

Tips for Navigating Unstructured Problems

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1. **Decide what you need to know**—*Framing productive questions*. Step one: state clearly what questions you need to answer in order to address the problem. That requires stating the problem and analyzing it to see what its components are. The more experience you have with problem solving, the better you will be able to know what questions will be productive.
2. **Investigate the possibilities**—*Assessing information*. Become expert in using libraries and computer databases to get relevant information and ideas. Exercise inquiry and investigative skills of your area of concentration--lab experiments, survey research, social observations, textual analysis [what we do in history].
3. **Consider the source**—*Evaluating information and information sources*. Not all ideas and information are equal. Anyone can put anything on the Internet--you must learn to be a discriminating consumer of data and opinions.
4. **Consider all points of view**—*Having a working knowledge of a range of analytic modes and the strengths and limitations of each*. The sciences, arts, humanities, and social sciences all involve different ways of approaching a problem and yield different kinds of insights. Particular problems may require understanding how people from different cultures or social groups may respond. You will need to take into account a variety of points of view and a variety of evidence.
5. **Become a person who knows a lot**—*Bringing to bear a mass of general information as a source of connections, analogies, and frameworks of ideas*. The more you know about virtually anything, the richer your problem-solving resources will be. Often an analogy or a connection between two quite different things will give you the insight you need. The more you learn and experience, the better you are able to work on problems. Clearly this process of storing up knowledge is the work of a lifetime, but college provides the opportunity to begin.
6. **Present ideas in many ways**—*Representing ideas in a variety of modes (verbal, mathematical, pictorial, schematic, etc.)*. Words aren't the only way to convey ideas. Often an idea will be clarified or a solution present itself by representing the problem or the information you have gathered in some other form. So it is valuable to learn different modes of representation.
7. **Connect thinking with doing**—*Understanding the relationship between the theoretical and the practical*. Theory and practice can reinforce or correct each other. But solutions arrived at purely on the basis of theory must be tested by applying them. Practices that persist despite bodies of theory and evidence that they are ineffectual are destructive.
8. **Think about what's right**—*Being aware of the moral and ethical implications of concepts and decisions and how to determine one's position in the face of them*. Many problems have moral and ethical dimensions. Dealing with them requires an ability to see those aspects of the problem and apply moral and ethical reasoning to them.
9. **Draw the big picture**—*Relating ideas one to another and synthesizing them*. Dealing with a problem requires **seeing patterns in data** or connections among ideas that weren't apparent earlier. Learning to make connections requires practice and the exercise of imagination.

[These ideas pertain to metacognition--thinking about how you think. Developing your critical & creative thinking abilities is far more important than trying to memorize tons of facts. Work on good thinking and improving your thinking--creating, evaluating, interpreting, analyzing data--that's what counts. Finally, the real world poses unstructured (fuzzy) problems, not neat canned ones. Practice the real stuff!]