

# REVERSE ENGINEER YOUR EDUCATION

(cognitive task analysis of learning & thinking skills)



An Introduction to the  
Human Knowledge MindMap  
- William Sheridan -

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# What do you think? (1)

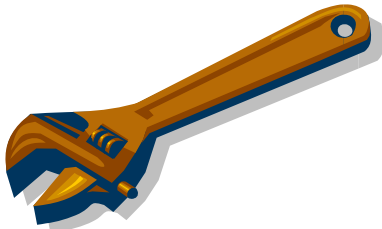
Effective thinking consists of a set of skills that will enable you to deal with important aspects of living in the knowledge society, from your education, to your job, to your personal life.



How does it work? At the heart of every question & answer, every problem & solution, every situation & circumstance, there are your assumptions about what is and isn't feasible. The Human Knowledge MindMap provides the framework to cope with all of these concerns.

# What do you think? (2)

There are a number of perspectives on issues and problems, each of which gives a partial view, but none of which gives the full picture.



To properly understand situations, you need to be aware of all the relevant considerations. With the conceptual tools in the Human Knowledge MindMap you can achieve that comprehension, *when you use these tools in the appropriate manner.*

# Learning Readiness (1): cognitive skills (modified from Elaine Gray's *Conscious Choices*, 2004)

## Critical Thinking

know what influences you

distinguish fact from opinion

consider diverse viewpoints

be open to alternatives

be a problem solver

## Comprehension

learn to sustain focus

develop active listening

observe situations accurately

develop a good memory

apply what you know

(many of these slides will use this split-screen approach for comparisons & contrasts)

# Learning Readiness (2): affective skills (modified from Elaine Gray's *Conscious Choice*, 2004)

## Motivation

clarify your principles

specify your goals

prioritize your efforts

declare your resolve

avoid delays and distractions

## Self-Mastery

develop self-awareness

become a responsible person

project confidence

keep yourself healthy

learn to be flexible

# *The Training Session Contract*

What you can expect from this session:

1. A useful and worthwhile presentation.
2. Opportunities to question and participate.
3. Tolerance within the limits of reason.

What this session expects of you:

- i. Recognize the role of the presenter.
- ii. Focusing on the purpose of the session.
- iii. Commitment to self-directed life-long learning.

# Dialogue

Are these arrangements acceptable?

Has anything been left out of the contract?

Should anything be added to the contract?.

Comments?      Suggestions?

# What are your expectations for the knowledge society?

- What does “a knowledge society” mean to you?
- How do you define “the thinking process”?
- Is there a common framework to all thinking?
- Does “thinking” cover all knowledge?
- Why do you need a better way of thinking?
- How much effort does this new thinking take?
- What questions do you have for this session?
- How can this session satisfy your needs?

# The Value of Education

“The ignorant are held to tedious, repetitive or otherwise burdensome toil and, on frequent occasion, to no work at all. **With education and only therewith comes improvement**; without it there is none...”

- John Kenneth Galbraith, *The Good Society*

“In work terms, a person’s human ‘potential’ consists in how **capable** he or she is **in moving from problem to problem, subject to subject**. The ability to move around in this way resembles the work of consultants...”

- Richard Sennett, *The Culture of the New Capitalism*

# Education for Life

“If you want to be truly educated, **you will have to educate yourself**, and at times you will have to do it in spite of the academy. Perhaps this is good, because knowledge which comes too easily doesn't train one to be an independent thinker, and **only an independent thinker is ever truly intelligent.**”

- Inge Bell et al, *This Book Is Not Required*

“When a person leaves schooling he or she must not only have a foundation of knowledge acquired in the course of learning to inquire but, more importantly, also **have the ability to go on acquiring new knowledge easily and skillfully the rest of his or her life.**”

- Malcolm S. Knowles, *Self-Directed Learning*

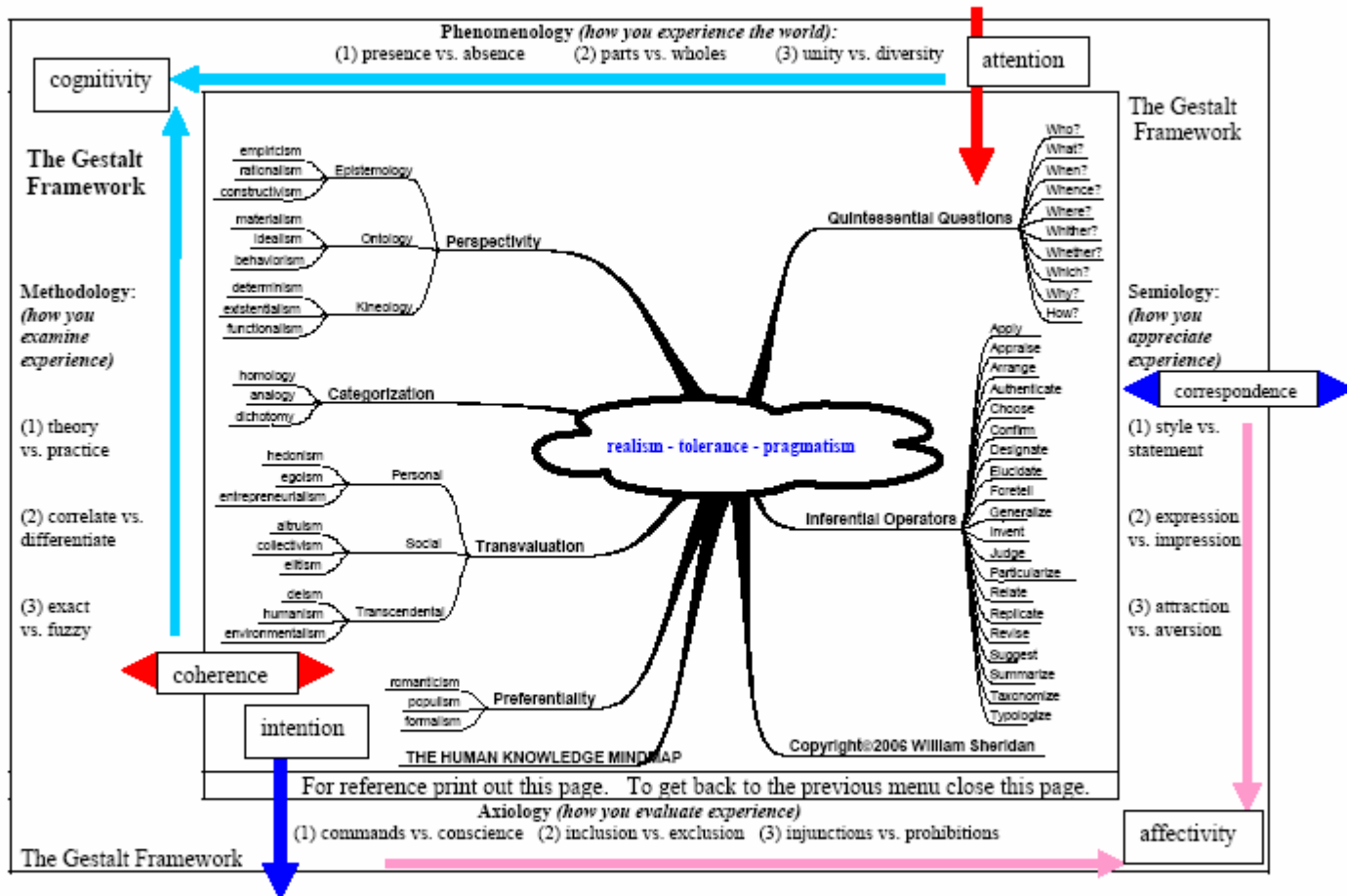
# Education as Good Work

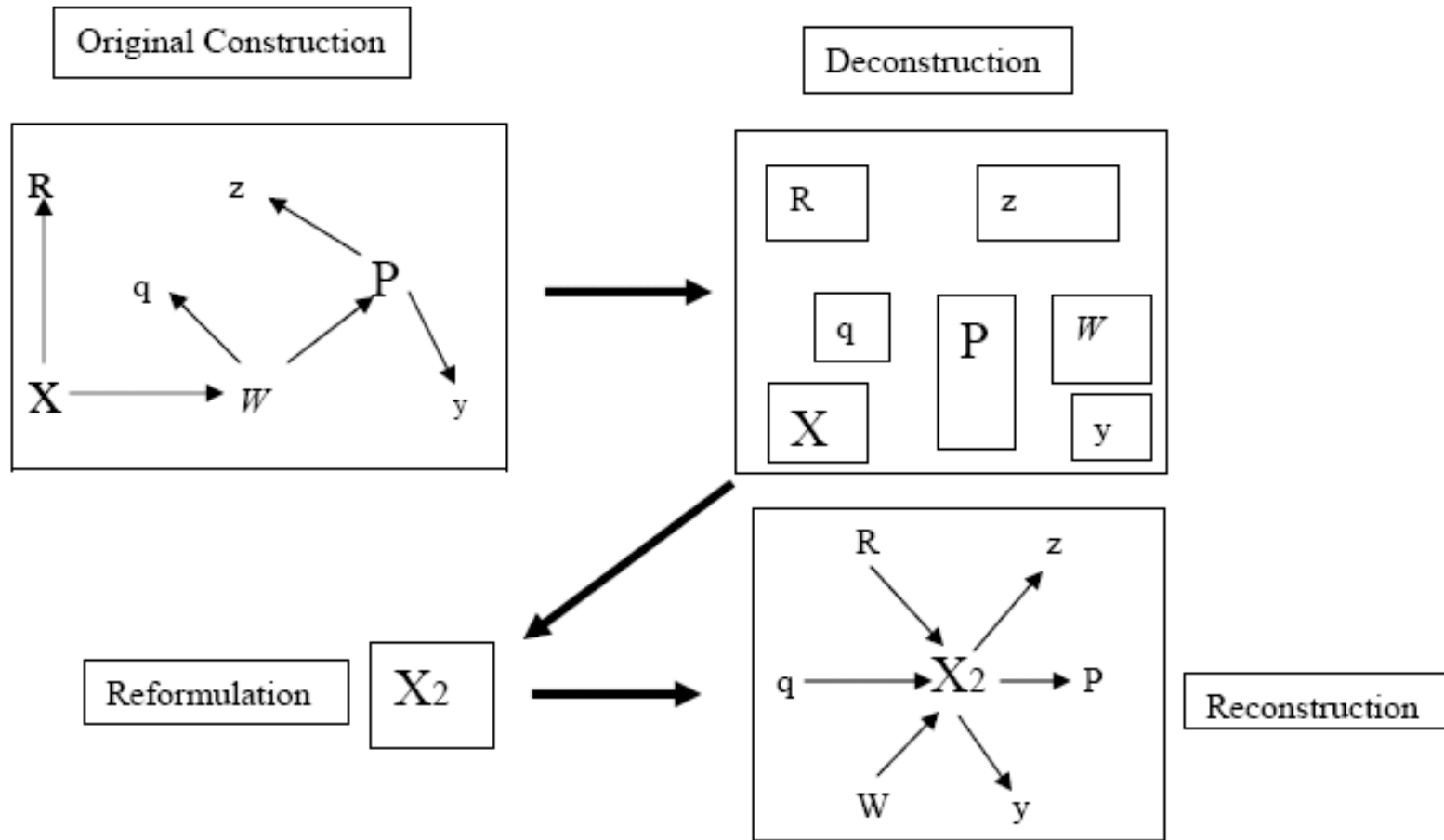
“Whether you call it enthusiasm, energy, passion, or self-confidence, the bottom line is that to succeed you have to get off your butt and do something positive. **That is your responsibility and no one else’s.**”

- B. Coplin, *10 Things Employers Want You to Learn in College*, 2003

**“I have yet to find a person who achieved success without working hard.** If you find one, let me know. I’ll put him in the ‘Oddities of Nature’ display in the museum...”

- Richard St. John, *Spike’s Guide to Success*, 2005





The Prototype of Concept R&D

# A Preview of Effective Thinking:

*(effective thinking requires a sequence of tasks)*

## Topical Processes

1. Asking questions  
*(which questions?)*
2. Inferring explanations  
*(inferring how?)*
3. Following implications  
*(following where?)*

## Integral Processes

- i. Checking assumptions  
*(whose assumptions?)*
- ii. Applying premises  
*(why premises?)*
- iii. Coordinating conclusions  
*(what conclusions?)*



# Practicing Concept R&D

- On Your Own

- choose an issue of interest
- decide concepts to be applied
- conduct an internal dialogue



- With Others

- choose an issue of interest
- decide concepts to be applied
- assign, play, and rotate roles



# How Concept R&D Works

(Critiquing the concept of “fundamentalism”)

## 1. Origins of the Idea

religious resistance to change

fear of innovative ideas

political adoption (fanaticism)

social adoption (conservatism)

cultural adoption (chauvinism)

## 2. Deconstruction

complete faith in core beliefs

denial of fallibility or error

intolerant of other beliefs

refusal to compromise

partisan division on all issues

## 3. Reformulation

specifics —————> generalities

one truth —————> many options

total faith —————> detached involvement

dogmatism —————> pragmatism

orthodoxy —————> freedom of thought

## 4. Reconstruction: tolerance

freedom to listen (actively)

freedom to question (deeply)

freedom to create (responsibly)

freedom to explain (thoroughly)

freedom to disagree (sincerely)

# Do It Yourself Example (1)

*Try Using Concept R&D to help in thinking about University Education?*

## Current Definitions

- What do students want from a university education?
- What does society want from those with a university education?

## Questioning Assumptions

- Are such expectations about university education realistic?
- What are your personal goals regarding university education?

## Re-defining Issues

- What would an ideal university education provide to students?
- What would an ideal university education provide to society?

## New Definitions

- Where does university education fit into life-long learning?
- Could students get more benefits from current university education?

## The Gestalt Frame

Your Perception: *what is real to you*  
(how you experience the world)

*Everyone* has premises, assumptions, *blind spots*.  
What people believe to be real is real in its consequences.

*Everyone* senses reality in three ways:

- presence vs. absence (here or elsewhere)
- parts vs. wholes (components or systems)
- unity vs. diversity (singularity or multiplicity)

*(you need to be aware of these 3 dimensions in all your perceptions)*

# Your Morality: *what is right or wrong*

(how you evaluate experience)

*Everyone* has biases, prejudices, hang-ups. What people value in their lives motivates their behaviour.

*Everyone* judges experience in three ways:

- commands vs. conscience (external or internal)
- inclusion vs. exclusion (in-group or out-group)
- injunctions vs. prohibitions (do's or don'ts)

*(you need to be aware of these 3 aspects in all of your evaluations)*

# Your Procedures: *how you do things*

(how you examine experience)

*Everyone* has filters, frameworks, *false sightings*.  
Every way of seeing is also a way of *not seeing*.  
Habits lighten the burden but narrow the vision.

*Everyone* organizes their inquiries in three ways:

- theory vs. practice (thinking or doing)
- correlate vs. differentiate (pattern or details)
- exact vs. fuzzy (fixed or flexible)

*(you need to be aware of these 3 considerations in all your procedures)*

# Your Preferences: *what you want*

(how you appreciate experience)

*Everyone* prefers some styles, practices some manners, conducts themselves with some ability. Fashion distinguishes the person.

*Everyone* appreciates things in three ways:

- style vs. statement (affect or effect)
- expression vs. impression (output or impact)
- attraction vs. aversion (like or dislike)

*(you need to be aware of these 3 factors in all your preferences)*

# Checking Gestalt Alternatives:

(perceptions, morals, methods, styles)

## On Your Own

- choose an area of interest
- decide what to focus on
- explore your own framework



## With Others

- choose an area of interest
- decide what to focus on
- assign, play and rotate roles



# Examples of Gestalt Framing

## Perception

### Naive Notions

1. Prisoners of history
2. A promising future
3. We are part of life's plan
4. The facts will decide

Fatalism or ?

Wishful thinking or ?

Concretization or ?

Personification or ?

## Political Conflict

### Vicious Cycles

- i. Each side blames the other
- ii. Opponents are demonized
- iii. Unconditional solidarity
- iv. Uncompromising demands

Transference or ?

Extremism or ?

Bias or ?

Provocation or ?

What are the implications of this way of thinking?

# Do It Yourself Example (2)

*Try using the Human Knowledge MindMap to help in thinking about Discrimination.*

## Perception

- What **human characteristics** does discrimination involve?
- **Does discrimination vary** between individuals and groups?

## Procedures

- What is the actual **process** by which discrimination occurs?
- How can the discrimination process be **effectively studied**?

## Preferences

- Is discrimination an individual **habit** or a social **pattern**?
- Do all groups practice **in-group** and **out-group** preferences?

## Principles

- Does acknowledging discrimination **challenge** or **reinforce** it?
- Should discrimination be considered **inevitable** or **reversible**?

# Ways of Learning: *how do you know?*

(look, think, invent)

*(you need to be aware of these 3 approaches in all your learning)*

## EMPIRICISM

*objectivity*

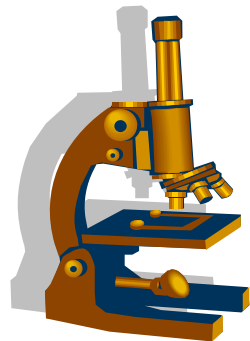
experimentation

verification

quantification

reductionism

*correlation*



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## RATIONALISM

*rationality*

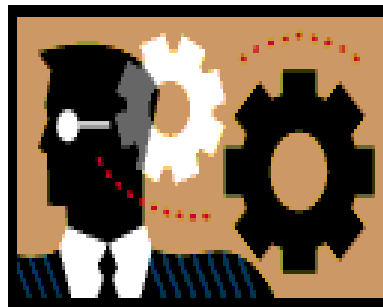
symbolization

inductions

deductions

algorithms

*inference*



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## CONSTRUCTIVISM

*creativity*

bisociation

heuristics

insights

hypotheses

*interpretation*



25

# Reality Bites: *what actually exists*

(things, ideas, habits)

*(you need to be aware of these 3 premises in all situations)*

## MATERIALISM

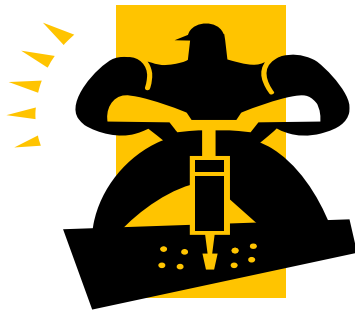
*facts*

tangibility

mechanisms

artifacts

*utility*



## IDEALISM

*concepts*

information

reflections

intentions

*clarity*



## BEHAVIOURISM

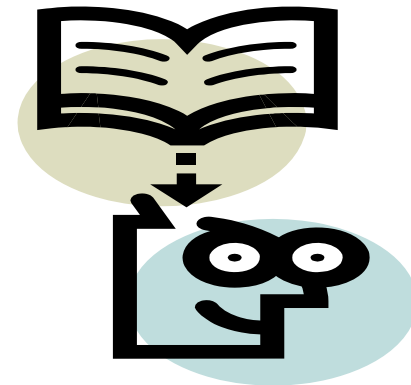
*behaviours*

stimuli

responses

conditioning

*necessity*



# How Do Things Change? *it depends!*

(minimally, moderately, radically)

*(you need to be aware of these 3 modalities in all change processes)*

## DETERMINISM

*cause*

lawful

regular

*predictable*

## EXISTENTIALISM

*choice*

arbitrary

random

*uncertain*

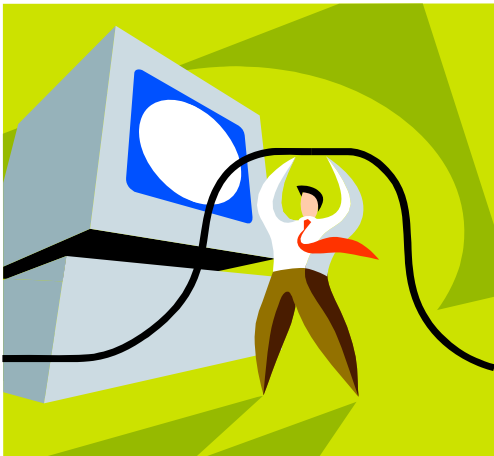
## FUNCTIONALISM

*context*

systemic

sequential

*approximate*



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27

# Logic: *how to categorize*

(sameness, similarity, difference)

**Traditional** logic was based on the premise that the world consisted of *natural* kinds and groups of things. **Modern** logic reversed this and proposed that all sorting was arbitrary. **Post-modern** logic can handle both approaches.

So, grouping of whatever variety is based on:

- homology (identity or equivalence of some form)
- analogy (resemblance of some degree)
- dichotomy (distinct, different, opposite, inverse)

*(you need to be aware of these 3 parameters in all your categorizing)*

# Using Postulates & Premises

(epistemology, ontology, kineology, logic)

## On Your Own

- choose your assumptions
- decide what to consider
- cycle through the alternatives



## With Others

- choose your assumptions
- decide what to consider
- assign & rotate through the alternatives



# Examples of Premises

## Idealism

### Consensus?

1. The majority rules
2. Group solidarity
3. Public opinion
4. Political correctness

Conformism or ?

Group think or ?

Intolerance or ?

Language police or ?

## Analogy

### Artificial intelligence?

- i. Machine learning
- ii. Computer memory
- iii. Network decision-making
- iv. User-responsive software

Programmed heuristics or ?

Data storage or ?

Routing protocols or ?

Pattern simulation or ?

What are the implications of this way of thinking?

# Do It Yourself Example (3)

*Try using the Human Knowledge MindMap to help in thinking about Global Warming.*

## Empiricism

- What is the climatic evidence **for** and **against** global warming?
- Is the evidence **consistent**, reliable, **conclusive**, and compelling?
- What **data is missing** from the debate on global warming?

## Rationalism

- What **different theories** can be used to account for global warming?
- How much of global warming is **man-made** (greenhouse gases)?
- How much **global warming occurs naturally** (changing solar flux)?

## Constructivism

- Is global warming caused by both **greenhouse gases** and **solar flux**?
- What **other causes or ideas** can account for global warming?
- What **creative ideas** can be deployed to deal with global warming?

*The MindMap has guidelines for asking and answering such questions!*

# Personal Ethics:

(it is all about you!)

*(you need to be aware of these 3 principles in all your commitments)*

## HEDONISM

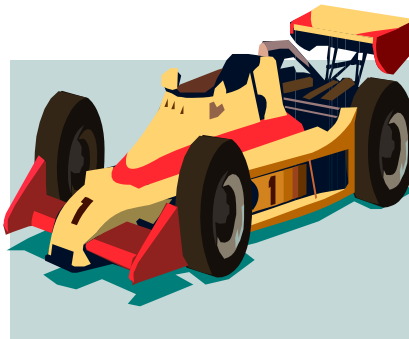
*pleasure*  
carefree  
casual  
indulgent  
*euphoria*

## EGOISM

*conceit*  
vanity  
determination  
arrogance  
*aggrandizement*

## ENTREPRENEURIALISM

*ambition*  
goals  
methods  
plans  
*accomplishment*



# Social Ethics

(it's all about others)

*(you need to be aware of these 3 maxims in all of your obligations)*

## ALTRUISM

*caring*

sympathy

empathy

sharing

*harmony*



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## COLLECTIVISM

*conformity*

obedience

retribution

re-distribution

*reciprocity*



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## ELITISM

*authority*

cooperation

coordination

leadership

*hierarchy*



33

# Transcendental Ethics

(it's all about the "big picture")

*(you need to be aware of these 3 creeds in every profound context)*

## DEISM

*sacred*

faith

magic

worship

*theocracy*

## HUMANISM

*cultural*

tradition

innovation

consciousness

*democracy*

## ENVIRONMENTALISM

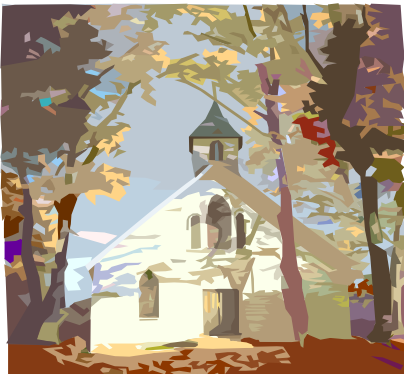
*ecological*

conservation

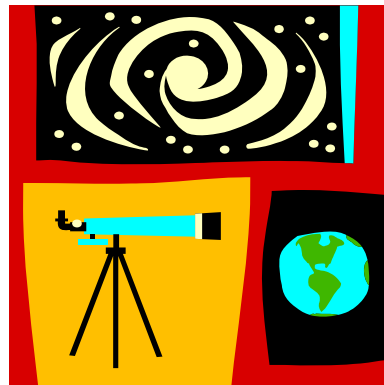
evolution

sustainability

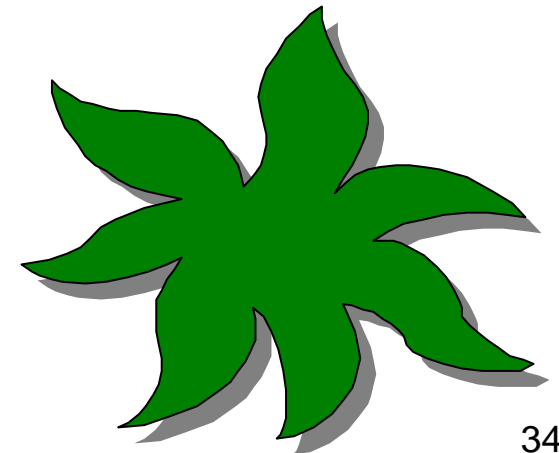
*ecotopia*



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34

# Aesthetics: *artfulness*

(creators, consumers, colleagues)

Each person and group finds a way to signify their *uniqueness*, whether through manners, attire, speech patterns or artifacts. *Artists* make these attempts a vocation. Who are they doing this for – *themselves*, their *fans*, or *fellow artists*?

There are three orientations to artistic output:

- romanticism (conveying personal meaning)
  - populism (giving the audiences what they want)
  - formalism (perfecting technique for accolades)
- (you need to be aware of these 3 demeanors in artistic depiction)*

# Using Principles & Preferences

(personal, social, transcendental, aesthetic)

## On Your Own

- choose principles/preferences
- decide issues to consider
- cycle through the alternatives



## With Others

- choose principles/preferences
- decide issues to consider
- assign and rotate through the alternatives



# Examples of Principles

## Family Values

### Focus?

1. Fatherly dominance
2. Childrens' obedience
3. Parental nurturance
4. Childrens' development

Moral authority or ?

Behaviour control or ?

Egalitarian environment or ?

Character formation or ?

## Personal Lifestyles

### Fulfillment?

- i. Group membership
- ii. Individual activities
- iii. Relaxation & leisure
- iv. Serious & studious

Interdependent or ?

Autonomy or ?

Frivolous or ?

Focused or ?

What are the implications of this way of thinking?

# Do It Yourself Example (4)

*Try using the Human Knowledge MindMap to help in thinking about Your Responsibilities.*

## Personal Responsibilities

- How do you decide what your personal responsibilities are?
- Have you systematically evaluated these responsibilities?
- Are your personal responsibilities aligned for effectiveness?

## Social Responsibilities

- Who decides what your social responsibilities are?
- How do you resolve conflicting social responsibilities?
- What about conflicts between personal and social responsibilities?

## Transcendental Responsibilities

- What larger responsibilities do you acknowledge?
- How do you resolve conflicting transcendental responsibilities?
- What about transcendental and other responsibility conflicts?

# Instrumental Concepts

## The Role of QUESTIONS:

(narrowing the possibilities)

Questioning is the art of narrowing the field of possibilities down from the full range of options to a manageable set with which you can deal.

Who? (demographics)

Whither? (destination)

What? (identify)

Whether? (alternatives)

When? (timeliness)

Which? (choices)

Whence? (origins)

Why? (intentions)

Where? (location)

How? (methodologies)

*(use only those questions that will answer your “need to know”)*

# The Function of Inferences (1)

(producing plausible processes)

What else can you do with knowledge besides **questioning, describing, and explaining?** You can also plan by extrapolating or interpolating from what you know to reasonable conclusions.

**Apply (procedures)**

Appraise (utility)

**Arrange (organize)**

Authenticate (validate)

**Choose (select)**

**Confirm (verify)**

Designate (specify)

**Elucidate (elaborate)**

Foretell (predict)

**Generalize (overview)**

*(use only those inferences that will provide relevant conclusions)*

# The Function of Inferences (2)

(producing plausible processes)

What happens when there is no “one best inference”, but rather a choice between several equally plausible alternatives? In that case, go for the inference that gives the best explanation.

**Invent (originate)**

Judge (decide)

**Particularize (details)**

Relate (associate)

**Replicate (copy)**

**Revise (change)**

Suggest (propose)

**Summarize (condense)**

Taxonomize (classify)

**Typologize (categorize)**

*(use only those inferences that will provide relevant conclusions)*



# Integrating Elements

(looking at the **coloured** lines)

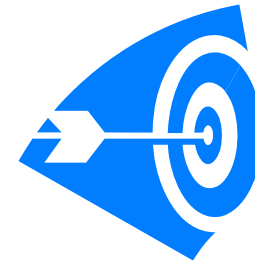
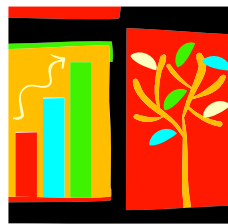
*("character" is the judgment to balance integration)*



The pointers towards **cognitivity** indicate that **phenomenology** and **methodology** are predominantly intellectual processes. The pointers towards **affectivity** suggest that **semiology** and **axiology** are predominantly emotional processes.

**Attention** is focused awareness of the **senses**, and **Intention** is the **purpose** of forthcoming action.

**Correspondence** concerns the **resemblance** between our perceptions and our environment, and **Coherence** involves **aligning** our perceptions and our knowledge.



# Using questions, inferences & integration

## On Your Own

- choose your instruments
- decide issues to consider
- apply and contemplate



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## With Others

- choose your instruments
- decide issues to consider
- assign, apply, and rotate through the alternatives



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43

# Example Question, Inference, and Integration

## Why?

Study?

Personal uncertainty

Social change

Information society

Knowledge work

Too many facts

Superficiality

Symbolic analysis

Skills in thinking →

## Apply

MindMap?

Explanations

Predictions

Expertise

Concept R&D

Framework

Insight →

Flexibility

Creativity →

## Intention

Life-Long Learning?

Makes Sense

Patterns

Opportunities

Competence

Comprehension

Foresight

Transferability

Marketability

# Do It Yourself Example (5)

*Try using the Human Knowledge MindMap to help in thinking about Interpersonal Conflicts.*

## Questions

- What is **the basis of interpersonal conflicts** (social, psychological)?
- What are **the issues** around which such conflicts are focused?
- Are such conflicts moderate or serious, **resolvable** or **irresolvable**?

## Inferences

- Does **how you appraise others** influence the likelihood of conflicts?
- Could you **choose to resolve or avoid** conflicts as a strategy?
- Can you resolve serious conflicts by **revising your attitude** to others?

## Intentions

- What do you **hope to gain** by maintaining or resolving conflicts?
- What are the **costs and tradeoffs** of how you handle conflicts?
- How does the way you handle conflicts relate to **your other goals**?

# The Central Control Room

(where you are in charge of your own thinking)

Of the early originators of psychiatry, **Alfred Adler** was by far the most socially inclined, and the most practical. He did not agree with **Freud** that the most basic human motivation was erotic, nor did he agree with **Jung** that it was esoteric. Instead he regarded the most basic human motive as **the desire to control the conditions of one's experience**. Experiments confirms this conclusion.

The Human Knowledge MindMap can put you in charge of your own thinking. Others may propose what they will, but you can decide for yourself. **You can choose what is worthwhile, how to accomplish it, AND be confident in the knowledge that you know what you are doing.**

# A Review of Effective Thinking:

*(effective thinking requires a sequence of tasks)*

## Topical Processes

1. Asking questions  
(which questions?)
2. Inferring explanations  
(inferring how?)
3. Following implications  
(following where?)

## Integral Processes

- i. Checking assumptions  
(whose assumptions?)
- ii. Applying premises  
(why premises?)
- iii. Coordinating conclusions  
(what conclusions?)



# Discerning Knowledge

- He who knows not, and knows not that he knows not, is a fool – avoid him.
- He who knows, and knows not that he knows, is asleep – awaken him.
- He who knows not, and knows that he knows not, is a student – teach him.
- He who knows, and knows that he knows, is a wise man – follow him.

- a Sufi Sage

# You gotta really wanna!

You can lead horses to water,

**But you can't make them drink;**

You can point people to knowledge,

**But you can't make them think!**

- Anonymous

# Books for Students (1)

Elaine Gray, *Conscious Choices*, Prentice-Hall, 2004

John Kenneth Galbraith, *The Good Society*, Mariner Books, 1996

Richard Sennett, *The Culture of the New Capitalism*, Yale University Press, 2006

Inge Bell, *This Book Is Not Required: An Emotional Survival Manual for Students*, Pine Forge Press, 2004

Gerald Nosich, *Learning To Think Things Through: Critical Thinking Across the Disciplines*, Prentice-Hall, 2004

Gerald Graff, *Clueless In Academe: Schooling Obscures the Life of the Mind*, Yale University Press, 2003

Malcolm S. Knowles, *Self-Directed Learning*, Prentice-Hall, 1975

# Books for Students (2)

Bill Coplin, *10 Things Employers Want You To Learn In College*, Ten Speed Press, 2003

David Bromwich, *Politics By Other Means: Higher Education and Group Think*, Yale University Press, 1994

Richard St. John, *Spike's Guide to Success (Much effort is required)*, Train of Thought Arts Inc., 2005

Alice L. Hamachek, *Coping With College: A Guide for Academic Success*, Pearson Education, 2007

Ron Zemke & Thomas Kramlinger, *Figuring Things Out*, Addison-Wesley, 1982

Mariana Funes & Nancy Johnson , *Honing Your Knowledge Skills*, Butterworth-Heinemann, 1998