

BUCCS 9/26/07 Table Notes

1. Attributes:

- Ability to solve complex problems
- Ability to reason logically
- Ability to recognize faculty logic
- Culminates in an action
- Learned moral and ethical basis

2. How do you measure?

- Solve and defend a solution to a complex problem
- Being able to stand up and defend your decision and the process of getting there

1. What does critical thinking look like?

- Gathering information related
- Listening and comprehending statements of others
- Objectively considering the information available to form an opinion, provide a response, make a decision, etc.
- Considering reliability and accuracy of information sources in weighing their value
- Ability to formulate questions to gain more information, determine accuracy and pertinence of information, etc.
- Using experiential learning
- Solving problems
- Able to make decisions without all pertinent information
- Ability to make a reasoned argument

2. What is critical thinking?

- Separating the Wheat from the Chaff
- Once separated, what to do with the results and why
- Assess relative merit (claims, logical, structure)
- Robustness of process, tools to make it possible
- Reflection on the ?? assumptions evidence, and logical inferences that lead to opinions and knowledge claims
- Ability to look openly and pointedly at issues and topics to assess their merit and/or import
- Term should be dropped “Think outside the box”

Engaged thinking

1. No one-sized

2. Logic

3. Out-of-box, well red – well ???

Ability to evaluate information

- Veracity
- Relevance
- Reliability

Ability to find/seek information that fits those parameters and utilize info ?? to pre-conceived “knowledge”

Ability to shape thought, arguments, offer coherent “application” of info

Part 1 –Define

Consider multiple possibilities perspectives before acting/responding experiences

Thinking reflective not reflexive deeply about a problem/topic – not reflexive response – not just reiteration of known facts – application of knowledge base to problem

Thinking that analyses/assesses/transforms thought

Thinking that is universality & adaptive able to apply logic/reason to problems/topics in diverse fields/different circumstances – adaptive
Should be introduced in several/many forums and evidenced throughout core experience
Thought that goes outside/beyond the “rote” response and entering requires student/person to in thought go outside the comfort zone
Continuity –applying info foundation from previous courses

Part 2 – Attributes

Attributes – open, inclusive (within appropriate consideration)
Being able to take info/knowledge base and design approach/experience to answer next questions especially if design approach to test (disprove) your theory question premise
Goes beyond comfort zone/out of box
Creative – imaginative, prepared
Ability to look at likelihood/experience
Deliberate, reflective
Measure – pose problem/goal without direction and ask to solve/achieve

Brainstorming (individual)

1. Logically think, analyze, reach conclusions based on reasoning
Students derive at answers to problems and working through steps, analyze situations
Consider option and outcomes
 2. Realize gray areas
Expanding beyond that is “seen” to imagine that which is not
Ability to evaluate information (veracity, relevance, reliability, etc.)
Ability to find/seek information that fits those parameters and to utilize info contrary to pre-conceived “knowledge”
Ability to shape thoughts, arguments, offer coherent “application” of information
Question ideas and opinions
Understanding the difference between ideas and opinions
Listening and deeply considering many diverse ideas, perceptions, perspectives
It either looks combative (delegate) – ratiocinative or collaborative (convergent) emphatic thinking
It acquires substantive engagement – diverse world views perception and perspectives and opinions
Preparation, investigation, analysis, use
CT involves investigation (looking at various sources, perspectives, opinions) evaluating it, analyzing it, internalizing it and acting on it
How to measure?
Application
Applied results
- Attributes of CI vary based on the specificity of what is to be considered and how

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Searching strategies – focus, bigger picture, assess topic/sources
Ethics – assess options – analyze/having awareness
Use of licensed resources 1st – to assess other source later

PT Health Sciences - Go beyond your belief system and experience

FCS – What is the problem to be solved

breaking down

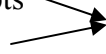
English – Reading/writing – pieces – analysis

Stages of critical thinking Novice – Expert

Attributes and Assessments

Assess – conversation- concepts

personal – sources



Results

process – reaction product – built to conclusion, to outcome

Habit/buying vs. rational purchase

Definition – redefinition – expanded definition

Evidence based practice/assessment/plan

Paper/evidence – conference – conversations – collaboration - End Results

Pass exams

Problem solvers

Communication

Critical thinking

Analytical thinking - Not always answers

Breakdown

Arguments - Research

Assumptions - Indepth knowledge

Evaluation - Debate

What is it based on - Free of bias

Perspectives - Collection of data

Process of analysis, inquiring, debate, perspective, recognizing assumptions, using evidence to work conclusions

Creative? Creative solutions

Not just: facts, answers

Problem solvers

Communicate ideas

Research

Collaboration

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Critical thinking as a renaming of the scientific method for problem solving

Process of identifying components, analyzing, synthesizing and evaluation

Logical way/process/methodology

Alternative view: thinking about the thought process

Read – Paul & Elder: “C.T. is the art of analyzing and evaluating thinking with a view to improving it.” From their little book

Exposition of what mathematicians view as C.T.

How to assess?

1. If you define critical thinking as problem solving, then assessment is easy: can you solve the problem at hand

2. For the more esoteric view of C.T. as thinking about thinking, assessment is: challenging students to identify underlying/hidden thought process

Examples: how assessment is done in:

BIO: Generate testable hypothesis; eliminate unwarranted hypoth

PT: Case studies

Math: Prior need: well defined terms

EE: the ability to understand “why” (why did you assume what you assumed) thinking about your own thought process

Critical thinking Attributes – problems solving strategies * evaluate validity of outcome – outcome measures (FCS)

Objectivity

Considering all points of view

Depth. . . ask questions

Common ground – dialogue, conflict

Define problem

Logic

Methodology

Civil discourse

Steps to a solution

Content and free reasoning

Measure: know it has taken place?

Follow process – define problem, strategy to solve, state outcome, assess outcome

Formulate question/debate

Essays

Using secondary sources

Counter factual thinking

Set of evaluative criteria

Formal logic or reasoning

Definition: Discern, determine whether something is true. Reason whether

Growing engagement and interaction with a subject

Take information and build structure

Thinking analytically Awareness that knowledge can be infinite

Awareness that premise and framework could be faulty

Develop a love for the process (deep) engagement

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Defining Critical Thinking: What is it? What does it look like?

Involves multiple possibilities, experiences, perspectives before acting or responding
Analyzes, assesses, transforms thought
Process of separating the shaft from the wheat
Once separated, what do you do with results and why?
Traditional cultures: poetry within critical thinking sophisticated analyses
Willingness to look at yourself and your own thinking
Critical thinking is engaged thinking
Investigation – various sources, perspectives, opinions
Evaluating for real-life impact
Learn something that means something to you
Are we trying to train people to be good thinkers? Do we need the term?
Maybe we really mean educated, informed thinkers and educated includes
thought/reflection/understanding what you don't know
Critical thinking leads to critical action what we're not pushing is teaching them how to act
Is critical thinking the same thing for all disciplines? Are we looking for a one-size-fits-all
definition?
Matters of fact, law, opinion, belief part of critical thinking is understanding differences between
terms, learning to differentiate between fact and opinion, use of analytic tools to reach these
conclusions
Analytic tools, how do we determine relative merits of an opinion or knowledge claim, different
from good thinking or helpful thinking, may not relate to all aspects of life/education, e.g. poetry
Thinking that is deep on a problem or topic, not simply a reflexive response
Universal and adaptive, applied across disciplines
What to do with results and why after separating wheat and chaff
Reflection on assumptions, inferences that had to knowledge claims
Across cultures, throughout time two processes involved: 1) separating 2) finding commonalities
Oral written expressions of thinking in the whole continuum of education from early experiences
throughout higher education
Critical thinking is different from "good thinking"

Summary #1

Goal: Is there enough common understanding for shared attributes to emerge?
Process of thinking and making a determination about what is being scrutinized. Analytic
assessment process to come to a conclusion (goal in mind)
Disagreement: Willingness to take action/ or not take action (Same or different attribute?)
Important to recognize feminist critique questioning the history from Plato in western thought.
Androcentric view is not the only framework in thinking. Important to embrace diversity of
world views
Educated person? Good thinking? Goal – not helpful for the process
Critical thinking is a process of becoming a critical actor
Assessing relative logical merit of an argument
Ability to look openly and pointedly at issues and topics to assess impact and import
Vacuous – do not use
Internalizing – expressing what is important to you

Value in curriculum is one's ability to think as part as a civil society – willing to look at self openly and honestly

Assessing Critical Thinking: What are its attributes? How do you measure it?

Measurement:

To solve and defend a solution to a complex problem

Defend decision and process of getting there

Well read, well rounded, willing to accept change, but knowing when to reject it

Process changes with each generation, we don't have to start from scratch any more

But don't we want to give them the skills that don't change over time

Regardless of where your starting point is, the process is applicable

If process is dependent on assumption, you have the wrong process

Pose a problem or goal without giving much or any direction, ask person to solve problem or achieve goal

Measured in its application-essay, argument, action or non-action

If everything is discipline-specific, you can measure what your discipline values, may not be able to come up with a cross-disciplinary measurement

Does technology embed a logic that encourages or discourages critical thinking? – question the input from technology

Tools may change, but process doesn't

Become dependent on a technology when we don't know how it works

Trying to understand what info you need that you may not have and what info you don't need

Dealing with uncertainty

Attributes:

Ability to solve complex problems

Ability to reason logically

Ability to recognize faculty logic

Culminates inaction

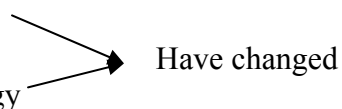
Deciding non-action

Learned, moral ethical bases

Reality

Tools

Technology



We don't understand the ability to think why, how the technology works

Investigate, observe, create

Intellectual curiosity

What info do I/do not need?

Uncertainty: not knowable bits

Set of routines (without thinking) other factors and variables

Open and inclusive with appropriate consideration, ability to take info/knowledge that includes ability to answer next logical question

Way to disprove/question a promise

Creative, imaginative, prepared to think about outcomes

Reflective and deliberate

Based on specificity of what is being considered/quantifiability, etc.

(in the absence of clarity or definition – discipline specific)

Knowing you are in the box, going to the edge of the box, being willing to go to the edge and climbing out of the box
Inductive and deductive process

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Defining Critical Thinking: What is it? What does it look like?

Reflection: Is it a skill set? Is it a habit?

Paradigm issues and shifting

Continuum of novice -----expert

Might prove useful

Knowledge based

Science based

Creative

Theory – theoretical foundation

Comprehensive - concepts across disciplines promoted at BU

Research strategies

Ethics of research

- world beyond Google
- evaluating sources
- go beyond own beliefs and experiences

What is the problem to be solved is an issue?

Breaking things to pieces/parts and examine to get to finished product

Similarity critical thinking and scientific research/process

Evidenced-based research health sciences not just fact

Process of debate is critical thinking – even without conclusion being a requirement of deciding what is best solution

Looking across areas to do critical thinking

Can be novice/expert in doing critical thinking

Analytical thinking – analysis

Different perspectives – issues of bias

Depth and breadth of knowledge

Process – analysis inquiry, debate perspectives, recognize assumption – use evidence to reach conclusion

Doesn't always have answers

Not just facts

Compare/contrast creative-critical thinking

Assessing Critical Thinking: What are its attributes? How do you measure it?

End product – solve problems, conduct research/scholarship, work in group, collaboration, communication

Research strategies (library work)

Process of working toward end product

Assess through conversations

Understanding steps in process

Creative reflection

Need clear definitions*

Overlap with creativity

Can vary across disciplines (multiple intelligence concepts)

Tied in with variety of general education classes

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Group 1 –

Processes related to validity of outcomes; means for constructive dialogue
Problem solving
Thinking about the thought process
Settled on broad definition for consensus
Gathering, processing, analyzing info (not sufficient)
Growing engagement/interaction with subject
Awareness knowledge can be infinite
Creativity=critical thinking?
Is engagement in a discipline part of critical thinking? Awareness and responsibility to community fit in (history methodology)
Commentary ↑ example of wide variance in the terminology
Knowledge is infinite (define) awareness that there may not be a solution
C.T. does not have to be part of every course
If define C.T. as problem solving
Can student address and assess underlying process - think about own thought process
Student has to do work measure work or output?
Deliberate: pause to think
Is there developmental process
Reflect too many distractions
Learn time management
Not outcome but process

Group 2 –

Don't sacrifice whole for brevity, maintain richness of concept
Problem solving strategy
Define problem and strategy to solve
Constructive dialogue agree to objective criteria
Renaming scientific method of problem solving - Define problem and method
Mathematics
Gathering info – process – outcome
Awareness that knowledge can be infinite
Challenging to truth
Critical analysis of art
Engagement of awareness of discipline components and involved in community movement through thinking process
Problem solving process
Methods of organizing thinking process
Engagement in a discipline accepting to challenging methods and conclusions
Knowledge is unbonded, may not be a final answer

Group 3 –

Assessment processes necessarily differ by discipline

How do you understand when assessment of process doesn't work versus when critical thinking is not shown?

Issue of developmental processes

Issue of support for "campus" about managing time

Don't sacrifice what the "whole" is for the sake of brevity!

Definition – Engagement of mind to connect with info

Attributes = validate knowledge identify trends

Some aspects don't know how to assess

Argumentative writing and how inability to define critical thinking can hinder

Not every moment of class will be used in critical thinking

Essay writing can demonstrate; not same across disciplines

Enablement of mind; connect with what is presented

What evidence supports conclusions

Some aspects are not assessable

Don't know how to assess critical thinking

Follow process indisciplinately formulate question and method to reach answer

Teach logic general that teaches various logics. Understand fallacious argument

