSC Higher Order Thinking Skills and Habits of Mind: Prepared by Insight Assessment, November 2009

As seen in Table 11, few UNTHSC students attained a 'Weak' score in higher order thinking skills, but a greater proportion of students in the School of Public Health and the School of Health Professions scored in the 'Satisfactory' range, and fewer in the 'Strong' range, than did students in the Texas College of Osteopathic Medicine and the Graduate School of Biomedical Sciences.

Table 11. Categorical CCTST Performance Range Percentages by School (N=307)

School	Total	Weak		Satisfactory		Strong	
		N	%	n	%	n	%
Texas College of Osteopathic Medicine	149	9	6	97	65	43	29
Graduate School of Biomedical Sciences	98	3	3	70	71	25	26
School of Public Health	23	1	4	21	91	1	4
School of Health Professions	37	0	0	34	92	3	9
Total	307	13	4	222	72	72	23

Source: Baseline Report on UNTHSC Higher Order Thinking Skills and Habits of Mind: Prepared by Insight Assessment, November 2009

Table 12 provides the percentile range based on mean scores for UNTHSC students in comparison to an aggregated sample of graduate and professional health science students. Based on a mean score of 20.8, the UNTHSC students scored between the 55th and 59th percentile.

Table 12. Comparison of Mean CCTST Scores of Entering 2009 UNTHSC Students with National Graduate/Professional Health Science Students (N=307)

School	Number of Students	Mean	Percentile
Texas College of Osteopathic Medicine	149	21.2	59th and 64th
Graduate School of Biomedical Sciences	98	21.3	59th and 64th
School of Public Health	23	19.2	50th and 55th
School of Health Professions	37	18.6	45th and 50th
UNTHSC	307	20.8	55th and 59th

Source: Baseline Report on UNTHSC Higher Order Thinking Skills and Habits of Mind: Prepared by Insight Assessment, November 2009

C. PREPARATION FOR IMPLEMENTATION OF QEP PILOT PROGRAM

UNTHSC is committed to improving student learning and ensuring the successful implementation of the QEP. Hence, UNTHSC completed the following activities in preparation for the implementation of the HOT plan:

- In the fall of 2008, the QEP Development Committee began the search for a director of the QEP to work with the QEP Development Committee and others who would be involved in the project's implementation. Local and national announcements produced several excellent candidates. The QEP Development Committee reviewed applications, conducted preliminary interviews by telephone, and ultimately brought five candidates to campus for daylong interviews. In early April 2009, it was decided to hire Dr. Vanneise A. Collins as the QEP Director. Dr. Collins began work on the project on May 18, 2009.

- In the fall of 2009, the QEP Director initiated the search to hire an assessment specialist, an instructional technology specialist, and an instructional course designer to support the QEP initiative and the faculty involved in teaching the 10 selected courses for the HOT plan. Local and national announcements resulted in strong pools of candidates. Three separate search committees were involved in reviewing applications, conducting phone interviews, and selecting candidates to for campus interviews. As of early January 2010, two of the three searches were completed. The decision was made to hire Dr. Christine Savi as the Assessment Specialist; she began work on the project in December 2009. AbuZafar Bashet was selected as the Technology Specialist and began working on the project in January 2010. Interviews for the Instructional Course Designer were completed in January 2010 and an offer has been made to the selected individual. It is anticipated that the new hire will begin work in April 2010.

- In the fall of 2009, the QEP Director developed the physical space for the Center for Learning and Development (CLD), which includes a suite of offices for the QEP Director and staff and an open area on the fourth floor of the Gibson E. Lewis Library for faculty development activities.

- Each school identified a team director to coordinate the school's HOT plan intervention and to serve as the point of contact with the QEP Director during the implementation stages. The QEP School Team Directors include Dr. Russell Gamber of the Texas College of Osteopathic Medicine, Dr. Patricia Gwirtz of the Graduate School of Biomedical Sciences, Dr. Elizabeth Trevino of the School of Public Health, and PA Hank Lemke of the School of Health Professions.

- In the fall of 2009, the QEP Director, the School of Public Health Team Director, and a QEP Development Committee member met with students from all of the schools to conduct focus groups and review the QEP plan for each school.

- In the fall of 2009, the QEP Advisory Council was organized. The Advisory Council is composed of faculty and students from each school and external content experts. The QEP Director conducted the first meeting of the QEP Advisory Council in November 2009.

- In September 2009, the QEP faculty participated in an off-site half-day retreat. The QEP faculty reviewed the HOT plan and developed the student learning outcomes for each school. The faculty retreat was lead by Drs. Vanneise Collins, QEP Director, and Richard Kurz, the Chair of the QEP Development Committee. President Scott Ransom provided the overview and context for the retreat.

- In October 2009, the entire faculty in the School of Public Health and faculty from the other schools who are involved in the HOT plan participated in an onsite daylong workshop facilitated by two experts from the National Center for Healthcare Leadership Training. The training focused on reviewing the aggregate results of the curriculum mapping for School of Public Health courses, including those in the school's HOT plan. Additionally, faculty examined the results of the curriculum mapping, which revealed that no courses explicitly included higher levels of Bloom's taxonomy in the defined student learning outcomes for the course. (More information on Bloom's taxonomy is provided in Section IV.B.)

- Two seminars were offered for faculty development related to the HOT plan: 1) Learn How to Create Your Own Rubrics, a webinar featuring Dannelle D. Stevens and Antonia Levi (August 2009), and 2) Principles and Profiles of Good Practice in Assessment, a webinar featuring Trudy Banta (September 2009).

D. CONCLUSION AND SUMMARY

Input gained from an institution-wide survey and theme-ranking process resulted in the selection of two key, interrelated topics for the QEP—improving students' **critical thinking** skills through **faculty teaching**. The development and initial implementation of this QEP is the result of a two-year process with active involvement from institutional stakeholders. The resulting HOT plan builds on the success of an important learning-centered initiative at UNTHSC using an innovative, application-based curriculum that emphasizes adult learning models.

Assessment results from the fall 2009 class revealed that although the students admitted into UNTHSC are strong academically as measured by undergraduate grade point averages and performance on standardized tests (such as the GRE and the MCAT), they can still benefit from interventions that improve their higher order thinking skills.

Results of the LASSI indicate that UNTHSC students can benefit from interventions designed to help them remember and understand the intensive amounts of information they will need to apply, analyze, and evaluate in order to achieve success in medical and graduate school.

Results of the CCTDI indicate that UNTHSC students are weak in the truth-seeking scale but strong on the inquisitive scale. "Half of the fall 2009 sample was aged 21–25 years old, and most of the overall scale scores were in the mid-range, which can occur with younger populations" (Baseline Report on UNTHSC Higher Order Thinking Skills and Habits of Mind: Prepared by Insight Assessment, November 2009, p.31)*. However, UNTHSC students are strong in critical disposition when compared to national samples of entering graduate students.*

Results of the CCTST indicate that the fall 2009 cohort scores are generally 'Satisfactory' or 'Strong,' although a few students showed significant weakness in specific areas of the CCTST. Evaluation, which is usually regarded as a more advanced skill is an area for focused training in the HOT plan. Also notable is the relative strength of the baseline sample in Inductive Reasoning over Deductive Reasoning skills.

Collectively, these results indicate that a HOT plan with a focus on improving students' critical thinking skills across the curriculum is both meaningful and relevant to UNTHSC's interest in training health care professionals who are not only caring individuals, but also have the critical thinking skills needed to provide the best solutions to complex problems.

Moreover, evidence of the successful implementation of the HOT plan should result in an improvement in student performance on the LASSI, CCTDI, and CCTST.

III.   Desired Student Learning Outcomes

A. GOALS, STUDENT LEARNING OUTCOMES, AND FACULTY OUTCOMES

The overall learning goal of the UNTHSC's HOT plan is to improve student performance in higher order thinking. Using the concepts of Bloom's Taxonomy (revised), higher order andragogical practices and assessment strategies will be integrated into curricula to build students' higher order thinking skills and enhance their learning and subsequent professional performance upon graduation. Students will learn to be more reflective, think analytically, apply what they learn, and synthesize knowledge, which are skills that will help them meet the critical health and research needs of both the state of Texas and the nation. Faculty in ten courses across the UNTHSC will introduce changes in curriculum, andragogy, and assessment methods focused on improving UNTHSC students' higher order thinking skills. The faculty, particularly those who are teaching the selected courses, will participate in a series of faculty development sessions to facilitate course revision, enhance andragogy, and develop strategies for assessing higher order thinking skills. To that end, the goals and outcomes for UNTHSC's QEP are as follows:

Goal 1: Improve and evaluate students' higher order thinking skills.

Student Learning Outcomes—In their role as developing health professionals and researchers:

1. Students will apply knowledge and skills toward critically assessing medical and health problems or issues.

2. Students will critically analyze data and other forms of information that address medical and health problems or issues.

3. Students will effectively evaluate data and other forms of information that address medical and health problems or issues.

Goal 2: Improve and evaluate faculty knowledge and skills in implementing instructional strategies and assessment tools that cultivate students' higher order thinking skills.

Faculty Outcomes—In their roles as instructors:

1. Faculty will design and use curriculum and curricular materials employing instructional strategies that improve students' higher order thinking skills

2. Faculty will design and use assessment tools that measure students' higher order thinking skills and learning.

B. PROGRESSIVE INTERVENTION OUTCOMES AND THEORY OF CHANGE MODEL

The student learning and faculty outcomes identified above will be facilitated by incremental changes over time. As described below and as illustrated in the subsequent Theory of Change Model for the HOT Plan (Figure 2), three levels of intervention outcomes are expected to occur: early, intermediate, and long-term intervention outcomes.

1. Early Intervention Outcomes

Students—Early intervention outcomes for students will include improved student performance in using higher order thinking methods in QEP-selected courses. Formative and summative inventories of student performance will be gathered and analyzed for each course participating in the QEP. Course evaluation and assessment data and student focus groups facilitated by the QEP Director will provide appropriate means of assessing student perceptions of their ability to understand and use higher order thinking methods. These assessment tools also will be used to determine if students' learning accurately reflects their competency in the application of higher order thinking methods.

Faculty—Early outcomes for faculty will include faculty demonstrating a greater understanding of higher order learning categories and how to use them to improve student learning. A faculty survey and corresponding rubric, constructed and tested by the QEP staff in collaboration with the QEP School Team Directors working with key faculty, will assess faculty knowledge of higher order learning categories and faculty confidence in applying these categories in the classroom. Faculty attitudes about higher order learning and related instructional and assessment methods also will be assessed using the survey and feedback obtained from QEP-facilitated faculty focus groups.

2. Intermediate Intervention Outcomes

Students—Intermediate intervention outcomes for students will include continued improvement in student performance using critical thinking methods in QEP-selected courses. Improvements in the use of higher order thinking methods will be reflected in course evaluation and assessment data and in feedback from student focus groups facilitated by the QEP Director.
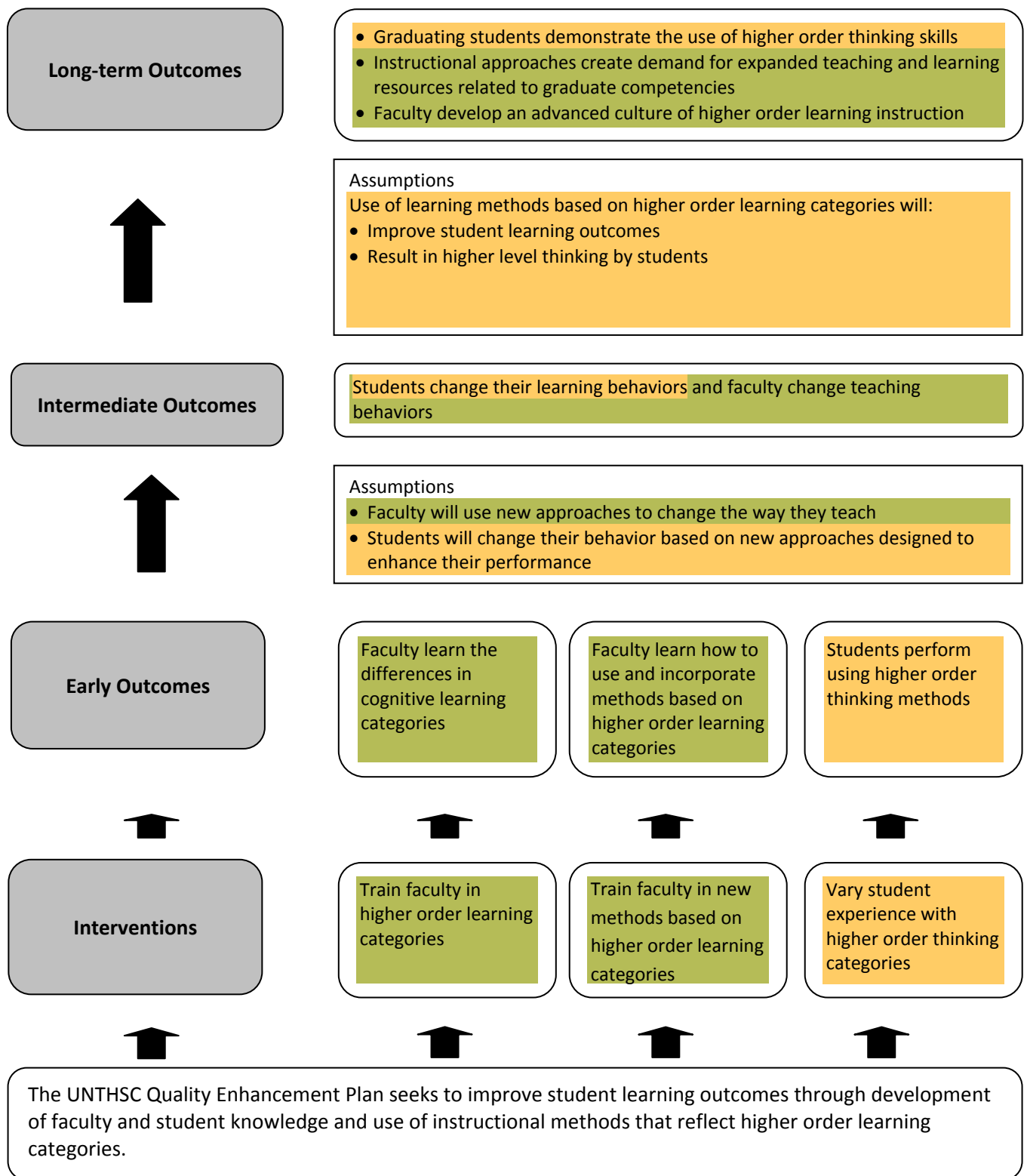
Faculty—Intermediate intervention outcomes for faculty will include changes in course syllabi and in-class and out-of-class activities to reflect the integration of higher order learning categories. Such integration will be assessed using a critical-thinking-elements checklist, constructed by QEP School Team Directors working with key faculty, to review relevant course syllabi and observe faculty activities.

3. Long-Term Intervention Outcomes

Students—Long-term intervention outcomes for students will include an overall demonstration of higher order thinking skills by graduating students. Students' overall performance in higher order thinking will be assessed using students' summative performance measures over time and a Student Follow-Up Survey, constructed and tested by student leaders, school directors, and QEP team members. The Student Follow-Up Survey will be distributed to students and their employers post graduation.

Faculty—Long-term intervention outcomes for faculty will include the development of their teaching competency and increased demand for resources to improve their andragogical knowledge and skill. Continued use of the Faculty Survey and corresponding rubric will be the primary tool for assessing long-term faculty outcomes. In addition, data will be collected regarding the faculty's use of the Center for Learning and Development (CLD), including information on the frequency, duration, and types of resources used. These data will provide information about the long-term impact of the HOT plan. Moreover, the professional development of participating faculty will produce a group of faculty leaders who can assist other faculty in integrating higher order learning categories into their instruction and assessment methods.

Figure 2. Theory of Change Model for the HOT Plan (Intervention Outcomes)

Long-term Outcomes
- Graduating students demonstrate the use of higher order thinking skills
- Instructional approaches create demand for expanded teaching and learning resources related to graduate competencies
- Faculty develop an advanced culture of higher order learning instruction

Assumptions
Use of learning methods based on higher order learning categories will:
- Improve student learning outcomes
- Result in higher level thinking by students

Intermediate Outcomes
Students change their learning behaviors and faculty change teaching behaviors

Assumptions
- Faculty will use new approaches to change the way they teach
- Students will change their behavior based on new approaches designed to enhance their performance

Early Outcomes
Faculty learn the differences in cognitive learning categories

Faculty learn how to use and incorporate methods based on higher order learning categories

Students perform using higher order thinking methods

Interventions
Train faculty in higher order learning categories

Train faculty in new methods based on higher order learning categories

Vary student experience with higher order thinking categories

The UNTHSC Quality Enhancement Plan seeks to improve student learning outcomes through development of faculty and student knowledge and use of instructional methods that reflect higher order learning categories.

Color Key: Gold = Student, Green = Faculty

IV. Literature Review and Best Practices

A. DEFINING CRITICAL AND HIGHER ORDER THINKING

Scholars from various disciplines have had much to say about the art of thinking critically. The term "critical thinking" emerged as a concept in the mid to late twentieth century (Foundation for Critical Thinking), and a cursory view of the literature on critical and higher order thinking reveals as many definitions of the concept as there are scholars who seek to define it.

Multiple definitions of critical thinking and the lack of specificity about the concept led to the need to refine the critical thinking construct. Using a qualitative research methodology known as the Delphi method, Dr. Peter A. Facione provided the theoretical framework for conducting a study on critical thinking. Commonly referred to as the Delphi study, Facione's report was based on the consensus of an interactive panel of experts composed of more than forty individuals representing philosophy, education, social sciences, and physical sciences, all of whom were recognized by their colleagues as having special experience and expertise in critical thinking instruction, assessment, or theory. Focused on developing a definition of critical thinking, the panel concluded: "We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological or contextual considerations upon which that judgment is based" (Facione 1990, 3).

The Foundation for Critical Thinking defines 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. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions, such as clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness.

It entails the examination of those structures or elements of thought implicit in all reasoning, such as purpose, problem, or question-at-issue; assumptions; concepts; empirical grounding; reasoning leading to conclusions; implications and consequences; objections from alternative viewpoints; and frame of reference. Critical thinking—in being responsive to variable subject matter, issues, and purposes—is incorporated in a family of interwoven modes of thinking, among them scientific thinking, mathematical thinking, historical thinking, anthropological thinking, economic thinking, moral thinking, and philosophical thinking.

Critical thinking purportedly has two components: 1) a set of information and belief-generating and processing skills, and 2) the habit, based on intellectual commitment, of using those skills to guide behavior. This should be contrasted with the following: 1) the mere acquisition and retention of information alone, because it involves a particular way in which information is sought and treated; 2) the mere possession of a set of skills, because it involves the continual use of them; and 3) the mere use of those skills "as an exercise" without acceptance of their results.

Critical thinking of any kind is never universal; everyone is subject to episodes of undisciplined or irrational thought. Therefore, the quality of thinking is dependent, among other things, on the quality and depth of experience in a given domain of thinking or with

respect to a particular class of questions. Thus, the development of critical thinking skills and dispositions is a life-long endeavor (Foundation for Critical Thinking).

1. Critical Thinking Disposition

In developing the widely used Watson-Glaser Critical Thinking Appraisal, Glaser (1941) defined critical thinking as the "(1) attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experiences, (2) knowledge of the methods of logical inquiry and reasoning and (3) some skill in applying those methods" (5-6).

Disposition to think critically can be defined as consistent willingness, motivation, inclination, and an intention to be engaged in critical thinking while reflecting on significant issues, making decisions, and solving problems (Facione, Facione, and Giancarlo 1996). According to Zoller et al. (2000), a student's disposition to think critically is a necessary precondition for critical thinking and greatly affects critical thinking capability. Facione (1998) describes the disposition toward critical thinking as the "consistent internal motivation to engage problems and make decisions by using critical thinking" (5). Facione concluded, "educational and professional success require[s] nurturing one's consistent internal motivation to think as well as developing one's thinking skills" (16). Paul and Binker (1992) argue that critical thinking is dependent upon a person's disposition to use it.

Experts continue to agree that critical thinking includes the dimensions of skill and disposition (Facione 1990; Norris and Ennis 1989). Facione (1990) and a group of experts identified a set of specific skills and sub-skills for the skill dimension of critical thinking and a specific set of attitudes for the disposition dimension. Facione subsequently developed the California Critical Thinking Disposition Inventory (CCTDI) in order to measure these skills, sub-skills, and attitudes (Facione et al. 2001). Giancarlo and Facione (2001) conducted a five-year longitudinal investigation of 7,926 students from 50 different college-level programs to examine relationships between critical thinking skill and disposition as well as other demographic factors. The results revealed positive correlations between overall critical thinking disposition and strength of critical thinking skill.

2. Discipline Specific Critical Thinking

While critical thinking skill and disposition are separate entities, both are open to educational influence, particularly when it is meaningfully, contextually bound (Brown 1997). Critical thinking is a valuable skill and is applicable once in many different disciplines. Yet researchers argue that there is a need to think critically within specific disciplines. Ennis, for example, advocates contextual-domain or subject-specific critical thinking. First, background knowledge is necessary for making justified critical thinking judgments. Second, critical thinking varies from discipline to discipline, and third, a full understanding of a discipline requires the ability to think critically in the discipline (Ennis 1990).

3. Higher Order Thinking

Every discipline uses critical thinking to add to the body of knowledge both within and outside the respective field of study. However, a broader term than 'critical thinking' is needed to include dimensions such as problem solving, creative thinking, critical

thinking, and decision making and to help educators transcend the split between the sciences' focus on 'problem solving' and the humanities' focus on 'critical thinking.'

The general belief among researchers is that higher order thinking consists of events occurring in the mind independently of the content of instruction. Moreover, higher order thinking involves manipulating information to produce certain outcomes (Underbakkee, Borg, and Peterson 1993; Halpern 1993).

Scholars generally agree that lower and higher order thinking skills are distinguishable. According to Newman (1990), lower order thinking needs only routine or mechanical application of previously learned information, while higher order thinking challenges the student to interpret, analyze, or manipulate information. Higher and lower order thinking, however, are relative. For example, a situation that requires higher order thinking by one person may only need lower order thinking for another in the same situation. Thus, differences in the learners' history may determine which skills are used.

Lewis and Smith (1993) offer the following definition of higher order thinking: **"Higher order thinking occurs when a person takes new information and information stored in memory and interrelates and/or rearranges and extends this information to achieve a purpose or find possible answers in perplexing situations."**

The term higher order thinking then encompasses a broad range of actions including deciding what to believe; deciding what to do; creating a new idea, a new object, or an artistic expression; making a prediction; and solving a non-routine problem. This broader definition reflects the scope of learning occurring in medical and graduate programs at a health science center. **Therefore, the conceptualization of higher order thinking by Lewis and Smith (1993) will provide the definition for the HOT plan.**

B. BLOOM'S TAXONOMY: A MODEL FOR LEARNING, TEACHING, AND ASSESSING

Benjamin Bloom promulgated the Taxonomy of Educational Objectives in 1956 under the title, *Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook 1: Cognitive Domain*, and it remains the most well known hierarchical system for classifying thinking and learning (Bloom 1956). Krathwohl (2002) states: "the framework was conceived as a means of facilitating the exchange of test items among faculty at various universities in order to create banks of items for measuring the same educational objective. Bloom imagined the original Taxonomy as more than a measurement tool. Bloom believed the Taxonomy could serve as a:

1. common language about learning goals to facilitate communication across persons, subject matter, and grade levels;

2. basis for determining for a particular course or curriculum the specific meaning of broad educational goals, such as those found in currently prevalent national, state and local standards;

3. means for determining the congruence of educational objectives, activities, and assessments in a unit, course, or curriculum; and

4. panorama of the range of educational possibilities against which the limited breadth and depth of any particular educational course or curriculum could be contrasted."

The four highest levels of thinking on the original six-level scale are application, analysis, synthesis, and evaluation, and fostering these skills is the goal of many modern

instructional plans. Indeed, the UNTHSC's HOT Plan targets the development of the taxonomy's top skills as demonstrated by student performance in higher order thinking.

A recent revision of Bloom's taxonomy brings this emphasis on higher order thinking into even sharper focus. In the late 1990s, a group of educators led by a former student of Bloom worked to make the taxonomy more applicable in a modern, technology-driven educational setting (Krathwohl 2002). The revision of the original taxonomy is a two-dimensional framework—knowledge and cognitive processes.

The revision renames three of the levels on the original scale, changing "knowledge" to "remember," "comprehension" to "understand," and "synthesis" to "create." The remaining categories are now verb forms instead of nouns. Like the original taxonomy, the revised taxonomy is in a hierarchy, as shown in Figure 3.

**Figure 3. Bloom's Taxonomy
(as revised by Krathwohl 2002)**
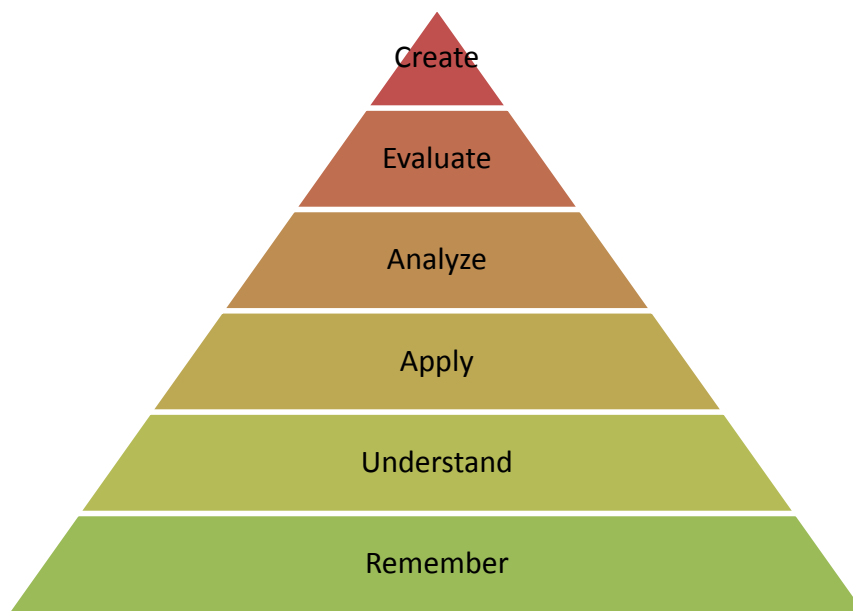
It is exactly this kind of creation and application of new ideas that the HOT plan seeks to build in UNTHSC students. Firmly grounded in the pursuit of the highest order thinking skills identified in Bloom's taxonomy, the HOT plan will introduce faculty to new methods for fostering "creating skills" and will help UNTHSC graduates perform complex, higher order tasks in their chosen health care field.

C. BEST PRACTICES FOR BUILDING HIGHER ORDER THINKING SKILLS

1. Paradigm Shift in Medical Education

Modern medical education has made few transitions since its inception at John's Hopkins University in the early 1900s. Historically, traditional medical education presented distinct classes (physiology and anatomy, for example) that were lecture-based and focused on students' passive acquisition of knowledge in a classroom setting.

In the 1960s, medical schools developed the "systems-based" curriculum in which knowledge was presented in the context of relevant body systems (such as the cardiac and nervous systems), but this method of imparting knowledge continued to be based

upon a lecture format in the classroom setting. In a systems-based curriculum, lectures are focused on systems rather than disciplines. Nevertheless, they are lectures, just reformatted in terms of their placement in the curriculum.

The 1980s saw some medical schools begin to develop problem-based learning (PBL), as conceived by two Canadian universities, McMaster University and the University of Calgary. PBL depends on small groups of students who derive their learning objectives from "paper based medical cases" with little or no faculty intervention in the determination of outcomes or knowledge delivery. A faculty member serving as a facilitator may guide the student group, but does not lecture the students. Students must develop their own learning objectives and then acquire the information they need to resolve case issues on their own. PBL depends upon knowledge acquisition, but does not emphasize the use and integration of knowledge.

While PBL medical education can be effective, it is also fraught with challenges. It is best suited to students who are already self-learners, learn best in interactive group environments, are highly capable of developing learning objectives on their own, and are capable of self-direction in the acquisition of information. Incoming first-year medical students are often poorly prepared for PBL learning. PBL groups need to be small and therefore require great amounts of space and enough faculty to ensure sufficient numbers of facilitators. Finally, students trained in PBL-based curricula have shown no demonstrable improvement in national board examination scores.

2. Building Higher Order Thinking Skills through Application-Based Curriculum

In the health science fields, two recent trends are a move toward application-based learning and a strong emphasis on assessment as a tool to ensure that graduates can meet or exceed the competencies set for their profession (Epstein and Hundert 2002; Harden and Shumway 2003). Friedman et al. (1998) present some interesting data and conclusions about medical students' thinking processes and errors in making diagnoses. Through their research, they concluded that a medical student's ability to make accurate diagnoses can be enhanced by focusing instruction on the student's ability to reason and think, rather than just the simple act of acquiring more knowledge and data.

In an application-based learning system, the learning objectives that drive the curriculum and assessment of those objectives are intrinsic and defining parts of the process. Health science programs must conduct assessments that measure the application of knowledge in solving real-world problems (Gijbels et al. 2005). In addition, a well-structured assessment plan will not only provide feedback to students, but also will help direct future learning and improve professional competence in the end (Epstein and Hundert 2002). These concepts lie at the core of the intervention discussed later in Section V, Actions to be Implemented.

3. Building Higher Order Thinking Skills through Competency-Based Curriculum

An important path to incorporation of higher order learning approaches into instruction is the development of a competency-based curriculum. Competency-based instruction has the effect of focusing faculty attention on the specific behaviors, skills, and attitudes necessary for a functioning professional at the entry level. A focus on competencies does not negate the need for understanding basic theories and principles; rather it emphasizes that these concepts should be presented in a manner that relate them to the actions the student must be able to perform as a practicing professional. The concepts and principles become more relevant, rather than less so. Hence, competency-based

instruction advances student learning by focusing both on the specific behaviors and skills necessary for success and on the effective application of those behaviors and skills through the use of higher order thinking.

4. Building Higher Order Thinking Skills through Use of Instructional Strategies

As shown in the educational literature, it is important to use a variety of instructional methods in recognition of different faculty-teaching and student-learning styles. It is undetermined whether instruction based on lower or higher order cognitive learning categories leads to better educational outcomes—however defined—but it is clear that providing a mix of instructional modalities leads to higher student satisfaction and greater access to educational materials (Carmel and Gold 2007). Increasing faculty use of higher order thinking approaches and creating instructional modules related to them is a necessary aspect of improved student learning and outcomes. This approach also may indirectly affect possible gains in student satisfaction and graduation rates.

Researchers have come to see that learning is more than simply absorbing, or passively receiving or recording objective knowledge. Learners actively construct and interpret knowledge through integration of new information and experiences into what they already know (Mayer 1998). New studies in cognitive research also reveal that although learning content information is essential to developing expertise, it is not enough to prepare learners more fully to use that knowledge in the real world (Gillespie 2002). Developing expertise is the result of a more complex, highly developed knowledge base related to a given field. Experts with a highly developed knowledge base are able to apply cognitive strategies to information that is relevant, eliminate what is unimportant, and use metacognitive strategies to access their knowledge base.

Research consistently has shown that the predominant approach to teaching in college and university is the traditional lecture method, where professors talk and students listen. Yet according to Schamel and Ayres (1992), "students learn best by doing," or preparing their own questions based on their observations rather than participating in a "predetermined exercise with a foregone conclusion." Similarly, Dow (2006) states that in the areas of technology and science, education must be concerned with interpretation as well as understanding, and she advocates identifying pedagogies that move away from the transmission of facts toward the development of autonomous learners. Chickering and Gamson (1987), in their review of the research literature, also indicate students must do more than just listen for learning to occur. In fact, to be fully engaged in learning as a process, students must be actively involved in doing higher order tasks such as analysis, synthesis, and evaluation. Bonwell and Eison (1991) propose that strategies promoting active learning include instructional activities in which students are doing things and have time to think about what they are doing.

In small group settings, commenting on student thinking processes for the purposes of developing higher order thinking calls for sensitivity and diplomacy on the part of the faculty member. The faculty member who is leading small group discussions must be careful to allow the student an opportunity to express their reasoning and support for their reasoning in a safe and supportive environment. Feedback conducted in a negative fashion can result in undue embarrassment for the student in front of their peers and cause the student to avoid further expressions of critical thinking. The facilitation of higher order thinking skills, therefore, calls for specialized critiquing skills on the part of the faculty member. In addition, the faculty member must be cognizant of behaviors that represent critical thinking and adopt supportive counseling techniques that encourage the student to advance.

Based on this review of the literature, Table 13 provides a summary of selected best instructional practices for strengthening medical and graduate students' higher order thinking skills.

**Table 13. Instructional Best Practices for Building
Medical and Graduate Students' Higher Order Thinking Skills**

Strategy	Outcome	Research
Argument Mapping	Provide visual representation of thinking process	Van Gelder 2005; Twardy 2005
Inquiry using Bloom's Taxonomy	Enhance higher order thinking skills	Hendricson et al. 2006
Case-Based Scenarios	Build higher order thinking skills	Oermann 2000
Cooperative Learning Groups	Facilitate learning	Weerts 2005; Ahern-Rindell 1998
Discussion	Support long-term retention of information and apply information in new settings	McKeachie et al. 1986
Metacognition	Enhance ability to analyze one's own thinking	Facione, Facione, and Giancarlo 1996
Problem-Based Learning	Develop deeper understanding of knowledge in the discipline	Bruno and Jarvis 2001
Reflection	Build higher order cognition. Create better understanding and basis for considering alternatives	Beckwith and Beckwith 2008
Simulation	Develop diagnostic reasoning skills	King and Kitchener 1994

5. Building Higher Order Thinking Skills through Faculty Development

Like other faculty across the nation, UNTHSC faculty identified higher order thinking as a method for improving student learning outcomes. However, "most know little about the intellectual foundations and research for higher-order thinking, including meta-cognition, epistemology, and adult developmental theory" (D'Avanzo 1997). One cannot assume that faculty know or have received instruction on how to build higher order thinking skills. A recent meta-analysis on the effect of educational style on critical thinking gives preliminary indication that andragogy matters (Abrami et al. 2008). Numerous studies from the last thirty years show that when instructors learn to teach appropriately, their students show the greatest increase in critical thinking ability, whether measured in terms of cognitive ability or in terms of being able to respond in specific situations. According to Abrami et al.'s analysis, a combination of instructor training and an emphasis on critical thinking in course design and administration yields the greatest impact on students' performance.

Indeed, faculty members are content experts in their respective fields, but as noted by Paul (2005), their expertise in teaching students to think critically pales when compared to their knowledge of their subject areas. "They [college faculty] believe that they

sufficiently understand it and assume they are already teaching [higher order thinking] to students."

The faculty development component of the UNTHSC's HOT plan (Goal 2) will promote student learning by ensuring that faculty are aware of best practices and instructional strategies for effectively teaching and assessing students' higher order thinking skills. These best practices and strategies include a focus on application-based and competency-based curricula. Additionally, faculty will receive training from both internal and external experts on how to design assessments, such as portfolios, rubrics, assignments, and tests, to assess higher order thinking skills.

D. CONCLUSION AND SUMMARY

The concept of critical and higher order thinking has different meanings and various elements. One can view higher order thinking as a set of skills and dispositions and, for the purpose of the HOT plan, the definition of higher order thinking will be the one proposed by Lewis and Smith (1993): "Higher order thinking occurs when a person takes new information and information stored in memory and interrelates and/or rearranges and extends this information to achieve a purpose or find possible answers in perplexing situations." While there is consensus that higher order thinking skills are teachable, whether students learn them is dependent upon a host of factors, such as students' predispositions and developmental readiness, the nature of the learning environment and learning activities, and whether instruction addresses students' developmental levels, among others.

Another concern related to this discussion is the transferability of higher order thinking skills among subject areas. Some scholars assert that higher order thinking is the same across disciplines, while others argue that that it is important to teach higher order thinking skills simultaneously with subject matter. Brown (1997) posits that students cannot progress in the development of their thinking unless they have something to think about within or outside of their courses, and that such knowledge becomes central to the development of their higher order thinking skills.

Instructors have a significant influence on the development of students' higher order thinking skills, and instructional strategies that promote the development of higher order thinking skills include paying attention to students' epistemological beliefs, promoting active learning, and stimulating interactions among students in the study of real-life problems. Allowing students to share their insights in discussion with other students and asking students to share their thinking verbally will help faculty understand students' frames of reference, thereby allowing faculty to select appropriate strategies for expanding students' capacity for higher order thinking.

The SACS-COC defines student learning as "changes in knowledge, skills, behaviors, or values." The goal of the UNTHSC HOT plan is improve student performance in higher order thinking and enhance learning. The anticipated result of the HOT plan is that UNTHSC students will learn to be more reflective, apply what they learn, and synthesize knowledge, which are skills they will need to be fully prepared to "improve the health and quality of life for the people of Texas and beyond."

V.   Actions to be Implemented

A. OVERVIEW OF HOT PLAN IMPLEMENTATION

The overall learning goal of UNTHSC's HOT plan is to improve student performance in higher order thinking. This goal is supported by two specific goals—one focused on improving and evaluating students' higher order thinking skills (Goal 1) and the other focused on improving and evaluating faculty knowledge and skills in implementing instructional strategies and assessment tools that cultivate students' higher order thinking skills (Goal 2). In support of these goals, selected course curricula in each school will be redesigned to include higher order thinking instructional and learning outcomes along with corresponding assessment instruments. Faculty teaching the selected courses will be supported by a variety of faculty development resources and activities. The courses and faculty selected for implementation of the HOT plan are listed in Table 14.

Table 14. HOT Plan Courses and Faculty

School/HOT Plan Courses	Faculty
Texas College of Osteopathic Medicine	
MEDE 7410: OMM 1	Kendi Hensel
MEDE 7314: OMM 2	Lesley Schmitz
MEDE 7421: OMM 3	Russell Gamber
MEDE 7320: OMM 4	
Graduate School of Biomedical Sciences	
BMSC 5304: Integrative Biomedical Sciences 4 – Physiology	Patricia Gwirtz
	Xiangrong Shi
School of Public Health	
HMAP 5300: Introduction to Health Management	Thaddeus Miller
HMAP 5328: Human Resources Management	Thomas Fairchild
HMAP 5324: Strategic Management and Marketing	Liam O'Neill
	Hsueh-Fen Chen
School of Health Professions	
MPAS 5241: Supervised Practice I	Jerry Friedman
MPAS 5242: Supervised Practice II	Chris Cooper
	Laura Mattingly
	Linda Davis
	Libby Hulsey

Implementation of the HOT plan also will be supported by broad-based involvement of UNTHSC stakeholders. The following table identifies key stakeholder groups and outlines the strategies that will be used to ensure their ongoing involvement in the HOT plan.

Table 15. Broad-Based Involvement in Implementation

Stakeholder Group	Strategy for Involvement	Person(s) Responsible
Students	• The HOT plan will be introduced at annual student orientation for each incoming class. • Updates about the HOT plan will be provided at student organization meetings at least once per semester. • Information sessions will be conducted and feedback will be obtained from surveys and focus groups of students directly involved with HOT plan courses. • Representatives from each School will serve on the QEP Advisory Council.	QEP Director, QEP Assessment Specialist, QEP Executive Committee members, and QEP faculty participants
Faculty	• Faculty will participate throughout the implementation. • Bi-annual updates about the HOT plan will be provided at meetings of the Faculty Senate, Council of Deans, Department Chairs, School Curriculum Committees, and Graduate Council. • Faculty will serve on the QEP Advisory Council. • Feedback from faculty will be obtained through surveys and questionnaires about the HOT plan. • The QEP website (www.hsc.unt.edu/QEP) and the Center for Learning and Development will provide resources for faculty to support implementation of higher order thinking across the curriculum.	QEP Director and Staff, QEP School Team Directors, QEP Executive Committee members, and QEP faculty participants
Leadership	• UNTHSC leadership will be involved throughout implementation. • The QEP Director reports to the Provost and Vice President for Academic Affairs. • The QEP Director will provide written quarterly updates for review by the QEP Advisory Council, Council of Deans, Executive Leadership Team, and the Leadership Team. • The QEP Director will provide monthly write-ups for the Provost and QEP Executive Committee.	QEP Director
Staff	• UNTHSC support staff will receive quarterly updates at Communications Team meetings. • Informational display panels, table tents, and other items will be available to maintain awareness of the HOT plan. • Updates in the Daily News and Campus Connection will keep staffed informed about the progress of the HOT plan.	QEP Director and Staff
Alumni	• Institutional Advancement will use existing communication networks to provide updates to UNTHSC alumni and will obtain feedback about the HOT plan from alumni using surveys and questionnaires.	QEP Assessment Specialist
Board of Visitors	• The QEP Director will provide updates on the progress of the QEP at Board of Visitor meetings annually.	QEP Director
General Public	• The UNTHSC QEP website will serve as the primary means to inform the public about HOT plan activities.	QEP Director and Staff

B. ACTIONS TO IMPROVE STUDENTS' HIGHER ORDER THINKING SKILLS (GOAL 1)

As outlined above, faculty in ten courses across the UNTHSC will introduce changes in curriculum, andragogy, and assessment methods focused on improving students' higher order thinking skills. Each school has identified a QEP School Team Director to coordinate the implementation of the HOT plan within the school. The team directors and selected faculty will work with the QEP Instructional Designer, QEP Instructional Technology Specialist, and the QEP Assessment Specialist to redesign the selected HOT plan courses. The Assessment Specialist will support curricular changes by collaborating with faculty as they create different ways of measuring student learning outcomes.

Each school's specific approach to improving student learning and building higher order thinking skills is outlined below.

1. The Texas College of Osteopathic Medicine: An Application-Based Approach for Osteopathic Manipulative Medicine

Statement of Purpose

Physicians are tasked with four areas in their scope of practice, including 1) the ability to perform a history and physical examination, 2) the ability to arrive at a diagnosis, 3) the ability to derive a treatment plan based upon the correct diagnosis, and 4) the ability to communicate their findings and therapies with their patients and colleagues. The accomplishment of these tasks requires a combination of pertinent competencies that involve a physician's ability to integrate information via higher order thinking and develop a treatment plan.

Classic medical education relies upon a lecture-based format (knowledge acquisition) that does not foster growth in important integrative skills that lead to higher order thinking. It is highly passive and inhibits complex conceptualization of the basic and clinical sciences relevant to patient care. The TCOM will foster enhanced higher order thinking skills in its medical education process via the further development of an application-based curriculum model in the area of osteopathic manipulative medicine (OMM).

The TCOM has already developed an application-based curriculum that adheres to many of principles of the learning sciences, including Benjamin Bloom's taxonomy of learning. In many of its courses, this TCOM curriculum emphasizes several tightly integrated elements, as follows:

1. Students receive structured reading assignments to be completed prior to classroom interaction with faculty.

2. For each problem considered in the system, students must perform differential diagnosis for that problem to a specified level of competence prior to meeting with faculty in the classroom. They do so through practice with cases presented via a web-based tutor (www.acdet.com). These exercises provide significant opportunity for applying diagnostic knowledge.

3. Diseases within a system are considered in the context of the problem that they most likely cause.

4. Classroom teaching is problem-focused and importantly application-driven. Case vignettes become the starting point for the presentation of complex questions that are answered via interactive keypad technology, which captures and displays student responses. Students' interaction is developed using the Socratic method, where an instructor queries individual students. The professor assumes that students have acquired the fundamental information in their designated self-study, and, using interactive question methodology, the classroom session is now devoted to comparing and contrasting how different diseases vary in their pathology and treatment. How students can apply the information previously acquired in their reading is the main emphasis of the classroom sessions. Thus, the in-person classroom activity enhances student comprehension and application of previously acquired information.

The above teaching methodology results in great success in the measured outcomes of the Comprehensive Osteopathic Medical Licensing Examination I (COMLEX I) national board examinations and the United States Medical Licensing Examination I (USMLE I) administered to TCOM students. For the past four years, the students of the TCOM received the highest level I board scores among all the osteopathic medical colleges in the nation. These results coincide with the beginning and growth of the application-based teaching model.

Although TCOM has adopted an application-based curriculum in many areas, its osteopathic manipulative medicine (OMM) courses have remained lecture-based. The lecture-based method used in OMM courses focuses on knowledge acquisition in the classroom, the lowest rung in Bloom's taxonomy, and is an inefficient method for teaching OMM material. TCOM's participation in the HOT plan will center upon the conversion of OMM training from a lecture-based format to an application-based format that will include manipulative skills training in combination with classroom activities.

Courses

At TCOM, medical students complete OMM courses during the first two years of school in the classes OMM 1, OMM 2, OMM 3, and OMM 4. These courses are progressive and span the curriculum from matriculation to the end of second year of medical school. The TCOM HOT activities will primarily focus on improving the OMM courses in the TCOM curriculum. These courses over four semesters represent well-defined and manageable opportunities for enhancing faculty facilitation and teaching of higher order thinking skills. During OMM courses, students receive systems-based instruction through several avenues, the primary avenue being hands-on practical training for three to four hours per week. In the Year 1 curriculum, demonstration videos of the next week's materials are posted on the course website to be practiced and studied prior to each class session. PowerPoint presentations, journal articles, and other learning materials are posted before each class to help the students better prepare for each session. In Year 2, each course day begins with one hour of condensed lecture materials covering the didactic material related to the techniques and disease processes being covered that day.

The HOT plan for TCOM will include faculty development and training in the application-based method of teaching for OMM faculty. During the first year, key faculty members will be identified and receive intense training in the theory and process of application-based teaching. Practice sessions will occur for the identified faculty members, and course content will be converted from a lecture-based (knowledge acquisition) format to a CIL application-based methodology. At the end of the first year, faculty will pilot their

new teaching methods in the classroom and skills laboratory. During the second and third years of the HOT plan project, further conversion of the OMM courses will occur until the entire two years of OMM education are in an application-based teaching style.

Students

This project will involve first- and second-year osteopathic medical students who are required to take OMM as part of their curriculum. The OMM courses run concurrently with the application-based systems and clinical medicine courses.

Student Learning Outcomes

The student learning outcomes for the intervention proposed by TCOM include the following:

- Year I students will apply their knowledge and skills in assessing somatic dysfunction through diagnosis exams and the use of palpatory skills.

- Year I students will apply osteopathic manipulative medicine knowledge and skills to address and treat somatic dysfunctions.

- Year II students will analyze patient information and evaluate the use of specific osteopathic manipulative medicine techniques as they apply to the treatment of disease states.

- Year I and II students will apply knowledge and skills demonstrating competency of osteopathic manipulative skills.

Measures

For the HOT plan, the following five overall measures will be used to assess the effectiveness of the TCOM OMM intervention on student learning outcomes related to higher order thinking:

- Students' disposition towards critical thinking using the CCTDI administered at the beginning of the OMM 1 course and again at the end of OMM 4 courses.

- Students' overall critical thinking skills using the CCTST administered at the beginning of the OMM 1 course and again at the end of OMM 4 courses.

- Performance on the COMLEX I and COMLEX II national board examinations.

- OMM practical examinations given in OMM 1 through 4 where students are directly observed and graded on their ability to diagnose and treat somatic dysfunction. Final examinations in OMM2 and OMM4 courses will be set up to model the COMLEX II-Performance Evaluation (PE) examination administered by the National Board of Osteopathic Medical Examiners. The performance of students will be tracked and trended with data evaluated at the end of the year to assess students' higher order thinking skills and mastery of manipulative medicine skills.

- Focus group discussions targeting key aspects of analyzing, evaluating, and synthesizing case studies will occur throughout each course, and feedback will be measured using a critical element checklist for targeted concepts.

Faculty

The instructors for the OMM courses include Drs. Russell Gamber, Kendi Hensel, and Lesley Schmitz. As Doctors of Osteopathic Medicine, they currently teach the OMM curriculum, but their professional preparation may or may not have included formal instruction in teaching, assessment, and course design. Also, they may not have received instruction in Bloom's taxonomy or what manifests higher order thinking. Thus, the HOT plan implementation for TCOM includes having Frank Papa, DO, PhD, and Michael Oglesby, PhD—the prime developers of TCOM's application-based curricular model—provide consultation and faculty development for the OMM faculty.

Summary of Implementation

OMM is a required component of osteopathic physician training and, in the medical education field, is unique to osteopathic education. The basis of OMM curricular content is a body of knowledge developed by the osteopathic profession and includes both cognitive/knowledge-based content (physiological concepts and osteopathic theory) and psychomotor skills that must be taught and refined. Historically, OMM has been taught in a standard lecture-based format combined with a skills-based laboratory.

At TCOM, medical students complete OMM courses during the first two years of school in the classes OMM 1, OMM 2, OMM 3, and OMM 4. These courses are progressive and span the curriculum from matriculation to the end of second year of medical school. Students participate in a core rotation in the TCOM OMM clinic during years three and four. During that time, observations of students' abilities to diagnose and treat problems unique to osteopathic medicine occur.

Although TCOM has adopted an application-based curriculum in many areas, its OMM courses have remained lecture-based. OMM lecture-based education focuses upon knowledge acquisition in the classroom, the lowest rung in Bloom's taxonomy, and is an inefficient method for teaching OMM material. Thus, TCOM's participation in the HOT plan will center upon converting OMM training from a lecture-based format to an application-based format that will include manipulative skills training in combination with classroom activities.

2. Graduate School of Biomedical Sciences: Development of Higher Order Thinking Skills for Pre-Medical Admissions

Statement of Purpose

The objective of the HOT plan for the GSBS is to achieve measurable improvement in student learning outcomes by training faculty members in higher order learning and teaching methods and consequently advancing higher order thinking skills in students. The focus of HOT plan activities in the GSBS will be to transform the core physiology course offered to students in the Master of Medical Sciences (MS) program from a strictly lecture-based course to a course designed around application-based learning methods.

Transformation of the physiology course complements a larger effort currently underway in the GSBS to develop core courses specifically for the Medical Sciences students. Until the 2009–2010 academic year, all graduate students in GSBS took the same core courses that focused primarily on training students for careers in research. In an effort to better prepare Medical Sciences students for medical school, faculty members are redesigning the core courses for Medical Sciences program to integrate more

applications-based learning methods. The redesign of the physiology course for the HOT plan will serve as a model for curricular changes in other core courses in the Medical Sciences program.

Implementation of the HOT plan in the GSBS will consist of three stages. First, faculty teaching the physiology course will identify current learning objectives in the course and determine how these objectives align with the category levels of Bloom's cognitive domain. Faculty will be supported in this analysis by professional development efforts of the QEP team and corresponding QEP School Team Directors. This step will allow faculty members to determine if higher order categories are currently in use.

In the second stage, the physiology faculty members will examine the teaching and learning methods used in the course and estimate the percent of time students experience each method during the course.

The third and final stage will be the development and implementation of an improvement plan for the course. This stage will begin with a review of the competencies, categories, instructional methods, and assessment methods used in the physiology course. The HOT plan's professional development seminars targeting instructional and assessment methods will allow faculty to compare, review, and modify current classroom strategies. Faculty also will consider the placement and sequencing of competencies in the course. Based on this information, the faculty will develop an improvement plan with goals for course improvement, identify an implementation approach with a timeline, and indicate the key success factors and barriers to the achievement of stated goals.

Courses

Integrative Biomedical Sciences IV: Physiology (BMSC 5304) is one of five core courses in the Medical Sciences program. Anecdotal evidence from students who take the course and subsequently are accepted into medical school suggests that the information learned in the physiology course makes their studies in medical school a basic review, revealing that they were well prepared for the medical school curriculum. The GSBS believes that implementation of the HOT plan will result in even better outcomes for students as they progress through medical school.

Students

The students who will be involved in the GSBS HOT plan are those who will enter the Medical Sciences program beginning with the 2009–2010 academic year and continuing through the cohort entering in the fall of 2012.

Student Learning Outcomes

As a result of the HOT plan intervention proposed by the GSBS, students who take the physiology course in the Master of Medical Sciences program will demonstrate the following student learning outcomes:

- Apply knowledge of and skills related to core principles of physiology during clinical case scenarios and in assessing/researching medical or health problems or issues.

- Analyze and interpret data and clinical cases that address medical or health problems or issues.

- Evaluate data and apply basic knowledge of physiology in developing clinical cases that address medical and health problems or issues.

Measures

The following five overall measures will be used to assess the effectiveness of the GSBS intervention on student learning outcomes related to higher order thinking:

- Students' disposition toward critical thinking will be assessed using the CCTDI administered at the beginning of the program in July and at the end of the physiology course the following May.

- The CCTST measure also will be applied to measure baseline and improvements in students' overall abilities to apply critical thinking skills and higher order learning. The CCTST will be administered at the beginning of the program in July and at the end of the physiology course the following May.

- Students' core knowledge of physiology will be assessed by classroom participation, group discussions, performance on examinations, and by students evaluating and presenting clinical case scenarios.

- Focus group discussions targeting key aspects of analyzing, evaluating, and synthesizing case studies will occur throughout the physiology course, and feedback will be measured using a critical element checklist for targeted concepts.

Faculty

The instructors for the core physiology course are Dr. Patricia A. Gwirtz and Dr. Xiang Shi, both senior faculty members in the department holding tenured positions. Dr. Gwirtz holds the position of Assistant Dean in the GSBS and is responsible for oversight of all specialized master's degree programs. Additionally, Dr. Gwirtz is the Year One Curriculum Director in the Texas College of Osteopathic Medicine and is involved with the development of the application-based curriculum used in the medical school.

Summary of the Intervention

The HOT plan allows for the redesign of physiology, one of core courses in the Master of Medical Sciences program, to incorporate application-based learning methods. The QEP Instructional Designer will assist the GSBS faculty in redesigning the course, and the QEP Instructional Technologist will ensure integration of the UNTHSC learning management system in addressing the specific needs of both students and faculty.

The redesign of the physiology course will not only increase students' ability to apply their knowledge through interactive technology and faculty led discussion, but will also serve to increase the quality of the applicant pool for professional medical education programs in US medical schools. It will also enhance the ability of the faculty to engage students in the higher order thinking skills required to apply the concepts of physiology to the solution of real-world clinical research problems. The improvements made in the physiology course will serve as a model for replication in other core courses in the Master of Medical Sciences program.

3. School of Public Health: Improving Higher Order Thinking by Developing National Center for Healthcare Leadership Competencies in Master of Health Administration Students

<u>**Statement of Purpose**</u>

In support of the HOT plan, the School of Public Health will enhance students' higher order thinking skills by implementing competency-based instruction based on higher order learning categories. The school's HOT plan activities will be implemented in specific courses of the curriculum for the Master of Health Administration (MHA) program in the Department of Health Management and Policy. Specifically, the faculty for these courses will develop and adopt appropriate higher order learning approaches for selected competencies and the associated instructional and assessment methods needed to advance student learning outcomes.

Redesigning the selected MHA courses for the HOT plan complements a larger effort in the School of Public Health to redesign all of its curricula over the next five years based on the competency model advocated by the National Center for Healthcare Leadership (NCHL). The NCHL model was developed in the early 2000s after the publication of two Institute of Medicine (IOM) reports. These reports and extensive data gathered from leaders within and outside of health care resulted in the conclusion that there was a need for a leadership model establishing core competencies for health care. Furthermore, the competency model seeks to ensure that students master the higher order thinking skills needed to apply the competencies. In 2004, the NCHL competency model began to be implemented across health systems among executives, doctors, and nurses as well as in ten health care management educational programs throughout the United States. In sum, the NCHL model is composed of two aspects: 1) the identification of a core set of leadership competencies appropriate to the health care setting and 2) the development of these competencies in individuals through higher order thinking as described in Bloom's Taxonomy.

<u>**Courses**</u>

For the purposes of the HOT plan, implementation of the NCHL competency model will focus on three courses—HMAP 5300, Introduction to Health Management and Policy; HMAP 5328, Human Resource Management; and HMAP 5324, Strategic Management and Marketing. These courses were selected because they are core courses for teaching management principles in the MHA curriculum. In any management program, courses must cover a wide variety of topics and management competencies. The most fundamental of these courses, however, are those that emphasize core management principles. Hence, the School of Public Health has chosen to begin the process of implementing the HOT plan in the MHA program with these core management courses.

Implementation of the NCHL model in these three courses is planned in three stages. The first two stages each consist of two steps. In the initial step of the first stage, external consultants and school directors assist faculty members in mapping their courses to identify the NCHL competencies that are already a part of their course curriculum. In the second step of stage one, faculty identify how the course learning objectives align with Bloom's higher order thinking category levels through professional development activities and workshops offered by the QEP Instructional Designer. This step allows the faculty member to determine if they are requiring higher order levels of thinking in their courses.

In the second implementation stage, faculty members examine the teaching and learning methods used in the course and estimate the percent of time students experience each method during the course. Since competencies are based on observable behaviors, it is important to ensure that the course requires practice and demonstration of behaviors using higher order thinking. During the second step in this stage, faculty members are offered alternative assessment methods by the QEP Assessment Specialist, and they estimate the number of times the learner experiences each of the assessment methods during the course. Assessment methods are then analyzed to validate that competency-based performance is being attained by students.

The third and final implementation stage is the development of an improvement plan for the course. This stage begins with a thorough review of the competencies, learning objectives, instructional methods, and assessment methods used in the courses by the faculty course and school directors. This review allows faculty members to begin improving their knowledge and skills in implementing instructional and assessment strategies that develop higher order thinking skills in their courses. Each faculty member develops an improvement plan in collaboration with their school directors that sets goals for their course improvement, identifies an implementation approach with a timeline, and indicates key success factors and barriers to the achievement of their goals.

The first implementation stage for the three selected HOT plan courses was completed in October 2009 when the entire faculty in the School of Public Health participated in an onsite daylong workshop facilitated by two experts from the National Center for Healthcare Leadership. The training focused on reviewing the aggregate results of the curriculum mapping for the school's courses, including the three MHA courses selected for HOT plan implementation. Results of the curriculum mapping revealed that no courses explicitly included higher levels of Bloom's taxonomy in the defined student learning outcomes.

Faculty members for the three identified HOT plan courses then examined the instructional and assessment methods used in the courses (stage 2), and began working on improvement plans (stage 3). The improvement plans will be discussed with other departmental faculty, QEP faculty from other schools, and the QEP staff in the Center for Learning and Development. Final plans will be completed for implementation in the 2010–2011 academic year.

Students

The students who will be involved in the School of Public Health's HOT plan activities are those enrolled in the MHA program beginning with the 2009–2010 academic year and ending with the 2012–2013 academic years and who are taking the courses mentioned above. Students in these cohorts will have the opportunity to experience each of these courses over their two years of study.

Student Learning Outcomes

In their role as developing health professionals, students will:

- Apply current knowledge and skills toward critically assessing health problems or issues through the demonstration of fundamental management competencies based on the NCHL competency model for entry-level health care management.

- Critically analyze data and other forms of information that address medical and health problems or issues particularly in the areas of health management and policy, strategic planning and marketing, and human resource management.

- Evaluate alternatives for effectively addressing medical and health problems or issues by evaluating the factors and policies that drive the US health care system and recognizing evidence-based management and strategies that achieve high performance within organizations.

Measures

The following measures will be used to assess the effectiveness of the School of Public Health's HOT plan intervention and its effect on student learning outcomes:

- Students' disposition towards critical thinking will be assessed using the CCTDI administered to MHA students at the beginning of the MHA program and at the end of completion of selected courses.

- Baseline and improvement in students' overall abilities to apply critical thinking skills and higher order thinking will be measured by utilizing the CCTST. The CCTST will be administered at that beginning of the MHA program and again at the completion of the selected courses.

- Student course evaluations will be distributed, gathered, and analyzed by satisfaction and ranking scales for each course.

- An American College of Healthcare Executives Competency Survey will be disseminated, assembled, and analyzed at the beginning and end of each academic year.

- A competency-based comprehensive exam will be administered at the conclusion of the program of study that measures application, analysis, and evaluation of key program competencies through cumulative scoring.

- An employer survey measured by scaled scores will be distributed to each student employer targeting key aspects of content synthesis.

- Focus group discussions targeting key aspects of analyzing, evaluating, and synthesizing case studies will occur throughout each course, and feedback will be measured using a critical element checklist for targeted concepts.

Faculty

The instructors for the three courses are Drs. Liam O'Neill, Thomas Fairchild, Hsueh-Fen Chen, and Thaddeus Miller. Dr. O'Neill and Dr. Fairchild are senior faculty in the department who hold tenured positions. They teach the core introductory course and the strategy course, respectively, which are viewed as crucial to the MHA course of study. Dr. Chen is an Assistant Professor on a tenure track who will play a key role in our management courses in the future. Hence, the SPH believes that it is also essential for her to be a part of this initial development program. Dr. Miller is a Research Assistant Professor who co-teaches HMAP 5300 with Dr. O'Neill.

Summary of the Intervention

The School of Public Health will focus its HOT plan efforts on integrating NCHL competencies in three MHA courses. The NCHL model consists of three leadership domains, containing twenty-six competencies. Each of the competencies is further subdivided into levels of accomplishment. As recommended by the NCHL, the MHA program will select competencies that are aligned with the mission and goals of the program. The selection of competencies and the improvement of the curriculum begin with a two-step iterative process of curriculum mapping and learning-experience

analysis. Curriculum mapping consists of a comparison of course objectives to the competencies in the NCHL model and to the cognitive levels in Bloom's taxonomy. In the second step, the learning experiences of students are analyzed through consideration of instructional and assessment methods. From these analyses, a competency-based improvement plan is created that identifies specifically how course objectives, learning methods, and assessment methods can be improved to expand the use of higher order learning approaches.

4. School of Health Professions: Enhancing Higher Order Learning in Physician Assistant Studies

<u>**Statement of Purpose**</u>

With regard to the HOT plan, the goal of the Physician Assistant (PA) Studies Program is to advance PA students' competencies related to higher order thinking through learning exercises that provide students the opportunity to observe experts in clinical practice and to practice critical thinking skills. These experiences will be enhanced by providing students with feedback that is direct and effective in focusing their attention on higher order thinking. To be effective, faculty must learn and adopt supportive feedback mechanisms designed to enhance students' dispositions towards critical thinking and to teach problem-solving skills. In doing so, faculty will encourage students to adopt decision-making techniques that reflect the higher levels of thinking outlined in Bloom's taxonomy—application, analysis, synthesis, and evaluation.

<u>**Courses**</u>

The School of Health Professions' HOT plan activities will focus on improving the Supervised Practice I and II courses within the Physician Assistant Studies curriculum. These two courses represent well-defined and manageable opportunities for enhancing facilitation and for teaching higher order thinking skills. Each of these two courses has ongoing small group discussions that involve students and focus on students' observation, thinking, and problem-solving skills. Each small group is facilitated by a clinical faculty member.

During Supervised Practice I and II small group meetings, each student is encouraged to present cases they have observed during their clinical experiences in real world settings and to discuss them relevant to the clinical reasoning that has been used to develop the patient's diagnosis and treatment. It is anticipated that during these discussions students will provide justification and critical review of the reasoning that supports a particular diagnosis and treatment plan. As a part of the intervention, the students are encouraged by faculty to also critically review the diagnoses and treatment choices and compare them with alternative choices. The faculty member serves as the group facilitator and is expected to listen carefully to each student's presentation and ask questions relevant to the case. During this process, the opportunity to give feedback and seek clarification about the student's thinking is available.

The small group facilitator (faculty member) then guides group discussion, pointing out how data presented by the students either supports or fails to support a particular diagnosis and treatment plan. These interactions are formative in nature with the goal being to develop the students' reasoning and thinking processes. Group facilitators are discouraged from lecturing on a particular disease or disease process since the overarching goal is to develop the students' ability to analyze and evaluate information, not to acquire new knowledge.

Implementation of the School of Health Professions' HOT plan intervention is planned to take place in three stages. First, school faculty will analyze the Supervised Practice I and II courses to identify and develop learning objectives related to higher order thinking. The QEP Instructional Designer, Instructional Technology Specialist, and Assessment Specialist will help the course and school directors increase their professional awareness about how to teach and assess for higher order thinking skills. This process is critical and will allow for better definition of specific learning outcomes related to higher order thinking. These outcomes, once defined, can then be addressed during course delivery and enhanced over time.

During the second stage of the intervention, engaged faculty members will be asked to examine teaching and learning methods they use (or have used) in these courses and estimate how effective they have been at addressing the development of students' dispositions toward using critical thinking skills. The intention during this stage of the intervention is to allow faculty an opportunity to consider their own roles in facilitating higher order thinking and also encourage them to evaluate the impact of student assessment on developing higher order thinking skills. Faculty members are anticipated to begin piloting their new teaching skills by the end of the first year.

Also during the second stage, faculty will work on developing a self-improvement plan with their school directors related to enhancing their higher order thinking teaching methods. Based on this, the expectation for each faculty member is to set goals for self-improvement, to identify an implementation timeline, and to indicate key success factors related to achievement of identified goals. During the second stage, faculty members also will attend faculty development workshops offered by the QEP team where they will receive training in the theory and processes related to higher order thinking and how to give formative student feedback.

In the third stage of the intervention, which is anticipated to begin during the second and third years of the project, further faculty development and course refinements are expected to occur.

Students

This project will involve second-year PA students enrolled in Supervised Practice I and Supervised Practice II courses. These courses run concurrently with other courses in Semesters 4 and 5 of the curriculum. Students enrolled in these courses will have already completed their basic science instruction and will be taking additional didactic instruction during these semesters that is related to disease in humans. The Supervised Practice I and II courses are skills-oriented and contribute directly to the students' preparation for entering clinical rotations, where they will learn how to further develop and demonstrate higher order thinking competencies under the supervision of clinical preceptors.

Student Learning Outcomes

In their role as developing health professionals, the PA students will:

- Apply current knowledge and skills toward critically assessing medical and health problems or issues through reviews and discussions of observational experiences completed in Supervised Practice I and II courses.

- Critically analyze data and other forms of information that address medical and health problems or issues, particularly as they pertain to the role of the physician assistant in general clinical practice.

- Evaluate alternatives for effectively addressing patients' medical and health problems or issues by capitalizing on the validity and sensitivity of information obtained and assessing its relationship to a differential diagnosis and appropriate treatment plan.

Measures

Six overall measures will be used to assess the effectiveness of the School of Health Profession's intervention and its effect on student learning outcomes related to higher order thinking, as follows:

- Students' disposition towards critical thinking will be assessed using the CCTDI administered at the beginning of the Supervised Practice I course and again at the end of the Supervised Practice II course.

- The CCTST measure will also be applied to measure baseline and improvements in students' overall abilities to apply critical thinking skills and higher order learning.

- Students will be expected to maintain a journal throughout both courses where they will document and track their individual performance on higher order thinking exercises and self-assess their progress and improvement in the development of higher order thinking skills.

- All students will participate in an Objective Structured Clinical Examination (OSCE) given at the conclusion of Supervised Practice II. This OSCE is summative in nature and designed to measure the individual student's ability to collect and analyze data.

- National certification examination results required to obtain licensure as a PA will be tracked each year in order to measure the progress of programmatic success in higher order thinking skills presented throughout the curriculum.

- Focus group discussions targeting key aspects of analyzing, evaluating, and synthesizing case studies will occur throughout each course, and feedback will be measured using a critical element checklist for targeted concepts.

Faculty members involved in the HOT plan are expected to improve their understanding of critical thinking and as a result are expected to become better instructors and facilitators of higher order thinking among their students. Faculty will be evaluated via direct observation and through student evaluations conducted in Supervised Practice I and II courses.

After graduation, all former students take and must pass a national certification examination to obtain licensure as a PA. Student performance on this exam is expected to improve as a result of the intervention, since portions of the exam call for higher order thinking skills.

Faculty

The plan is to engage the faculty members in a development program that will focus on their own learning of how to recognize and develop higher order thinking skills, while concurrently giving them a useful model upon which to deliver feedback to students. Dr. Jerry Friedman, Chris Cooper, Laura Mattingly, Linda Davis, and Libby Hulsey are involved in leading small group discussions in Supervised Practice I and II. These faculty are practicing PAs who have not have received formal instruction in teaching, small

group facilitation, or how to give effective feedback. Most have not received instruction in Bloom's taxonomy or what manifests higher order thinking.

Summary of the Intervention

The Department of PA Studies plans to focus its efforts under the HOT Plan on developing competency-based instruction in higher order thinking categories in two courses—Supervised Practice I and Supervised Practice II. These two courses are a regular part of the fourth and fifth semesters of the Master of Physician Assistant Studies curriculum and are designed to introduce PA students to patient care experiences conducted by practicing clinicians. During these two courses, students are expected to gain practical insights and first-hand observational experiences in diagnostic and clinical reasoning skills as applied by experts to actual patients with real-life concerns. Upon returning from these experiences, students discuss patient care scenarios in small groups facilitated by faculty. The purpose of these discussions is to review the students' experiences and discover what they have learned. Indirectly, these discussions also help students develop their own higher order thinking related to clinical practice.

The first step of the intervention will be to work on formalizing student outcomes related to higher order and critical thinking in the Supervised Practice I and Supervised Practice II course objectives. These critical thinking skills will help the students learn how to capitalize on information obtained from a patient's medical history and physical examination and apply higher order thinking evaluation and analysis to developing a differential diagnosis and treatment plan. The QEP Instructional Specialist will collaborate with the school's faculty to redesign these courses so they incorporate the new course objectives and to develop instructional modules that support student learning outcomes in the area of higher order thinking.

Clinical faculty, by virtue of their expertise, may not always be fully aware of the advanced nature of their own critical thinking processes, and, as a result, they can misinterpret students' inaccurate reasoning as a failure to collect data when in fact the real problem lies in how students have analyzed or evaluated the data they have collected. To improve on this, faculty must be educated on what represents higher order thinking processes and must be taught how to apply this knowledge to their evaluations of students' performance. The QEP Assessment Specialist will support the School of Health Professions faculty in designing a system to evaluate student performance that will effectively measure higher order thinking processes. In addition, the QEP Instructional Technology Specialist will help faculty capitalize on the institution's learning management system to supplement face-to-face encounters with online discussion boards and other electronic tools as appropriate.

C. ACTIONS TO IMPROVE FACULTY KNOWLEDGE AND SKILLS (GOAL 2)

Successful implementation of the plans outlined above depends on the faculty's ability to integrate higher order learning methods into their courses. Thus, Goal 2 of the HOT plan focuses on helping faculty improve their knowledge and skills in implementing instructional strategies and assessment tools that cultivate students' higher order thinking skills. The HOT plan's faculty development activities are designed to improve teaching through the use of higher order learning approaches that advance student learning outcomes. Furthermore, QEP staff and faculty recognize that new, often technologically-mediated instruction and assessment methods will be needed for faculty members to implement higher order learning approaches in their courses. Hence, the HOT plan supports two major goals identified in the Academic Affairs focus area of the

UNTHSC five-year strategic plan: 1) to enhance and expand faculty development and retention and 2) to enhance academic support and technology. In support of these goals, UNTHSC already supports a variety of faculty development activities at the institutional level. For example, the Office of Research provides research-related training and development for faculty, and the Office of Professional and Continuing Education (PACE) sponsors faculty development activities for UNTHSC faculty and other health professionals. The HOT plan faculty development activities will complement these ongoing efforts.

Each academic year, the HOT plan will initiate the year's faculty development activities with a retreat for all faculty and staff involved in the project. Next, the faculty, particularly those who are teaching the selected courses, will participate in a series of faculty development sessions to facilitate course revision, enhance andragogy, and develop strategies for assessing higher order thinking skills. Faculty development will consist of developmental workshops, consultations with experienced professionals, and financial support to attend professional faculty development conferences designed to assist the faculty in transforming their respective curricula. Each year a minimum of six HOT-plan workshops will be available, in addition to the school-specific faculty development required to implement each school's intervention. Topics identified by the faculty for upcoming development workshops include, but are not limited to, the following:

- Use of Bloom's Taxonomy for Teaching, Learning, and Assessing

- Teaching Today's Learners

- Principles and Profiles of Good Practice in Assessment

- How to Teach Critical Thinking using Active Learning

- Effective Grading and Assessment: Strategies Encouraging Higher Order Thinking and Enhanced Student Learning

- Developing an Outcomes-Based Syllabus that Integrates Teaching, Learning, and Assessment Using Technology to Enhance Student Learning

D. SUMMARY AND CONCLUSIONS

Each school has identified its HOT plan courses, students, and faculty and described the activities it will implement to improve students' higher order thinking skills and learning outcomes. A summary of current and proposed teaching methods by school and course is provided in Table 16. A similar summary of current and proposed assessment measures is provided in Table 17.

Table 16. Current and Proposed Teaching Methods by Course

Courses	Current Teaching Methods	Proposed Teaching Methods
Texas College of Osteopathic Medicine		
MEDE 7410: OMM 1	Lecture Hands-on practical training Self-study materials: 　Demonstration videos 　PowerPoint presentations 　Journal articles	Case vignettes Case-based differential diagnoses Hands-on practical training Provision of student self-study materials: 　Demonstration videos 　PowerPoint presentations 　Journal articles
MEDE 7314: OMM 2	Lecture Hands-on practical training Self-study materials: 　Demonstration videos 　PowerPoint presentations 　Journal articles	Case vignettes Case-based differential diagnoses Hands-on practical training Provision of student self-study materials: 　Demonstration videos 　PowerPoint presentations 　Journal articles
MEDE 7421: OMM 3	Lecture Hands-on practical training Self-study materials: 　Demonstration videos 　Power points 　Journal articles	Problem-specific Clinical Integrative Laboratories Interactive training targeting clinical competencies Case-based classroom exercises Hands-on training simulations Demonstration and dysfunction scenarios Multimedia simulations Interactive learning tasks KBIT
MEDE 7320: OMM 4	Lecture Hands-on practical training Self study materials: 　Demonstration videos 　PowerPoint presentations 　Journal articles	Problem-specific Clinical Integrative Laboratories Interactive training targeting clinical competencies Case-based classroom exercises Hands-on training simulations Demonstration and dysfunction scenarios Multimedia simulations Interactive learning tasks KBIT

Table 16. (cont.)

Courses	Current Teaching Methods	Proposed Teaching Methods
Graduate School of Biomedical Sciences		
BMSC 5304: Integrative Biomedical Sciences 4 – Physiology	Lecture Case scenarios Clinical correlations	Lecture Case scenarios Clinical correlations Workshops and reviews Case-based group presentations
School of Public Health		
HMAP 5300: Introduction to Health Management	Lectures Presentations Class discussions	Case-base scenarios and analysis Group presentations
HMAP 5328: Human Resources Management	Lectures Presentations Case and class discussions Problem set exercises	Peer-review evaluations Case-base scenarios and analysis
HMAP 5324: Strategic Management and Marketing	Lectures Instructor presentations Case analyses Reflective learning strategies Class discussions Group presentations	Case-base scenarios Cooperative learning groups.
School of Health Professions		
MPAS 5241: Supervised Practice I	Case lectures Class discussions	Case reviews Class discussions Scenario creations Student journals
MPAS 5242: Supervised Practice II	Case lectures Class discussions	Case reviews Class discussions Scenario creations Student journals

NOTE: KBIT = Knowledge Based Inference Tool

Table 17. Current and Proposed Assessment Measures by Course

Courses	Current Assessment Measures	Proposed Assessment Measures
Texas College of Osteopathic Medicine		
MEDE 7410: OMM 1	Lectures Student Course Evaluations Practical exams	CCTST CCTDI Focus group analysis Student course evaluations Post graduate survey Diagnosis exams COMLEX I, COMLEX II, NBOME II PE OMM performance-based practical exams
MEDE 7314: OMM 2	Lectures Student Course Evaluations Practical exams	Focus group analysis Student course evaluations Diagnosis exams COMLEX I, COMLEX II, NBOME II PE OMM performance-based practical exams
MEDE 7421: OMM 3	Lectures Student Course Evaluations Practical exams	Focus group analysis Student course evaluations Evaluation of first problem-specific CIL OMM performance-based practical exams KBIT performance
MEDE 7320: OMM 4	Lectures Student Course Evaluations Practical exams	CCTST CCTDI Focus group analysis Student course evaluations Evaluation of second problem-specific CIL OMM performance-based practical exams KBIT performance
Graduate School of Biomedical Sciences		
BMSC 5304: Integrative Biomedical Sciences 4 – Physiology	Student Course Evaluations Written exams	CCTST CCTDI Rubric-based written exams Focus group analysis Clinical case scenario creation and presentations Student course evaluations

Table 17. (cont.)

Courses	Current Assessment Measures	Proposed Assessment Measures
School of Public Health		
HMAP 5300: Introduction to Health Management	Student course evaluations Comprehensive exam	CCTST CCTDI Focus group analysis Student course evaluations ACHE competency survey Competency-based comprehensive exam Employer survey
HMAP 5328: Human Resources Management	Student course evaluations Comprehensive exam	CCTST CCTDI Focus group analysis Student course evaluations ACHE competency survey Competency-based comprehensive exam Employer survey
HMAP 5324: Strategic Management and Marketing	Student course evaluations Comprehensive exam	CCTST CCTDI Focus group analysis Student course evaluations ACHE competency survey Competency-based comprehensive exam Employer survey
MPAS 5241: Supervised Practice I	Student course evaluations OSCE PA national certification exam	CCTST CCTDI Focus group analysis Student journal review Student course evaluations OSCE PA national certification exam
MPAS 5242: Supervised Practice II	Student course evaluations OSCE PA national certification exam	CCTST CCTDI Focus group analysis Student journal review Student course evaluations OSCE PA national certification exam

NOTE: ACHE = American College of Healthcare Executives
CCTDI = California Critical Thinking Disposition Inventory
CCTST = California Critical Thinking Skills Test

COMLEX = Comprehensive Osteopathic Medical Licensing Examination
KBIT = Knowledge Based Inference Tool
NBOME = National Board of Osteopathic Medical Examiners
OSCE = Observed Student Clinical Skills Evaluation

VI. Timeline

A proposed five-year timeline for implementing the HOT plan is provided below. Topics of the faculty development workshops and seminars will change annually after the first year to meet current needs and emerging opportunities, as identified by evaluation of HOT plan outcomes.

<u>Schedule for Summer 2009</u>

July 2009

- Make presentations about HOT plan at student orientations (Texas College of Osteopathic Medicine, Graduate School of Biomedical Sciences, and School of Health Professions)
- Update UNTHSC Board of Visitors on HOT plan
- Review higher order thinking assessments for baseline data collection
- Attend SACS-COC Summer Institute

<u>Schedule for Fall 2009</u>

August 2009

- Make presentation about HOT plan at School of Public Health student orientation
- Purchase higher order thinking assessments
- Update the Executive Team, Leadership Team, and faculty/staff across schools about the HOT plan

September 2009

- Collect baseline student data
- Conduct Faculty Retreat to review institutional student learning outcomes
- Discuss and develop HOT plan student learning outcomes for each school

October 2009

- Initiate School of Public Health intervention with NCHL consultants
- Meet with student focus groups to review HOT plan
- Recruit staff for Center for Learning and Development (CLD)

November 2009

- Meet with student organizations to review HOT plan
- Update the Council of Deans and Board of Regents on the HOT plan
- Hold initial meeting of QEP Advisory Council
- Interview candidates for Instructional Designer, Technology Specialist, and Assessment Specialist for CLD

December 2009

- Review and revise QEP final draft
- Attend SACS Annual Meeting in Atlanta, Georgia
- Develop Faculty Survey and QEP Rubrics

Schedule for Spring 2010

January 2010

- Conduct campus-wide review of QEP
- Submit QEP to SACS-COC
- Conduct campus-wide marketing of HOT plan
- Hire staff for Center for Learning and Development
- Revise Faculty Survey and QEP Rubrics

February 2010

- Attend Texas A&M Assessment Conference (College Station, Texas)
- Host open house for Center for Learning and Development
- Finalize Faculty Survey and QEP Rubrics
- Host Faculty Development Workshop: Bloom's Taxonomy and Higher Order Thinking
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

March 2010

- Host SACS-COC Onsite Visit
- Host Faculty Development Workshop: Designing Courses Using Bloom's Taxonomy and Higher Order Thinking (Dr. Frank Papa, Associate Dean for Texas College of Osteopathic Medicine)
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

April 2010

- Hold QEP Advisory Council Meeting
- Host Faculty Development Workshop: Andragogical Approaches to Building Higher Order Thinking Skills
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

May 2010

- Host Faculty Development Workshop: Teaching with Technology
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

Schedule for Summer 2010

June 2010

- Host Faculty Development Conference Presentations: John Tagg, Learning Paradigm; Peter Seldin and Beth Miller, The Academic Portfolio; Jose Bowen, Teach Naked on June 8–9, 2010 in Fort Worth
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

July 2010

- Administer CCTST, CCTDI, and LASSI
- Make presentations about HOT plan at student orientations (Texas College of Osteopathic Medicine, Graduate School of Biomedical Sciences, and School of Health Professions)

- Update Board of Visitors on HOT plan
- Host Faculty Development Workshop: Developing an Outcomes-Based Syllabus that Integrates Teaching, Learning and Assessment
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

Annual Schedule for Fall 2010–Fall 2014

August

- Implement changes in HOT plan courses for each school
- Make presentations about HOT plan at School of Public Health student orientation
- Hold QEP Advisory Council Meeting
- Update the Executive Team, Leadership Team, and faculty/staff across schools about HOT plan
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

September

- Update student groups on HOT plan
- Host Fall Faculty Retreat (2010 Topic: Teaching Today's Learners, Dr. Mark L. Taylor)
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

October

- Host Faculty Development Workshop (2010 Topic: Effective Grading and Assessment: Dr. Virginia Johnson Anderson, Professor of Biological Sciences, Towson University)
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

November

- Update Board of Regents on HOT plan
- Hold QEP Advisory Council Meeting
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans
- Host Faculty Development Workshop (2010 Topic: Creating Quality Rubrics)

December

- Review and analyze assessment data on fall HOT plan courses
- Submit monthly QEP update to Leadership Team
- Attend SACS Annual Meeting
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

Annual Spring Schedule 2010–2015

January

- Implement findings from review of fall assessment results
- Host Faculty Development Workshop (2010 Topic: Use of Portfolios for Assessing HOT skills)

- Update alumni groups on HOT plan
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

February
- Attend Texas A&M Assessment Conference (College Station, Texas)
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans
- Update alumni groups on HOT plan
- Host Faculty Development Workshop (2010 Topic: Teaching with Technology)

March
- Host Faculty Development Workshop (2010 Topic: Retooling the Lecture as an Instructional Technique: Kathryn Cunningham, University of Kentucky)
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

April
- Hold QEP Advisory Council Meeting
- Host Faculty Development Workshop (2010 Topic: Using Conceptual Approach for Course Design-Edmund Hanson, Northeastern Illinois University)
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

May
- Review and analyze assessment results from spring HOT plan courses
- Complete and submit Annual QEP Report
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

Annual Summer Schedule 2010–2015

June
- Implement annual assessment results
- Host Faculty Development Workshop (2010 Topic: Teaching for the Intergenerational Classroom)

July
- Administer CCTST, CCTDI, and LASSI
- Host Faculty Development Workshop (topics to be determined)
- Attend SACS Summer Institute
- Provide monthly HOT plan update to Provost, QEP Executive Committee, and Council of Deans

August
- Host Faculty Development Workshop (topics to be determined)

VII. Organizational Structure

The UNTHSC HOT plan will be under the auspices of the Provost and Executive Vice President for Academic Affairs. The QEP Director will be responsible for the overall management of the HOT plan and will be accountable to the Provost and Executive Vice President, with oversight provided by the QEP Executive Team.

UNTHSC will implement and sustain the HOT plan with support from the Vice President for Information Resources and Technology, QEP staff, the QEP Advisory Council, and critical support services. In addition, each school has established a QEP School Team Director to lead its faculty in implementing the school's HOT plan. These faculty teams are a fundamental component of the overall organizational structure. They will focus on the school-level implementation, oversight, and management of the HOT plan. The QEP Director and staff also will provide support to assist faculty in implementation of the HOT plan project. Responsibilities of key personnel and committees are described below and illustrated in the subsequent organizational chart (Figure 4). All QEP committees and their membership are listed in Appendix IX.

Provost and Executive Vice President for Academic Affairs: The Provost and Executive Vice President for Academic Affairs is responsible for all academic activities at the Health Science Center.

QEP Director and Staff: The QEP Director is responsible for the overall management of the HOT plan and for overseeing the QEP staff, which includes an administrative assistant as well as the professional expertise of an Assessment Specialist, Instructional Technologist, and Instructional Designer. The qualifications and responsibilities for each of these professional positions are summarized in the table below.

Table 18. Qualifications and Job Responsibilities of QEP Professional Staff

Qualifications	Job Responsibilities
QEP Director	
• Master's or Doctoral degree • At least five years progressive responsibility in large-project management • Demonstrated success in facilitating and ability to work independently in a team environment • Demonstrated ability to manage a budget to achieve project goals • Demonstrated ability to organize, prioritize, coordinate, and implement multiple projects • Demonstrated personnel management skills in an educational setting • Demonstrated high-level customer service skills in an educational setting	• Manage the daily operation of QEP • Supervise personnel • Coordinate project activities • Prepare project reports and materials • Monitor project budget • Evaluate project • Oversee creation of a Center for Learning and Development

Table 18. (cont.)

Qualifications	Job Responsibilities
QEP Assessment Specialist	
• Master's degree in Education, Math, Science, Statistics, Psychology, or related field • Three years experience in research design and qualitative/quantitative program assessment • Excellent interpersonal skills and the ability to work in an intergenerational environment • Ability to quickly develop good project management skills, to multi-task, and to work effectively in a fast-paced environment • Highly organized with the ability to work collaboratively with faculty and staff from a wide variety of health education disciplines	• Provide assessment and evaluation expertise to support the work of faculty • Develop appropriate assessment/evaluation plans for QEP curriculum project • Prepare and submit college-wide assessment and program reports • Develop, administer, and analyze learning outcomes, especially assessment of higher order thinking • Provide ongoing faculty training for use of assessment tools and methods
QEP Instructional Technologist	
• Bachelor's degree (Master's preferred) in instructional technology, informatics, technical communication, educational technology, or a related field • At least three years relevant experience • Increasingly more responsible experience incorporating technologies in classroom teaching in higher education • Experience using course management systems (preferred WebCT, Blackboard Vista) • Experience working with university faculty in using instructional technologies • Experience working with adult learners in higher education (preferred health care or health professions experience)	• Assist faculty in designing instructional modules and developing learning resources • Support the campus-wide course management system (CMS) and provide training in the use of the CMS • Assist faculty in moving courses from web-based and other media to the CMS • Work in coordination with QEP faculty to create, implement, and evaluate the technology-mediated and competency-based learning programs • Assists faculty in the redesign of courses or course elements for face-to-face and electronic delivery • Offer workshops or one-on-one training
QEP Instructional Designer	
• Master's or Doctoral degree in Educational Technology, Instructional Development, or related field • Three years of experience as an instructional designer (preferred higher education or health care related institution) • Experience in collaborating with faculty to develop and implement learning outcomes and using analytical tools to identify the andragogical needs of courses • Assist in developing project timelines and schedule meetings with faculty and content experts during the design process • Experience with emerging technologies, such as Twitter, Voicethreads, and Second Life • Demonstrable expertise and experience in assessing student learning	• Create and revise course design documents and other related materials to meet the requirements of faculty or staff • Coordinate the process of collaboration with faculty, staff, and external professionals to facilitate content transfer and writing of course materials • Maintain currency with innovations and trends in andragogical research • Assist the continuing development of a coherent instructional design strategy based on current andragogical research and health education practice • Research and review courses and programs developed by other institutions/organizations • Represent instructional design philosophy within UNTHSC and to outside organizations

Vice President for Information Resources and Technology: The Vice President is responsible for UNTHSC information resources, such as the Library, Web Programming Services, Academic Information Services, and Biomedical Communications services for the Center for Learning and Development.

QEP Executive Committee: The QEP Executive Committee is responsible for providing institutional support in the implementation of the QEP. The QEP Executive Committee, in collaboration with the QEP Director, will monitor all aspects of the project, including implementation, budgeting, evaluation, and supervision.
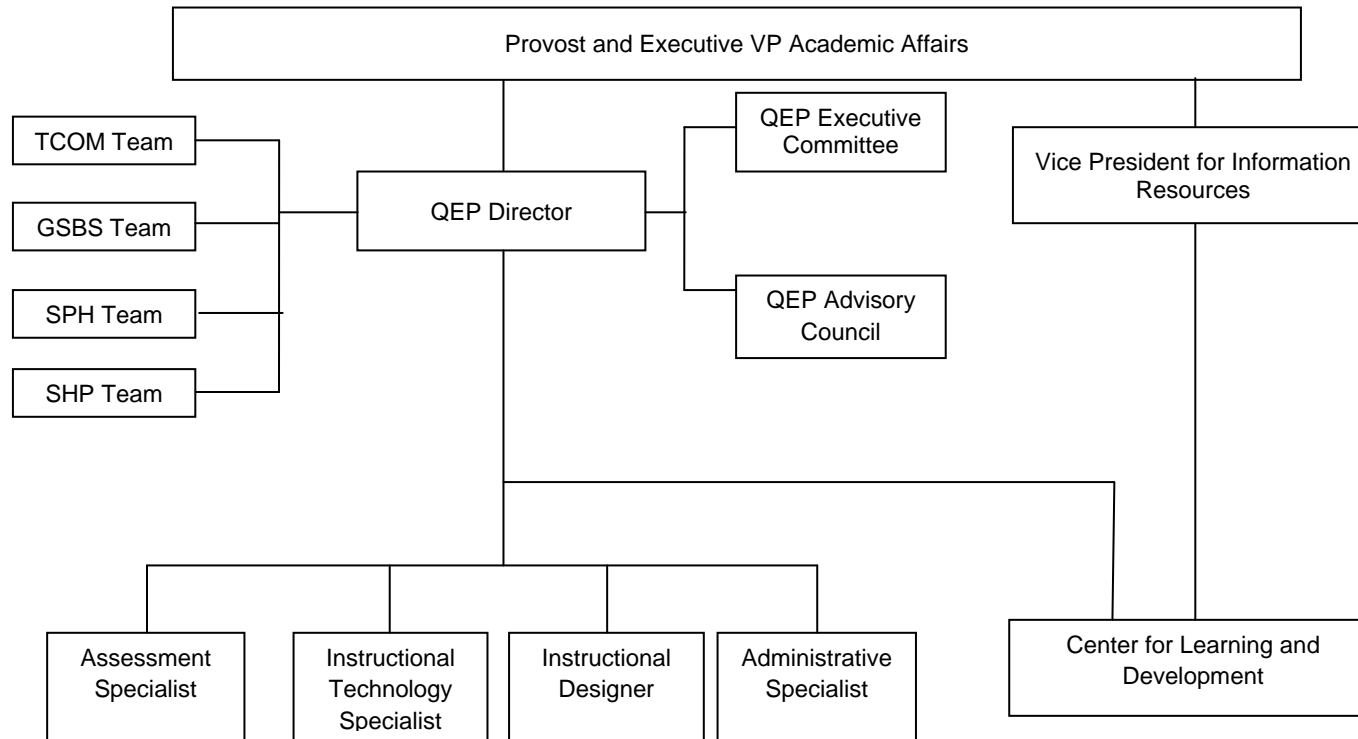
QEP Advisory Council: The Advisory Council will provide content expertise regarding the implementation and evaluation of the QEP. Membership on the Advisory Council includes UNTHSC faculty and students from each of the schools and external persons with content expertise.

QEP School Team Directors: The QEP School Team Directors are responsible for the accomplishment of course redesign in collaboration with each other, the QEP Director, faculty, consultants, information services staff, and the Center for Learning and Development staff.

Faculty: UNTHSC faculty in courses selected for the HOT plan are responsible for introducing changes in the curriculum, andragogy and assessment methods to improve UNTHSC students' higher order thinking skills.

Center for Learning and Development: The purpose of the Center for Learning and Development is to provide resources and faculty development support to advance student learning through the use of higher order thinking.

Figure 4. QEP Organizational Chart

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                    Provost and Executive VP Academic Affairs
                                                                      
  TCOM Team                              QEP Executive
                                          Committee            Vice President for Information
  GSBS Team          QEP Director                                      Resources
                                          QEP Advisory
  SPH Team                                  Council

  SHP Team


  Assessment    Instructional    Instructional    Administrative    Center for Learning and
  Specialist     Technology        Designer         Specialist           Development
                 Specialist
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VIII. Resources

The UNTHSC has developed a five-year budget committing a total of $2,610,954 from the budget of the Provost and Executive Vice President of Academic Affairs for implementation of the HOT plan. As described in the following budget justification and illustrated in the subsequent chart (Figure 5), the budget for all five years of the HOT plan (academic year 2010–2011 through academic year 2014–2015) is adequate to support implementation of the plan's goals and objectives.

A. PERSONNEL

The full-time staff includes the QEP Director, three full time professionals (an assessment specialist, instructional designer, and instructional technology specialist), and an administrative specialist. The QEP Director's salary and benefits are provided from the budget for the Office of the Provost, while the salaries and benefits for other QEP staff are provided from the HOT plan budget. In years two through five, the budget reflects a 2% annual salary increase and includes the full cost of fringe benefits on salaries.

B. LEARNING AND DEVELOPMENT

Assessment Instruments: An annual allocation of $9,000 will be set aside to cover costs for pre and post testing using the California Critical Thinking Disposition Inventory and the California Critical Thinking Skills Test for a total of $45,000.

Faculty Development: An annual allocation of $10,000 is available to support on-campus faculty development workshops focusing on using higher order thinking instructional strategies and assessing student learning outcomes.

School Based Interventions: An annual allocation of $15,000 in years 1–4 and $12,000 in year 5 will be available for schools to hire consultants to work with the school on its specific needs for implementing the HOT plan.

Faculty Release Time: Funds will be available to reimburse HOT plan faculty for clinical and research time with a total annual allocation of $36,000.

Travel: Travel funds for faculty and staff to attend conferences, workshops, and SACS meetings will be available with a total annual allocation of $10,000.

C. EQUIPMENT AND FURNITURE

Equipment: Funds will be available to purchase computer equipment, software for QEP staff, laptops for faculty use, an LCD projector, a Smart Board electronic whiteboard, an IP-based conference telephone, and a 32-inch flat panel monitor with an allocation of $5,000 in year 1, $9,000 in year 2, $7,500 in year 3, $4,000 in year 4, and $1,500 in year 5.

Furniture: The budget includes furniture for QEP full-time staff and the QEP Center for Learning and Development and renovation costs associated with the creating a permanent location for the center at $17,320 in year one of the project.

D. MARKETING AND COMMUNICATION

A total allocation of $31,000 over five years will be set aside for the production of publications, purchasing of promotional materials, and for costs associated with

designing and branding marketing materials, such as table tents, buttons, pamphlets, and information panels.

E. ADMINISTRATIVE

Consumables such as office supplies, photocopying, postage, and telephone, as well as maintenance and repairs for technology-related devices and other communication costs are budgeted at $28,500 over five years.

F. PHYSICAL RESOURCES

1. Center for Learning and Development

For student learning to advance through higher order thinking and competency-based instruction, faculty access to information regarding these topics must be available and easily accessible. Therefore, UNTHSC will create the Center for Learning and Development during the 2009–2010 and 2010–2011 academic years. The purpose of the center is to support improvement of educational outcomes by directly enhancing faculty's teaching skills and encouraging teaching styles that support the development and assessment of higher order thinking skills.

The center will employ an instructional technologist, instructional designer, and assessment specialist to provide direct support for the QEP School Team Directors and other faculty involved in the HOT plan. The center also will provide experts from the Information Resources and Technology Services Department, such as Academic Information Services, Biomedical Communications, and the Library, to complete the educational support team. These experts will work directly with faculty to augment their digital competencies and to help faculty implement new approaches to instruction and assessment of student learning and higher order thinking.

The QEP full-time staff will occupy a suite of offices and open space area in the Gibson D. Lewis Library. In addition to its educational offerings, the learning and development center will achieve its goals using spatial design, furnishings, and technology that encourage collaboration and exchange of ideas. This kind of smart design is essential to the success of such a "learning commons" and ensures that the educational process is in a space that fosters success.

2. Information Resources and Technology Support

Support will be provided to the QEP initiative through existing departments that are a part of the Information Resources and Technology division. These departments include Infrastructure and Security, Web and Programming Services, the Gibson D. Lewis Health Science Library, Academic Information Systems, and Biomedical Communications. Infrastructure and Security will support the computer networking and central computer applications, such as SharePoint, Exchange, and other programs. Web and Programming Services will help maintain the QEP web site and provide institutional data as needed for assessment or reporting. The Gibson D. Lewis Health Science Library will interact with and support the QEP faculty and staff through a combination of instructional and bibliographic activities as well as through general support for the creation and operation of a physical space for the Center for Learning and Development.

Academic Information Services team members will provide assessment support through data collection, analysis, and reporting and will collaborate with the center's assessment specialist.

Biomedical Communications will provide a host of administrative and production support services that the Center for Learning and Development will require for its various activities and programs. Graphic Arts and Print Services will produce printed promotional and instructional materials. The Media Group will provide electronic and interactive promotional and instructional materials, as well as video- and web-conferencing services. Along with the Photography Division, they will also provide documentation. Biomedical Communications will provide multi-function devices for faxing, copying, and printing. Moreover, the department will develop equipment or technical specifications to meet the system planning needs of the Center for Learning and Development.

G. SUSTAINABILITY

To sustain the project work of the HOT plan, faculty and student learning behaviors will become integrated into the standard operations of the schools though faculty development activities and the curriculum revision process. The actual impact of the HOT plan over time will vary by school because of differences in selected higher order thinking competencies and because some schools begin the QEP process at a more advanced point in defining competencies and curriculum improvement processes for their programs.

The integration of HOT plan resources and services into the Center for Learning and Development also will help ensure that necessary support services are sustained. Over time, the focus of the QEP Director will switch from 100% time administering the HOT plan to 100% time administering the Center for Learning and Development. In this role, the director will continue to advance faculty development and student learning. By the end of five years, the educational activities of the HOT plan will be integrated into the schools' curricula and the support functions will be fully integrated into the Center for Learning and Development.

Figure 5. QEP Five-Year Budget, All Funding Sources

QEP Budget											
Human Resources		**2010**		**2011**		**2012**		**2013**		**2014**	**Total**
Assessment Specialist	$	65,000	$	66,300	$	67,626	$	68,979	$	70,358	$ 338,263
Instructional Course Designer	$	65,000	$	66,300	$	67,626	$	68,979	$	70,358	$ 338,263
Technology Specialist	$	65,000		$66,300	$	67,626	$	68,979	$	70,358	$ 338,263
Administrative Assistant	$	37,000	$	37,740	$	38,495	$	39,265	$	40,050	$ 192,550
Fringe Benefits (Calculate@24%)	$	55,680	$	56,794	$	57,930	$	59,088	$	60,270	$ 289,761
	$	287,680	$	293,434	$	299,303	$	305,290	$	311,394	$ 1,497,100
Learning and Development											
Assessment Instruments (CCTST, CCTDI)	$	9,000	$	9,000	$	9,000	$	9,000	$	9,000	$ 45,000
Faculty Development Workshops (Speakers)	$	10,000	$	10,000	$	10,000	$	10,000	$	10,000	$ 50,000
School Based Interventions (Consultants)	$	15,000	$	15,000	$	15,000	$	15,000	$	12,000	$ 72,000
Faculty Release Time	$	36,000	$	36,000	$	36,000	$	36,000	$	36,000	$ 180,000
Travel (Staff & Participants)	$	10,000	$	10,000	$	10,000	$	10,000	$	10,000	$ 50,000
	$	80,000	$	80,000	$	80,000	$	80,000	$	77,000	$ 397,000
Equipment and Furniture											
Computers, printers, media, software	$	5,000	$	9,000	$	7,500	$	4,000	$	1,500	$ 27,000
Furniture for QEP Center for Learning and Development and for QEP Full Time Staff	$	17,320	$	-	$	-	$	-	$	-	$ 17,320
	$	22,320	$	9,000	$	7,500	$	4,000	$	1,500	$ 44,320
Marketing & Communications (publications, promotion, focus groups)	$	5,000	$	8,500	$	7,500	$	5,000	$	5,000	$ 31,000
Administrative (e.g.,office supplies, photocopying, repair)	$	5,000	$	8,500	$	5,000	$	5,000	$	5,000	$ 28,500
Total - QEP Budget	$	400,000	$	399,434	$	399,303	$	399,290	$	399,894	$ 1,997,920
Office of Provost Budget											
QEP Director	$	95,000	$	96,900	$	98,838	$	100,814	$	102,830	$ 494,382
Fringe Benefits (Calculate @ 24%)	$	22,800	$	23,256	$	23,721	$	24,195	$	24,679	$ 118,652
Total - Office of Provost Budget	$	117,800	$	120,156	$	122,559	$	125,009	$	127,509	$ 613,034
Total - All Funding Sources	$	517,800	$	519,590	$	521,862	$	524,300	$	527,403	$ 2,610,954

IX. Assessment

A. THE OVERVIEW: MOVING FROM GOALS TO ASSESSMENT

This section provides an overview of the process for monitoring, documenting, and evaluating the HOT plan in terms of 1) overall effectiveness of its implementation and 2) its impact on student learning and faculty development. A continuous assessment approach using both quantitative and qualitative methodology is central to the assessment plan, which uses a multi-phase process to ensure the implementation of activities, measurement of intervention results, and subsequent use of the results for revising HOT plan activities to achieve better results.

The QEP Director will have supervisory oversight for implementation of the assessment plan with support from the QEP Assessment Specialist, QEP Advisory Council, and the Office of Strategy and Measurement.

B. ASSESSMENT OF INSTITUTIONAL IMPLEMENTATION OF THE HOT PLAN (PROCESS EVALUATION)

UNTHSC will monitor and evaluate its effectiveness in implementing the HOT plan. This assessment will measure the operational goals, objectives, and outcomes for successful implementation of the plan, as summarized in the table below.

Table 19. Operational Goal, Objectives, Outcomes, and Measures for Assessing Effectiveness of Institutional Implementation of the HOT Plan

Operational Goal: The overall institutional goal for the QEP is the successful implementation of the UNTHSC HOT plan.
Operational Objectives
1. Provide sufficient financial resources to support the HOT plan goals.   2. Provide sufficient staff to support the HOT goals   3. Collect and review the assessment data generated from the HOT plan.
Operational Outcomes
1. Annual allocation for QEP operating budget.   2. Sufficient administrative staff to support the QEP goals.   3. Establish and staff a Quality Enhancement Plan office.   4. Create and staff the Center for Learning and Development.   5. Establish a QEP Advisory Council.   6. Provide regular updates on the QEP activities and assessment results to UNTHSC stakeholders and solicit feedback on ways to improve the QEP.   7. Annual report on the QEP activities to key UNTHSC stakeholders.

Table 19. (cont.)

Operational Measures
1. Number, frequency, and duration of users of QEP CLD related services and staff.   2. Number of professional development seminars, presentations, and workshops provided.   3. Number and type of participants at professional development activities.   4. Number of QEP-related presentations and/or publications produced by UNTHSC personnel.   5. Percentage of student performance and faculty development and implementation of QEP HOT skills over time.

6. Number and frequency of QEP stakeholder meetings.
7.

Evaluation of feedback from all stakeholder groups will be conducted on a continuous basis. At the conclusion of each academic year, results of the year's HOT plan activities will be summarized. Improvement plans will be developed based on evaluation results, and improvements will be implemented starting in Year 2 and at the beginning of each subsequent academic year.
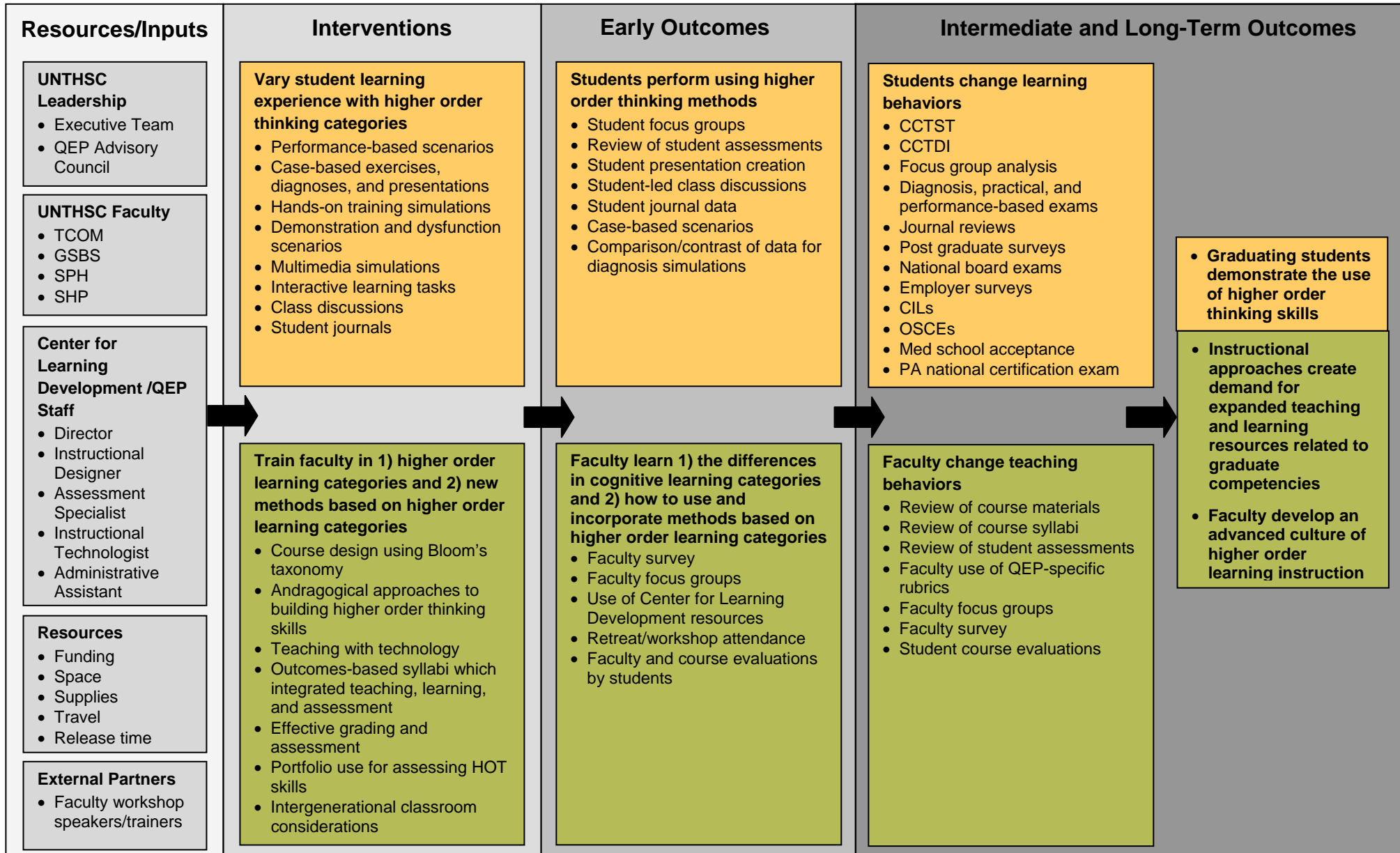
C. ASSESSMENT OF IMPACT OF HOT PLAN ON STUDENT LEARNING AND FACULTY DEVELOPMENT

The overall learning goal of the UNTHSC's HOT plan is to improve student performance in higher order thinking. This goal is supported by two specific goals—one focused on improving and evaluating students' higher order thinking skills (Goal 1) and the other focused on improving and evaluating faculty knowledge and skills in implementing instructional strategies and assessment tools that cultivate students' higher order thinking skills (Goal 2). Each of these goals and associated outcomes will be assessed to determine the impact of the HOT plan on student learning, as summarized in Figure 6. This logic model of the HOT plan evaluation process provides a snapshot of the resources/inputs, interventions, and early, intermediate, and long-term outcomes projected for the HOT plan. It is an extension of the Theory of Change Model for the HOT Plan presented earlier (Figure 2) and contains the various measures that will be used to assess attainment of the HOT plan's objectives.

Figure 6. Logic Model for HOT Plan Intervention Outcomes and Assessment

Goal 1: Improve and evaluate students' higher order thinking skills.

Goal 2: Improve and evaluate faculty knowledge and skills in implementing instructional strategies and assessment tools that cultivate students' higher order thinking skills.

Resources/Inputs

UNTHSC Leadership
- Executive Team
- QEP Advisory Council

UNTHSC Faculty
- TCOM
- GSBS
- SPH
- SHP

Center for Learning Development /QEP Staff
- Director
- Instructional Designer
- Assessment Specialist
- Instructional Technologist
- Administrative Assistant

Resources
- Funding
- Space
- Supplies
- Travel
- Release time

External Partners
- Faculty workshop speakers/trainers

Interventions

Vary student learning experience with higher order thinking categories
- Performance-based scenarios
- Case-based exercises, diagnoses, and presentations
- Hands-on training simulations
- Demonstration and dysfunction scenarios
- Multimedia simulations
- Interactive learning tasks
- Class discussions
- Student journals

Train faculty in 1) higher order learning categories and 2) new methods based on higher order learning categories
- Course design using Bloom's taxonomy
- Andragogical approaches to building higher order thinking skills
- Teaching with technology
- Outcomes-based syllabi which integrated teaching, learning, and assessment
- Effective grading and assessment
- Portfolio use for assessing HOT skills
- Intergenerational classroom considerations

Early Outcomes

Students perform using higher order thinking methods
- Student focus groups
- Review of student assessments
- Student presentation creation
- Student-led class discussions
- Student journal data
- Case-based scenarios
- Comparison/contrast of data for diagnosis simulations

Faculty learn 1) the differences in cognitive learning categories and 2) how to use and incorporate methods based on higher order learning categories
- Faculty survey
- Faculty focus groups
- Use of Center for Learning Development resources
- Retreat/workshop attendance
- Faculty and course evaluations by students

Intermediate and Long-Term Outcomes

Students change learning behaviors
- CCTST
- CCTDI
- Focus group analysis
- Diagnosis, practical, and performance-based exams
- Journal reviews
- Post graduate surveys
- National board exams
- Employer surveys
- CILs
- OSCEs
- Med school acceptance
- PA national certification exam

- **Graduating students demonstrate the use of higher order thinking skills**

- **Instructional approaches create demand for expanded teaching and learning resources related to graduate competencies**

- **Faculty develop an advanced culture of higher order learning instruction**

Faculty change teaching behaviors
- Review of course materials
- Review of course syllabi
- Review of student assessments
- Faculty use of QEP-specific rubrics
- Faculty focus groups
- Faculty survey
- Student course evaluations

Color Key: Gold = Student, Green = Faculty

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Assessment of Goal 1: Improve and evaluate students' higher order thinking skills.

Components of the CCTST and CCTDI will be used to assess changes in higher order thinking among students for each of the school-specific student learning outcomes across all schools. All schools will also use student focus groups and student course evaluations to assess student learning outcomes. Baseline data for the focus groups will be established during the first round of focus group meetings for each school. Baseline data for student course evaluations will be extracted from the existing UNTHSC course evaluation process administered by Academic Information Services. Each school also will use school-specific measures to assess performance related to higher order thinking skills, as follows:

The Texas College of Osteopathic Medicine will use their annual post-graduate survey and national board exam scores (COMLEX I and II, NBMOE II PE). Baseline data exist for all measures.

The Graduate School of Biomedical Sciences will assess students' higher order thinking through the school's annual post-graduate survey and participating students' acceptance into a medical school within one year after graduation. Baseline data exist for all measures.

The School of Public Health's measures of students' higher order thinking will include the American College of Healthcare Executives (ACHE) competency survey, a competency-based comprehensive examination, and a competency-based employer survey. The ACHE competency survey will be administered in the fall and spring semesters to participating students during each academic year. The first competency-based comprehensive examination will be administered to graduating MHA students at the end of the spring 2010 semester and to each succeeding graduating class. The competency-based employer survey will be administered to employers of MHA students one year after the first class has completed the program and to employers for each succeeding class thereafter.

The School of Health Professions will assess students' higher order thinking using student self-assessment as documented in journals maintained by students, performance on an Objective Structured Clinical Examination (OSCE) at the conclusion of Supervised Practice II, and performance on the PA National Certification Examination (PANCE). Baseline data exists for the OSCE and PANCE. A rubric will be developed to assess student journaling and a baseline will be set with the first review of the student journals.

The following table lists the institution-wide student learning outcomes for the HOT plan and corresponding school-level student learning outcomes, measures, and the parties responsible for data collection and analysis related to Goal 1.

Table 20. Student Learning Outcomes, Measures, and Responsible Party by School

INSTITUTION-WIDE HOT PLAN GOAL 1 AND STUDENT LEARNING OUTCOMES

GOAL 1: Improve and evaluate students' higher order thinking skills.

STUDENT LEARNING OUTCOMES:

1. Students will apply knowledge and skills toward critically assessing medical and health problems or issues.

2. Students will critically analyze data and other forms of information that address medical and health problems or issues.

3. Students will critically evaluate data and other forms of information that address medical and health problems or issues.

School-Level Outcomes	Measures	Responsible Parties
Texas College of Osteopathic Medicine		
TCOM Student Learning Outcome1: Year I students will: • Apply their knowledge and skills in assessing somatic dysfunction through diagnosis exams and the use of palpatory skills • Apply osteopathic manipulative medicine knowledge and skills to address and treat somatic dysfunctions Year I and II students will apply knowledge and skills demonstrating competency of osteopathic manipulative skills **TCOM Student Learning Outcome 2:** Year II students will analyze patient information and evaluate the use of specific osteopathic manipulative medicine techniques as they apply to the treatment of disease states **TCOM Student Learning Outcome 3:** Year III and IV students will evaluate pertinent clinical data relating to realistic patient applications through comparative analysis.	CCTST CCTDI Focus group analysis Diagnosis exams OMM performance-based practical exams Problem-focused clinical competency exams Evaluation of two problem-specific CILs Student course evaluations Post graduate survey COMLEX I, COMLEX II, NBOME II PE KBIT performance	QEP Director and staff TCOM Team Director for QEP Academic Information Services

Table 20. (cont.)

INSTITUTION-WIDE HOT PLAN GOAL 1 AND STUDENT LEARNING OUTCOMES

GOAL 1: Improve and evaluate students' higher order thinking skills.

STUDENT LEARNING OUTCOMES:

1. Students will apply knowledge and skills toward critically assessing medical and health problems or issues.

2. Students will critically analyze data and other forms of information that address medical and health problems or issues.

3. Students will critically evaluate data and other forms of information that address medical and health problems or issues.

School-Level Outcomes	Measures	Responsible Parties
Graduate School of Biomedical Sciences		
GSBS Student Learning Outcome 1: Apply knowledge and skills of core principles of physiology during clinical case scenarios and in assessing/researching medical or health problem or issues **GSBS Student Learning Outcome 2:** Analyze and interpret data and clinical cases that address medical or health problems or issues **GSBS Student Learning Outcome 3:** Evaluate data and apply basic knowledge of physiology in developing clinical cases that address medical and health problems or issues	CCTST CCTDI Focus group analysis Clinical case scenario creation and presentations Rubric-based written exams Performance-based interviews and evaluations Student portfolios Student course evaluations Acceptance in Medical school within one year of graduation	QEP Director and staff GSBS Team Director for QEP Academic Information Services
School of Public Health		
SPH Student Learning Outcome 1: Apply the knowledge and skills of NCHL competency based model in assessing medical and health problems or issues **SPH Student Learning Outcome 2:** Analyze data and other forms of information that address medical and health problems or issues **SPH Student Learning Outcome 3:** Evaluate and formulate alternative solutions for addressing medical and health problems or issues	CCTST CCTDI Focus group analysis Student course evaluations ACHE Competency Survey Competency-based comprehensive exams Employer survey	QEP Director and staff SPH Team Director for QEP Academic Information Services

Table 20. (cont.)

INSTITUTION-WIDE HOT PLAN GOAL 1 AND STUDENT LEARNING OUTCOMES

GOAL 1: Improve and evaluate students' higher order thinking skills.

STUDENT LEARNING OUTCOMES:

1. Students will apply knowledge and skills toward critically assessing medical and health problems or issues.

2. Students will critically analyze data and other forms of information that address medical and health problems or issues.

3. Students will critically evaluate data and other forms of information that address medical and health problems or issues.

School-Level Outcomes	Measures	Responsible Parties
School of Health Professions		
SHP Student Learning Outcome 1: Apply current knowledge and skills toward critically assessing medical and health problems or issues through reviews and discussions of observational experiences completed in Supervised Practice I and II courses **SHP Student Learning Outcome 2:** Critically analyze data and other forms of information that address medical and health problems or issues, particularly as they pertain to the role of the physician assistant in general clinical practice **SHP Student Learning Outcome 3:** Evaluate alternatives for effectively addressing patients medical and health problems or issues by capitalizing on the validity and sensitivity of information obtained and assessing its relationship to a differential diagnosis and appropriate treatment plan	CCTST CCTDI Focus group analysis Student journal review Student course evaluations OSCE PA national certification exam	QEP Director and staff SHP Team Director for QEP Academic Information Services

NOTE: Results will be collected and summarized at the end of the semester and academic year.

Improvements will be implemented at the beginning of each academic year starting with Year 2.

Instructional/assessment activities will be continuously monitored and modified as necessary to improve student learning.

ACHE = American College of Healthcare Executives

CCTDI = California Critical Thinking Disposition Inventory

CCTST = California Critical Thinking Skills Test

COMLEX = Comprehensive Osteopathic Medical Licensing Examination

KBIT = Knowledge Based Inference Tool

NBOME = National Board of Osteopathic Medical Examiners

OSCE = Observed Student Clinical Skills Evaluation

Assessment of Goal 2: Improve and evaluate faculty knowledge and skills in implementing instructional strategies and assessment tools that cultivate students' higher order thinking skills.

Faculty outcomes will be assessed through the review of course syllabi, materials, and assessments; observation of faculty teaching; the faculty survey; and faculty focus groups. Table 21 lists the faculty outcomes for Goal 2 along with the assessment dimension, data collection method, and responsible party.

Table 21. Faculty Outcomes, Assessment Dimension, Data Collection Method, Assessment Tool(s), and Responsible Parties

Assessment Dimension	Data Collection Method	Assessment Tool(s)	Responsible Parties
Goal 2: Improve and evaluate faculty knowledge and skills in implementing instructional strategies and assessment tools that cultivate students' higher order thinking skills.			
Faculty Outcome 1: Faculty will design and use curriculum and curricular materials employing instructional strategies that improve students' higher order thinking skills.			
Use of higher order instructional/curricular methods	Review of Course Syllabi Review of Course Materials Faculty Observation of Teaching	Collaborative rubrics Demonstration checklists	QEP Director and staff QEP School Team Directors
Knowledge of higher order instructional/curricular methods	Review of Course Materials Faculty Survey	Collaborative rubrics Survey scale scores	
Knowledge of Bloom's higher order learning categories	Faculty Survey Faculty Focus Groups	Survey scale scores Rating scales	
Faculty attitudes of higher order instructional & curricular methods	Faculty Survey Faculty focus groups	Survey scale scores Rating scales	
Faculty Outcome 2: Faculty will design and use assessment tools that measure students' higher order thinking skills and learning.			
Development and use of assessment tools	Review of Assessments Review of Course Syllabi Review of Course Materials	Collaborative rubrics	QEP Director and staff QEP School Team Directors
Knowledge and use of Bloom's higher order learning categories for assessment	Faculty Survey Review of Course Syllabi Review of Course Materials	Survey scale scores Collaborative rubrics	
Faculty attitudes of higher order assessment methods	Faculty Focus Groups Faculty Survey	Rating scales Survey scale scores	

NOTE: Results will be collected and summarized at the end of each semester and academic year. Improvements will be implemented at the start of each academic year beginning in Year 2. Faculty development activities will be continuously monitored and modified as needed to improve student learning.

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UNT HEALTH SCIENCE CENTER

Mission	Vision	Values
To improve the health and quality of life for the people of Texas and beyond through excellence in education, research, clinical care, and community engagement and to provide national leadership in primary care	To become a top 10 health science center	Compassion　　Excellence　　Innovation Integrity　　Pride　　Teamwork

Goals What do we expect to achieve?	Goals What do we expect to achieve?	Goals What do we expect to achieve?	Goals What do we expect to achieve?	Goals What do we expect to achieve?
Administration Optimally support and facilitate the creation of a top 10 health science center devoted to developing knowledge and creating professionals to maximize health and quality of life	**Academic Affairs** Create knowledge, scientists and health care professionals devoted to meeting the critical health needs of the state of Texas and the nation	**Research** To become the leading health science center devoted to collaborative and translational research focused on critical health needs of Texas and the nation	**Clinical Affairs** To become the preeminent multispecialty medical practice in Tarrant County and the health care partner of choice in our communities	**Community Engagement** To create and maintain a partnership based environment in the internal, external and professional communities
Tactical Initiatives – Processes to accomplish long-term goals	**Tactical Initiatives – Processes to accomplish long-term goals**	**Tactical Initiatives – Processes to accomplish long-term goals**	**Tactical Initiatives – Processes to accomplish long-term goals**	**Tactical Initiatives – Processes to accomplish long-term goals**
1. Improve institutional performance through ongoing process improvement and quality enhancement activities 2. Increase funding and revenue from a variety of sources 3. Optimize institution's IT infrastructure and customer support 4. Improve staff recruitment, retention and performance through staff development and evaluation, and compensation 5. Enhance strategic use of financial reporting and alignment to assure alignment of budget to strategy 6. Align use of educational and research facilities with institutional strategies	1. Expand enrollment in current educational offerings and increase student services and number and quality of faculty to support growth 2. Expand programs in PT, Public Health and ROME and consider developing a new LCME accredited school 3. Enhance faculty development activities in education and research 4. Develop capacity for interdisciplinary research by hiring funded researchers 5. Implement academic assessment program to include institutes and centers 6. Implement the QEP to improve student learning outcomes 7. Fully implement comprehensive faculty compensation program 8. Enhance student access to educational resources and technology	1. Support faculty retention and development efforts 2. Support process for strategic hires 3. Strengthen commercialization partnerships 4. Expand networks with academic partners, providers, and industry 5. Optimize and evaluate investment for interdisciplinary research 6. Provide seed funding for Health Institutes of Texas research priority areas with a strong probability of future extramural funding 7. Develop IT resources for investigator's research data storage, security, and backup	1. Continuous improvement in quality of care and care delivery processes, while enhancing patient access 2. Implement a service excellence program to enhance patient satisfaction which includes provider and staff training 3. Fully implement the physician compensation program 4. Develop and implement clinical faculty recruitment plan 5. Collaborate with community partners to ensure UNT Health market presence in areas of population growth to maximize utilization and insure financial viability 6. Fully implement Electronic Medical Record at all appropriate UNT Health clinic sites	1. Redefine the HSC brand to optimize positive awareness internally and externally 2. Employ technology to its fullest to expand effective internal and external communications 3. Develop bilateral civic connections through the establishment and maintenance of civic councils and other volunteer-driven efforts 4. Build a broader base of unrestricted revenue 5. Increase the role of Alumni, Foundation Board, and other constituencies 6. Expand fund raising capabilities through the development of programs using seed funds
Institutional **Performance Measures**	**Institutional** **Performance Measures**	**Institutional** **Performance Measures**	**Institutional** **Performance Measures**	**Institutional** **Performance Measures**
1. Administration cost as a percentage of total expenditures 2. Institutional Reserves (days) 3. Faculty and staff pride survey (even years) 　• Culture of Quality 　• Job Satisfaction 　• Empowerment 4. Team orientation rating from Denison Survey (odd years)	1. Number of enrolled students 　• Headcount 　• FTEs 2. Student Satisfaction 　• Accomplish goals 　• Quality of teaching 3. Implementation of QEP in target courses 4. Student Diversity	1. Total extramural research funding 2. Dollar value of grant applications submitted 3. Total number of unduplicated peer-review publications – published/in press	1. Overall visit score 　• Excellent 　• Excellent or Very Good 2. Time to next third new appointment (primary/specialty) 3. UNT Health administrative costs 4. Total net clinical revenues 5. Total clinical revenues 6. UNT Health Reserves (days) 7. Percent of eligible patients placed on clinical pathways	1. Alumni donors (number, percent of population) 2. Employee donors (number, percent of population) 3. Total amount of gifts 4. Pledges for new program

Appendix I (cont.) UNTHSC Five Year Strategic Plan

UNT HEALTH SCIENCE CENTER — FIVE YEAR STRATEGIC PLAN FOR UNTHSC: 2009 - 2014

Mission
To improve the health and quality of life for the people of Texas and beyond through excellence in education, research, clinical care, and community engagement and to provide national leadership in primary care

Vision
To become a top 10 health science center

Values
Compassion Excellence Innovation
Integrity Pride Teamwork

Academic Affairs
Enhance Quality and Grow Academic Programs:
- Expand enrollment in current educational offerings and increase number of faculty to match growth
- Develop new programs in PT, Health Administration, and PhD in Public Health
- Initiate discussions on establishing a program in Veterinary Medicine
- Develop certificate education programming to meet demands of the health science workforce
- Enhance quality of curriculum

Enhance Academic Support and Academic Technology:
- Provide customized evaluations and assessments
- Expand electronic access to information and enhanced library services
- Develop a comprehensive student support and academic enhancement program
- Provide up-to-date delivery of education materials, e.g. streaming video, video-conferencing, distance education
- Provide best continuing educational opportunities

Enhance and Expand Faculty Development and Retention Activities:
- Provide faculty development activities in education and research
- Review incentives and compensation

Maximize Use of Educational and Research Facilities:
- Align use of educational and research facilities with institutional strategies

Research
Invest in Faculty:
- Expand faculty retention and development efforts
- Focus on strategic hires
- Improve and expand the flexibility of start-up packages for new hires
- Expand support services and instrumentation available to faculty

Enhance Facilities and Infrastructure:
- Finish CBH and construct Building H for housing the HIT
- Expand support of Clinical Research Center and Clinical Trials operations

Expand Technology Commercialization & Industrial Partnerships:
- Create a Technology Validation Fund
- Strengthen our commercialization partnership with TECH Fort Worth
- Expand support for Technology Transfer & Commercialization operations
- Consider in promotion and tenure decisions intellectual property development

Increase Community and University Partnerships
- Expand networks with academic partners, providers, and industry

Clinical Affairs
Put People First:
- Continuous improvement in patient satisfaction and quality of care
- Increase staff development and performance based compensation
- Develop clinical faculty recruitment plan with TCOM

Expand and Consolidate Clinical Operations:
- Ensure UNT Health market presence in areas of population growth in Tarrant and contiguous counties to maximize utilization and ensure financial viability
- Ensure clinics have basic primary care services (also available outside normal business hours) and selected specialty services
- Add ambulatory surgical and urgent care services

Develop Capacity for Interdisciplinary Academic, Research, and Clinical Centers of Excellence in:
- Aging and Alzheimer's
- Cancer
- Physical Medicine & Rehabilitation
- Primary Care

Administration
Create a Culture of Excellence, Performance Improvement and Accountability:
- Develop administrative support training program and enhance customer service training
- Upgrade EIS functionality
- Improve institutional performance through ongoing process improvement and quality enhancement activities

Ensure Best Utilization of Current and Future Facilities and Space:
- Provide customer focused services and aesthetically pleasing, well-maintained facilities
- Support Master Plan

Diversify Funding Sources:
- Increase funding and revenue from a variety of sources, including executive training programs

Enhance Technology to Support all Mission-Centric Areas
- Expand Institution's IT Infrastructure and customer support

Promote Diversity Among Faculty, Staff and Students
- Provide a supportive campus climate for people of diverse backgrounds

Enhance the Institution's Human Capital Management:
- Enhance staff performance through improved evaluation and feedback
- Increase staff development and improve staff recruitment and retention
- Support a "pay for performance" culture

Community Engagement
Create Optimal Positive Awareness of UNTHSC:
- Refine and build the HSC brand internally and externally
- Leverage our UNT ties to enhance our mission centric areas
- Employ technology to its fullest for effective internal and external communications

Create an Environment That Provides the Recognition of the UNTHSC as a World-Class Institution Worthy of Support:
- Marry HSC values with civic values to create community pride
- Develop HSC's role as expert health educator to the community

Rapidly Increase Philanthropic Revenue for our Institutional Priorities:
- Build a broader base of unrestricted revenue and revenues directed to long-term marketable areas
- Engage philanthropic leaders by inviting and welcoming their input on our mission, strategies and tactical directions
- Increase the role of Alumni, Foundation Board, and other natural constituencies

01/06/09

Appendix II. Suggested QEP Themes – Abridged

1.   More space in the classrooms, i.e., space between chairs, rows, and ergonomic chairs

2.   Use retired faculty members for on-campus academic and as off campus ambassadors

3.   Create and develop a faculty development program that results in improved faculty teaching and enhanced student learning

4.   Faculty Development Opportunities to enhance presentation skills and technology skills

5.   Integrate staff and professional development into educational programs

6.   Strengthening the recruitment of a diverse and highly qualified student body

7.   Strengthening the retention of a diverse and highly qualified student body

8.   Mental health counseling incorporated into an academic support program (address the link between depression and academic performance)

9.   Enhancing student satisfaction with their educational experiences

10. Coupling a counseling program with our Academic Assistance program would be extremely beneficial for providing tools for coping with the stressors that come with balancing family and academics

11. A first year experience program could help to assimilate new students into the culture of the institution by providing mentorship opportunities as well as programs focusing on professionalism and establishing cohort groups. This could be especially helpful for our international population

12. First year experience program for Graduate and Professional Students (mentor program, living and learning community networks, and cohort group programming)

13. Develop leadership skills among students

14. Integrating evidence based practice across the educational continuum

15. Increase biomedical research competencies in the curriculum

16. Increase inclusion of research and bioinformatics into the curriculums

17. Incorporate the osteopathic philosophy into all areas of the curriculum

18. Utilize simulation labs for ongoing instruction during medical student & PA training

19. Increase use of the SimLab and other simulation technologies

20. Increase hands-on learning with cadavers

21. Improving student proficiency in invasive procedures

22. Create education channel for grand rounds and other professional education

23. Expansion of the Knowledge Based Inferencing Tools (KBIT)

Appendix II (cont.)

24.   Intellectual development through technology: Class to clinical applications

25.   Advancing higher education through hi tech means

26.   Building brilliant health professionals through technology literacy

27.   Technology use in building cutting-edge health professionals

28.   Creating ingenious intellectuals through innovation

29.   Distant Learners: Refining distance education access and curriculum

30.   Remote learning: Fostering learning via distance education

31.   Health care professionals advancing through Information currency

32.   Information literacy skills

33.   Building lifelong learners for the 21st Century

34.   Liberating learning for a lifetime

35.   Connected learning

36.   Link educational activities to professional opportunities

Appendix III. Ranking of QEP Themes by Constituent Group

Ranking by Theme
Faculty

Ranking by Theme
Staff
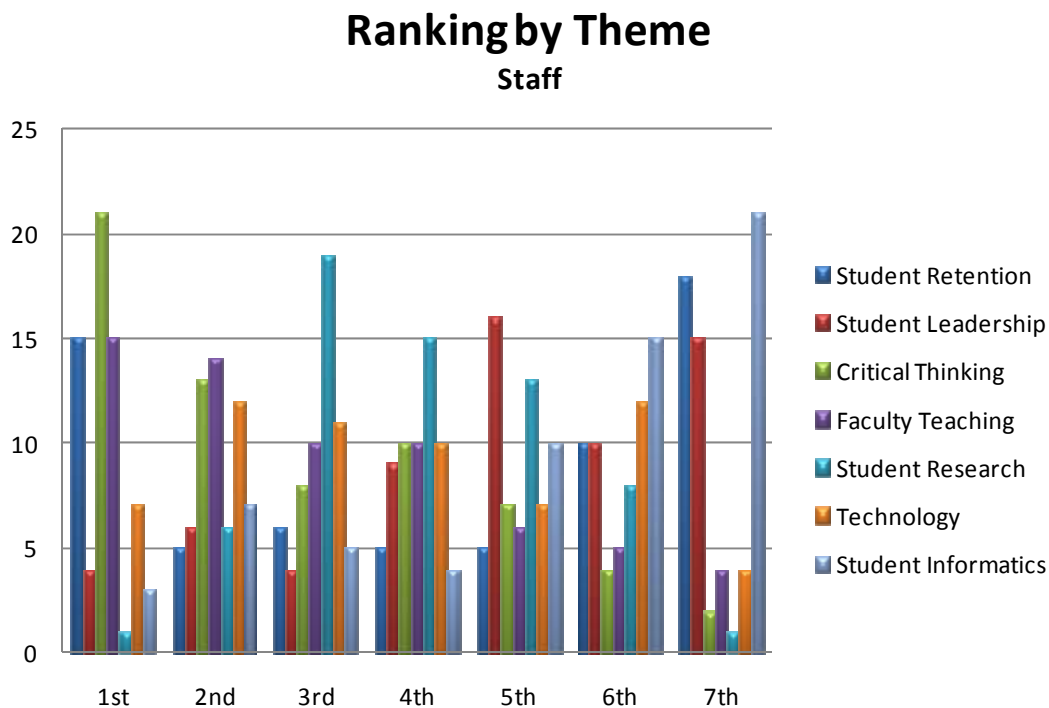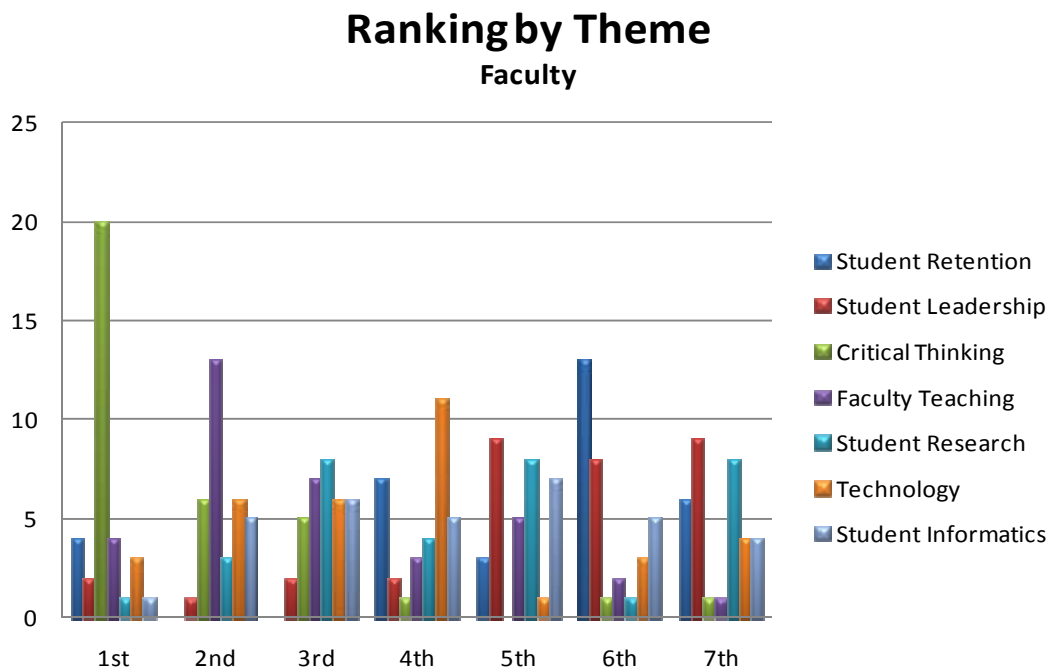
Appendix III (cont.)

Ranking by Theme
Students
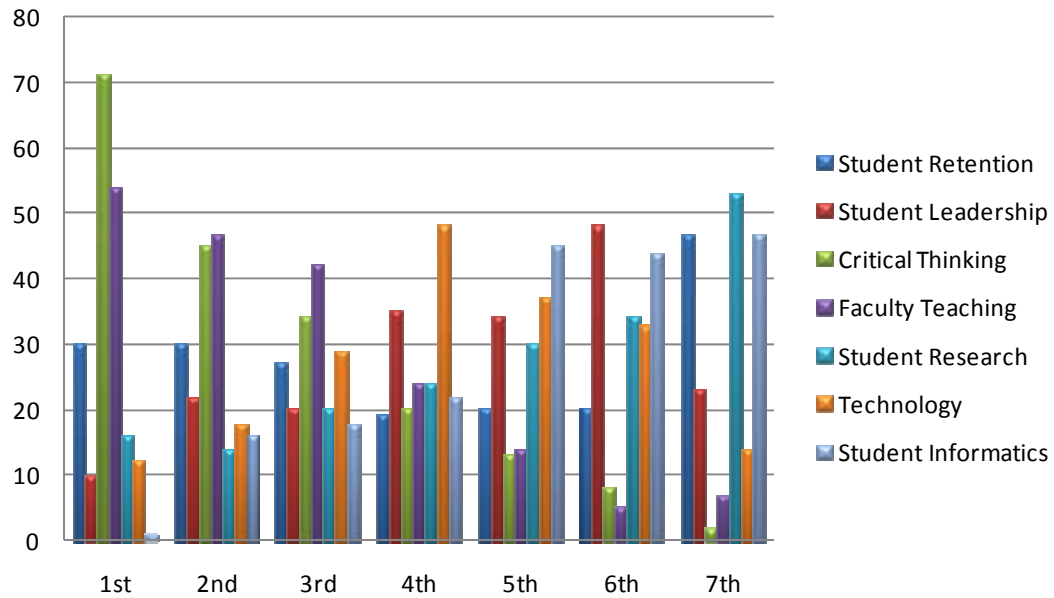
Appendix IV. UNTHSC Quality Enhancement Plan Request for Applications

Deadline for Pre-Proposals May 30, 2008

Background

In support of SACS Reaffirmation for Accreditation, UNTHSC must develop a Quality Enhancement Plan that meets the following criteria:

- Evidence of a broad-based institutional process for selection of QEP topic
- Focus on learning outcomes and/or environment supporting student learning
- Demonstrate Institutional capability to achieve QEP goals
- Broad-based involvement in development & implementation of QEP
- Identifiable goals and assessment plan
- Potential to impact all academic programs

More in-depth information about the QEP Program may be found on pp. 21-28 of the SACS Handbook for Reaffirmation of Accreditation that can be accessed at http://www.sacscoc.org/pdf/handbooks/Exhibit%2027.ReaffirmationOfAccreditation.pdf or in the QEP Handbook located at http://www.sacscoc.org/pdf/081705/QEP%20Handbook.pdf.

Objective

UNTHSC will provide funds for one or more projects designed to improve learning outcomes and/or the environment-supporting student learning. The QEP must be a five-year plan (September 1, 2009 to August 31, 2014) for increasing the effectiveness of some aspect of UNTHSC's educational program relating to student learning. Projects **must** be aligned with one or more elements of the UNTHSC Strategic Plan http://intranet.hsc.unt.edu/StrategyMap/ and be linked to one or both of the QEP themes: improving student learning through enhanced critical thinking and/or through enhanced faculty teaching. A **requirement** of the program is that **multiple UNTHSC faculty, staff, and/or students must be involved** and discussion of the merits of the project must have been presented and discussed in several venues such as department meetings, committees and faculty meetings. Multidisciplinary proposals that involve several co-investigators and cut across academic programs are strongly encouraged. Measurable learning outcomes must be identified with an appropriate assessment plan developed to quantify student learning.

Funding and Budget Justification

Budgets must be reasonable and justified appropriately to align with the proposal. Funds will be awarded for a maximum of five years, with formal program funding commencing September 1, 2009. QEP budget requests should contain enough detail so that an adequate assessment can be conducted by the review team. Faculty release time may be included as part of the budget. If the project budget includes funds for purchasing equipment, the applicant must document that such equipment is not available or accessible at UNTHSC. Funds may be awarded to one or more proposals based on the decisions of the review team.

Who may apply

Any team of UNTHSC faculty, staff, and/or students is eligible to submit a proposal. Principal Investigators must be UNTHSC faculty or staff.

Appendix IV (cont.)

<u>**QEP Themes**</u>
The proposal must be related to one or both of the following themes:
1. **Improving student learning through enhanced critical thinking**

    Critical thinking is 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. In its exemplary form, it is based on universal intellectual values
    that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance,
    sound evidence, good reasons, depth, breadth, and fairness.

    It entails the examination of those structures or elements of thought implicit in all reasoning:
    purpose, problem, or question-at-issue; assumptions; concepts; empirical grounding;
    reasoning leading to conclusions; implications and consequences; objections from
    alternative viewpoints; and frame of reference. Critical thinking — in being responsive to
    variable subject matter, issues, and purposes — is incorporated in a family of interwoven
    modes of thinking, among them: scientific thinking, mathematical thinking, historical thinking,
    anthropological thinking, economic thinking, moral thinking, and philosophical thinking.

    Critical thinking can be seen as having two components: 1) a set of information and belief
    generating and processing skills, and 2) the habit, based on intellectual commitment, of
    using those skills to guide behavior. It is thus to be contrasted with: 1) the mere acquisition
    and retention of information alone, because it involves a particular way in which information
    is sought and treated; 2) the mere possession of a set of skills, because it involves the
    continual use of them; and 3) the mere use of those skills ("as an exercise") without
    acceptance of their results.
    http://www.criticalthinking.org/aboutCT/define_critical_thinking.cfm

2. **Improving student learning through enhanced faculty teaching**

    Promote and enhance learning within the university community by:
    *   Developing and advancing a broad range of services and programs to meet the needs of
        diverse learners and scholars
    *   Providing resources and programs to assist faculty, graduate students, and others who
        teach with their professional development as educators
    *   Enabling participants to implement approaches to teaching and learning through
        innovative experiences and opportunities
    *   Promoting teaching practice that is grounded in scholarship
    *   Linking technology with education and training to enhance learning outcomes
    *   Evaluating programs and curricula, and providing recommendations for improvement
        and reform

Appendix IV (cont.)

Pre-Proposal and Proposal Submission Process

1. Applicants must complete a pre-proposal synopsis using the template starting on page 4. Pre-proposals may be single-spaced and use at least 11-point font. Pre-proposals should be sent via e-mail to QEP@hsc.unt.edu by May 30, 2008. The pre-proposal's background, methods, and evaluation will serve as the agenda for the initial review by the QEP Team.

2. The QEP Planning Committee will review pre-proposals using the criteria specified on page 9 and will invite selected teams to complete full proposals. Full proposals will be due December 1, 2008.

3. Completed proposals will be critiqued by the QEP Team. One or more projects will be selected by the QEP Planning Committee and recommended to the Executive Team for funding by January 10, 2009.

4. After being selected, the QEP Principal Investigator(s) and co-investigators will be expected to work with other faculty and staff to develop the QEP for submission to SACS, due six weeks prior to the SACS onsite visit in 2010. Funds to support the development of the Quality Enhancement Plan will be provided as available in FY 2009.

5. The QEP Principal Investigator(s) will be expected to submit written reports, including a summary of expenditures, at 6 month intervals during fiscal years 2010-2014 and a final report at the end of the five year project period that coincides with the SACS five-year interim report.

Key Dates:

Pre-proposals due	May 30, 2008
Pre-proposal selections announced	June 30, 2008
Full proposals due	December 1, 2008
Full proposals announced	January 10, 2009
Quality Enhancement Plan Development	January 2009 - 2010
Proposal Implementation (pre-implementation may precede submission of QEP to SACS)	September 1, 2009–August 31, 2014
Final QEP Report Due	October 2014

Appendix IV (cont.)

Project Title:

Position	Name	Title	E-mail	Phone
Principal Investigator				
Co-Investigator				
Co-Investigator				
Co-Investigator				
Co-Investigator				
Co-Investigator				

Budget:

Category	Role in the Project	2010	2011	2012		
1. Personnel		$	$	$	$	$
2. Equipment		$	$	$	$	$
3. Hourly Services		$	$	$	$	$
4. Consumable Supplies		$	$	$	$	$
5. Other Expenses		$	$	$	$	$
6. Total		$	$	$	$	$

Appendix IV (cont.)

Justification: Budget requests to support salary and travel related to a QEP project must be carefully justified. If the project budget includes funds for purchasing equipment, document that such equipment is not available or accessible at UNTHSC.

UNTHSC Quality Enhancement Plan Pre-Proposal

1. Background: What is the educational problem and documented need that is addressed by this project: Keep in mind the project must be aligned with one or more elements of the UNTHSC Strategic Plan and linked to one or more of the QEP themes. (Limit response to one page or less)

2. Methods: What do you propose to do? Briefly describe what you will develop, how and when you will implement it, and the expected product or outcome. (Limit response to one page or less)

3. Evaluation: What will be the impact of this project: What type(s) and numbers of students will directly benefit? How will you evaluate project effectiveness? (Limit response to one page or less)

4. Broad-based Involvement: which other individual faculty and staff and groups do you plan to involve in the (a) creation, (b) implementation and, (c) evaluation of the project? (Limit response to one page or less)

Appendix V. QEP Pre-Proposal Submissions

QEP Title	Authors	Reviewers
Inter-Professional Health Professions Education: Course Sharing Between Physician Assistant Studies and Physical Therapy	Warren Anderson Hank Lemke	Bruce Dubin Melissa Oden Matt Havlik
The Synergy in Multidisciplinary Practice, Learning and Education (SIMPLE) Project	des Anges Cruser Claudia Coggin Patricia Gwirtz Roy Martin Vicki Nejtek Alan Podawiltz Nancy Tierney Katy Kemp Angie Treviño	Warren Anderson Amy Raines Hank Lemke
The Academic Retention and Matriculation Initiative (ARMI)	Harlan P Jones Jerry Alexander Chiana Diggs Lynley Dungan Stephen Mathew Katy Kemp	Thomas Fairchild Karan Singh Dinesh Jasti
Improving Retention and Graduation Rates Through the Establishment of a Writing Center	Katy Kemp Daniel Burgard Chiana Diggs Trisha Van Duser	Patricia Gwirtz Craig Elam Doug Mains
Technology-Based Instructional Skills for Health Science Education	Robert Wright Dan Burgard Michele Grauerholz Suzanne Gravois Robert Roysden	Matt Havlik Thomas Yorio Melissa Oden
TEACH-HSC: Technological and Other Educational Advances for Coursework in Health: Development of Competency-based Instruction with an Emphasis on Critical Thinking	Richard Kurz Bruce Dubin Patricia Gwirtz Hank Lemke Warren Anderson Robert Woelfel Robert Wright Jerry Alexander	Doug Mains Dinesh Jasti Thomas Fairchild
Promoting Academic Success and Life Skills Through Critical Thinking: Implementing a First-Year Experience Program at a Graduate Professional Institution	R. Michael Haynes Misty Smethers Andrew Axsom Amber Dean Chiana Diggs Katy Kemp Nancy Vanboskirk Trisha Van Duser	Hank Lemke Warren Anderson Craig Elam
PTA (Peer Teaching of Anatomy)	Robert E. Routh Rustin E. Reeves	Karan Singh Bruce Dubin Thomas Moorman
Enhancing Faculty Teaching Skills Through the Creation and Operation of a Team-Based Digital Learning and Development Center	Daniel Burgard Robert Wright Elizabeth Grama	Thomas Yorio Patricia Gwirtz Amy Raines

Appendix VI. UNTHSC Quality Enhancement Plan Pre-Proposal Review Criteria

(Please enter comments electronically)

Proposal Title:
Reviewer Name:

	Marginal	Good	Outstanding
1. Description and justification of the problem, need or deficiency Why should this project be implemented? What problem, need or deficiency will be addressed by this project? And why is it important to address this problem?	☐	☐	☐
Comments:			
2. Uniqueness of the project What will be developed or implemented and, <u>importantly</u>, why is this approach innovative and likely to enhance students' learning or the quality of their educational experience?	☐	☐	☐
Comments:			
3. Potential for impact What objective(s) will be achieved by implementing this project? How many students will be affected?	☐	☐	☐
Comments:			
4. Thoroughness of the work plan What tasks will be performed, how it will be done, and who will do the work?	☐	☐	☐
Comments:			
5. Appropriateness of evaluation plan Are objectives clearly stated with corresponding measures and targets? How will success be measured?	☐	☐	☐
Comments:			

Appendix VI (cont.)

6. Capacity of team Do team members represent multiple disciplines? Do team members span across multiple programs?	☐	☐	☐
Comments:			
7. Overall Rating Should this pre-proposal be considered for a full proposal?	☐	☐	☐
Comments:			

QEP pre-proposals selected for full proposals

As part of the 2010 SACS (Southern Association of Colleges and Schools) institutional reaffirmation process, the UNT Health Science Center must submit a five-year Quality Enhancement Plan (QEP) to improve student learning. Nine QEP pre-proposals, submitted by UNTHSC faculty and staff, were reviewed by the QEP Team of faculty, staff and students on June 24, 2008. The QEP Team selected five pre-proposals to be developed into three full proposals (three pre-proposals were recommended to join forces and submit one joint proposal). The QEP Planning Committee would like to thank all nine teams that submitted pre-proposals.

Full proposals are due on September 1, 2008 and one will be selected to be the basis for the UNTHSC Quality Enhancement Plan. To learn more about the SACS reaffirmation process, or about SACS Quality Enhancement Plans, visit the Office of Strategy and Measurement's Web Site or contact Doug Mains at ext. 0473.

Appendix VII. Faculty and Staff Selected to Submit Full Proposals

QEP Pre-Proposal Title	Investigators
The Synergy in Multidisciplinary Practice, Learning and Education (SIMPLE) Project	des Anges Cruser, Claudia Coggin, Patricia Gwirtz, Roy Martin, Vicki Nejtek, Alan Podawiltz, Nancy Tierney, Katy Kemp, Angie Treviño
The Academic Retention and Matriculation Initiative (ARMI)	Harlan P Jones, Jerry Alexander, Chiana Diggs, Lynley Dungan, Stephen Mathew, Katy Kemp
The following three pre-proposals were invited to combine forces to submit one full proposal:	
TEACH-HSC: Technological and Other Educational Advances for Coursework in Health: Development of Competency-based Instruction with an Emphasis on Critical Thinking	Richard Kurz, Bruce Dubin, Patricia Gwirtz, Hank Lemke, Warren Anderson, Robert Woelfel, Robert Wright, Jerry Alexander
Technology-Based Instructional Skills for Health Science Education	Robert Wright, Dan Burgard, Michele Grauerholz, Suzanne Gravois, Robert Roysden
Enhancing Faculty Teaching Skills Through the Creation and Operation of a Team-Based Digital Learning and Development Center	Daniel Burgard, Robert Wright, Elizabeth Grama

**Appendix VIII. University of North Texas Health Science Center
Quality Enhancement Plan Full Proposal Preparation Guidelines**

1. Quality Enhancement Plan (QEP): Definition and Development at UNTHSC
The University of North Texas Health Science Center has been accredited by the
Commission on Colleges of the Southern Association of Colleges and Schools,
commonly referred to as "SACS," since 1994. In order to have its accreditation
continued without interruption, UNTHSC must by 2010 demonstrate compliance with
various SACS "core requirements," one of which mandates the development of an
"acceptable Quality Enhancement Plan."

In support of SACS Reaffirmation for Accreditation, UNTHSC must develop a Quality
Enhancement Plan that meets the following criteria:

- Evidence of a broad-based institutional process for selection of QEP topic
- Focus on learning outcomes and/or environment supporting student learning
- Demonstrate Institutional capability to achieve QEP goals
- Broad-based involvement in development & implementation of QEP
- Identifiable goals and assessment plan
- Potential to impact all academic programs

More in-depth information about the QEP Program may be found on pp. 21-28 of the
SACS Handbook for Reaffirmation of Accreditation that can be accessed at
http://www.sacscoc.org/pdf/handbooks/Exhibit%2027.ReaffirmationOfAccreditation.pdf or in
the QEP Handbook located at http://www.sacscoc.org/pdf/081705/QEP%20Handbook.pdf.

To meet the challenge of developing a QEP as part of the SACS reaffirmation process,
UNTHSC has assembled the QEP Planning Team. This group of fourteen individuals,
including faculty, administrators, students, and alumni, is charged with helping to identify
the topic and recommend proposals for final QEP development.

In early 2008, the QEP Planning Team conducted an institution-wide survey, asking
respondents to identify QEP themes that would enhance student learning outcomes. A
list of 36 themes was compiled from which the QEP Team developed seven macro
themes. Students, staff, and faculty were then invited to rank the seven themes and
Critical Thinking and Faculty Teaching were ranked the highest. The QEP Team issued
an RFA for pre-proposals and received nine pre-proposal submissions by the May 30,
2008 due date.

The QEP Planning Team has now examined all nine pre-proposals submitted; and—in
light of the SACS-mandated criteria for QEPs—has identified the five most promising of
these.

Authors of these five pre-proposals are now invited   produce three full proposals. (Three
pre-proposals were recommended to combine forces to develop one full proposal.)

Appendix VIII (cont.)

This document presents guidelines for the preparation of full QEP proposals. It specifies the scope and structure for full proposals, describes the submission process, and details the criteria to be employed in their evaluation.

2. Proposal Scope and Structure

Cover Page
- Proposal Title
- Identifying Information: name, department for lead applicant
- Contact Information: telephone and e-mail address for lead applicant
- Identifying Information: name, department for all co-applicants
  Contact Information: telephone and e-mail address for lead all co-applicants

Section 1: Goals and Objectives
- Specific, well-defined goals and objectives, including student learning outcomes, related to the long-term improvement of student learning
- Clear and concise description of the critical issue(s) to be addressed
- Relationship between the focus of the plan and student learning

Section 2: Literature Review and Best Practices
- Evidence of consideration of best practices related to the proposal
- Comprehensive and clear analysis of the importance of the proposal for improving the learning environment
- Identification of the benefits to be derived from the proposal

Section 3: Methods
- Actions to be implemented
  Evidence of careful analysis of institutional context in designing actions capable of generating the desired student learning outcomes

Section 4: Timeline
- A logical calendaring of all actions to be implemented as part of the proposal

Section 5: Organizational Structure
- Clear lines of responsibility for implementation and sustainability
- Broad-based participation of multiple institutional constituencies
- Identification of qualified individuals to administer and oversee implementation of the proposal

Section 6: Resources & Budget Request
- Realistic allocation of sufficient human, financial, and physical resources to support the proposed activities
- Five-year budget, FY 2010 to 2014, using budget form on page 4

Appendix VIII (cont.)

Section 7:   Assessment
- Comprehensive evaluation plan for assessing success of the proposal, both process and outcome indicators
- Identification of relevant internal and external measures to evaluate the proposal, including baseline measures
- Identification of a system for evaluating the proposal and monitoring its progress
- Description of how the results of the evaluation will be used to improve student learning

3. Submission Process Each proposal is limited to 15 pages, including the cover page and an appendix (if necessary) of no more than 10 pages. Left and right margins are to be 1 inch. The document must be single-spaced, employing a 12-point font. Please submit each proposal, including appendix, if any, as a single, electronic document. The preferred form of submission is a PDF or Word attachment to an e-mail addressed to QEP@hsc.unt.edu. The deadline for submission of full proposals is 5:00 pm, Monday, September 1, 2008. The QEP Team will be accepting proposals until 5:00 pm, October 1, 2008.

4. Proposal Evaluation The QEP Planning Team will assess full proposals in light of the above guidelines, determining the degree to which each proposal is successful in meeting all the challenges specified for each section. Reviewers will employ a five-level scale ("Strongly Agree," "Mostly Agree," "Neutral," "Somewhat Disagree," and "Strongly Disagree") to indicate the degree to which each challenge is convincingly met. These evaluations and rankings will be an important component in the careful and thorough consideration of all full proposals, after which the QEP Planning Team will select the top proposal(s) to send to the UNTHSC Executive Team, who will make the final selection from among the top proposals. The Executive Team will decide to designate one or more proposals to be developed into the UNTHSC Quality Enhancement Plan. An announcement of the decision will be made on or before November 1, 2008. Once a selection is made, a QEP Development Team will be formed to prepare the QEP for submission and begin implementation.

Key Dates:

Full proposals due	September 1, 2008
Proposals accepted until	October 1, 2008
QEP Selection Announced	November 1, 2008
Quality Enhancement Plan Development	November 2008 – August 2009
Proposal Pre-Implementation (pre-implementation will precede final QEP approval by SACS)	September 2009
Proposal Implementation	Upon QEP approval in 2010
Final QEP Report Due	October 2014

Appendix IX. QEP Committees

QEP Planning Team

Douglas Mains, Chair	Associate Director, Strategy & Measurement, SACS Liaison
Warren Anderson	Dean, School of Health Professions
Subhash Aryal	Assistant Professor, School of Public Health, Biostatistics
Bruce Dubin	Vice Dean, Texas College of Osteopathic Medicine, Office of the Dean
Thomas Fairchild	Vice President, Strategy & Measurement
Patricia Gwirtz	Assistant Dean, Graduate School of Biomedical Sciences
Matt Havlik	Communications Coordinator, Marketing & Communications
Dinesh Jasti	GSBS Student Representative
Hank Lemke	Director, Physician Assistant Studies Program
Thomas Moorman	Associate Vice President, Student Affairs
Kim Niaki-Aldy	GSBS Student Representative, GSA Secretary
Melissa Oden	SPH Student Representative
Amy Raines	SPH Alumni Representative
Karan Singh	Chair, Biostatistics
Lisa Smith	Outreach Librarian, Library
Phil Turner	Professor, Library & Information Sciences, UNT Denton
Thomas Yorio	Executive Vice President, Academic Affairs & Research

QEP Development

Richard S. Kurz, Chair	Dean/Professor, School of Public Health, Office of the Dean
Jerry Alexander	Director/Associate Professor Academic Information Services, Information Resources and Technology
Warren Anderson	Dean, School of Health Professions
Daniel Burgard	Director/Senior Director Public Services, Library
Renee Drabier	Vice President, Information Resources and Technology
Bruce Dubin	Vice Dean, Texas College of Osteopathic Medicine, Office of the Dean
Patricia Gwirtz	Assistant Dean, Graduate School of Biomedical Sciences
Rebel Jones	Manager Testing and Evaluation Services, Academic Information Services
Hank Lemke	Director, Physician Assistant Studies Program
Eryn Loney	Director, Program Development, Texas College of Osteopathic Medicine, Office of the Dean
Robert Woelfel	Director, Web and Programming Services, Information Resources and Technology
Robert Wright	Director, Biomedical Communications Administration, Biomedical Communications

Appendix IX (cont.)

QEP Advisory Council

Frank Papa	Faculty, Texas College of Osteopathic Medicine
Rhonda Roby	Faculty, Graduate School of Biomedical Science
Sumi Suzuki	Faculty, School of Public Health
Olive Chen	Faculty, School of Public Health
Amir Barzin	Student, Texas College of Osteopathic Medicine
Adam Odeh	Student, Graduate School of Biomedical Science
Robin Dore	Student, School of Health Professions
Michael Budd	External, Texas College of Osteopathic Medicine
Richard G. MacDonald	External, Graduate School of Biomedical Science
Daniel Gentry	External, School of Public Health

QEP Executive Committee

Richard Kurz	Dean/Professor, School of Public Health, Office of the Dean
Renee Drabier	Vice President, Information Resources and Technology
Thomas Fairchild	Vice President, Strategy & Measurement
Hank Lemke	Director, Physician Assistant Studies Program
Douglas Mains	Associate Director, Strategy & Measurement, SACS Liaison
Patricia Gwirtz	Assistant Dean, Graduate School of Biomedical Sciences
Tina Machu	Assistant Dean of Pre-clinical Medical Education, TCOM
Don Peska	Dean, Texas College of Osteopathic Medicine

QEP School Team Directors

Russell Gamber	Associate Dean, TCOM Admissions, Interim Chair, Osteopathic Manipulative Medicine
Patricia Gwirtz	Assistant Dean, Graduate School of Biomedical Science
Elizabeth Trevino	Assistant Dean for Curriculum/Assistant Professor, Health Management and Policy, School of Public Health
Hank Lemke	Director, Physician Assistant Studies Program

Appendix IX (cont.)

EXECUTIVE TEAM

Scott B. Ransom, DO, MBA, MPH
President
Professor in Obstetrics, Gynecology,
Health
Management and Policy

Warren Anderson, EdD
Dean
School of Health Professions

Glenn Dillon, PhD
Vice President
Research

Renee Drabier, PhD, MBA
Vice President
Information Resources and Technology

Thomas Fairchild, PhD
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Strategy and Measurement

Kathleen Forbes, MD
Executive Vice President,
Clinical Affairs and Business
Development
President, UNT Health

Gary Grant, JD
Vice President for Development
Institutional Advancement

Rand Horsman
Vice President
Human Resource Services

Daniel M. Jensen
Vice President
Governmental Affairs

Richard Kurz, PhD
Dean
School of Public Health

William LeMaistre, JD
Senior Associate General Counsel
UNT System

Thomas Moorman, EdD
Vice President
Student Affairs

Don Peska, DO
Dean
Texas College of Osteopathic Medicine

Steve R. Russell
Executive Vice President
Finance and Administration

Jean Tips
Vice President
Marketing and Communications

Jennifer M. Trevino, MBA
Chief of Staff
Office of the President

Greg Upp
Senior Vice President
Community Engagement

Jamboor Vishwanatha, PhD
Dean
Graduate School of Biomedical
Sciences

Thomas Yorio, PhD
Provost and Executive Vice President
Academic Affairs

Appendix IX (cont.)

BOARD OF VISITORS

Appendix X. Description of
University of North Texas Health Science Center at Fort Worth

Historical Overview

The University of North Texas Health Science Center at Fort Worth is a 33-acre graduate school located in Fort Worth's Cultural District and is one of nine public, health-related institutions in Texas. The initial school was chartered as the Texas College of Osteopathic Medicine (TCOM) in 1966, accepting its first students in 1970. The first class graduated in 1974.

In 1975, TCOM was established as a state medical school under the University of North Texas (UNT) Board of Regents (formerly North Texas State University). In 1993, the name of the institution was changed to University of North Texas Health Science Center at Fort Worth. The campus includes the Texas College of Osteopathic Medicine (1966), Graduate School of Biomedical Sciences (1993), School of Public Health (1999) and the School of Health Professions (2004). The Physician Assistant Studies (PAS) program was elevated to the Master's level in 2000, a doctoral degree in Public Health (DrPH) was added in 2001. The PAS program was transferred into the School of Health Professions in 2008. School of Health Professions will house the planned doctoral degree in Physical Therapy (DPT). The Master of Health Administration (MHA) was added to the School of Public Health in 2008.

Current Overview

Currently UNT Health Science Center offers the following degrees: Doctor of Osteopathic Medicine, Master of Physician Assistant Studies, Doctor of Philosophy of Biomedical Sciences, Master of Science of Biomedical Sciences, Master of Public Health, Master of Health Administration, Doctor of Public Health, Master of Public Health/Master of Science in Nursing (dual degree offered in partnership with University of Texas at Arlington).

UNT Health Science Center is the setting for number of research inititatives and centers. Office of Professional and Continuing Education (PACE), which provides high-quality continuing education opportunities for physicians, physician assistants, nurse practitioners, nurses, and other health care professionals.

UNT Health Science Center is an active partner in the Texas Osteopathic Postdoctoral Training Institute (OPTI), an educational consortium committed to assuring the advancement of osteopathic postdoctoral training that includes an array of internships, residency programs and fellowships in Family Practice, Internal Medicine, Obstetrics and Gynecology, Pediatrics, Psychiatry, and more.

Appendix XI. Glossary of Acronyms and Abbreviations

ACHE	American College of Healthcare Executives
CIL	Clinical Integrative Laboratory
CLD	Center of Learning and Development
COMLEX	Comprehensive Osteopathic Medical Licensing Examination
CT	Critical Thinking
DO	Doctor in Osteopathy
DPT	Doctor of Physical Therapy
DRPH	Doctor of Public Health
GSBS	Graduate School of Biomedical Sciences
HOT	Higher Order Thinking
IOM	Institute of Medicine
KBIT	Knowledge Based Inference Tool
MHA	Master of Health Administration
MPAS	Master of Physician Assistant Studies
MPH	Master of Public Health
MS	Master of Medical Sciences
NBOME	National Board of Osteopathic Medical Examiners
NCHL	National Center for Healthcare Leadership
OMM	Osteopathic Manipulative Medicine
OPTI	Osteopathic Postdoctoral Training Institute
OSCE	Observed Student Clinical Skills Evaluation
PA	Physician Assistant
PACE	Professional and Continuing Education
PAS	Physician Assistant Studies
PBL	Problem Based Learning
QEP	Quality Enhancement Plan
SHP	School of Health Professions
SPH	School of Public Health
TCOM	Texas College of Osteopathic Medicine
TEACH-HSC	Technological and Other Education Advances for Curricula in Health -Health Science Center
UNT	University of North Texas
UNTHSC	University of North Texas Health Science Center
USMLE	United States Medical Licensing Examiation