Asparagus is a Healthy Option, Even If You Prefer Broccoli:
Applying Learning Preference to College Students

GUIDED NOTES

PART 1: Debunking the Learning Styles Neuromyth

More than 70 learning styles theories have been developed – what do they have in common?

1. People learn in _____ ways.
2. By _____ the way an individual learns with instruction provided, learning will be _____.

Evidence from several studies show belief in learning styles is _____ in education.

Numerous reviews have found _____ evidence to support that matching the instructional method to an individual's learning style improved learning. Even controlled studies of matching instruction method to learning style have found _____.

Why do so many people still believe in the myth?

1. It makes "sense"
2. Misunderstanding between learning style, cognitive style/ability, and learning preference

    - Learning styles suggest that people learn in different ways and that learning will be optimal if the instruction being provided matches the way an individual learns

    - Cognitive style/ability refers to how a person thinks, perceives, and solves problems, as well as the skills used to perform those tasks

    - Learning preferences refers to the way people like to learn

3. Relying on "learning style" measures that lack psychometric support
4. Theories of learning styles have become "common knowledge"

Confirmation bias is seeking evidence that _____ our beliefs and _____ information that _____.

Dangers of continuing to believe in learning styles include _____ and _____.

Growth.Mindset	Fixed.Mindset
Failure is an _____ to grow	Failure is the _____ of my abilities
I can _____ to do anything I want	I'm either good at it or _____
Challenges _____ to grow	I _____ to be challenged
I'm _____ by the success of others	_____ by the success of others
I like to try _____	I stick with the _____

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PART 2: Neuroscience Perspective on Learning

Neuroscience is the scientific study of the _____ system including the brain, spinal cord, and peripheral nervous system. It integrates principles from many disciplines (e.g., physiology, molecular biology, psychology, physics, chemistry, etc.) to understand _____, function, and _____ to understand behavior and cognitive processes in humans and other species.

What are the basic principles of Neuroscience?

1. Neurons are specialized cells of the nervous system that receive, process, and send information throughout the body using _____ signaling.
2. Neural networks are complex systems of _____ neurons within the nervous system.
3. Neural plasticity refers to the capacity of the nervous system to _____ its structure and function in response to experience, learning, and injury.
4. Synaptogenesis is the process of creating new synapses, which are required for _____ connections between neurons.
5. Neurogenesis is the process by which new neurons are _____ from neural stem cells in the nervous system. It is crucial for _____ development and occurs throughout the lifespan of an organism.

How does the brain change because of experience?

> The brain undergoes significant changes in response to experiences through a process known as **neuroplasticity**. This _____ allows the brain to modify its structure and function based on interactions with the environment, learning, and memory.

Why is this important for learning and memory?

> Neuroplasticity is crucial for learning and memory because it enables the brain to adapt and reorganize itself in response to experiences. When we learn something new, neuroplasticity facilitates the physical changes in the brain that encode this information. As experiences shape our neural pathways, the brain forms new _____ and strengthens existing ones, allowing for effective _____ and retrieval of memories. This means that every learning experience can lead to lasting changes in the brain's structure, enhancing our ability to remember and apply knowledge in the future.

Why are “learning styles” not supported by neuroscience research?

> Neuroscience research suggests that the brain processes information in a more integrated manner than the learning styles model implies. For example, effective learning often involves multiple sensory modalities working together, rather than relying solely on one preferred style. This _____ aligns with our understanding of how the brain functions, as it engages various neural networks to process and retain information.

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What are some examples of evidence-based learning strategies?

1. Spaced vs. massed practice – better to spread out learning over time with rest periods rather than studying all at once because neural networks associated with learning and memory require time to _____ the information.

2. Practice testing – retrieval practice that involves taking tests on material you've studied. Recalling information stored in memory requires it to be _____, a process which strengthens the neural network containing the information.

3. Connecting _____ learning to _____ learning is a fundamental principle of how the brain learns. By linking new information to existing neural networks, the brain enhances encoding, retention, and retrieval.

4. Making new learning _____ to the individual involves engaging the brain's intrinsic motivation systems, connecting learning to personal experiences, and fostering emotional and cognitive relevance.

5. Presenting information in a _____ of ways —such as through visuals, text, audio, and hands-on activities—enhances learning by engaging different sensory and cognitive pathways in the brain. This approach, often referred to as **dual coding** or **multimodal learning.**

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PART 3: Evidence-Based Learning Preferences of Modern Learners and Active Learning Techniques

What are the 7 characteristics of a modern learner?

1. Mobile minded – 70% of students are _____ motivated by mobile learning experiences; they know how to access information and complete tasks on mobile devices

2. Impulsive indulgers – 50% of survey respondents _____ they have become less patient over the past 5 years; expect instant answers to our questions and learning content designed for rapid consumption

3. Autonomous agents – 79% of autonomous workers report _____ engagement levels; more likely to proactively seek out information, set personal learning goals, and choose their own learning methods

4. Social savants – 84.6% of learners prefer social learning tools to be used in their training; likely to thrive in collaborative learning environments through group assignments, projects, and discussions

5. Digital dynamos – Millennials and Gen Z will make up 58% of the workforce by 2029; they are comfortable with computers, the internet, and other digital devices

6. Multitasking masters – 72% of modern learners have been forced to turn to multitasking as a coping mechanism

7. Deeply distracted – The average employee loses 720 work hours every year due to distractions

Active.Learning	Passive.Learning
Active engagement and participation by _____.	Passive _____ of information.
Interaction through _____, problem-solving, or activities.	Typically _____ communication like lectures or reading.
Encourages _____ and practical application.	May lead to memorization without _____ understanding.
Enhances long-term _____ and deeper understanding.	Can result in _____ understanding.
Often involves collaboration and _____ learning.	Lacks _____ elements.

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What are some examples of active learning classroom techniques?

1. Guided Notes – prepared by the instructor to provide students with background information and cues with specific spaces to write key facts or concepts either during lecture or independently

2. Practice Exercises –similar to case scenarios where students apply what they've learned by responding to prompts using the skills learned either as a group or independently

3. "Entrance Tickets" – can be assigned prior to class starting or at the beginning to orient students to the course content and encourage them to interact with the materials

4. Matching Games – prior to playing, students handwrite the terms and definitions for a specified topic; students must read aloud each card they turn over and identify which term the definition matches to (and vice versa)

5. Bingo – start with guided notes; instructor reads the example or definition of a key term, and students have to identify which term is being described to mark it on their card

6. Jeopardy (with a twist) – students create their own questions from the assigned material and then take turns asking their questions; if the other groups answer the question incorrectly or do not provide an answer within 1 minute, the group that created/asked the question gets a point

7. Jeopardy (traditional) – instructor creates the jeopardy board prior to class and students take turns answering the questions; if they answer correctly, they get the dollar amount of the question and if they answer incorrectly, they do not have money deducted

8. Reversed Classroom (Group Presentations) – assign students a section of the material and have them create a presentation on key points during class time. When students present, the instructor provides guided notes for the other students to complete, as well as provides additional information as needed during the student presentations

9. Reflection Questions – first discussed in small groups and then discussed in the large group

10. Private Q&A – at the end of each unit, students submit questions they have about the content directly to the instructor; then the instructor types up a document answering all student questions and shares the document with the whole class

11. Large Group Q&A – read question and answer options aloud and allow time for students to respond orally with the correct answer; if they are struggling to answer correctly, the instructor can provide clarification on the content

12. Turn-and-Talk – similar to the reflection questions; first have students respond to a prompt on their own and then have them share with someone next to them

13. Kahoot! – game-based learning platform to create learning games or trivia quizzes