

ADVANCED ORGANIZER - CHAPTER 4

LEARNING ABILITIES and LEARNING PROBLEMS

- I. Intelligence in the 1990's.
 - A. What is intelligence?
 - B. Is there one intelligence or many?
 - C. Is intelligence stable or modifiable?

- II. Individual differences in Intelligence
 - A. General Intelligence
 - B. Multiple Intelligence - How are we different?
 - 1. Guilford's Faces of Intelligence
 - 2. Gardner's Multiple Intelligence
 - C. Multiple Intelligence - How are we the same?
 - Sternberg's Triarchic Theory of Intelligence
 - D. Perkins' Learnable Intelligence

- III. Measuring Intelligence
 - A. Alfred Binet and IQ tests
 - B. IQ scores and types of tests
 - C. Environment or Heredity
 - 1. Heritability
 - 2. Reaction Range

- IV. Ability Differences and Teaching
 - A. Ability Grouping (Between-class and Within-class)
 - B. Cognitive and Learning Style

Does equal opportunity = equal treatment

Can we change almost any characteristic of the children we interact with, or are we severely limited in modifying the “abilities” that children have when they enter our classrooms?

What is Intelligence ?

**How important is Intelligence
in our society and school?**

**Is intelligence important enough
for children to try to “fake it”?**

THE ORIGINS OF DIFFERENCES

Everyone is different, but to what can we attribute those differences?

Heritability Ratio - The proportion of a particular characteristic's variability within a group that can be attributed to genetic causes.

Reaction Range - Heredity sets certain limits to the development of an individual and the environment fulfills, or fails to fulfill, the potential that genetics sets.

A High Profile Difference - Intelligence What Does It Mean?

Historically Intelligence was defined as:

1. The capacity to learn
2. The total knowledge a person had acquired
3. The ability to adapt successfully to new situations and to the environment in general

History of Intelligence Testing and Theory

General View of Intelligence

1. Capacity to Learn
2. Total Knowledge
3. Adapting to New Situations.

Intelligence as One Ability

Spearman (1927)
General Intelligence (“g”)

Multiple Views of Intelligence

Guilford (1988)

Faces of Intelligence

- C Mental Operations
- C Contents
- C Products

Gardner (1983)
Multiple Intelligences

1. Linguistic
2. Musical
3. Spatial
4. Logical-Mathematical
5. Bodily
6. Knowledge of Self
7. Understanding Others

Goleman (1995)
Emotional Intelligence

- C Inter - personal
- C Intra - personal

Intelligence as a Process

Sternberg (1990)

Triarchic Theory of Intelligence

- C Component
- C Experiential
- C Contextual

Perkins (1995)

Theory of Learnable Intelligence

- C Neural Intelligence
- C Experiential Intellig
- C Reflective Intellig

HISTORY OF INTELLIGENCE TESTING

Charles Spearman - One factor intelligence ("G")

Guilford - A number of primary mental abilities. Guilford called this "faces of intelligence" which have three components: (overheads)

Mental Operations - processes

Content - what we think about

Products - end results of thinking

Howard Gardner - **Theory of Multiple Intelligence** proposes seven different kinds of intelligence:

1. Linguistic (Verbal)
2. Musical
3. Logical-Mathematical
4. Spatial
5. Bodily (Physical)
6. Knowledge of Self
7. Understanding of Others

Emotional Intelligence (EQ)

(Goleman, 1995; Salovey & Mayer, 1990)

Emotional Intelligence is the ability to monitor your own emotions and the emotions of other people, to differentiate different emotional reactions, and to use this understanding to guide your own behavior and your interactions with other people.

Goleman identifies 5 aspects of emotional intelligence, 3 of which Gardner would describe as interpersonal and two of which fall into Gardner's intrapersonal intelligence.

I. Intrapersonal Intelligence

- A. **Knowing your own Emotions** - The ability to recognize how you feel and communicate those feelings to other.
- B. **Managing your own Emotions** - The ability to manage your emotions, particularly strong "negative" emotions.
- C. **Self-Motivation** - The ability to focus energy, control your impulses, delay gratification, and persist in the face of difficulty to strive for important goals. (See SRL of Motivation & Affect)

II. Interpersonal Intelligence

- D. **Recognizing Emotions in Others**
- E. **Handling Relationships**

Sternberg's Triarchic Theory of Intelligence

Most theories of intelligence (Spearman, Binet, Guilford, and Gardner) **explore how people differ in the content of their intelligence.**

Sternberg's Theory emphasizes the processes that are common to all people's thought.

I. Analytic/Component Intelligence - Mental programs that operate on information that we already possess, how we “plan” for gaining new information, and how we know what is relevant and what isn't. At this level we are assessing what we are thinking about to see if it is working - our BOS (Brain Operating System)

- A. **Meta-components** - Thinking about how we are thinking. This component involves planning, choosing strategies, and monitoring our understanding. “Do I understand the textbook?” “Am I spending enough time thinking up examples for Level II questions?” “Have I been studying the right way for Level III questions?”
- B. **Performance Components** - Once I have selected a strategy how will I execute the strategy I have chosen.
- C. **Knowledge Acquisition Component** - While learning I need to decide if new material is relevant or not.

This level of “intelligence” is very important in this class when studying for tests.

**Is it possible to become” smarter” in this area?
What could you do to become smarter?**

Sternberg's Triarchic Theory of Intelligence

Sternberg's Theory emphasizes the processes that are common to all people's thought.

II. Creative/Experiential Intelligence - This type of intelligence is knowing how to apply new information and old information in a new environment. It includes combining information to create solutions to problems you have never experienced and becoming an "expert" quickly by internalizing these skills.

A. **Insight** - The ability to understand what a novel problem is asking and come up with solution. Can you look at a Level III problem and identify what relationship is implied in the problem?

B. **Automaticity** - The internalization of a behavior, skill, or thinking process so thoroughly that you do not have to think about using it ... it happens automatically. Can you automatically apply what you know to a Level II questions that asks about a classroom example?

III. Practical/Contextual Intelligence - Can I find where my skills fit? This type of intelligence deals with a person's ability to choose or modify an environment to increase the possibility that they will be more successful. Do you work better by studying by yourself or with another person? If you need a partner can you find someone to work with and control that environment? This includes **tacit intelligence** that comes from practical real-world experiences that take the form of "know how..." rather than "knowing that..."

David Perkins' Theory of Learnable Intelligence

David Perkins theory of Learnable Intelligence describes intelligence as “Mindware”; “ ...whatever people can learn that helps them to solve problems, make decisions, understand difficult concepts, and perform other intellectually demanding tasks better. ... mindware is software for the mind”. Perkins recognizes three dimensions of intelligence:

- c **Neural Intelligence** - The contribution of neural efficiency to intelligent behavior. Perkins believes this is, in large part, genetically determined.

- c **Experiential Intelligence** - The contribution of a storehouse of personal experience in diverse situations to intelligent behavior. Perkins believes that extensive common knowledge and skills, and specialized knowledge and skills, make people experts.

- c **Reflective Intelligence** - The contribution of knowledge, understanding, and attitudes about how to use our minds to intelligent behavior - in other words, the contribution of mindware. Perkins believes that reflective knowledge is the key to learnable intelligence. It includes strategies for memory and problem solving. It is metacognition, mental management, self-monitoring and includes a positive attitude toward investing mental energy and imagination to solve problems.

HOW INTELLIGENCE IS MEASURED

Mental Age - The score recorded on an IQ test

Intelligence Quotient -
$$\frac{\text{Mental Age}}{\text{Chronological Age}} \times 100$$

Deviation IQ - MA/CA replaced by comparisons to your own age

Wechsler Scales: Three types of individual scales

WAIS-R - Wechsler Adult Intelligence Scale

WISC-R - Wechsler Intelligence Scale for Child

WPPSI - Wechsler Preschool and Primary Scale of Intelligence

What do Intelligence Scores Mean?

Norm Referenced Tests

Mean = 100 Standard Deviation = 15

Ability Groupings

Between-Class Ability Groupings

A common approach in high school around the world. Despite what seems like “common sense” there are problems:

- C Research indicates it helps high ability students somewhat but causes problems for low ability students.
- C Low ability students receive lower quality instruction.
- C Teachers are less enthusiastic about teaching low ability students and are likely to be less effective.
- C Teachers typically have a negative attitude toward low ability students and are likely to have lower expectations and communicate those expectations.
- C Between-class ability grouping can lead to re-segregation

Within-Class Ability Groupings

Clustering students by ability within the same classroom can be effective **IF** teachers observe the following conditions:

- C Group by current performance and change often
- C Discourage between group comparisons
- C Keep groups small - two or three groups per class
- C Teachers need to adjust pace and instructional format

Cognitive Styles and Learning Styles

Cognitive Styles and Learning Styles are frequently used interchangeably but there is an important difference. **Cognitive Styles** refer to how people process information; the differences between how people view and approach the world. **Learning Styles (or Learning-Style Preferences)** refer to a person's personal preferences for where or how they will learn.

Cognitive Style

Field Dependent learners tend to perceive the big picture and are less likely to attend to the details of their environment. They tend to enjoy working in groups and are sensitive to other people

- difficulty focusing on details of a situation
- good memory for social information
- can view the "big picture" but may be unaware of details
- prefers subjective subjects such as literature and history

Field Independent learners are more likely to focus on the details of a situation and are good at analyzing a pattern and picking out the difference between figure and ground. (e.g., find the boat)

- good at analyzing a picture for details within the picture
- not as good at social relationships
- prefer analytical subjects such as math and science

Learning-Style Preferences

Learning-Styles Preferences refer to environmental factors for which an individual may have a preference. These could include factors such as environment, emotions, relationships, and physical attributes

- Environmental - sound, light, temperature, design
- Emotional - motivation, persistence, responsibility, structure
- Sociological - who to work with and what authority
- Physical - Senses, intake (food), time, mobility
- Psychological - analytical/global