LEARNING OBJECTIVES POSTED AS ESSENTIAL QUESTIONS

What is intelligence? What constitutes intelligence? How is it acquired?

HOW DO THEORETICAL PERSPECTIVES ON INTELLIGENCE VARY?

How do different theoretical views about intelligence affect the ways we teach or learn?
Module 4. THEORIES OF INTELLIGENCE

**Introduction**

Raty and Snellman (1995, p. 1) state, “All systems of education are based on some notions of intelligence.” But different researchers have different notions, definitions and issues about the nature of intelligence. Major issues that persist pertain to a generally acceptable definition of intelligence, the causes of intelligence, whether it can be appropriately measured, if it is innate or changeable. We shall attempt to address these issues, and it may be best to begin with the following readings:

**INTELLIGENCE: INTRODUCTORY READINGS**

*Theories of Intelligence* by OTEC


In *The teacher’s guide to diversity: Building a knowledge base.*
Brown University (pp. 40-44).
(pdf file: limited availability, on request)

**What is intelligence?**

Studies have shown that the way we view the nature of intelligence influences how we approach the ways we learn and the ways we teach. In this unit, we shall attempt to obtain a deeper understanding about the concept of intelligence.

“An intelligence is the ability to solve problems, or to create products, that are valued within one or more cultural settings.”
— Howard Gardner
*FRAMES OF MIND* (1983)
Is intelligence a general faculty that is **inherited and fixed?** Is it **shaped** by the environment?

**FIRST, THINK ABOUT IT…**

Reflect on your personal views:

How would you personally define intelligence—its nature and what comprise it?

How do you explain your own IQ or abilities to learn?  
Is it something you inherited, a set of traits that somehow runs in the family? Or do you believe that your intellectual capacity is something that you can alter?

Do you think it is possible for you to alter the ability to learn of students who have had a long track record of academic failure?

Find out what others have to say about this issue from this video:

**Mother/Child IQ Correlation (video)**

**WHAT IS NATURE VERSUS NURTURE?**

The nature versus nurture debate is one of the oldest issues in psychology. The debate centers on the relative contributions of **genetic inheritance** and **environmental factors** to human development. Some philosophers such as Plato and Descartes suggested that certain things are inborn, or that they simply occur naturally regardless of environmental influences. Other well-known thinkers such as John Locke believed in what is known as **tabula rasa**, which suggests that the mind begins as a blank slate. According to this notion, everything that we are and all of our knowledge is determined by our experience.

For example, when a person achieves tremendous academic success, did they do so because they are genetically predisposed to be successful or is it a result of an enriched environment? Today, the majority of experts believe that behavior and development are influenced by both nature and nurture. However, the issue still rages on in many areas such as in the debate on the origins of homosexuality and influences on intelligence.

-- Kendra Cherry [http://psychology.about.com/od/nindex/g/nature-nurture.htm]
Evidence of genetic influences:
- Twin studies suggest that identical twins IQ's are more similar than those of fraternal twins (Promin & Spinath, 2004).
- Siblings reared together in the same home have IQ's that are more similar than those of adopted children raised together in the same environment (McGue & others, 1993).

Evidence of environmental influences:
- Identical twins reared apart have IQ's that are less similar than identical twins reared in the same environment (McGue & others, 1993).
- School attendance has an impact on IQ scores (Ceci, 2001).
- Children who are breastfed during the first three to five months of life score higher on IQ tests at age 6 than same-age children who were not breastfed (Reinberg, 2008).

Current popular notions more strongly support the idea that both genetics and the environment interact to determine exactly how inherited genes are expressed.

What constitutes intelligence?

In the next subsections, we will take a look at the various views that some theorists propose about what constitutes intelligence. You may be able to note that, even among experts, there remains to be no general agreement about how we should define, explain, measure or predict human intelligence.

Major questions about intelligence and IQ testing:
- Is intelligence a single ability, or does it involve an assortment of multiple skills and abilities?
- Is intelligence inherited, or does the environment play a larger role?
- Are intelligence tests biased?
- What do intelligence scores predict, if anything?

It may be useful to keep in mind that there are still other perspectives on intelligence that have not been included here. Those of you who are interested are encouraged to pursue further inquiry; textbooks and the internet are rich in such additional information.
READ: Historical Beginnings of IQ Tests

Since when have we started to measure intelligence?
How did this practice evolve?
What do these tests reveal about varying notions regarding the nature of intelligence?

The History and Development of Modern IQ Testing

CHARLES SPEARMAN - GENERAL INTELLIGENCE

Charles Spearman (1863-1945) used factor analysis, a statistical method, as a very objective way to examine scores from mental aptitude tests. He argued that intelligence is a general cognitive construct that can be numerically quantified. He found that people’s performance across different tests tended to be similar—those who scored well in a test tended to score well in all other tests, and conversely, those who scored low in one, tended to score low in all others. He thus conceptualized the notion of general intelligence, or the factor g.

Several instruments that have been designed to measure intelligence are fundamentally anchored on the assumption that intelligence can be described as a numerical quantity, e.g.:

Individual Intelligence Tests
- The Binet Tests.
- The Wechsler Scales

Group Intelligence Tests
- Lorge-Thorndike Intelligence Tests
- Otis-Lennon School Ability Test (OLSAT)

LOUIS L. THURSTONE - PRIMARY MENTAL ABILITIES

Louis L. Thurstone (1887-1955) argued that intelligence is not a unified ability, and a single factor, g, is not an adequate measure of intelligence. He proposed that intelligence is composed of seven "primary mental abilities":

- Verbal comprehension
- Reasoning
- Perceptual speed
- Numerical ability
- Word fluency
- Associative memory
- Spatial visualization
Robert Sternberg proposed a triarchic view of intelligence. He is quoted to have explained that “successfully intelligent individuals succeed in part because they achieve a functional balance among a "triarchy" of abilities: analytical abilities, which are used to analyze, evaluate, judge, compare and contrast; creative abilities, which are used to create, invent, discover, imagine; practical abilities, which are used to apply, utilize, implement, and activate” (in Oregon Technology in Education Council, http://otec.uoregon.edu/intelligence.htm#Sternberg).

- **Practical intelligence**--the ability to do well in informal and formal educational settings; adapting to and shaping one's environment; street smarts.

- **Experiential intelligence**--the ability to deal with novel situations; the ability to effectively automate ways of dealing with novel situations so they are easily handled in the future; the ability to think in novel ways.

- **Componential intelligence**--the ability to process information effectively. This includes metacognitive, executive, performance, and knowledge-acquisition components that help to steer cognitive processes.

http://otec.uoregon.edu/intelligence.htm

The internet is rich in materials that pertain to Sternberg’s theory; below are some of them:

MORE ON STERNBERG’S TRIARCHIC THEORY

- **Triarchic Theory of Intelligence** by Grigorenko in Education.com.
- **Intelligence - Triarchic Theory Of Intelligence** in Education Encyclopedia - StateUniversity.com
- **A quick overview**, in Instructional Design.org
- **Interview with Dr. Sternberg.**
  http://www.indiana.edu/~intell/sternberg_interview.shtml
- **Sternberg's Adaptive Behavior**
- **Sternberg's Beliefs about Why Intelligent People Fail** (Huitt, 2002)
DAVID PERKINS’ DIMENSIONS OF IQ

- **Neural intelligence.** This refers to the efficiency and precision of one’s neurological system.
- **Experiential intelligence.** This refers to one’s accumulated knowledge and experience in different areas. It can be thought of as the accumulation of all of one’s expertises.
- **Reflective intelligence.** This refers to one’s broad-based strategies for attacking problems, for learning, and for approaching intellectually challenging tasks. It includes attitudes that support persistence, systemization, and imagination. It includes self-monitoring and self-management.

Gardner’s Multiple Intelligence theory

“*It’s not how smart you are, it’s how you are smart!*”

— Howard Gardner

*Interview, "Common Miracles" ABC, 1993*

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Examples</th>
<th>Discussion</th>
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<tbody>
<tr>
<td>Bodily-kinesthetic</td>
<td>Dancers, athletes, surgeons, crafts people</td>
<td>The ability to use one's physical body well.</td>
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<tr>
<td>Interpersonal</td>
<td>Sales people, teachers, clinicians, politicians, religious leaders</td>
<td>The ability to sense others' feelings and be in tune with others.</td>
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<tr>
<td>Intrapersonal</td>
<td>People who have good insight into themselves and make effective use of their other intelligences</td>
<td>Self-awareness. The ability to know your own body and mind.</td>
</tr>
<tr>
<td>Linguistic</td>
<td>Poets, writers, orators, communicators</td>
<td>The ability to communicate well, perhaps both orally and in writing, perhaps in several languages.</td>
</tr>
<tr>
<td>Logical-mathematical</td>
<td>Mathematicians, logicians</td>
<td>The ability to learn higher mathematics. The ability to handle complex logical arguments.</td>
</tr>
<tr>
<td>Musical</td>
<td>Musicians, composers</td>
<td>The ability to learn, perform, and compose music.</td>
</tr>
<tr>
<td>Naturalistic</td>
<td>Biologists, naturalists</td>
<td>The ability to understand different species, recognize patterns in nature, classify natural objects.</td>
</tr>
<tr>
<td>Spatial</td>
<td>Sailors navigating without modern navigational aids, surgeons, sculptors, painters</td>
<td>The ability to know where you are relative to fixed locations. The ability to accomplish tasks requiring three-dimensional visualization and placement of your hands or other parts of your body.</td>
</tr>
<tr>
<td>Another one (or more)?</td>
<td>??</td>
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[http://otec.uoregon.edu/intelligence.htm](http://otec.uoregon.edu/intelligence.htm)
**Module 4: Theories of Intelligence**

**KNOW MORE ABOUT MI**

Explore **Tapping into Multiple Intelligences** in Concept to Classroom site.

- What is the theory of multiple intelligences (M.I.)?
- How does this theory differ from the traditional definition of intelligence?
- What do multiple intelligences have to do with my classroom?
- How has M.I. theory developed since it was introduced in 1983?
- Who are the critics of this theory and what do they say?
- How might using an MI approach in my classroom be beneficial?
- How can applying M.I. theory help students learn better?

*See also Gardner’s MI by Huit (2002).*

**ACTIVITY: My M.I.-Mnemonics**

Try inventing your own mnemonic or acronym to help you remember the nine multiple intelligences.

Any order is fine. For instance, the famous mnemonic My Very Educated Mother Just Served Us Nine Pizzas. (This leads to Mercury, Venus, Earth, Mars, and so on.) help children proudly name the planets in the solar system.

The ability for teachers to name all nine intelligences isn't so important in the scheme of things -- however, a good mnemonic sticks with you forever and the challenge of making up some kind of mnemonic (a silly song?) could be fun and creative.

When you have made up a mnemonic (or if you haven't yet) think of some other devices you might use to remember the nine intelligences identified so far. Would a visual diagram be a better device for you? Or imagining the rooms of a house that you walk through mentally? The smell of lime tea triggered Marcel Proust's nine volume, *REMEMBRANCE OF THINGS PAST.*

(http://www.thirteen.org/edonline/concept2class/mi/w1_think1.html)

**Emotional Intelligence**

Daniel Goleman, author of Emotional Intelligence and other books on EI, disputes that traditional measures of intelligence (i.e., IQ) do not sufficiently predict success in life. Rather, he contends that emotional intelligence is a better determinant. Emotional Intelligence (EI) encompasses the ability to perceive, control and evaluate emotions accurately and adaptively, or the ability to understand one’s self as well as other people, and to get along with them. EI emphasizes the interpersonal, intrapersonal, and practical aspects of intelligence, which we can find to have been incorporated in some theories in one way or another, e.g. Gardner’s interpersonal intelligence and intrapersonal intelligence and Sternberg’s practical intelligence.

“All learning has an emotional base.”

Plato

Lou Juachon, Ph.D. / UPOU
UNDERSTANDING EMOTIONAL INTELLIGENCE


Check the list of links to more videos, talks and blogs about EI at the end of this module.

Although recently popularized by Daniel Goleman’s Emotional Quotient (EQ), the development of the concept of emotional intelligence is traced to Peter Salovey and John Mayer (1990) whose model identifies four dimensions:

1. Perceiving Emotions – to take other peoples’ points of view, to understand nonverbal language, to empathize
2. Reasoning With Emotions – use feelings to facilitate thought (e.g., positive mood to stimulate creativity)
3. Understanding Emotions – understand how emotions influence relationships
4. Managing Emotions – control emotions such as anger and impulsivity

The works of Peter Salovey, John Meyer, Howard Gardner, Robert Sternberg and Jack Block, among others, have each contributed to Goleman’s theory of emotional intelligence (PsychTests AIM Inc., 2012). In a blog, Goleman mentions how his concept of EI has been influenced by the previous works of others. Models of emotional intelligence have further evolved since the publication of Goleman’s book, and various labels and approaches have since emerged (http://www.eiskills.com/about.html), e.g.:

- Socio-Emotional Learning
- Emotional Competencies
- Competencies
- Soft Skills
- Emotionally Intelligent Behavior

Why is emotional intelligence important?
How could awareness of one’s own EI, as well as the EI of those we deal with, improve learning?
A little investigation: SOCIAL INTELLIGENCE

Daniel Goleman also published another book, SOCIAL INTELLIGENCE. How different is social intelligence from emotional intelligence? Is social intelligence an aspect that educators and/or learners should be concerned about?

Self-Assessment

How have varying views about intelligence emerged over time? What were the significant influences that led to the evolution of each of these perspectives?

Compare and contrast different theories of intelligence.

Discuss what makes people intelligent.

Discuss heritability and the problems with heritability studies.

Describe research on group differences in intelligence.

Identify and explain how intelligence is measured. Describe what IQ tests are, how they are scored, and what they say about a person’s future.

Describe creativity and why some people are more creative than others.

Discuss the success of efforts to enhance intelligence and creativity.

An Optional Assignment

Mini Field Investigation: “INTELLIGENT DATA”

Ask people around you:

- Define intelligence.
- Describe an intelligent person.

You can make this task more interesting if you pool your data together with some classmates and organize them according to some criteria.

Use the ideas of Raty and Snellman (1995) and the major theories discussed in this module to help you interpret the data from this mini investigation.
Suggestions for Open Thread Discussions

The forum is open for any related discussion and must not be limited to the following suggestion/s. You may generate your own questions/discussion threads in the Open Forum.

- Cite evidences from personal experience that would support one or both ideas that intelligence is inherited or shaped by environmental factors.

- Having learned various theoretical perspectives on intelligence, how do you think intelligence should be measured?
  
  - What are the weaknesses of standardized tests (Binet-Stanford, etc.) as determinants for qualification for employment/admission into schools?
  
- Can you suggest alternative ways that would qualify as a “more fair” or “more valid” basis for assessment of intelligence?

- In what ways do our notions about intelligence affect the way we teach and/or learn?

- Having thus considered different views of intelligence, how do you think intelligence should be defined (i.e., how would you refine the definition of intelligence)?

Guide for your e-Journal

For your e-journal entries, you may use the following as guides, but feel free to express other thoughts (and feelings) about learning as they have been stimulated by the topics in this chapter. Keep in mind that learning is very personal and your e-Journal should be reflective of those personal learning events.

1. What strategies do you use to learn? How do you know how well you have learned; what are your indicators of learning? According to your learning strategies, where do you (in practice) seem to stand in the nature-nurture debate?

2. Discuss your own perspectives about intelligence. In this light, address the following questions:
   - How have your personal views about intelligence affected the way you approach learning?
   - What are your ideas about the way teaching or testing can be done best?

3. Are there ways in which you have already experienced multiple intelligence approaches in school, either with or without realizing it?

4. How can you design your own learning (in your present courses) so that you can tap your multiple intelligences?
Module 4: Theories of Intelligence

Note to Students

The list that follows may be too long for some of you. You may filter the list according to what you deem useful for your personal learning goals. On the other hand, the list may appear quite short for some of you, because articles and discussions on Intelligence is quite abundant in the internet.

Essential Readings


Theories of Intelligence. [http://otec.uoregon.edu/intelligence.htm](http://otec.uoregon.edu/intelligence.htm)

Intelligence. In *About.com*. [http://psychology.about.com/od/intelligence/Intelligence.htm](http://psychology.about.com/od/intelligence/Intelligence.htm)

Contains links to a broad range of topics on intelligence, including IQ, EQ, MI.


References

Cherry, K. *History of intelligence testing: The history and development of modern IQ testing*. In Acout.com [http://psychology.about.com/od/psychologicaltesting/a/int-history.htm](http://psychology.about.com/od/psychologicaltesting/a/int-history.htm)

Cherry, K. *What is nature versus nurture?* In Acout.com [http://psychology.about.com/od/nindex/g/nature-nurture.htm](http://psychology.about.com/od/nindex/g/nature-nurture.htm)

Current Use of the Stanford-Binet (L-M) [http://www.gifteddevelopment.com/PDF_files/a05.pdf](http://www.gifteddevelopment.com/PDF_files/a05.pdf)

Module 4: Theories of Intelligence

Web Destinations

**IQ**
Current Use of the Stanford-Binet (L-M) [http://www.gifteddevelopment.com/PDF_files/a05.pdf](http://www.gifteddevelopment.com/PDF_files/a05.pdf)
The History and Development of Modern IQ Testing [http://psychology.about.com/od/psychologicaltesting/a/int-history.htm](http://psychology.about.com/od/psychologicaltesting/a/int-history.htm)

**STERNBERG’S TRIARCHIC THEORY**

**MULTIPLE INTELLIGENCE**
Howard Gardner, Multiple Intelligences & Education. [http://www.infed.org/thinkers/gardner.htm](http://www.infed.org/thinkers/gardner.htm)
Multiple Intelligence Theory [http://www.multipleintelligencetheory.co.uk/](http://www.multipleintelligencetheory.co.uk/)
Tapping into Multiple Intelligences. In Concept to Classroom page. [http://www.thirteen.org/edonline/concept2class/mi/index.html](http://www.thirteen.org/edonline/concept2class/mi/index.html)
TeacherVision. *Multiple Intelligence Resources.*
Index to articles about Howard Gardner's Multiple Intelligences theory. Includes specific strategies for bringing out the best in each student.

**GOLEMAN’S EMOTIONAL INTELLIGENCE AND SOCIAL INTELLIGENCE**
Defines Emotional Intelligence and addresses the question, “*Is EI a Better Predictor of Success than IQ?*”


**Goleman: Talks, Interviews, Blogs**
- Daniel Goleman's TED talk: "Why Aren't We All Good Samaritans?"
- Reconsidering, From the Heart: An interview with Daniel Goleman
- They've Taken Emotional Intelligence Too Far (Daniel Goleman for TIME)
- The Must-Have Leadership Skill (Daniel Goleman for the Harvard Business Review)
- Daniel Goleman on Leadership and The Power of Emotional Intelligence (Forbes.com)
- "What Makes a Leader?" from Business & Leadership
Module 4: Theories of Intelligence

**Video-Clips**

Daniel Goleman Explains Emotional Intelligence.
[http://www.youtube.com/watch?v=NeJ3FF1yFyc](http://www.youtube.com/watch?v=NeJ3FF1yFyc)


Interview with Daniel Goleman; More ideas from Goleman.
[http://bigthink.com/users/danielgoleman](http://bigthink.com/users/danielgoleman)
Contains several links to media

Daniel Goleman on compassion at TED talk.

Robert Sternberg on Practical Intelligence.
[http://abavtooldev.pearsoncmg.com/sbx_videoplayer_v2/simpleviewer.php?projectId=MPL&clipId=intvw7_ster02.flv&ui=2](http://abavtooldev.pearsoncmg.com/sbx_videoplayer_v2/simpleviewer.php?projectId=MPL&clipId=intvw7_ster02.flv&ui=2)

Robert Sternberg on Giftedness.
[http://abavtooldev.pearsoncmg.com/sbx_videoplayer_v2/simpleviewer.php?projectId=MPL&clipId=intvw8_ster03.flv&ui=2](http://abavtooldev.pearsoncmg.com/sbx_videoplayer_v2/simpleviewer.php?projectId=MPL&clipId=intvw8_ster03.flv&ui=2)

[http://abavtooldev.pearsoncmg.com/sbx_videoplayer_v2/singleplay.php?projectId=MPL&clipId=v0104.flv&ui=2](http://abavtooldev.pearsoncmg.com/sbx_videoplayer_v2/singleplay.php?projectId=MPL&clipId=v0104.flv&ui=2)