Introduction to UofL’s Critical Thinking Framework

CIS150 - Fundamentals of Information Systems
Introduction

- Why is UofL focused on critical thinking?
  - As part of the accreditation process, universities are asked to develop a university-wide quality enhancement plan to improve student learning.
  - The UofL plan, known as Ideas to Action (i2a), was developed to “sharpen our existing focus on building undergraduate students' critical thinking skills, starting in the general education program and continuing through undergraduate major courses. Students will be required to demonstrate their critical-thinking skills in a culminating experience, such as a thesis, service learning project, internship or capstone project” – from What is i2a?
  - Ideas to Action was recommended in Spring 2007.
Why Focus on Critical Thinking?

- The ability to think critically calls for a higher order thinking
  - More than simply the ability to recall information
- We want to aid students in advancing from knowledge of concepts to application, analysis, synthesis, and evaluation
- For students to be prepared to apply what they’ve learned after they graduate, their critical thinking skills have to be regularly exercised
  - Employers generally aren’t impressed by one’s ability to repeat information from a textbook
  - Employers want employees that can solve complex problems
    - Critical thinking is required
What is Critical Thinking?

- Definitions of critical thinking abound in educational literature.
- After a careful review of the mountainous body of literature defining critical thinking and its elements, UofL has selected the definition of Michael Scriven and Richard Paul (2003):
  - “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.”
- This conceptualization of critical thinking has been refined by Richard Paul and Linder Elder into the Paul-Elder Model of critical thinking adopted by UofL.
  - The model is comprehensive, uses discipline-neutral terminology, and is applicable to all disciplines.
### Paul-Elder Critical Thinking Framework

#### Intellectual Standards

<table>
<thead>
<tr>
<th>Accuracy</th>
<th>Precision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarity</td>
<td>Depth</td>
</tr>
<tr>
<td>Relevance</td>
<td>Significance</td>
</tr>
<tr>
<td>Logical</td>
<td>Fairness</td>
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<tr>
<td>Sufficiency</td>
<td>Breadth</td>
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</tbody>
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Which leads to deeper

#### Intellectual Traits

<table>
<thead>
<tr>
<th>Humility</th>
<th>Perseverance</th>
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<tbody>
<tr>
<td>Autonomy</td>
<td>Empathy</td>
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<tr>
<td>Fair-mindedness</td>
<td>Integrity</td>
</tr>
<tr>
<td>Courage</td>
<td>Confidence in reasoning</td>
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</table>

Must be applied to

#### Elements of Thought

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Inferences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
<td>Concepts</td>
</tr>
<tr>
<td>Point of view</td>
<td>Implications</td>
</tr>
<tr>
<td>Information</td>
<td>Assumptions</td>
</tr>
</tbody>
</table>

to develop
Elements of Thought/Reasoning

- **Point of View**
  - frames of reference, perspectives, orientations

- **Purpose**
  - goals, objectives

- **Question at Issue**
  - problem, issue

- **Information**
  - data, facts, observations, experiences

- **Interpretation & Inference**
  - conclusions, solutions

- **Concepts**
  - theories, definitions, laws, principles, models

- **Assumptions**
  - presuppositions, axioms, taking for granted

- **Implications & Consequences**

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Checklist for Reasoning

1. All reasoning has a PURPOSE
   - State your purpose clearly
   - Distinguish your purpose from related purposes
   - Check periodically to be sure you are still on target
   - Choose significant and realistic purposes

2. All reasoning is an attempt to FIGURE something out, to settle some QUESTION, solve some PROBLEM
   - State the question at issue clearly and precisely
   - Express the question in several ways to clarify its meaning and scope
   - Break the question into sub-questions
   - Distinguish questions that have definitive answers from those that are a matter of opinion and from those that require consideration of multiple viewpoints
Checklist for Reasoning

3. All reasoning is based on ASSUMPTIONS
   - Clearly identify your assumptions and determine whether they are justifiable
   - Consider how your assumptions are shaping your point of view

4. All reasoning is done from some POINT OF VIEW
   - Identify your point of view
   - Seek other points of view and identify their strengths as well as weaknesses
   - Strive to be fair-minded in evaluating various points of view and the perspectives that others might have on a given issue
Checklist for Reasoning

5. All reasoning is based on DATA, INFORMATION and EVIDENCE
   - Restrict your claims to those supported by the data you have
   - Search for information that opposes your position as well as information that supports it
   - Make sure that all information used is clear, accurate, and relevant to the question at issue
   - Make sure you have gathered sufficient information

6. All reasoning is expressed through, and shaped by, CONCEPTS and IDEAS
   - Identify key concepts and explain them clearly
   - Consider alternative concepts or alternative definitions of concepts
   - Make sure you are using concepts with care and precision
Checklist for Reasoning

7. All reasoning contains INFERENCES or INTERPRETATIONS by which we draw CONCLUSIONS and give meaning to data
   - Infer only what the evidence implies
   - Check inferences for their consistency with each other
   - Identify assumptions that lead to inferences

8. All reasoning leads somewhere or has IMPLICATIONS and CONSEQUENCES
   - Trace the implications and consequences that follow from your reasoning
   - Search for negative as well as positive implications
   - Consider all possible consequences

-from the *Miniature Guide to Critical Thinking Concepts & Tools*
Questions using the Elements of Thought

- **Purpose**
  - What am I trying to accomplish? Why?
  - What is my central aim? My purpose?

- **Questions**
  - What question am I raising?
  - What question am I addressing?
  - Am I considering the complexities in the question?

- **Information**
  - What information am I using in coming to that conclusion?
  - What experience have I had to support this claim?
  - What information do I need to settle the question?
Questions using the Elements of Thought

- **Inferences/Conclusions**
  - How did I reach this conclusion?
  - Is there another way to interpret the information?

- **Concepts**
  - What is the main idea here?
  - Can I explain this idea?

- **Assumptions**
  - What am I taking for granted?
  - What assumption has led me to that conclusion?
Questions using the Elements of Thought

- Implications/Consequences
  - If someone accepted my position, what would be the implications?
  - What am I implying?

- Points of View
  - From what point of view am I looking at this issue?
  - Is there another point of view I should consider?

—from the *Miniature Guide to Critical Thinking Concepts & Tools*
Universal Intellectual Standards

Universal intellectual standards are standards which should be applied to thinking to ensure its quality

- **Clarity**
  - Clarity is a gateway standard. If a statement is unclear, we cannot determine whether it is accurate or relevant. In fact, we cannot tell anything about it because we don’t yet know what it is saying.

- **Accuracy**
  - A statement can be clear but not accurate, as in “Most dogs are over 300 pounds in weight.”

- **Precision**
  - A statement can be both clear and accurate, but not precise, as in “Jack is overweight.” (We don’t know how overweight Jack is, one pound or 500 pounds.)
Universal Intellectual Standards

- **Relevance**
  - A statement can be clear, accurate, and precise, but not relevant to the question at issue

- **Depth**
  - A statement can be clear, accurate, precise, and relevant, but superficial (that is, lack depth)

- **Breadth**
  - A line of reasoning may be clear, accurate, precise, relevant, and deep, but lack breadth (as in an argument from either the conservative or liberal standpoints which gets deeply into an issue, but only recognizes the insights of one side of the question)
Universal Intellectual Standards

- **Logic**
  - When we think, we bring a variety of thoughts together into some order. When the combination of thoughts are mutually supporting and make sense in combination, the thinking is “logical.” When the combination is not mutually supporting, is contradictory in some sense, or does not “make sense,” the combination is “not logical.”

- **Significance**
  - Focusing on the important, not trivial

- **Fairness**
  - We naturally think from our own perspective, from a point of view which tends to privilege our position. Fairness implies the treating of all relevant viewpoints alike without reference to one’s own feelings or interests.

-from the *Miniature Guide to Critical Thinking Concepts & Tools*
Questions using the Intellectual Standards

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

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

- **Precision**
  - Could you be more specific?
  - Could you give me more details?
  - Could you be more exact?
Questions using the Intellectual Standards

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

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

- **Breadth**
  - Do we need to look at this from another perspective?
  - Do we need to consider another point of view?
  - Do we need to look at this in other ways?
Questions using the Intellectual Standards

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

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

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

-from the *Miniature Guide to Critical Thinking Concepts & Tools*
The Well-Cultivated Thinker

- The well-cultivated thinker:
  - raises vital questions and problems, formulating them clearly and precisely;
  - gathers and assesses relevant information, using abstract ideas to interpret it effectively;
  - comes to well-reasoned conclusions and solutions, testing them against relevant criteria and standards;
  - thinks openmindedly within alternative systems of thought, recognizing and assessing, as need be, their assumptions, implications, and practical consequences; and
  - communicates effectively with others in figuring out solutions to complex problems.

-from the *Miniature Guide to Critical Thinking Concepts & Tools*
Stages of Critical Thinking Development

- **Unreflective Thinker**
  - We are unaware of significant problems in our thinking

- **Challenged Thinker**
  - We are faced with significant problems in our thinking

- **Beginning Thinker**
  - We try to improve but without regular practice

- **Practicing Thinker**
  - We recognize the need for regular practice

- **Advanced Thinker**
  - We advance in keeping with our practice

- **Master Thinker**
  - We advance in keeping with our practice
Critical Thinking Resources

- UofL’s *Ideas To Action site*
  - What is i2a?
  - i2a Resources
  - Critical Thinking Webliography
- Paul-Elder Framework
- *Foundation for Critical Thinking*
  - *Interactive Guide* to the Elements of Reasoning and Intellectual Standards
  - *Where to Begin* for University Students
  - *Articles for Students*
  - *Critical Thinking in the News*
Summary

- The ability to think critically necessitates a higher order thinking than you may have been exposed to in the past
  - More than simply the ability to recall information
- Some questions you should be able to answer include:
  - What is meant by critical thinking?
  - What are the elements of thought in the Paul-Elder model of critical thinking?
  - What are the universal intellectual standards in the Paul-Elder model by which we judge the quality of thought?