

General Education - Critical Thinking and Assessment - Oct. 10, 2014

LAURA BLASI & KAREN BORGLUM

CURRICULUM AND ASSESSMENT

The Goal of the workshop

- Have a shared understanding of the Critical Thinking work at Valencia.
- Simplify the assessment of Critical Thinking in the General Education Program.

Agenda

1. History of the Critical Thinking Outcome at Valencia
2. Results from the 2014-2015 Assessment
3. *The Thinker's Guide to Analytic Thinking* – The Blue Book
4. Reflection and Application Activities
5. Next Steps – The Assessment Activities for Fall 2014

Part I – History of the Critical Thinking Outcome

Critical Thinking

Critical Thinking is applying systematic thinking based on evidence across disciplines, for example, from poetry to chemistry. *We think critically* by evaluating assumptions in light of data, trying to create explanations, and considering appropriate action steps (Brookfield, 1987). The ability to think critically, in relation to problem solving, is high among employer expectations.

Richard Paul's (1995) comprehensive model lists seven key components of critical thinking:

- Purpose
- Key Questions
- Data
- Concepts
- Implications
- Assumptions
- Point of View

Year of Think

The Year of THINK was held in 2005-06 focused on assessing the THINK Competency. The objective of the project was to investigate an assessment process for Valencia's core competency of THINK grounded in the evaluation of actual student work. This was assessed as part of Think, Value, Communicate, and Act (TVCA.)

Rubric for the Analytical of Critical Thinking across the Curriculum

Year of Think-Rubric

Use of Evidence	THINK Indicators	Levels of Achievement			
		Beginning	Developing	Competent	Accomplished
	Analyzing information: data, ideas, or concepts	Inaccurate Copies information (data, ideas, or concepts) often inaccurately, incompletely, or omits relevant information	Correct Reports information (data, ideas, or concepts) with minor inaccuracies, irrelevancies, or omissions	Accurate Presents information (data, ideas, or concepts) accurately and appropriately in familiar contexts	Precise Interprets information (data, ideas, or concepts) accurately, appropriately and in-depth in new contexts
Bias	Presenting multiple solutions, positions or perspectives	Singular Names a single solution, position, or perspective, often inaccurately, or fails to present a solution, position or perspective	Dualistic Identifies simple solutions, over-simplified positions, or perspectives with minor inaccuracies	Multiplistic Describes two or more solutions, positions, or perspectives accurately	Balanced Explains—accurately and thoroughly—multiple solutions, positions, or perspectives that balance opposing points of view
Context	Subject Knowledge: depth of content, relevant support, clear explanation	Illogical Attempts a conclusion or solution that is inconsistent with evidence presented, that is illogical, or omits a conclusion or solution altogether	Reasonable Offers an abbreviated conclusion or simple solution that is mostly consistent with evidence presented, with minor inconsistencies or omissions	Logical Organizes a conclusion or solution that is complete, logical, and consistent with evidence presented	Perceptive Creates a detailed conclusion or complex solution that is well-supported, logically consistent, complete and often unique

Critical Thinking

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Use of Evidence



Bias



Context



Gen Ed Checklist: Critical Thinking- 2014

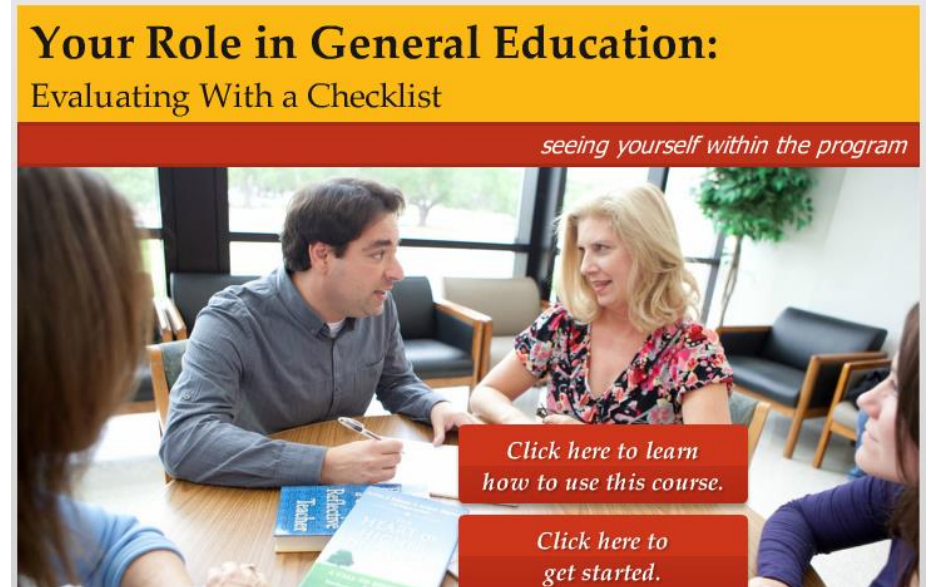
Overall, this student:		Yes	No	N/A
A1 Critical Thinking - Influence of <u>Context</u>	Examines the relevance of appropriate contexts when presenting ideas.			
A2 Critical Thinking – <u>Bias</u>	Effectively analyzes own and others' assumptions			
A3 Critical Thinking – <u>Use of Evidence</u>	Demonstrates a comprehensive synthesis or analysis of issues, ideas, artifacts, or events.			

Faculty work leading to Fall 2014

Faculty members in the Humanities, Comp I & II, and the Social Sciences met on the afternoon of Assessment Day and identified the need for an online training for use of the Checklist (LOBP 3333).

Science faculty members have been developing and administering multiple choice questions over the past several years and raised the need for more reliable and valid questions.

All of the Gen Ed disciplines are looking to assess Critical Thinking in meaningful ways.



Your Role in General Education:
Evaluating With a Checklist

seeing yourself within the program

[Click here to learn how to use this course.](#)

[Click here to get started.](#)

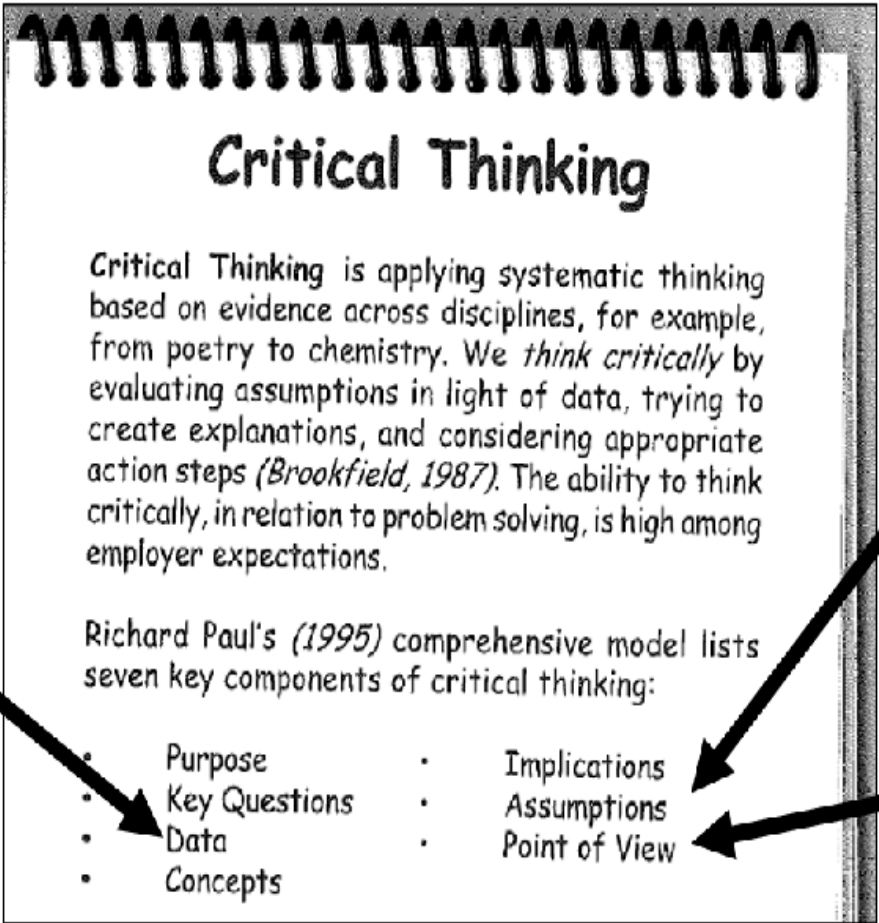
House Bill 7135

House Bill 7135 **Florida Statute 1007.25 General education courses; common prerequisites; other degree requirements.** Each general education core course option must contain high-level academic and critical thinking skills and common competencies that students must demonstrate to successfully complete the course.

The Assessment of Student Learning Outcomes in General Education—2014-2015

General Education Learning Outcomes		Communications		Humanities <small>Assignment with Rubric / Checklist Randomized Sample</small>	Mathematics <small>Exam Randomized Sample</small>	Science <small>Exam All Students</small>	Social Science <small>Standardized Assessment Randomized Sample</small>	NSE <small>Assignment with Rubric / Checklist Randomized Sample</small>
		English <small>Assignment with Rubric / Checklist Randomized Sample Camp 1 & 2</small>	Speech <small>Assignment with Rubric / Checklist Randomized Sample</small>					
Critical Thinking	Critical Thinking	X	X	X	X	X	X	X
	Quantitative Reasoning				X <small>All Gen Ed Math Classes</small>			
	Scientific Reasoning					X <small>All Gen Ed Science Classes</small>		
Communication	Written Communication	X		X			X	
	Oral Communication		X					X
	Interpersonal Communication		X					X
Ethical Responsibility							X	X
Cultural & Historical Understanding				X <small>All Gen Ed Humanities Classes</small>				
Information Literacy		X		X			X	

The Assessment of Student Learning Outcomes in General Education—2014-2015

General Education Learning Outcomes	Communications			Humanities	Mathematics	Science	Social Science		
	NSE Assignments with Checklist Randomized Sample	English Assignment with Checklist Randomized Sample Comp I & II	Speech Assignment with Checklist Randomized Sample					Assignment with Checklist Randomized Sample	Exam Randomized Sample
Critical Thinking									
Quantitative Reasoning	<div style="border: 1px solid black; padding: 10px;">  <h3 style="text-align: center;">Critical Thinking</h3> <p>Critical Thinking is applying systematic thinking based on evidence across disciplines, for example, from poetry to chemistry. We <i>think critically</i> by evaluating assumptions in light of data, trying to create explanations, and considering appropriate action steps (<i>Brookfield, 1987</i>). The ability to think critically, in relation to problem solving, is high among employer expectations.</p> <p>Richard Paul's (1995) comprehensive model lists seven key components of critical thinking:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> • Purpose • Key Questions • Data • Concepts </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> • Implications • Assumptions • Point of View </td> </tr> </table> </div>							<ul style="list-style-type: none"> • Purpose • Key Questions • Data • Concepts 	<ul style="list-style-type: none"> • Implications • Assumptions • Point of View
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Use of Evidence

Bias

Context

2013-2014 What we have been learning

Fall 2013: English and Humanities

- Students completed written assignments that the faculty members had piloted and refined over the past three years in English and Humanities
- Over 450 students were assessed.
- The results were documented using the faculty-developed checklist tied to specific outcomes (including Critical Thinking and Written Communication.)

Assignment Instructions HUM2250 – 20th Century Humanities

- 1) Describe and discuss the impact of (**Column A**) upon the development of (**Column B**). Be sure to reference at least one specific example (primary source) of visual art, theater/film, etc., to illustrate your conclusions. You must discuss in detail the historical context of (**the specific example used from Column B**). Your paper must be between 750-1250 original words in length.
- 2) Compare and contrast two examples (works) of (**Column B**) that detail the change in the medium influenced by (**Column A**). Be sure to reference at least two specific examples (primary sources) of visual art, theater/film, etc., to illustrate your conclusions. You must discuss in detail the historical context of (**the specific example used from Column B**). Your paper must be between 750-1250 original words in length.

Column A	Column B
Existentialism	Visual Art
Freudian Revolution/New Psychology	Literature
World War(s)	Architecture
Ethnic/Racial Identity	Philosophy/Religion
Globalization	Performing Arts
Modernism	

Critical Thinking was Assessed: English and Humanities

Critical Thinking

Students will be able to effectively **analyze, evaluate, synthesize, and apply** information and ideas from diverse sources and disciplines.

Evaluation of Context

English 76.7%

Humanities 76.7%

Analyzes Assumptions

English 73.7%

Use of Evidence

English 63.4%

Humanities 63.4%

English N= 480

Humanities N= 210

Fall 2013: Student Success (SLS) and Speech

For the first time samples of student work in the Student Success (SLS) courses and in the Speech courses were assessed using the same rubric with a focus on Critical Thinking as well as Oral and Interpersonal Communication outcomes (assessing a total of 1,492 students.)

SLS & Speech: Critical Thinking Assessed in “Central Message” and “Supporting Materials”

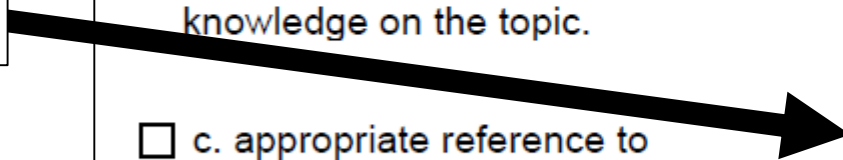
II. Central Message:

- a. can be deduced, but is NOT EXPLICITLY STATED in the presentation.
- b. is BASICALLY UNDERSTANDABLE but is not often repeated and is not memorable.
- c. is CLEAR AND CONSISTENT with the supporting material.
- d. is COMPELLING (precisely stated, appropriately, repeated, memorable, and strongly supported.)

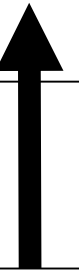
III. Supporting Materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make:

- a. insufficient supporting materials make reference to information or analysis that MINIMALLY SUPPORTS the presentation or establishes the presenter's knowledge on the topic.
- b. appropriate reference to information or analysis that PARTIALLY SUPPORTS the presentation or establishes the presenter's knowledge on the topic.
- c. appropriate reference to information or analysis that GENERALLY SUPPORTS the presentation or establishes the presenter's knowledge on the topic.
- d. appropriate reference to information or analysis that SIGNIFICANTLY SUPPORTS the presentation or establishes the presenter's knowledge on the topic.

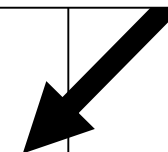
Bias



Context



Use of Evidence



Critical Thinking was Assessed: SLS and Speech

Critical Thinking

Students will be able to effectively **analyze, evaluate, synthesize, and apply** information and ideas from diverse sources and disciplines.

Central Message

(logically derived from critical analysis, etc.)

SLS 65% / Speech 81%

Supporting Materials

(explanations, examples, etc.)

SLS 70% / Speech 74%

SLS N= 691

Speech N= 782

Fall 2013: Science and Math

Students across all of the science courses were invited into the assessment (with 3,255 responding) to take a short online exam that the instructors had piloted and refined over the past two years. Students in Math were also assessed (141) using exam questions that had also been developed and refined prior.

Quantitative Reasoning as Critical Thinking

Critical Thinking

Students will be able to demonstrate quantitative reasoning.

N= 141

Classifying and utilizing facts and formulas correctly
Average score in **Math: 2.15**
(37.5% scored a 3 or higher)

Drawing well-supported conclusions
Average score in **Math: 2.04**
(31.7% scored a 3 or higher)

Solving using appropriate procedures
Average score in **Math: 2.14**
(36.5% scored a 3 or higher)

Constructing a mathematical model
Average score in **Math: 2.11**
(34.6% scored a 3 or higher)

Scientific Reasoning as Critical Thinking

Critical Thinking

Students will be able to demonstrate **scientific reasoning**.

Understanding of hypothesis and related inferences

49% scored a three or higher

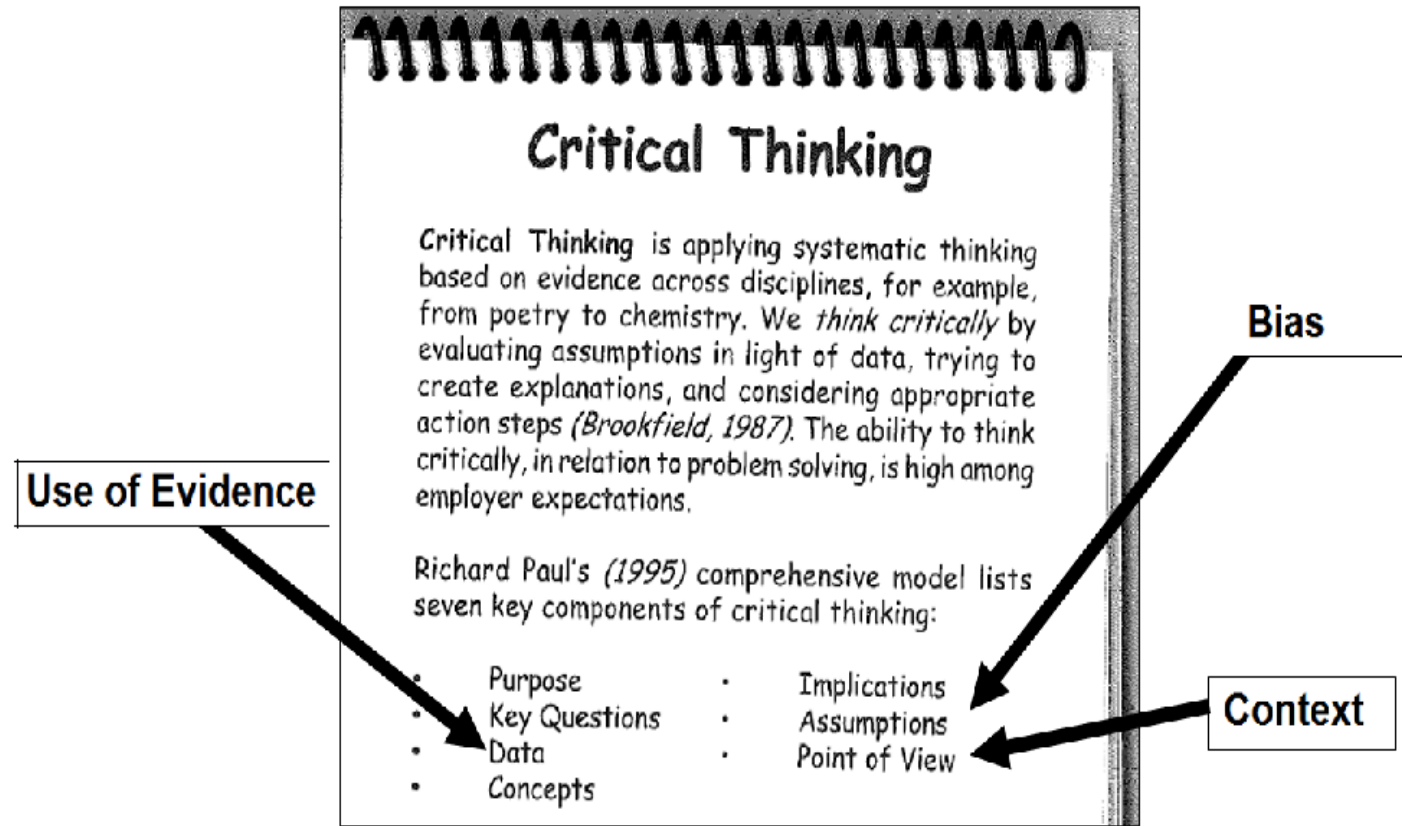
N= 3,255

Examples - Acting on the Results

Science faculty members developed tutorials over the summer to address areas they want to strengthen related to the Scientific Method. The tutorials are specific to different disciplines within science and are able to be shared with students consistently across all locations. **Science work teams were also responsible for designing discipline-specific scenarios for use as college-wide assessments** of scientific reasoning that are general enough to be implemented within any of the sciences that a student may be enrolled in during a given term.

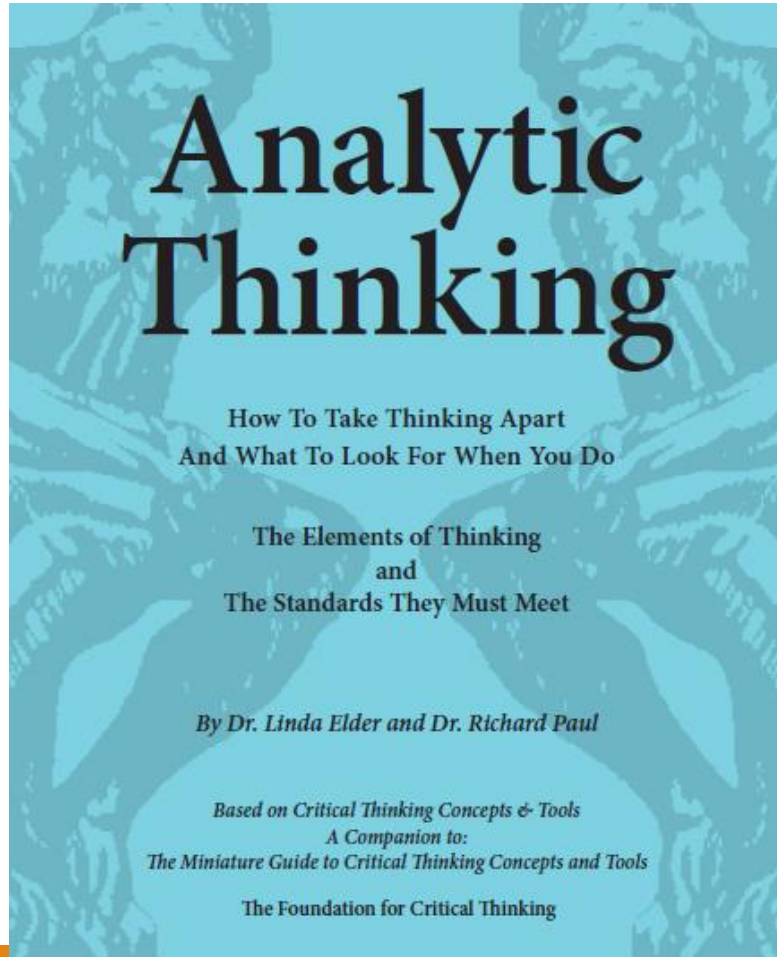
Faculty members in the Social Sciences worked in teams over the summer designing an Ethical Reasoning survey with a core set of questions and added items that are discipline-specific. They also looked for a Critical Thinking exam that could be purchased for use with a sample of students in Gen Ed. The three shared Critical Thinking indicators and the Analytical Thinking blue book will provide the foundation for Valencia's own exam.

Part II The Three Indicators of Critical Thinking in Gen Ed A Shared Understanding Based on the Blue Book



The Foundations of Analytic Thinking

How to Take Thinking Apart and What to Look for When You Do



The Elements of Thinking
and the Standards They Must Meet
By Dr. Linda Elder and Dr. Richard Paul

“I’ll do my best to fix your car, but frankly I’ve never understood the parts of the engine...”

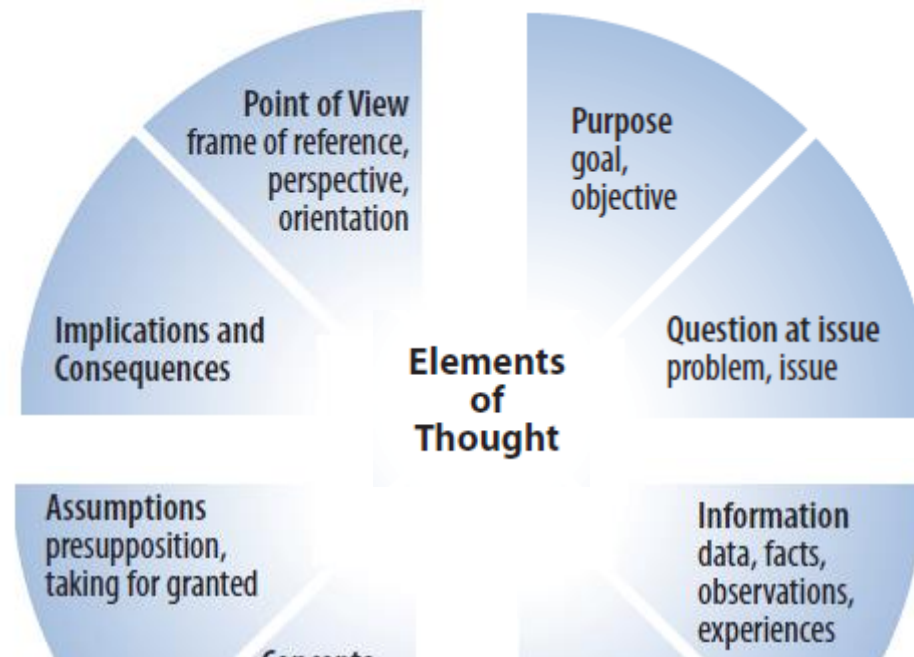
...what would we think of an auto mechanic who said, “I’ll do my best to fix your car, but frankly I’ve never understood the parts of the engine....”

....or of a grammarian who said, “Sorry, but I have always been confused about how to identify the parts of speech.”

Clearly, students should not be asked to do analysis if they do not have a clear model, and the requisite foundations, for the doing of it.

- generates purposes
- raises questions
- uses information
- utilizes concepts
- makes inferences
- makes assumptions
- generates implications
- embodies a point of view

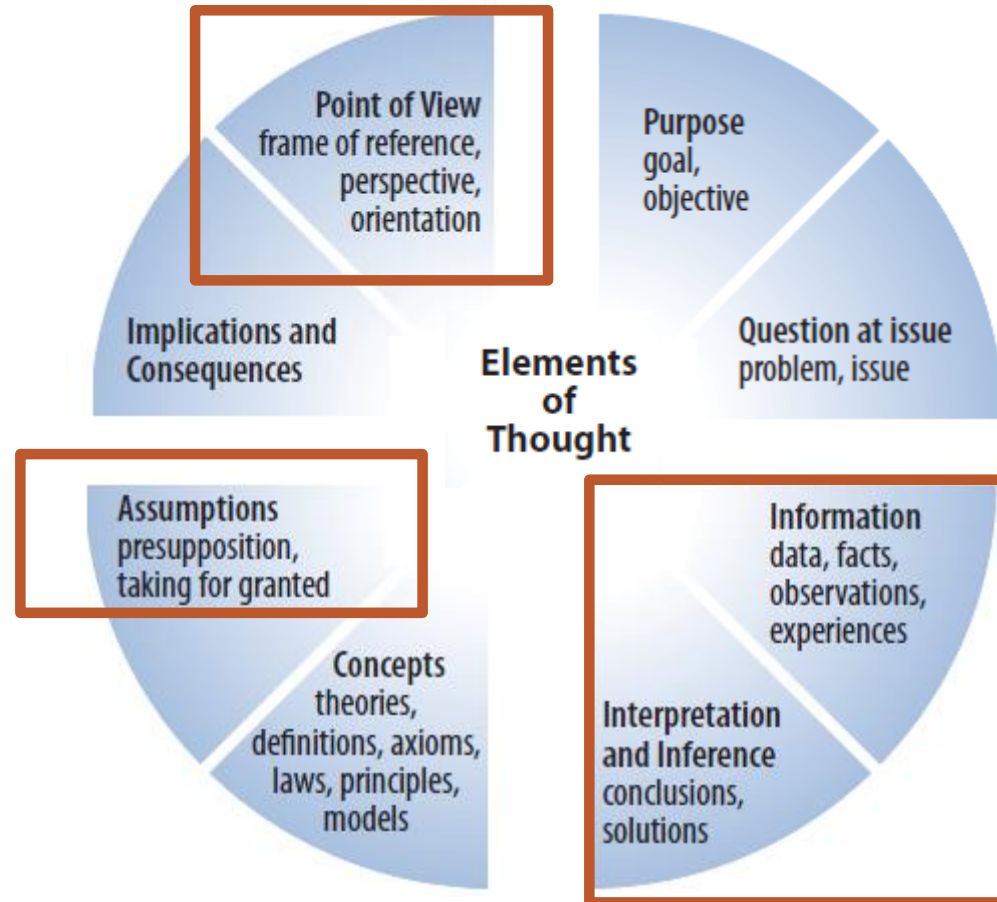
All Thinking Is Defined by the Eight Elements That Make It Up



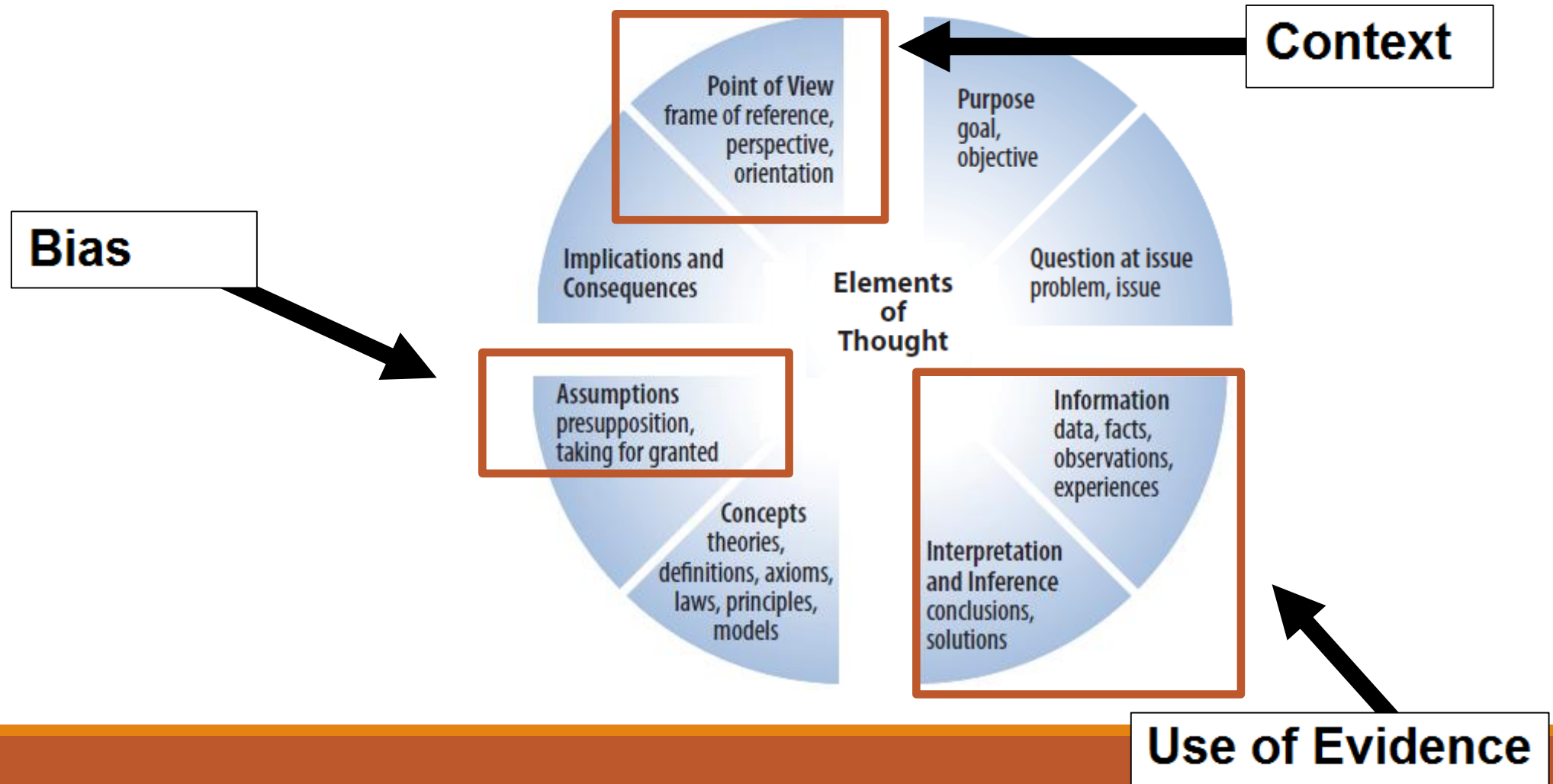
Essential Idea: There are eight structures that define thinking. Learning to analyze thinking requires practice in identifying these structures in use.

- generates purposes
- raises questions
- uses information
- utilizes concepts
- makes inferences
- makes assumptions
- generates implications
- embodies a point of view

All Thinking Is Defined by the Eight Elements That Make It Up



All Thinking Is Defined by the Eight Elements That Make It Up



For Reflection and Discussion

From the blue book section on “Analyzing the Logic of a Subject.”

Context in my discipline...

- What is the main purpose or goal of studying this subject?
- What are people in this field trying to accomplish?

Evidence in my discipline....

- What types of inferences or judgments do they typically make? (Judgments about...)

Bias in my discipline.....

- What do professionals in this field take for granted or assume?

Consider the three indicators from Valencia's General Education Program in the Context of your Discipline

Critical Thinking- 2014

Context

Bias

Use of Evidence

Overall, this student:	
1 Critical Thinking - Influence of <u>Context</u>	Examines the relevance of appropriate contexts when presenting ideas.
2 Critical Thinking - <u>Bias</u>	Effectively analyzes own and others' assumptions
3 Critical Thinking - <u>Use of Evidence</u>	Demonstrates a comprehensive synthesis or analysis of issues, ideas, artifacts, or events.

What question might you ask a student in your discipline so you could see whether or not they can apply one of these three skills?

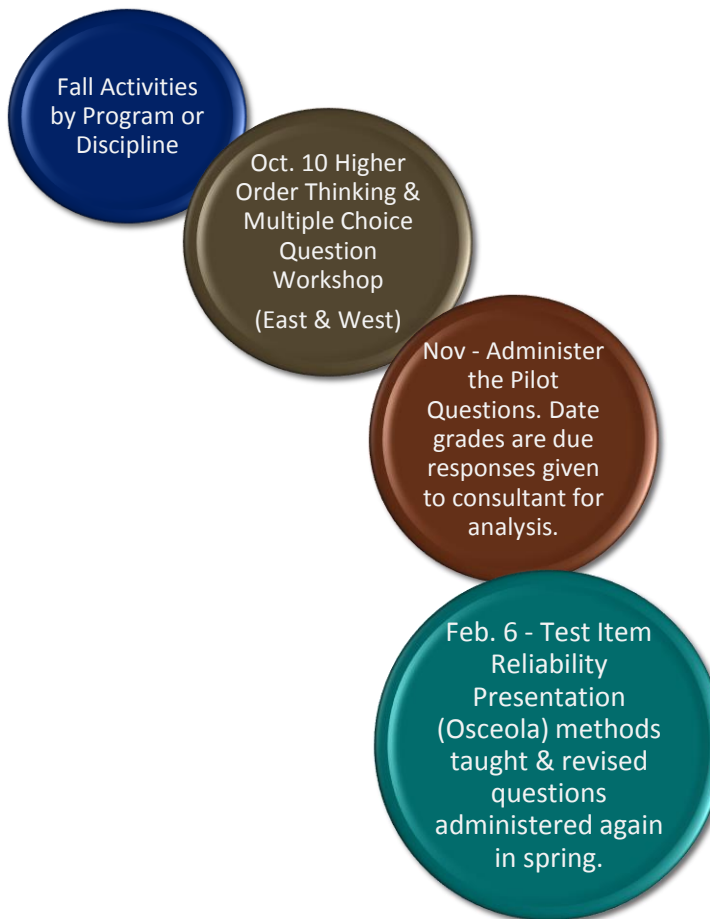
1. **Critical Thinking:** Effectively analyze, evaluate, synthesize, and apply information and ideas from diverse sources and disciplines

Humanities

Science

Social Science

2. **Quantitative and Scientific Reasoning:** Use processes, procedures, data, or evidence to solve problems and make effective decisions
3. **Communication Skills:** Engage in effective interpersonal, oral, written communication
4. **Cultural and Historical Understanding:** Demonstrate understanding of the diverse traditions of the world, and an individual's place in it
5. **Information Literacy:** Locate, evaluate, and effectively use information from diverse sources
6. **Ethical Reasoning:** Demonstrate awareness of personal responsibility in one's civic, social, and academic life



Workshop template to document faculty-developed Multiple Choice Question (MCQ) items

MCQ Template - Directions:

Please use this template to submit multiple choice questions (MCQ) by Oct. 27th. These will be reviewed by faculty in the discipline for use in the Gen. Ed. bank of test items for program assessment. They will be piloted in November, analyzed for reliability in December, and the results presented by a statistician from USF at a related meeting in February.

Critical Thinking- 2014

Overall, this student:	
1 Critical Thinking - Influence of <u>Context</u>	Examines the relevance of appropriate contexts when presenting ideas.
2 Critical Thinking - <u>Bias</u>	Effectively analyzes own and others' assumptions
3 Critical Thinking - <u>Use of Evidence</u>	Demonstrates a comprehensive synthesis or analysis of issues, ideas, artifacts, or events.

Question Development for the General Education Critical Thinking Outcome Assessment		
Date:		
Your Name and E-mail:		Three Indicators of Critical Thinking Your question should ask students to demonstrate one of the three indicators of critical thinking that faculty members have decided to assess in the General Education program. Please select one of the three below.
Your Discipline / Program:		
The subject area/ discipline specific to this question:		
Question:	Possible Answers:	
	a.	
	b.	
	c.	
		<input type="checkbox"/> Context <input type="checkbox"/> Bias

The Assessment Workshops

East Campus

Morning Session

Session Locations: 8-101 & 8-144

8:30AM – 9:00AM

Light breakfast and refreshments (Room 8-101)

9:00AM – 10:00AM

Critical Thinking Discussion (Room 8-101)

10:00AM – 12:00PM

Multiple Choice Question (Room 8-101) or
Essay Question Development (Room 8-144)

West Campus

Afternoon Session

Session Location: 11-106 & 11-216

1:30PM – 2:00PM

Light snacks and refreshments (Room 11-106)

2:00PM – 3:00PM

Critical Thinking Discussion (Room 11-106)

3:00PM – 5:00PM

Multiple Choice Question (Room 11-106) or
Essay Question Development (Room 11-216)

Dr. Steven Downing - MCQ

- Dr. Downing received a Ph.D. from Michigan State University in Educational Psychology, specializing in educational measurement and has worked extensively with high stakes testing programs in medicine and the professions.
- Prior to joining the University of Illinois at Chicago faculty in 2001, he was Director of Health Programs at the American College Testing Program, Director of Client Programs and Deputy Vice President at the National Board of Medical Examiners (NBME), Senior Psychometrician and Senior Program Manager for the Institute for Clinical Evaluation at the American Board of Internal Medicine.
- Now retired Prof. Downing consults for various national and international programs in all areas of test development and psychometrics, with particular interest in selected-response formats, test validity issues, testing program evaluation, and computer-based testing. Dr. Downing is the senior editor of the *Handbook of Test Development* (2006) and *Assessment in Health Professions Education* (2009.)