

Intelligence

Slide 1	<p>Anytime one is working with human beings it is expected that there will be diversity and guiding learning is no exception. One of the most important diversity issues is intelligence and this presentation will provide a brief overview of some of the major concepts used in describing intelligence. My name is Bill Huitt and I am Professor Emeritus at Valdosta State University and Adjunct Professor at Capella University.</p>
Slide 2	<p>Intelligence is quite difficult to define and there are many different views. However, one component on which most psychologists agree is that it is an aptitude or potential. That is, all human beings are born with a potential to learn about themselves and the world around them.</p>
Slide 3	<p>This potential is then actualized through biological maturation and interacting with the environment that results</p>
Slide 4	<p>in the creation of actualized competencies or skills. It is critical that the individual is provided with a rich environment if the potential is to be actualized. As an analogy, imagine two seeds that are exactly alike, yet one is planted in a rich soil and is provided optimum amounts of water and sunlight while the second is planted in poor soil and given inadequate amounts of sunlight and water. One can easily predict that there will be differences in the resulting actualized plants.</p>
Slide 5	<p>There are a number of different approaches to defining and explaining intelligence. The dominant view is labeled the psychometric approach as it is focused on measurements and statistical analysis of the construct.</p>
Slide 6	<p>Researchers working within this paradigm assume that intelligence, like all characteristics such as height or weight, is normally distributed. That is, approximately two-thirds of all measures will be within one standard deviation of the mean or arithmetic average with the remainder of the scores distributed equally above and below one standard deviation. Actual measures are then statistically manipulated to produce that assumed distribution of scores.</p>
Slide 7	<p>The scores on these types of assessment are quite useful in predicting academic achievement as well as success in the workplace. Remember that in the presentation on factors predicting student achievement that IQ scores had an effect size of greater than 1 and, therefore, was one of the best predictors of scores on standardized tests of basic skills.</p>

Slide 8	This relationship is understandable as both intelligence as it is defined psychometrically and student achievement measure cognitive knowledge and processing and are statistically produced using essentially the same procedures.
Slide 9	There is also substantial empirical research to support the conclusion that about 50% of variance in IQ scores can be explained as a result of inheritance and about 40% can be attributed to the environment. The remaining 10% is due to measurement error.
Slide 10	Additional research shows that IQ scores can be modified.
Slide 11	One of the most impressive bodies of research, labeled the Flynn effect, showed that increasing the sociocultural conditions of a population can have a dramatic impact on IQ scores. For example, the young people in this picture are eighth-grade students taking a test to see who can go on to high school. This is substantially different from the conditions that most of us had when we were in middle school.
Slide 12	A second factor is the home environment with such factors as the level of mother's education and the amount of reading material in the house as important contributors.
Slide 13	A third factor is the implementation of specific programs such as Reuven Feuerstein's Instrumental Enrichment program. Learners who have spent at least two years in this program have shown substantial increases in IQ scores.
Slide 14	However, there are alternatives to the psychometric approach that offer quite different perspectives. One is Jean Piaget's genetic epistemology theory.
Slide 15	Remember that Piaget proposed a human development theory of knowledge based on an assumption that human beings are genetically prepared to interact with, and process information from, the environment as they attempt to meet its demands.

Slide 16	Piaget proposed that human beings use mental representations called schema that they create as they interact with the environment. The individual first attempts to interact with the world in a similar way using existing schema which is called assimilation. When that does not work, such as hitting an egg on a table when the child had been using a rattle or wooden block, the child accommodates by creating a new, more appropriate schema.
Slide 17	The thinking processes develop in stages, from only using the senses before language develops to thinking logically with concrete objects during the elementary school years. Piaget proposed that the ability to use abstract symbolic reasoning was the most important feature of human intelligence and that all adolescents would acquire this competence.
Slide 18	However, empirical studies demonstrated that only about 35% of high school graduates actually attained this level of thinking. This shows that more than traditional schooling is needed to actualize this potential.
Slide 19	A second alternative theory is Robert Sternberg's Triarchic theory of intelligence. He proposed three separate, though related, intellectual abilities: analytical, creative, and practical.
Slide 20	Analytical intelligence involves the ability to investigate the elements of a problem and look at the relationships among elements. This ability is quite similar to that measured by traditional psychometric instruments. Some related terms include logical, objective, or sequential thinking, being rational, seeking convergent solutions, and being systematic in the process of solving problems.
Slide 21	Creative intelligence involves the ability to think about challenges in new and original ways. Some associated terms include being original and subjective in the process of solving problems, using parallel and non-rational methods, and seeking divergent solutions in a somewhat disordered manner.
Slide 22	Practical intelligence focuses on solving problems in everyday contexts. Some associated terms include having street smarts or common sense, being adaptive, and concerned with the here and now.

Slide 23	Sternberg and his colleagues have been prolific in not only defining and explaining intelligence, but also in providing materials that parents and educators can use to address the different components of intelligence. This is certainly a strength of this approach.
Slide 24	A third alternative is Howard Gardner's Multiple Intelligences theory. He defined intelligence in terms of solving problems and creating an effective product for doing so. He proposed seven different and distinct intelligences and added an eighth as he continued to develop his theory.
Slide 25	Three of the intelligences have been labeled symbol analyst intelligences as they involve the use of linguistic, mathematical, and musical symbols in an often abstract manner.
Slide 26	Two of the intelligences have been labeled personal intelligences as they involve making distinctions among other individuals as well as knowing one's own thoughts and feelings.
Slide 27	And three of the intelligences have been labeled non-canonical in that they do not relate to each other. These involve spatial intelligence which refers to the ability to mentally visualize and rotate objects, bodily-kinesthetic intelligence which involves control over one's body and handling objects skillfully, and the new intelligence, labeled naturalistic, which involves the ability to discern differences in the living environment.
Slide 28	Gardner focused most of his energies on explaining and defining the different intelligences, but others have provided extensive materials on how his work can be applied in classroom and school activities.
Slide 29	In summary, there are multiple perspectives on exactly how to define and assess intelligence
Slide 30	in ways that can be beneficial to parents and educators as they attempt to guide children and youth towards successful adulthood.
Slide 31	For example, if the goal is to improve a young person's IQ score, it is best to provide a wide variety of experiences with a particular focus on developing a strong vocabulary, especially through reading, and provide the individual with an opportunity to engage with the materials and procedures used in the Feuerstein Instrumental Enrichment program.

Slide 32	If the desired outcome is preparing the young person for successful adulthood, the materials and procedures developed by Piagetian educators and Sternberg's Triarchic theory would be most beneficial.
Slide 33	And if the goal is the development of the potentials of the whole person, then the work completed by Gardner and his followers would be the more useful. Of course, it is always possible to integrate these different approaches and use methods appropriate for a specific situation or child.
Slide 34	It is this latter approach that I took when developing the book explaining the Brilliant Star framework. I surveyed the domains that researchers had labeled as an intelligence and then created a chapter on each, providing a definition, how that intelligence developed, how it could be guided through instructional activities, and how it could be assessed. For parents, educators, and policy makers, simply knowing that intelligence scores predict academic achievement or life success is inadequate. It is more important to implement guided activities that can empower the individual to turn a potential into a competence and enhance that potential whenever possible.
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<p>Slide 37</p>	<p>Sternberg, R. (1988). <i>The triarchic mind: A new theory of human intelligence</i>. New York, NY: Penguin Books.</p> <p>Sternberg, R., Forsythe, G., Hedlund, J., Horvath, J., Wagner, R., Williams, W., Snook, S., & Grigorenko, E. (2000). <i>Practical intelligence in everyday life</i>. Cambridge, UK: Cambridge University Press.</p> <p>Sternberg, R., & Grigorenko, E. (2016). <i>Teaching for successful intelligence: To increase student learning and achievement</i> (2nd ed.). New York, NY: Corwin/Skyhorse Publishing.</p> <p>Sternberg, R., Jarvin, L., & Grigorenko, E. (2015). <i>Teaching for wisdom, intelligence, creativity, and success</i>. Thousand Oaks, CA: Corwin.</p>
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