

CRITICAL THINKING TASK FORCE REPORT

“Critical thinking is a lot like jazz. We may not be able to define it, but we can recognize it when we hear it.”

John Netland in Critical Thinking at Calvin College, 2007



Members: Dr. Julie Allison, Dr. Ananda Jayawardhana, Dr. Celia Patterson, Ms. Mary Polfer, Dr. James McBain, Dr. Brian Sandford, Mr. Tim Thomas, and Dr. Howard Smith, Task Force Chair.

Ex-Officio Members: Dr. Patricia Lindley, Mr. Earl Lee and Dr. Barbara McClaskey

SPRING 2014

Summary of the Task Force Study Process

The Task Force met from fall 2012 to spring 2014. The Task Force committee was comprised of faculty and administration representing all colleges as well as ex-officio members representing supportive academic services. Input was sought by committee members throughout the process from the areas they represented. Findings and recommendations were shared with appropriate university committees as indicated in the charge. The committee examined background data regarding existing practices at other institutions and held discussions regarding how they related to Pittsburg State's practice.

Charge to the Critical Thinking Task Force

The charge of the Critical Thinking Task Force was to examine the existing implementation of General Education Goal #2, specifically the nature of critical thinking instruction in the general education curriculum, and to propose an effective assessment process for documenting progress toward, and improving attainment of, Goal #2. Specific elements of the charge were to:

1. Develop a working definition of critical thinking for general education at PSU.
2. Investigate critical thinking instruction models at other institutions.
3. Develop a critical thinking instructional model for PSU incorporating the needs of general education.
4. Consult with the Assessment Committee and Faculty Senate General Education Committee to develop an appropriate assessment plan to support the instructional model.
5. Ensure recommendations of the task force are consistent with current developments in the assessment of critical thinking as a learner outcome defined by the Kansas Board of Regents. (*Added note: Assessment data regarding this learner outcome must be submitted for the first time in FY2014.*)
6. Make necessary recommendations to the Faculty Senate General Education Committee for the developed assessment plan.

Findings and Recommendations

Charge 1 - Develop a working definition of critical thinking for general education at PSU.

Recommendation: Utilize the following working definition.

Critical Thinking: An Explication for Pittsburg State University

While it is unlikely that any one single definition will capture what everyone calls "critical thinking," we will attempt to provide an explication of "critical thinking." Our explication will be an attempt to provide Pittsburg State University a practical and precise account of 'critical thinking' so as to ensure the best for our students. The need for this explication is for assessing our students' performance to strengthen their critical thinking skills.

§1 The Basis of the Explication

Critical thinking (henceforth, CT) is to be identified with abilities and activities. In perhaps its simplest form, CT is analyzing what is said, assessing what is said, acquiring evidence for claims when it is needed, combining information in a coherent way, identifying mistakes in reasoning, questioning things that do not make sense, and making decisions based upon the best information and arguments available. While this account is too vague to guide measurement, it reflects the spirit of that with which we are looking. CT is a tool. It is a tool that is essential for inquiry.ⁱ

Rather than explicating CT as a set of mental states or character traits, we propose to identify CT as the process of reasoning rooted in a skill set. This skill set is a set of cognitive skills.ⁱⁱ This set represents those features which students should develop from CT instruction. The cognitive skills represent the core set of skills needed in order to think critically. These skills are the ones needed in every area of life and do not rely on any domain-specific knowledge. While most domain-specific instruction does use these cognitive skills, CT instruction focuses upon these skills themselves and not any specific domain.

§2 Cognitive Skills

We identify six CT cognitive skill categories.ⁱⁱⁱ For each cognitive skill category, we will identify those skills which characterize that category. The six categories are:

1. Interpretation
2. Analysis
3. Evaluation
4. Inference
5. Explanation
6. Self-Regulation

It must be understood that these are general categories of skills and should not be looked at as if they represent singular skills. Furthermore, categories 1-5 represent for us clear measurable skills while category 6 represents an essential skill in CT, but one which cannot be measured in the same way. Self-regulation would require that the instruction be part of the development of the student's reasoning/project. While it is not in principle impossible to measure, it would require a more direct method. We will now explicate each.

§2.1 Interpretation

Interpretation is the specifying of the meaning of experiences, judgments, conventions, data, situations, procedures, criteria, rules, or beliefs. This can be sub-divided into:

- Categorization
 - The apprehension of and formulation of categories, distinctions, or frameworks.
- Identification of Significance
 - The detection, identification, and description of content including, but not exclusively limited to, informational, intentional, affective, normative, inferential, etc.
- Clarification of Meaning
 - The reconstruction of content to make explicit through paraphrasing, stipulation, description, analogy, etc.

§2.2 Analysis

Analysis is the identification of the actual and intentional inferential relationships between the elements of lines of reasoning. This can be sub-divided into:

- Examination of Ideas
 - Activities include determination of the roles of expressions used, definition of terms, conceptual comparison, identification of issues/problems and their component parts.
- Detection of Arguments
 - The identification of the statements which are to function as premises and those which are conclusions.
- Analyzing Arguments
 - The ability to differentiate implicit and explicit premises, conclusions, structure of arguments, type of argument being used, and the validity and soundness, or strength or weakness of arguments.

§2.3 Evaluation

Evaluation is the assessment of the credence of statements or the logical strength of arguments. This can be sub-divided in two ways:

- Assessment of Claims
 - Assessment of the warrant as a source of information.
 - Assessment of the contextual relevance of the information.
 - Assessment of the confidence level able to be attached to the information.
 - Assessment of the truth or falsity of the claim.
- Assessment of Arguments
 - Determination as to whether the argument is inductive, deductive, or abductive.
 - Assessment of the truth of the premises.

- Assessment of the type of argument and the inferences being made in terms of validity, soundness, and/or strength.
- Assessment of any formal or informal fallacies in the argument.

§2.4 Inference

Inference refers to the ability to identify the elements needed and to draw reasonable conclusions. This can be sub-divided into:

- Evidential Inquiry
 - Judgment of informational relevancy.
 - Identification of premises which require further support and the development of a strategy to acquire that support.
- Identification of Alternatives
 - Formulation of multiple strategies for problem solving.
 - The projection of alternative hypotheses.
 - The identification of presuppositions and the possible consequences of a line of reasoning.
- Drawing Conclusions
 - Given a set of premises and their support, to draw forth with proper logical strength (given the type of argument it is) the conclusion which is entailed.

§2.5 Explanation

We take explanation to be the statement of the results of one's reasoning. This may also include the justification of considerations that went into the reasoning. This can be sub-divided into:

- Statement of Results
 - The accurate production of the results of one's reasoning.
- Justification of Procedures
 - The presentation of the methodological, conceptual, evidential, criteriological, and contextual considerations in the reasoning.
- Presentation of Arguments
 - The ability to give reasons for one's reasoning and why others are to accept that reasoning.
 - This may also include responding to possible objections to that reasoning.

§2.6 Self-Regulation

Self-regulation refers to the ability to monitor one's own cognitive activity. This self-monitoring includes, but is not limited to, the ability to correct one's previous mistaken reasoning, evaluation of one's own inferences, and the reformulation of the reasoning in light of new information. This can be sub-divided into:

- Self-Examination
 - Reflection on the cognitive skills used, the methods one used, and the application of the previous elements of critical thinking in one's reasoning.
 - Reflection on one's own beliefs and reasons for holding those beliefs and reasons.
 - Identification of one's own epistemic deficiencies.
 - Identification of one's own biases, prejudices, emotions, etc. which may affect reasoning.
 - Reflection on the motivation, intentions, and interests underlying the reasoning.
 - Reflection as to whether critical thinking was necessary to the issue.
- Self-Correction
 - The ability to correct any errors or deficiencies in one's reasoning.
 - The ability to design ways of correcting those errors or deficiencies.

During the process of reviewing definitions and descriptions of critical thinking across various disciplines, the Task Force members considered the likelihood that the PSU Math, Oral Communication, and Writing Rubrics assessed one or more of the six cognitive skills categories. To explore this relationship for each of the three PSU Rubrics separately, performance behaviors that represented cognitive skill categories and that were scored at the highest level of the rubric were mapped to the Holistic Critical Thinking Rubric sub-skills listed under the "Strong 4--

Consistently does all or almost all of the following" (See Appendix). The Holistic Critical Thinking Rubric was selected because it was developed by Facione, lead author of the Delphi Report, and strongly based on that Delphi Report.

In addition, the Task Force members were interested in exploring the relationship of the Holistic Critical Thinking Rubric sub-skills to the skills measured by the Collegiate Learning Assessment (CLA). PSU has used the CLA to measure critical thinking and writing since 2008-09, and will likely continue to use it in the future. To explore this relationship, CLA scoring criteria at the highest level of six for analytic reasoning and evaluation and then for problem solving were mapped to the Holistic Critical Thinking Rubric sub-skills listed under the "Strong 4-- Consistently does all or almost all of the following".

The mapping was then shared with the Task Force and with the four faculty leaders responsible for the general education assessment: Dr. Shirley Drew for Oral Communication; Drs. Don Judd and Janet Zepernick for Writing; and Dr. Karla Childs for Math. Reviewers unanimously agreed with the mapping: components of the PSU Oral Communication, Math, and Writing Rubrics and the CLA assess critical thinking sub-skills on the Holistic Rubric. (See Appendix)

ⁱFacione (1990), 2.

ⁱⁱFacione (1990), 4. This model is taken from Peter A Facione, "Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction," California Academic Press, 1990 (also known as "The Delphi Report"). The reason we base our explication on this work is due to the depth of its research and the applicability to various (if not all) disciplines. For example, the sub-committee members working on this explication were from the Applied Sciences (Pat Lindley), English (Celia Patterson), Philosophy (James McBain), and Psychology (Julie Allison). All members found it the best suited. The Delphi Report also matched the input we received from members of the PSU faculty in English, History, Philosophy, Political Science, Psychology, Sociology, and Social Work. This model also encompasses what Pittsburg State University Mathematics Assessment measures. Lastly, as Celia Patterson has pointed out, there is a positive connection between this model and the Writing Assessment for PSU.

ⁱⁱⁱFacione (1990, 2011) and Hanover Research (2011).

Resources on Critical Thinking—Definitions, Descriptions

PSU

- Critical Thinking in English (ENGL 101 and ENGL 299). Dr. Celia Patterson.
- Critical Thinking in HPSS. Dr. Jim McBain.
- Critical Thinking in Psychology. Dr. Julie Allison. Reference to Facione 1990.
- First Year Experience topics schedule. Heather Eckstein.
- General Education Mathematics Rubric. Zimbra briefcase.
- General Education Writing Rubric, rev. 12 Sept 2012. Zimbra briefcase.
- General Education Undergraduate Goals. Available at http://catalog.pittstate.edu/psu/contentm/blueprints/blueprint_display.php?bp_listing_id=162&blueprint_id=128&sid=1&menu_id=7984
- Results of the Collegiate Learning Assessment. Dr. Patricia Lindley.

Various Disciplines

- American Management Association. (2010). 2010 Critical Thinking Skills Survey at <http://www.amanet.org/news/AMA-2010-critical-skills-survey.aspx>
- Association to Advance Collegiate Schools of Business at www.aacsb.edu
- Facione, N.C. & Facione, P.A. (2008) Critical thinking and clinical judgment. Retrieved 11/51/12 at www.insightassessment.com/content/download/765/4852/file/CH+1+CT+%26+CR++-+Facione+%26+Facione.pdf
- Kreitzberg, A., & Kreitzberg, C. (2010). The business case for critical thinking skills. Accessed 11/5/12 at www.agilecriticalthinking.com
- National Business Education Association at www.nbea.org
- Niewoehner, R.J. Applied disciplines: A critical thinking model for engineering. Retrieved 11/5/12 at www.criticalthinking.org/pages/applied-disciplines-a-critical-thinking-model-for-engineerin/578
- P21 at www.p21.org

Frequently Cited Critical Thinking References

- AAC& U Critical Thinking VALUE Rubric. Accessed 11/14/12 at www.in.gov/che/files/All_VALUE_Rubrics.pdf
- Bloom's 1956 taxonomy, revised cognitive domain, higher-order thinking skills. Retrieved 10/22/12 at www.nwlink.com/~donclark/hrd/bloom.html
- Facione, P.A. (1990). Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction. Executive summary "The Delphi Report." The complete *American Philosophical Association Delphi Research Report* is available as ERIC Doc. No.: ED 315 423. Millbrae, CA: The California Academic Press.
- Hanover Research. (2011). Assessing critical thinking skills. Available in the Zimbra briefcase.
- Lai, E.R. (2011). Critical thinking: A literature review. Research Report. Accessed 11/5/12 at www.pearsonassessments.com/hai/images/tmrs/criticalthinkingreviewfinal.pdf
- Paul, R. & Elder, L. (2007). *The Miniature Guide to Critical Thinking Concepts and Tools*. Retrieved 11/5/12 at www.d.umn.edu/~jetterso/documents/CriticalThinking.pdf

Charge 2 - Investigate critical thinking instruction models at other institutions

Data used in the formulation and study to determine Critical Thinking Approach at PSU.

Institution	Critical Thinking Definition	Rubric for Assessing	Methods of Teaching
Daytona State College	"Systematic and creative thinking skills to analyze and evaluate issues and arguments, to solve problems, and/or to make decisions."	-The Community College Survey of Student Engagement (CCSSE) -Test of Everyday Reasoning (TER)	SLS2505 Critical Thinking course
Georgia State University	"An active process that goes beyond basic acquisition and memorization of information to the ability to recognize and rationally consider multiple concepts or elements that constitute a body of thought."	-Academic Program Review -Annual assessment plans defining and assessing program outcomes of each major -National Survey of Student Engagement (NSSE)	6 hours "Critical Thinking Through Writing" courses are required for graduation (117 available courses)
University of Arkansas Little Rock	"The intellectually-disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information."	-Washington State University Critical Thinking Rubric	-All university core courses must include one or more objective related to critical thinking development. -6 hours upper level courses in discipline outside of major.
Thomas Moore College	"Discovery of creative multiple approaches to issues, thoughtful and logical deliberation, application of discipline-specific problem solving techniques, using research for effective solutions, and articulation of justification of conclusions."	-CAT (Critical Thinking Assessment Test) -ETS Measures of Academic Proficiency -Freshman/Senior writing test samples	Introducing a shared critical thinking vocabulary and methodology that is consistent with both core and major curriculum.

Institution	Critical Thinking Definition	Rubric for Assessing	Methods of Teaching
Parker University	“Examining structures or elements of thought implicit in all reasoning, such as purpose, judgment of evidence, context, concepts, assumptions, methods, criteria, reasoning, alternative viewpoints and frame of reference.”	-Health Science Reasoning Test (HSRT) for pre- and post-tests of self-reported critical thinking skills. -Academic Retention Exam (ARE)	Capstone courses based on critical thinking components and contextualized curriculum will be added.
Meredith College	“Purposeful, self-directed process in which we take charge of knowledge, use reason to propel our scholarship and solve problems, and integrate these essential skills in intellectual endeavors and actions.”	-Valid Assessment of Learning in Undergraduate Education (VALUE) -Watson-Glaser Critical Thinking Appraisal (WGCTA) -Describe, Examine, Articulate Learning (DEAL)	-PRISM seminar for freshmen, focusing on the introduction and development of critical thinking concepts and skills. -Critical thinking components infused in all classes.
Dillard University	“Being able to offer solutions to real-world problems by reading analytically, writing critically, and speaking and presenting effectively.”	Senior-year capstone research electronic portfolio with critical-thinking artifacts.	First year program implemented and entire curriculum strengthened through critical thinking implementation throughout curriculum.
Palm Beach Atlantic University	“The continual improvement of critical-thinking, reasoning, and problem-solving skills is essential not only to intellectual development, but to the development of the sense of self, the worldview, and the calling of the individual.”	-MAPP (Motivational Appraisal of Personal Potential) -PBA (Performance Based Assessment)	Critical thinking implementation in: Comp. I & 2, Public Speaking, Humanities I, II, and III, and First-Year Experience

Institution	Critical Thinking Definition	Rubric for Assessing	Methods of Teaching
University of North Carolina Charlotte	<p>“Ability to identify, negotiate, and construct the ideas, information, emotions, and arguments, to marshal appropriate discourses, genres, and media, and to understand how composing processes are shaped by audience and purpose in ways that do not artificially distinguish between content and form.”</p>	<p>Reports and departmental feedback and reports after “Phase One” to know how to proceed. After Phase Three, conduct assessment (none mentioned).</p>	<p>Include analytic essays, reports and oral presentations in all classes to encourage critical thinking.</p>
Loyola University New Orleans	<p>“Analyzing problems, thinking creatively, and expressing one’s self clearly and coherently.”</p>	<ul style="list-style-type: none"> -Tests and papers -Course evaluation -Faculty evaluation -NSSE and CLA (Collegiate Learning Assessment) data -Retention data -Pre-and-post-test performance evaluations 	<p>First Year Seminars that encourage critical thinking, writing, speaking, and information literacy skills.</p>
Washington State University	<p>“Problem identification, establishment of a clear perspective on an issue, recognition of alternative perspectives, context identification, evidence identification and evaluation, recognition of fundamental assumptions implicit or stated by the representation of an issue, and assessment of implications and potential conclusions.”</p>	<p>WSU Critical Thinking Rubric</p>	<p>Implementing the WSU Critical Thinking Rubric in General Education core courses.</p>

Institution	Critical Thinking Definition	Rubric for Assessing	Methods of Teaching
Truman State University	"The ability to understand and articulate well-reasoned arguments. The skillful application of a repertoire of validated general techniques for deciding the level of confidence you should have in a proposition, in light of the available evidence."	-CLA -NSSE -Portfolios	Adopting a systematic vocabulary, framework, pilot project, and rubric.
Calvin College	(Defined the concept of critical thinking through grading rubric)	-WSU Grading Rubric	-English 101, Philosophy 153 -Rubric to be widely distributed and used by faculty
Howard College	"Thinking with purpose, skill, and confidence."	-CCTT (California Critical Thinking Test) -CCSE -CTAR (Critical Thinking Assessment Rubric)	Implementation of critical thinking activities and projects into English, math, and science courses.
Chowan University	"Improving the quality of thought by the skillful use of elements and standards in the analysis and evaluation of their thinking and the thinking of others."	-Strategic plan to assess progress.	Infusion-based model throughout curriculum.
Fisk University	"Utilizing problem-solving techniques applicable to personal issues and professional challenges, to evidence both quantitative and qualitative reasoning skills, and to demonstrate information literacy"	-CAT	-Infusion model throughout curriculum. -Core 100: University Seminar -Core 120: Critical Thinking

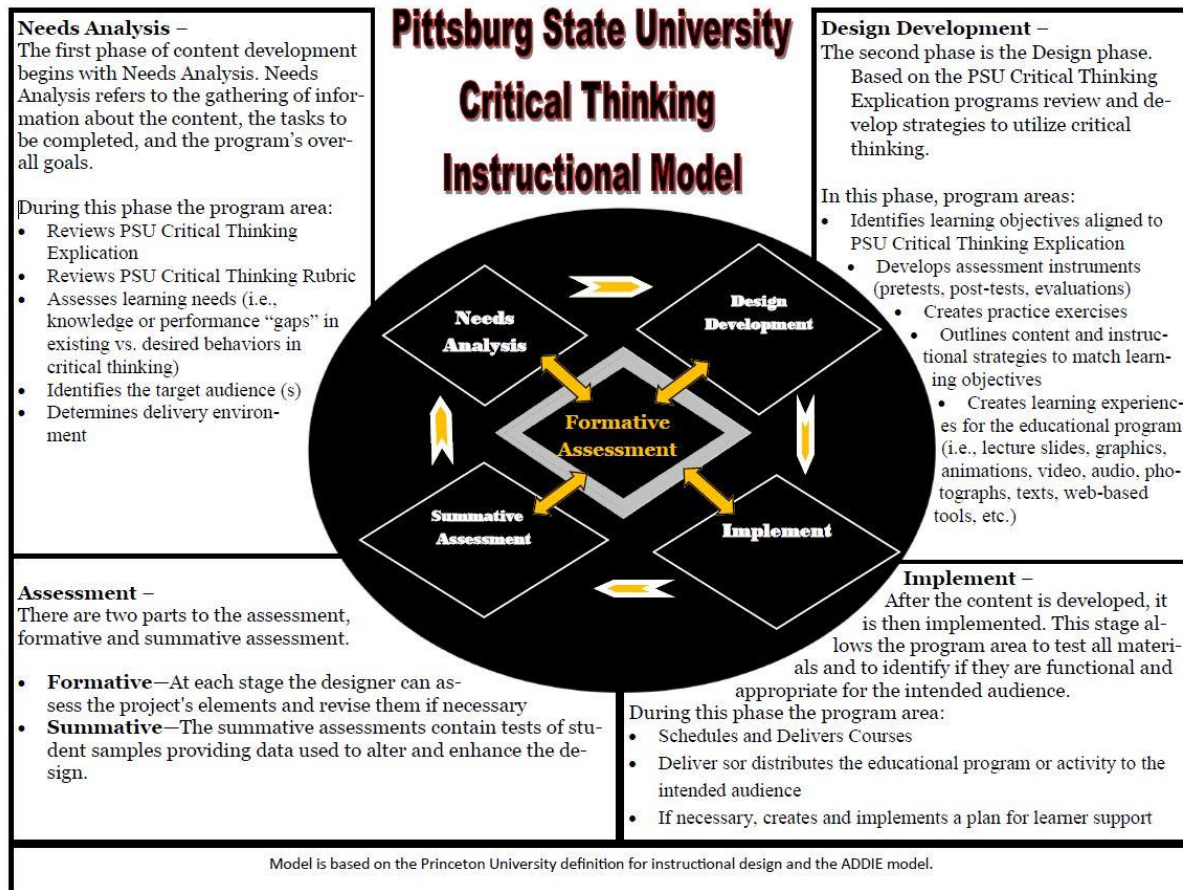
Institution	Critical Thinking Definition	Rubric for Assessing	Methods of Teaching
Aiken College	“The open-minded, deliberate, dynamic, and reflective process of collecting, analyzing, evaluating, and applying information in order to reach a reasonable position, decision, and/or plan of action.”	-ATC General Education Outcomes Assessment Plan -MAPP	Setting intellectual standards in all courses taught.
University of Texas Permian Basin	“Thinking that attempts to arrive at a decision or judgment only after honestly evaluating alternatives with respect to available evidence and arguments.”	-CAT -UTPB C Rubric	-English Composition 1301 -English Composition 1302
University of Louisville	“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.”	-NSSE -UL Course Evaluations -SSI -UL Critical Thinking Rubric -CCTT -CCTDI (California Critical Thinking Dispositions Inventory) -CLA	Critical thinking explicitly taught in general education courses and must provide evidence for preparing students for upper-division course requirements.
Eastern Kentucky University	“Explore and use relevant information in order to gain knowledge and solve problems. Evaluate information and ideas using appropriate methods. Expand and generate own ideas and express them effectively. Express a point of view and develop it with awareness of alternatives.”	-CAT -NSSE -Co-Op Employer Survey -EKU Critical/Creative Thinking Rubric	Implemented throughout all of the general education courses.

Institution	Critical Thinking Definition	Rubric for Assessing	Methods of Teaching
Wilkes Community College	"Acquiring knowledge, understanding, insights, and skills in any given body of content."	<ul style="list-style-type: none"> -CCTDI -Article Analysis in ACA 15 -ACA 115 Portfolios -Course Work Samples -Capstone Course Project -Student Opinion Instrument 	<ul style="list-style-type: none"> -Paul/Elder Model -ACA 115 Pilot Programs
Surry Community College	"Self-directed, self-disciplined, self-monitored, and self-corrective thinking."	<ul style="list-style-type: none"> -Critical Thinking Grid -Critical Thinking Worksheet 	<ul style="list-style-type: none"> -Paul/Elder Model -College-wide critical thinking implementation
Beacon College	"Develop an understanding of the fundamental and powerful concepts of an academic discipline."	<ul style="list-style-type: none"> -CCTDI 	<ul style="list-style-type: none"> -Paul/Elder Model -Institute of Critical Thinking

Charge 3 - Develop a critical thinking instructional model for PSU incorporating the needs of general education.

Methods of Teaching Critical Thinking Summary Gleaned from Other Institutions	
Activities and projects in multiple courses	Institute
Analytic essays	Multiple courses
Core class	Multiple general courses
Critical thinking vocabulary and methodology in curriculum	Reports and oral presentations
Explicit instruction in general courses	Seminar Class
First year seminar	Seminar for freshman
General education core classes	Single course
Implemented throughout curriculum; Infusion-based model throughout curriculum	Standards in all courses
Implemented throughout general courses	Systematic vocabulary
Infused in all classes	

Recommendation: Implement the following Instructional Model.



Note: Charge 4 and Charge 6 are combined and will follow Charge 5.

Charge 5 - Ensure recommendations of the task force are consistent with current developments in the assessment of critical thinking as a learner outcome defined by the Kansas Board of Regents. (Added note: assessment data regarding this learner outcome must be submitted for the first time in FY2014.)

Finding: The recommendations of this task force are consistent with KBOR standards.

FORESIGHT 2020

A 10-Year Strategic Agenda for the State's Public Higher Education System

Measures

- ❖ Performance of students on institutional assessments in three areas:
 - Mathematics/Quantitative/Analytical Reasoning,
 - Written and Oral Communication,
 - Critical Thinking/Problem Solving.
- ❖ Percent graduates employed in Kansas post graduation.
- ❖ Average wages earned by graduates post graduation.
- ❖ Performance of students on selected third-party technical program certificate/credential assessments.
- ❖ Number of certificates and degrees awarded in selected high-demand occupations.
- ❖ Percent of credentials awarded in STEM fields

Charge 4 - Consult with the Assessment Committee and Faculty Senate General Education Committee to develop an appropriate assessment plan to support the instructional model.

And

Charge 6 - Make necessary recommendations to the Faculty Senate General Education Committee for the developed assessment plan.

Finding/Recommendation: The committees were supportive of the recommendations from the task force. A comment worth more consideration was that “If everyone is doing it, then maybe no one is doing it”. A key individual or individuals should be identified to continue to monitor the critical thinking work taking place on campus.

Methods Used to Assess Critical Thinking Summary Gleaned from Other Institutions	
ACA 115 Portfolios (ACA 115=Success in Study Skills Course – critical thinking focus)	Critical Thinking Worksheet
ACA 115 Article Analysis	ETS measures of academic proficiency (MAPP)
Academic program review	Faculty evaluation
Academic Retention Exam (ARE)	Health Science Reasoning Test (HSRT) – Pre/Post tests
Annual assessment	Motivational Appraisal of Personal Potential (MAPP)
ATC General Education Outcomes Assessment Plan (ATC=Aiken Technical College)	Performance Based Assessment (PBA)
California Critical Thinking Test (CCTT)	Portfolios
Capstone Course Project	Pre/post-test performance evaluations
California Critical Thinking Dispositions Inventory (CCTDI) – 3 times	Reports and departmental feedback
California Critical Thinking Test (CCTT)	Retention data
Collegiate Learning Assessment data (CLA) – 4 times	Senior-year research electronic portfolio with artifacts
Community College Survey of Student Engagement (CCSSE) – 2 times	Strategic plan to assess progress
Co-Op Employer Survey	Student Opinion Instrument
Course evaluation – 2 times	Test and papers
Course work samples	Valid Assessment of Learning in Undergraduate Education (VALUE)
Critical Thinking Assessment Rubric (CTAR)	Watson-Glaser Critical Thinking Appraisal (WGCTA)
Critical Thinking Assessment Test (CAT) – 4 times	Writing test samples
Critical Thinking Grid	

Recommendation: Utilize the following approach for assessment at PSU.

The Assessment of Critical Thinking at PSU

Since the 2008-09 academic year, PSU has used the Collegiate Learning Assessment (CLA) to assess students' performances in critical thinking and writing. On this online, constructed-response test, students have 90 minutes to complete one of two possible tasks, the Performance Task or the Analytic Writing Task (see Table 1). For the Performance Task, students respond to open-ended questions about a hypothetical situation; they use a Document Library of various sources of information to create their responses. In the Analytic Writing Task, students are asked to make or critique an argument. Scores on the sub-scales (Performance Measured column in Table 1) became available in 2011. During the 2013-14 academic year, CLA+, a revised version of the CLA, was introduced. The CLA+ continues to assess critical thinking and writing, but now adds the assessment of scientific and quantitative reasoning and critical reading and evaluation.

Table 1. Performance Measured on the CLA Tasks

<u>CLA Tasks</u>	<u>Performance Measured</u>
Performance Task	<ul style="list-style-type: none">• Analytic reasoning and evaluation• Problem solving• Writing effectiveness• Writing mechanics
Analytic Writing Task: Make-An-Argument and Critique-An-Argument	<ul style="list-style-type: none">• Analytic reasoning and evaluation• Recognition of logical fallacies in arguments (Critique-An-Argument only)• Writing effectiveness• Writing mechanics

Convenience samples of freshmen and seniors are used. Beginning with seniors during their spring 2014 testing period, the Director of Assessment will monitor the gender and race/ethnicity of students who completed the CLA in order to achieve a sample representative of PSU demographics.

During a class session before the CLA testing session and at the start of the CLA testing session, students are presented an overview of the CLA and testing process and informed that participation is voluntary. The original protocol for the CLA, which was submitted by the Council for Aid to Education, was approved by the Western Institutional Review Board (IRB) in 2008. Institutions using the CLA must adhere to the WIRB protocol. In addition, IRB approval was secured at PSU and renewed annually.

During the fall semester, a minimum of 100 students from the Freshmen Experience courses complete the CLA. The Directors of First Year Programs and of Assessment identify four or five sections of the Freshmen Experience course. Sections are limited to those offered on Tuesday-Thursday to better match the 90-minute time frame for the CLA. At least one section of students with undeclared majors is included. Students complete the CLA during their scheduled class time.

For the senior sample of a minimum of 100, the Director of Assessment coordinates the selection of senior capstone courses with the Deans, Department Chairs, and course faculty. At least one senior capstone course is chosen from the Colleges of Business, Education, and Technology; two from the College of Arts and Sciences. CLA testing may be scheduled during class time or immediately preceding or following class time during the spring semester.

The full report of results from the academic year testing arrives in middle to late summer. CLA results are included in university documentation of student learning outcomes at the institutional level; this documentation is shared internally. In addition, some CLA results are available on the Assessment website. CLA results are also annually submitted to the VSA College Portrait.

Beginning in the 2013-14 academic year, results will be sent to the Chair of the Faculty Senate General Education Committee for their consideration of how PSU students performed on critical thinking and how improvements can be made through general education curriculum. In addition, results will also be shared with the Chair of the University Assessment Committee, charged with the oversight of all general education student learning. When sample sizes permit, CLA results by degree programs (derived from students' majors) will be shared with the appropriate Department Chairs, faculty, and Deans for their improvement purposes.

In addition to the Collegiate Learning Assessment, a random sample of seniors complete the National Survey of Student Engagement (NSSE) during odd-numbered years. Two items from the NSSE pertain to critical thinking. Both items are indirect measures as they ask students to reflect on how well PSU prepared them to think critically and to solve problems (see Table 2).

Table 2. 2007-13 PSU Results for Critical Thinking

<i>Critical Thinking</i> (PSU General Education Goal 2)	PSU 2007	PSU 2008	PSU 2009	PSU 2010	PSU 2011	PSU 2012	PSU 2013	Peers 2013	National 2013
Direct Measures									
1. Analytic Reasoning and Evaluation (ARE) average senior score (CLA Performance Task)					3.1	3.3	3.1		3.4
1a. PSU senior average ARE score as % of national senior average score					91%	97%	91%		
1b. PSU senior average ARE score as % gain from freshmen average score					19%	38%	35%		17%
2. Recognition of Logical Fallacies in Arguments (RLFA) average senior score (CLA Critique-An-Argument)			1129	1152	1060	1127	1121		1178
2a. PSU senior average RLFA score as % of national senior average score			91%	93%	91%	96%	95%		
2b. PSU senior actual average RLFA score as % of expected score			93%	96%	94%	100%	98%		
3. Problem Solving (PS) average senior score (CLA Performance Task)					3.1	3.2	2.9		3.3
3a. PSU senior average PS score as % of national senior average score					91%	97%	88%		
3b. PSU senior average PS score as % gain from freshmen average score					19%	33%	45%		22%
Indirect Measures									
4. Seniors said PSU contributed to thinking critically/analytically <i>quite a bit/very much</i> (NSSE)	86%	85%	87%	85%	90%	87%	93%	83%	86%
New: PSU contributed to thinking critically/analytically (1-4 scale)							3.4	3.2 p<.05 ES .22	3.3
5. Seniors said PSU contributed to solving complex real-world problems <i>quite a bit/very much</i> (NSSE)	62%	60%	66%	67%	69%	66%	69%	60%	63%
New: PSU contributed to solving complex real-world problems (1-4 scale)							2.9	2.8	2.8
Notes: Measures are the National Survey of Student Engagement (NSSE; new version in 2013, assessed in odd-numbered years) and the Collegiate Learning Assessment (CLA; assessed annually). NSSE peers are 29 4-year, public institutions in the plains geographic region of KS (ESU, KSU, KU, WSU), IA, MO, MN, NE, and ND. ALL new NSSE indicators in 2013; weighted by gender and enrollment status (and institutional size for comparison groups). ES = effect size, calculated as mean difference divided by pooled standard deviation (Cohen's h). ES reflects practical importance of observed difference; 0.2 considered small, 0.5 medium, and 0.8 large effect sizes. Shaded areas have no data available.									

Recommendation:

1. Use the following Rubric as a standard for courses at PSU.
2. Provide for training and support to faculty on best practices for utilizing this process in classes.

The Holistic Critical Thinking Scoring Rubric

A Tool for Developing and Evaluating Critical Thinking

Peter A. Facione, Ph.D. and Noreen C. Facione, Ph.D.

Strong 4. Consistently does all or almost all of the following:

- Accurately interprets evidence, statements, graphics, questions, etc.
- Identifies the most important arguments (reasons and claims) pro and con.
- Thoughtfully analyzes and evaluates major alternative points of view.
- Draws warranted, judicious, non-fallacious conclusions.
- Justifies key results and procedures, explains assumptions and reasons.
- Fair-mindedly follows where evidence and reasons lead.

Acceptable 3. Does most or many of the following:

- Accurately interprets evidence, statements, graphics, questions, etc.
- Identifies relevant arguments (reasons and claims) pro and con.
- Offers analyses and evaluations of obvious alternative points of view.
- Draws warranted, non-fallacious conclusions.
- Justifies some results or procedures, explains reasons.
- Fair-mindedly follows where evidence and reasons lead.

Unacceptable 2. Does most or many of the following:

- Misinterprets evidence, statements, graphics, questions, etc.
- Fails to identify strong, relevant counter-arguments.
- Ignores or superficially evaluates obvious alternative points of view.
- Draws unwarranted or fallacious conclusions.
- Justifies few results or procedures, seldom explains reasons.
- Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.

Weak 1. Consistently does all or almost all of the following:

- Offers biased interpretations of evidence, statements, graphics, questions, information, or the points of view of others.
- Fails to identify or hastily dismisses strong, relevant counter-arguments.
- Ignores or superficially evaluates obvious alternative points of view.
- Argues using fallacious or irrelevant reasons, and unwarranted claims.
- Does not justify results or procedures, nor explain reasons.
- Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.
- Exhibits close-mindedness or hostility to reason.

(c) 1994, 2009, Peter A. Facione, Noreen C. Facione, and Measured Reasons LLC, Hermosa Beach, CA USA

Published by the California Academic Press / Insight Assessment, Millbrae, CA 94030.

To download free copies of this rubric visit <http://www.insightassessment.com/9HCTSR.html>

Permission is granted to students, faculty, staff, or administrators at public or nonprofit educational institutions and organizations for unlimited duplication and free distribution of the *Holistic Critical Thinking Scoring Rubric*, for teaching, assessment, research, or other non-commercial uses, provided that no part of the scoring rubric is altered, that the copies are distributed free of charge, and that "Facione and Facione" are cited as authors.

How To Use *The Holistic Critical Thinking Scoring Rubric*

1. Understand what the Rubric is intended to Address.

Critical thinking is the process of making purposeful, reflective and fair-minded judgments about what to believe or what to do. Individuals and groups use critical thinking in problem solving and decision making. This four level rubric treats this process as a set of cognitive skills supported by certain habits of mind. To reach a judicious, purposeful judgment a good critical thinker engages in analysis, interpretation, evaluation, inference, explanation, and reflection to monitor and, if needed, correct his or her thinking. The disposition to pursue open-mindedly and with intellectual integrity the reasons and evidence wherever they lead is crucial to reaching sound, objective decisions and resolutions to complex, high-stakes, ill-structured problems. So are the other critical thinking habits of mind, such as being inquisitive, systematic, confident in reasoning, anticipatory of possible consequences, prudent in making judgments.

2. Differentiate and Focus.

Holistic scoring requires focus. Whatever one is evaluating, be it an essay, a presentation, a group decision making activity, or the thinking a person displays in a professional practice setting, many elements must come together for overall success: critical thinking, content knowledge, and technical skill (craftsmanship). Deficits or strengths in any of these can draw the attention of the rater. However, in scoring for any one of the three, one must attempt to focus the evaluation on that element to the exclusion of the other two. To use this rubric correctly, one must apply it with focus only on the critical thinking, which is the reasoning process used.

3. Practice, Coordinate and Reconcile.

Ideally, in a training session with other raters one will examine samples (documents, videotaped examples, etc.) which are paradigmatic representations of each of the four levels. Without prior knowledge of their level, novice raters will be asked to evaluate and assign ratings to these samples. After comparing these preliminary ratings, collaborative analysis with the other raters and the experienced trainer is used to achieve *consistency of expectations* among those who will be involved in rating the actual cases. Training, practice, and inter-rater reliability are the keys to a high quality assessment. This gives operational agreement, which is very important.

Usually, two raters will evaluate each essay, assignment, project, or performance. If they disagree there are three possible ways that resolution can be achieved: (a) by a conversation between the two raters regarding their evaluations, (b) by using an independent third rater, or (c) by taking the average of the two initial ratings. But, the averaging strategy is strongly discouraged. Discrepancies of more than one level between raters indicates that the raters must review together the evidence considered salient by each rater.

This rubric is a **four** level scale, forced choice scale. Half point and “middle of the two” scoring is not possible. The only variation which would be consistent with this tool is to combine #1 and #2 so that this became a three level scale: Strong, Acceptable, Weak.

When working alone, or without paradigm samples, one can achieve a greater level of internal consistency by not assigning final ratings until a number of essays, projects, assignments, or performances have been given preliminary ratings. Frequently natural clusters or groupings of similar quality soon come to be discernible. At that point one can be more confident in assigning a firmer critical thinking score using this four level rubric. After assigning preliminary ratings, a review of the entire set assures greater internal consistency and fairness in the final ratings.

Appendix

Performance Task
Interpret, analyze, and evaluate quality of information
Identify information relevant to problem
Highlight connected and conflicting information
Detect flaws in logic and questionable assumptions
Explain why information is credible, unreliable, or limited

Analytic Reasoning and Evaluation	Demonstrate accurate understanding of large body of information	Identify most facts/ideas that support/refute all major arguments (or salient features of all objects to be classified)	Identify most facts/ideas that support/refute all major arguments (or salient features of all objects to be classified)	Identify most facts/ideas that support/refute all major arguments (or salient features of all objects to be classified)	Provide analysis beyond obvious Makes several accurate claims about quality of information	Provide analysis beyond obvious Makes several accurate claims about quality of information
	Accurately interpret evidence, statements, graphics, questions, etc.	Identify salient arguments (reasons and claims) pro and con	Thoughtfully analyze and evaluate major alternative points of view	Draw warranted, judicious, non-fallacious conclusions	Support key results and procedures, explains assumptions and reasons	Fair-mindedly follows where evidence and reasons lead

Performance Task
Consider and weight information from discrete source to make decisions (draw conclusion and/or propose course of action) that logically follow from valid arguments, evidence, and examples
Consider implications of decisions and suggest additional research when appropriate

Problem Solving	Provide solid rationale based on credible evidence from variety of sources	Provide solid rationale based on credible evidence from variety of sources	Weigh other options	Provide decision and solid rationale based on credible evidence from variety of sources	Present decision as best given available evidence When applicable, propose course of action that follows logically from conclusion, consider implications	Present decision as best given available evidence When applicable, propose course of action that follows logically from conclusion, consider implications When applicable, recognize need for additional research, recommend specific research to address unanswered questions
------------------------	--	--	---------------------	---	--	--

	Accurately interpret evidence, statements, graphics, questions, etc.	Identify salient arguments (reasons and claims) pro and con	Thoughtfully analyze and evaluate major alternative points of view	Draw warranted, judicious, non-fallacious conclusions	Support key results and procedures, explains assumptions and reasons	Fair-mindedly follows where evidence and reasons lead
<p><u>Make-an-Argument</u> <i>Start a position</i> <i>Provide valid reasons to support position</i> <i>Demonstrate understanding of complexity of issue by considering and possibly refuting alternative viewpoints</i></p>						
Analytic Reasoning and Evaluation	Provide analysis that reflects thorough consideration of complexity of issue	Provide analysis that reflects thorough consideration of complexity of issue	Possibly refute major counterarguments or consider contexts integral to issue (e.g., cultural, ethical, social, political)	Assert insightful position and provide multiple sound reasons to justify it	Assert insightful position and provide multiple sound reasons to justify it	Assert insightful position and provide multiple sound reasons to justify it
<p><u>Critique-an-Argument</u> <i>Interpret, analyze, and evaluate quality of information</i> <i>Highlight conflicting information</i> <i>Detect flaws in logic and questionable assumptions</i> <i>Explain why information is credible, unreliable, or limited</i> <i>This score is also used as a measure of Recognition of Logical Fallacies in Arguments."</i></p>						
Analytic Reasoning and Evaluation	Demonstrate accurate understanding of complete argument	Identify multiple deficiencies in argument	Identify multiple deficiencies in argument	Identify multiple deficiencies in argument	Provide analysis beyond obvious	Provide analysis beyond obvious