Theories of Learning in The Learner's Journey

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John Dewey Theory

❖ John Dewey was a revolutionary in the concept and application of education reform and developed and studied many reforms that created the modern educational system that we have today.

❖ One of those reforms is called "progressive education" which was defined in Ben Janse's article, "The John Dewey Theory" in which he said, "progressive education in essence is a vision of education that emphasizes the necessity of learning by doing" (Janse, 2019).

❖ John Dewey's theory places significant weight on the act of doing or hands-on learning as the single, most effective way to learn.

❖ Dewey's theory values the importance of the relationship between students, the teachers and their inter-cooperation with their environment learning to adapt to different tasks and situations that are constantly changing day-to-day.

❖ Dewey's theory states that by challenging the student to adapt to their environment, not only will the student learn, but there is a call and response communication from teacher to student and vice-versa which will teach student to adapt to the new environment while also learning new skills, tools and knowledge to apply on their assignments, tasks, and even in the real world.

John Dewey Theory

❖ Dewey was seen as a radical theorist of his time at the end of the 19th and early 20th century by arguing, "that education can only be truly effective when children have learning opportunities that enable them to link current knowledge to past experiences and knowledge" (Janse, 2019).

❖ Dewey not only developed these theories of education, but he also put them into practice, studied the ins and outs meticulously and applied them to different schools that he founded.

❖ One of those schools was the University Elementary School, which was part of the University of Chicago.

❖ The University Elementary School was used to test Dewey's theories, however, his wife and partner was fired leading to his own resignation (Janse, 2019).

❖ In stark contrast to his failures at the University Elementary School, many years later Dewey partnered with Charles Beard, James Harvey Robinson, and Wesley Slair Mitchell to successfully found The New School for Social Research in 1919.

❖ This school led to Dewey's philosophies and theories gaining significant ground as "Dewey gave a lecture on educational reform in schools all over the world" (Janse, 2019).

John Dewey Theory

❖ Dewey rejected the widely accepted theory at the time that children were "passive recipients of knowledge" (Janse, 2019).

❖ This commonly accepted theory of the time period left children in "desks that were in rows in the classroom and students wouldn't leave their chair all day" (Janse, 2019).

❖ However, Dewey proposed a different application within schools which "recommends an interdisciplinary curriculum, or a curriculum that focuses on connecting multiple subjects where students can walk freely in and out of classrooms. In this way, they pursue their own interests, and build their own method for acquiring and applying specific knowledge" (Janse 2019).

❖ This method works by students taking their own initiative to recognize their interests, applying their ever-changing skill-sets and knowledge to tasks at hand while the teacher provides direction and the space for the students to learn, grow and ultimately thrive.

❖ By the teachers setting the environment for the students to learn and stepping back, the teacher facilitates those students to think critically and learn to develop problem solving skills by adapting to the obstacles that they face on their assignments and tasks.

❖ This method led to the current application in educational curriculums of presentations, projects, and other group assignments which flourish out of first hand application by students' innovation and collaboration.

Piaget's Student Centered Learning Theory

→ The root of a curriculum can be applied in an educational setting by using either of two separate approaches.

- ◆ One method is the teacher-centered approach which gives teachers the central power to choose which tasks and assignments for students to complete as well as the method of which to complete those assignments.

- ◆ The student-centered approach on the other hand focuses entirely on the creativity, critical thinking, problem solving and collaboration of the students in order for them to learn, adapt and grow.

→ Student centered learning has its basis from Jean Piaget's constructivist theory.

→ Teacher-centered methods that have utilized student-centered ideas include personalized learning and project based learning.

- ◆ Personalized Learning is defined by Mitchell Jay in his article "what exactly is student centered approach" in which he says, "personalized learning is a student centralized approach where the student's interests and culture are taken into consideration and incorporated into their education" (Jay, 2016).

- ◆ Project based learning gives students the chance to think outside the box, creatively and inventively develop their own products, problem solve, and work cooperatively and collaborate with their fellow students which "...encourages students to develop an array of skills that can be applied anytime/anywhere..." (Jay, 2016).

Piaget's Student Centered Theory
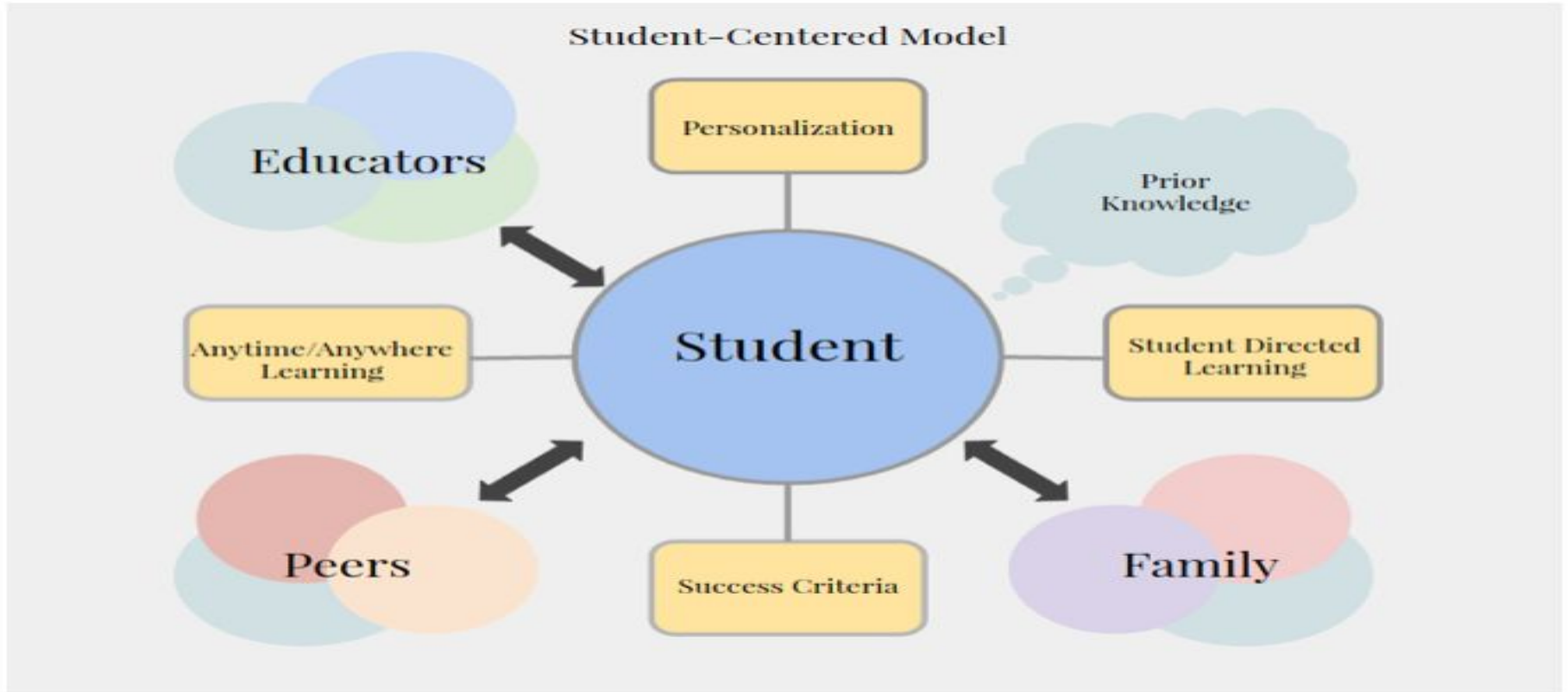
Piaget's Student Centered Learning Theory

➔ Piaget "observed that children cognitively construct knowledge and meaning through new experiences and interaction, as opposed to rote memorization" (Jay, 2016).

➔ Student-centered approach follows these 4 rules of which the students identify:

◆ "What they want to learn" (Jay, 2016)

◆ "How they are going to learn it" (Jay, 2016)

◆ "How to track their progress" (Jay, 2016)

◆ "What determines success" (Jay, 2016)

➔ By following these underlying rules, the student has an active process in their education by which they work with teachers and their parents for their own educational success.

➔ That success relies upon a "formative assessment" (Jay, 2016) by which, "students can identify, understand, and track the quality of their work with the support of their educational community" (Jay, 2016).

➔ Additionally, this community, while student directed, is democratic and relies on each system to work as equal parts towards the educational success of the students including the educators, the administrators, guidance counselors, the PTA, and even in the broader sense the board chairs and legislators that support the budgets and curriculum.

Piaget's Student Centered Learning

➔ Mitchell Jay expresses the ideal educational philosophy by saying, "The most ideal education incorporates the needs and interests of the student while simultaneously enabling the student to track, guide, and have a stake in the process of their education" (Jay, 2016).

➔ This process of education identifies the skills, passions, and interests of the student and implements that same intrigue into the curriculum.

➔ The student has drive and purpose with regards to their education which leads them to learn and grow at a much faster and more efficient rate.

➔ Jay states that this can be applied by "Fascinations and interests easily lend themselves to fun projects and reward systems, just as they lend themselves to the development of literacy via an ever-present thirst for knowledge" (Jay, 2016).

➔ Furthermore, as a curriculum is centered around the topic of interest for the student, this can then leave room for the development of student directed goals which can be identified and set quarterly, by semester, or by the year.

➔ By becoming self directed and motivated this "...provides the students access to a stake in the outcomes of their education" (Jay, 2016).

➔ Therefore, by investing in the qualities and strengths of the students, "this style of instruction gradually develops independent thinkers, endowed with the tools necessary for lifelong learning" (Jay, 2016).

Gardner's Theory of Multiple Intelligences

- Since theories of intelligence have been circling the psychological realm of scientists, philosophers, and educators in the early 1900's many theories have been formulated.

- However, the first to have the volume of neuroscientific evidence to support their theories was Howard Gardner and his formulation of the Multiple Intelligence Theory.

- Gardner was quoted as defining his theory of intelligence in his book "Frames of Mind" in which he said intelligence is "...the ability to solve problems or create products that are valued in a culture or community" (Gardner, 1983, 1993, 1999; Shearer, 2020).

- Gardner breaks down and identifies the 8 different forms of intelligence as, "...linguistic, logical-mathematical, visual-spatial, bodily kinesthetic, musical, interpersonal, intrapersonal, and naturalist" (Shearer, 2020).

- In the subject of education and learning, "the introduction of multiple intelligences (MI; Gardner, 1983, 1999) had a profound and lasting impact on the educational community and is still of worldwide interest more than 30 years after its introduction (Chen, Moran, & Gardner, 2009; Shearer, 2020).

- Furthermore, currently the debate continues on regarding the scientific basis for general intelligence or multiple intelligences such as "...triarchic (Sternberg, 1988), emotional intelligence (Goleman, 1995; Salovey & Mayer, 1990), structure or intellect, (Guilford, 1954), faculties of mind (Thurstone, 1938), and cognitive styles (Kolb & Kolb, 2005)" (Shearer, 2020).

Gardner's Theory of Multiple Intelligences

Table 1

Multiple Intelligences Core Cognitive Units and Dominant Neural Correlates (Source: Shearer & Karanian, 2017; Shearer, 2019b)

Intelligences	Core cognitive units	Primary regions	Sub-regions
Interpersonal	Social perception	Frontal	Medial-temporal
	Interpersonal understanding	Temporal	Amygdala
	Social effectiveness	Cingulate	Dorsolateral PFC
	Leadership	Parietal	Anterior cingulate
			Superior temporal sulcus
Intrapersonal	Self-awareness	Frontal	Prefrontal-cortex
	Self-regulation	Cingulate	Anterior cingulate
	Executive functions	Temporal	Dorsomedial PFC
	Self-other management	Parietal	Lateral prefrontal
		Subcortical	Ventromedial
Logical-Mathematical	Mathematical Reasoning	Frontal	Prefrontal
	Logical reasoning	Parietal	Intraparietal sulcus
		Temporal	Inferior parietal lobule
Linguistic	Speech	Temporal	Superior temporal gyrus
	Reading	Frontal	Inferior frontal gyrus
	Writing	Parietal	Broca's area
	Multimodal communication of meaning		Posterior inferior frontal gyrus
Spatial	Spatial cognition	Frontal	Premotor cortex
	Working with objects	Parietal	Motor cortex
	Visual arts	Temporal	Medial temporal
	Spatial navigation	Occipital	Prefrontal
Musical	Music perception	Frontal	Superior temporal gyrus
	Music and emotions	Temporal	Primary auditory cortex
	Music production	Subcortical	Premotor cortex
		Cerebellum	Basal ganglia
			Supplementary motor
Kinesthetic	Body Awareness/control	Frontal	Motor cortex
	Whole body movement	Parietal	Primary motor cortex
	Dexterity	Subcortical	Premotor cortex
	Symbolic movement	Cerebellum	Basal ganglia
Naturalist	Pattern cognition	Temporal	Superior temporal sulcus
	Understanding living entities	Subcortical	Amygdala
	Understanding animals		Brainstem
	Understanding plant Life		Thalamus
	Science		Midbrain
			Basal ganglia

Note. PFC = prefrontal cortex. Eight forms of intelligence are described by Gardner with several core cognitive components per intelligence. Each intelligence (and constituent components) are aligned with specific patterns of neural activation. A selection of the dominant neural regions are listed here.

Gardner's Theory of Multiple Intelligences

Table 2
Search Terms and Core Cognitive Units for the Multiple Intelligences

Intelligence	Search terms	Core cognitive components
Linguistic	Verbal skill Reading Writing Speaking Rhetoric	Speech Reading Writing Multimodal communication of meaning
Logical-mathematical	Reasoning Calculations Math skill Abstraction Meaning making	Mathematical reasoning Logical reasoning
Musical	Vocal/singing Instrumental ability Musical appreciation Improvisation Music and emotions	Music perception Music and emotions Music production
Kinesthetic	Large motor movement Fine motor Dexterity Tool use Eye hand coordination Dance Athletics	Body awareness/control Whole body movement Dexterity Symbolic movement
Spatial	Mental visualization Imagination Spatial orientation	Spatial cognition Working with objects Visual Arts Spatial navigation
Interpersonal	Empathy Theory of mind Interpersonal perspective taking Leadership	Social perception Interpersonal understanding Social effectiveness Leadership
Intrapersonal	Metacognition Emotional intelligence Self-management Impulse control	Self-awareness Self-regulation Executive functions Self-other management
Naturalist	Understanding animals Plant care Science Classification	Pattern cognition Understanding living entities Understanding animals Understanding plant life Science

Note. Each intelligence is comprised of several inter-related skills and cognitive components listed in column three.
Source: Shearer and Karanian (2017).

Gardner's Theory of Multiple Intelligences

Table 3
Whole Brain, Model-Free rsFC Networks Associated With the Multiple Intelligences–Summary

Intelligence	Networks identified	No. studies	Core structures	Cognitive correlates
Visual-spatial	Visual system	10	Three components: 1: Mesial: striate, extra-striate, lingual gyrus 2: Lateral visual areas: Occipital pole, occipito-temporal regions 3: Striate cortex, polar visual areas	Mental imagery Spatial visualization
Kinesthetic	Sensorimotor Primary motor Somatomotor Cerebellar Basal ganglia	12	2 Networks- Motor strip Precentral gyrus Postcentral gyrus Supplementary motor Subcortical: thalamic Primary motor and premotor areas, Anterior pulvinar nuclei, insula, primary somatosensory, posterior cingulate Cerebellar- Retrosplenial Lateral cerebellum, L and R Inferior cerebellum	Large motor movement Dexterity and coordinated movements.
Musical	Auditory Auditory motor rhythm	6	Core regions: Superior temporal gyrus (BA22) Heschl's gyrus Insula Postcentral gyrus (BA 1_2)	Sound processing
Linguistic	Language	3	Temporo-parietal component Core regions: Inferior frontal gyrus Medial temporal gyrus Superior temporal gyrus Angular gyrus	
Logical-mathematical	Fronto-parietal Executive control	10	Lateralized fronto-parietal: 2 components: Right hemisphere Left hemisphere Inferior frontal gyrus Medial frontal gyrus	General intelligence Executive functions: Planning, goals, control, working memory

(table continues)

Gardner's Theory of Multiple Intelligences

Table 3 (*continued*)

Intelligence	Networks identified	No. studies	Core structures	Cognitive correlates
			Precuneus	
			Inferior parietal	
			Angular gyrus	
			DLPC: R and L	
			Intraparietal sulcus	
			Executive functioning:	
			Frontopolar area (BA 10), prefrontal cortex (BA 11), dorsal anterior cingulate (BA 32), and superior Parietal cortex (BA 7)	
Intrapersonal	Default mode network (DMN)	11	Default mode network: core regions -	Self-reflection
	Executive control		Precuenus/posterior cingulate	Self-monitoring/control
			Dorsal anterior cingulate	Self-Regulation
	Other networks:		Lateral parietal cortex	
	Cingulo-opercular		Mesial prefrontal	
	Salience		Hippocampi	
			Medial frontal gyrus	
Interpersonal	Default mode network	6	DMN: (see above)	
	Ventral attention		Ventral Attention Network:	Self reflection
			Superior Parietal lobules	
			Dorsal lateral prefrontal cortex	Social perception
			Portions of the medial frontal gyrus	

Note. DLPC = doral lateral prefrontal cortex; DMN= Default Mode Network. Multiple intelligence (MI) listed first followed by associated resting-state functionally networks (rsFC) neural network(s) and the number of rsFC studies that identify these networks. Core neural structures (if identified) are listed along with cognitive corr details and reference sources in online supplemental materials SI 3.

Gardner's Theory of Multiple Intelligences

- Intelligence is used in the development, planning and process of education in a number of ways.
- For instance, linguistic intelligence provides the ability and skill to comprehend, understand and develop language as well as read and write which are central to every task, assignment, project and exam given by educators to students.
- Linguistic intelligence provides the skills and abilities needed for the educators to provide direction to students, answer questions, facilitate assignments and for students to listen and comprehend those directions, formulate their questions, responses and collaborate with their peers and participate in the classroom.
- Logical-mathematical intelligence provides the deductive reasoning for students to evaluate an assignment, problem solve, think critically and provide solutions to those problems in any of their tasks at hand.
- Visual-spatial intelligence provides the student an ability to assess and interact with their environment, the assignments in front of them and gives the students the ability to adapt, innovate and create.
- Bodily kinesthetic intelligence provides the students the ability to have the motor movement and dexterity to construct the product of their assignments while also providing students with the knowledge of the body language of their peers and their instructors. This gives them the knowledge of when and how to participate in class.

Gardner's Theory of Multiple Intelligences

- The musical intelligence provides students with the ability to be creative, understand, perceive and deduce melodies, harmonies, layers of music and even notes which gives students an ability to escape from mental exhaustion.
- This also allows students to develop, produce and collaborate on an artistic and musical level which teaches lifelong valuable skills such as teamwork, listening actively and openly, and thinking outside the box.
- Interpersonal intelligence gives students the ability to be kind, compassionate and empathize with their peers which enables them to build and develop healthy relationships
- This also teaches these students how to communicate openly, actively, and how to effectively, openly and actively communicate, collaborate and interact with one another.
- Intrapersonal intelligence gives students the ability to build and develop a self concept, self esteem, and problem solve on a social and emotional level when issues come up such as bullying or other interpersonal challenges affect the self-concept.
- Naturalist intelligence provides students the ability to understand the concepts and applications of life and humanity. Additionally, this gives students the skills and processing ability to assess the patterns of our place in this world and universe through the study of biology, chemistry, astronomy, geology and oceanography among other life sciences.

Vygotsky's Theory of Social Development

★ Lev Vygotsky is well known in the study of education and psychological development as well as pedagogy, but is most notable for his concept of the Zone of Proximal Development (ZPD).

★ Vygotsky spent the majority of his years teaching various subjects such as literature, aesthetics, and art history and devoted his life to education as an educator and as a student of educational psychology.

★ Vygotsky's Zone of Proximal Development was defined in Vygotsky's book, "The Development of Higher Psychological Processes", saying "...it is the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance in collaboration with more capable peers" (Vygotsky, 1978; Esteban-Guitart, 2018).

★ So, this (ZPD) can be summed up as the environment by which a student can learn, adapt, grow and develop skills such as problem solving and critical thinking skills by collaborating with their peers and having guidance and facilitation by an adult.

★ As an educator Vygotsky spent much of his life focusing on "...three core areas of work or interest… during this period (from 1917 to 1924) in Gomel: (a) pedagogical and educational issues; (b) question of aesthetics, art criticism, and institutional promotion of the arts; (c) questions that concern actual psychology" (Esteban-Guitart, 2018).

Vygotsky's Theory of Social Development

★ Vygotsky, with regards to educational psychology, believed that humankind, society and education could be transformed through the development of a "...a quasi-religious utopia built upon the social transformation of mankind" (Esteban-Guitart, 2018).

★ This transcendence, Vygotsky believed, was the development of a rational, logical, mathematical and scientific world that was influenced by data that would reshape the world to act "...from a rationalistic, scientific perspective, using experiment-based methodology" (Esteban-Guitart, 2018).

★ Furthermore, Vygotsky by using his scientific research, would seek out to study cultures, the workings of society and groups, and to forming his own branch of psychology in that of education.

★ Vygotsky defined this branch of his own "...as the product, or result, of 'pedagogical vocational psychology' allied to applied psychological research in the field of education, and the 'psychology of culture': 'together they form a genuine educational psychology...'" (Vygotsky, 1926/1997; Esteban-Guitart, 2018).

★ Vygotsky believed that in order to teach we had to first understand the workings of people and society as a whole.

★ He worked to study people in their own environment to recognize "...'inherited reactions' and 'acquired reactions' and 'instincts,' 'conditional reflexes,' and 'superreflexes'" (Vygotsky, 1926/1997; Esteban-Guitart, 2018).

Bandura's Observational Learning

❑ Bandura is most notably known for his studies on observational learning including his famous bobo doll experiment with children.

❑ This experiment studied reactions and behaviors of children towards a bobo doll following the behavior of an adult.

❑ This study was made up of of 36 boys and girls from the Stanford University Nursery School between ages 3-6.

❑ 24 of those children (12 boys and 12 girls) observed aggressive behavior by an adult towards the bobo doll, 24 children (12 boys and 12 girls) had an adult play with in a non-aggressive way completely ignoring the bobo doll, and 24 children (12 boys and 12 girls) had no adult model of behavior.

❑ Each of the 72 children were "subject to 'mild aggression arousal,'" (McLeod, 2014) brought into a separate room with toys and they asked not to play with those toys, but they could play with the toys in the next room.

❑ Then, in the next room there were both aggressive and non-aggressive toys. Saul McLeod writes in his description of the experiment "The non-aggressive dolls included a tea set, crayons, three bears and plastic farm animals. The aggressive toys included a mallet and a peg board, dart guns, and a 3 foot bobo doll."

Bandura's Observational Learning

❏ McLeod goes on to say that "The child was in the room for 20 minutes, and their behavior was observed and rated though a one-way mirror. Observations were made at 5-second intervals, therefore, giving 240 response units for each child" (McLeod, 2014).

❏ For those children that observed the aggressive behavior, they seemed to imitate the aggressive behavior and much higher rates than any of the children in the other two groups and even behaved with more partially aggressive behavior that was not imitated.

❏ The girls were more likely to imitate physically aggressive behavior if their model was male and express verbal aggression if the model was female.

❏ Boys were more likely to imitate models of the same-sex.

❏ Boys also behaved with more physically aggressive behavior than the girls.

❏ Bandura's experiment clearly shows that the example that adults show children, whether that is how we treat each other, communicate to one another, and interact with one another has a profound impact on the children's behavior.

❏ Therefore, it is paramount that adults such as parents, educators, mentors, and any other role model set a positive example such as compassion, empathy, open and active listening, and respect for all human beings and animals. This will in turn set up the next generation with the skills needed to communicate, collaborate and innovate with their peers by learning to treat others with kindness and dignity.

Bandura's Observational Learning
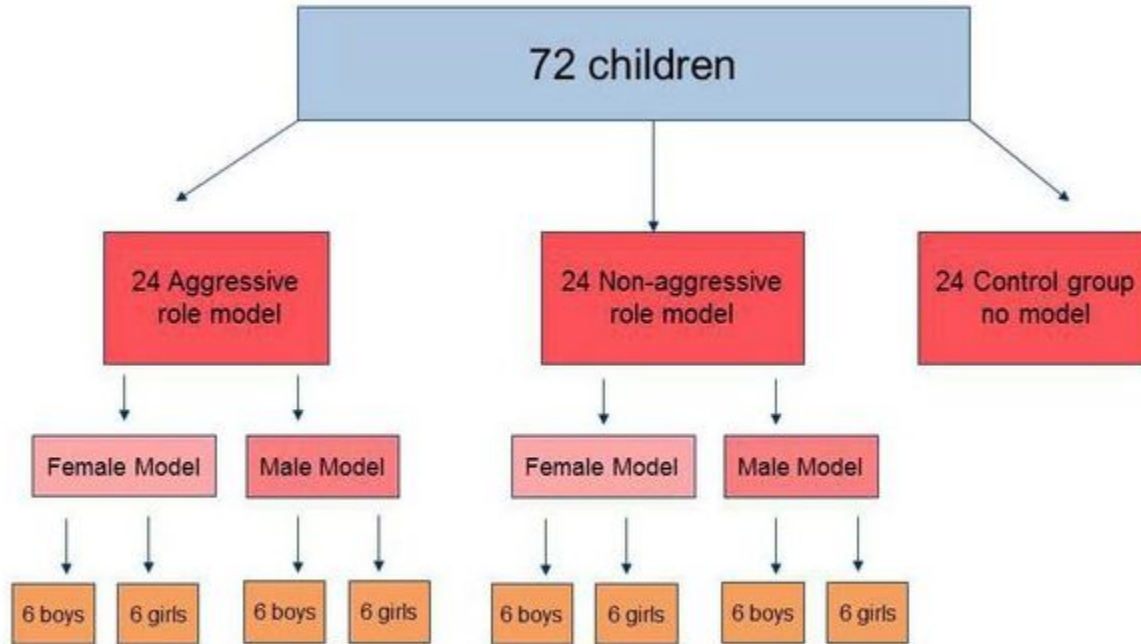
# My Own Theory of Learning (Strengths Approach)

- ❖ Many of these theories provide methods of individualizing the approach of teaching to the student such as Piaget's student-centered approach or Gardner's theory of multiple intelligences.
- ❖ My own theory or the Strengths Approach, would identify the qualities, interests, strengths, and types of intelligence that each student identifies the most with and focus the curriculum on those students needs and interests.
- ❖ At the beginning of the year, and in every class the educator should assess the students interests, background, goals and strengths.
- ❖ I believe that the students should have full control over how they learn and that curriculums should be project and group based, yet the weight of the grade should be only based on individual work.
- ❖ Students should be broken up into groups based on their own types of intelligence, strengths and interests that they identify with by working with students that also share the same interest and intellectual qualities.
- ❖ These groups would individually break down one section of the larger subject matter of each topic that is completed throughout the curriculum.
- ❖ Students would work with like-minded students in a collaborative space and each of the groups should have a team-leader.

Strengths Approach

❖ Those team leaders would have group meetings with other team leaders at different stages of the project in order to collaborate on different perspectives and gain different insights into the larger picture of the subject matter.

❖ The teams would be broken up into 8 groups based on each type of intelligence and each group will teach themselves about a topic facilitated and picked by the instructor in each subject. Each group will then use their like-minded strengths and skills to develop a product of their choosing associated with that topic.

❖ But first, there will be 6 stages of progress on each project following the "Blooms Taxonomy" by which each stage is a piece of the greater puzzle of learning.

  ➢ Knowledge: Research stage

  ➢ Comprehension: Assess, analyze and discuss the research

  ➢ Application: Creating, problem solving and developing a product.

  ➢ Analysis: Analyzing the experiment of the product

  ➢ Synthesis: Modifying the product design to fix issues.

  ➢ Evaluation: Final presentation with peer feedback and a written reflection

❖ By using this method of instruction students get to apply their strengths and interests to their learning. Also, these students get to socialize and collaborate with like-minded individuals in order to create a product that fits in with a topic on the curriculum. The result is student centered learning using the strengths approach.
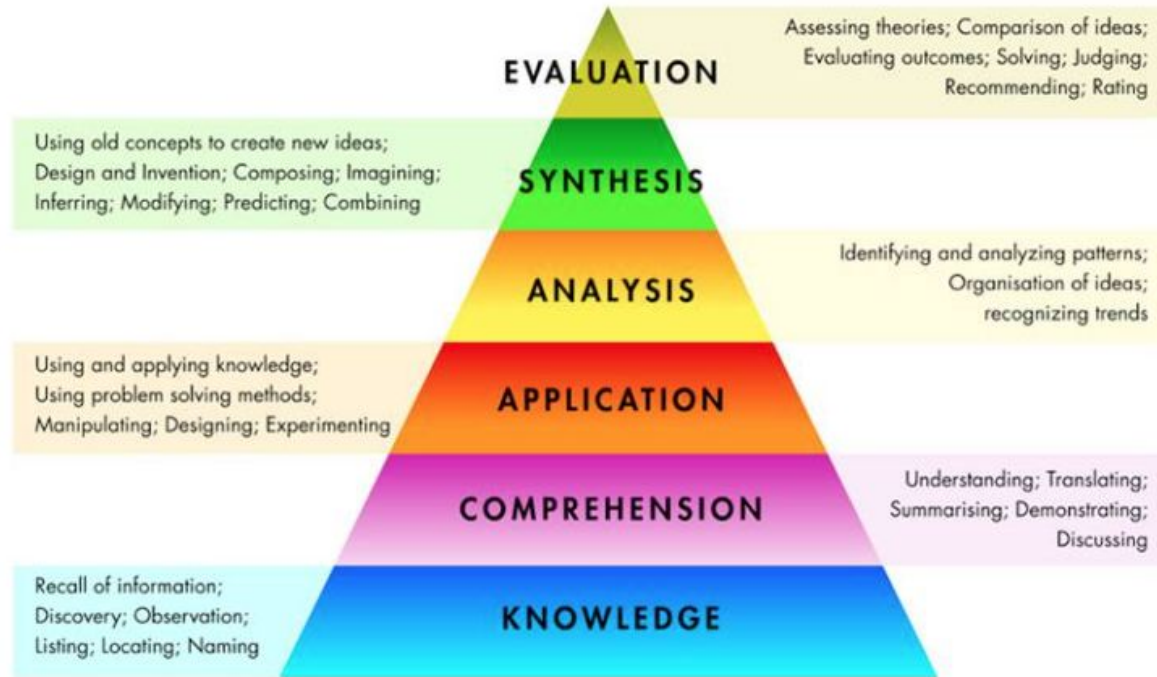
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