DIFFERENT BRAINS, DIFFERENT LEARNERS pdf

1: Types of Learning Styles | LearningRx

Different Brains, Different Learners and millions of other books are available for Amazon Kindle. Learn more Enter your mobile number or email address below and we'll send you a link to download the free Kindle App.

CC0 Public Domain Detecting patterns is an important part of how humans learn and make decisions. Findings showed that the brain processes pattern learning in a different way from another common way that people learn, called probabilistic learning. Researchers showed study participants 50 series of 12 images that included various combinations of three photosâ€"a hand, a face and a landscapeâ€"sometimes in a pattern and sometimes in a random order. Participants were in an MRI machine that showed what parts of their brain were active as they chose what photo they thought was coming up next. Krajbich conducted the research with Arkady Konovalov, a postdoctoral researcher at the University of Zurich who received his Ph. The study appears in the journal Neuron. Humans try to detect patterns in their environment all the time, Konovalov said, because it makes learning easier. For example, if you are given driving directions in an unfamiliar city, you can try to memorize each turn. But if you see a patternâ€"for example, turn left, then right, then left, then rightâ€"it will be easier to remember. The study involved 26 adults. Each photo they were shown began as a scrambled image that was revealed over a period of three seconds. They hit a button as soon as they thought they knew which one of the three images was being presented. The object was to select which image was being shown as quickly as possible. Participants earned money for their correct answers and the faster they responded, the more they earned. In the probabilistic model, people learn by determining the probability of an event happening after some other event. For example, you might learn that your favorite sports team usually wins two out of three of its games after a loss. With patterns, you know that a particular event is going to happen at a specific point in time. They are learning patterns and developing rules that guide their decision and make them faster and more accurate," Konovalov said. Probabilistic and pattern learning differ in how they engage the brain, Krajbich said. In this study, the researchers found different parts of the brain were active depending on two kinds of uncertainty that the participants faced. One kind of uncertainty was the question of which image was coming next. Findings showed, not surprisingly, that the same parts of the brain were involved for this task that earlier studies had found were involved in probabilistic learning, Krajbich said. The other kind of uncertainty concerned whether there was a pattern in the images presented. As the participants worked out this question, a different part of the brainâ€"the ventromedial prefrontal cortexâ€"was activated. This part of the brain has been shown in other research to be associated with reward. The hippocampus was another part of the brain that was particularly active when participants were figuring out patterns. Overall, the study showed that pattern learning is treated differently in the brain from probabilistic learning. It is looking for rules to help predict better and faster.

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2: PPT â€“ Different Brains, PowerPoint presentation | free to download - id: ef-ZDQwM

Different learners have different ways of learning, but when students are exposed to chronic stress, trauma, or drugs, or when a student's brain is impacted by developmental delays, abnormality, or chemical imbalances, academic achievement is threatened.

Interest runs particularly high in stories about the neuro-development of babies and children and the effect of early experiences on learning. The fields of neuroscience and cognitive science are helping to satisfy this fundamental curiosity about how people think and learn. In considering which findings from brain research are relevant to human learning or, by extension, to education, one must be careful to avoid adopting faddish concepts that have not been demonstrated to be of value in classroom practice. Among these is the concept that the left and right hemispheres of the brain should be taught separately to maximize the effectiveness of learning. Another widely held misconception is that people use only 20 percent of their brainsâ€"with different percentage figures in different incarnationsâ€"and should be able to use more of it. However, it is now known that these silent areas mediate higher cognitive functions that are not directly coupled to sensory or motor activity. Advances in neuroscience are confirming theoretical positions advanced by developmental psychology for a number of years, such as the importance of early experience in development Hunt, What is new, and therefore important for this volume, is the convergence of evidence from a number of scientific fields. As the sciences of developmental psychology, cognitive psychology, and neuroscience, to name but three, have contributed vast numbers of research studies, details about learning and development have converged to form a more complete picture of how intellectual development occurs. Clarification of some of the mechanisms of learning by neuro- Page Share Cite Suggested Citation: Brain, Mind, Experience, and School: The National Academies Press. These technologies have allowed researchers to observe human learning processes directly. This chapter reviews key findings from neuroscience and cognitive science that are expanding knowledge of the mechanisms of human learning. Three main points guide the discussion in this chapter: Learning changes the physical structure of the brain. These structural changes alter the functional organization of the brain; in other words, learning organizes and reorganizes the brain. Different parts of the brain may be ready to learn at different times. We first explain some basic concepts of neuroscience and new knowledge about brain development, including the effects of instruction and learning on the brain. We then look at language in learning as an example of the mind-brain connection. Lastly, we examine research on how memory is represented in the brain and its implications for learning. Brain development and psychological development involve continuous interactions between a child and the external environmentâ€"or, more accurately, a hierarchy of environments, extending from the level of the individual body cells to the most obvious boundary of the skin. Greater understanding of the nature of this interactive process renders moot such questions as how much depends on genes and how much on environment. As various developmental researchers have suggested, this question is much like asking which contributes most to the area of a rectangle, its height or its width Eisenberg, ? Several crucial questions about early learning particularly intrigue neuroscientists. How does the brain develop? Are there stages of brain development? Are there critical periods when certain things must happen for the brain to develop normally? How is information encoded in the developing and the adult nervous systems? And perhaps most important: How does experience affect the brain? Page Share Cite Suggested Citation: Nerve cells are equipped with a cell bodyâ€"a sort of metabolic heartâ€"and an enormous treelike structure called the dendritic field, which is the input side of the neuron. Information comes into the cell from projections called axons. Most of the excitatory information comes into the cell from the dendritic field, often through tiny dendritic projections called spines. The junctions through which information passes from one neuron to another are called synapses, which can be excitatory or inhibitory in nature. The neuron integrates the information it receives from all of its synapses and this determines its output. At birth, the human brain has in place only a relatively small proportion of the trillions of synapses it will eventually have; it gains about two-thirds of its adult size after birth. The rest of the synapses are formed after birth, and a portion of this process is guided by experience. Synaptic connections are added to the brain in two basic ways. The first way is that synapses are overproduced, then selectively lost. Synapse overproduction and loss is a fundamental mechanism that the brain uses to incorporate information from experience. It tends to occur during the early periods of development. In the visual cortexâ€”the area of the cerebral cortex of the brain that controls sightâ€”a person has many more synapses at 6 months of age than at adulthood. This is because more and more synapses are formed in the early months of life, then they disappear, sometimes in prodigious numbers. The time required for this phenomenon to run its course varies in different parts of the brain, from 2 to 3 years in the human visual cortex to 8 to 10 years in some parts of the frontal cortex. Some neuroscientists explain synapse formation by analogy to the art of sculpture. Classical artists working in marble created a sculpture by chiseling away unnecessary bits of stone until they achieved their final form. The nervous system sets up a large number of connections; experience then plays on this network, selecting the appropriate connections and removing the inappropriate ones. What remains is a refined final form that constitutes the sensory and perhaps the cognitive bases for the later phases of development. The second method of synapse formation is through the addition of new synapsesâ€”like the artist who creates a sculpture by adding things together until the form is complete. This process is not only sensitive to experience, it is actually driven by experience. Synapse addition probably lies at the base of some, or even most, forms of memory. As discussed later in this chapter, the work of cognitive scientists and education researchers is contributing to our understanding of synapse addition. Wiring the Brain The role of experience in wiring the brain has been illuminated by research on the visual cortex in animals and humans. In adults, the inputs entering the brain from the two eyes terminate separately in adjacent regions of the visual cortex. Subsequently, the two inputs converge on the next set of neurons. People are not born with this neural pattern. But through the normal processes of seeing, the brain sorts things out. Neuroscientists discovered this phenomenon by studying humans with visual abnormalities, such as a cataract or a muscle irregularity that deviates the eye. If the eye is deprived of the appropriate visual experience at an early stage of development because of such abnormalities , it loses its ability to transmit visual information into the central nervous system. When the eye that was incapable of seeing at a very early age was corrected later, the correction alone did not helpâ€”the afflicted eye still could not see. When researchers looked at the brains of monkeys in which similar kinds of experimental manipulations had been made, they found that the normal eye had captured a larger than average amount of neurons, and the impeded eye had correspondingly lost those connections. This phenomenon only occurs if an eye is prevented from experiencing normal vision very early in development. The period at which the eye is sensitive corresponds to the time of synapse overproduction and loss in the visual cortex. Out of the initial mix of overlapping inputs, the neural connections that belong to the eye that sees normally tend to survive, while the connections that belong to the abnormal eye wither away. When both eyes see normally, each eye loses some of the overlapping connections, but both keep a normal number. In the case of deprivation from birth, one eye completely takes over. The later the deprivation occurs after birth, the less effect it has. By about 6 months of age, closing one eye for weeks on end will produce no effect whatsoever. The critical period has passed; the connections have already sorted themselves out, and the overlapping connections have been eliminated. This anomaly has helped scientists gain insights into normal visual development. By overproducing synapses then selecting the right connections, the brain develops an organized wring diagram that functions optimally. The brain development process actually uses visual information entering from outside to become more precisely organized than it could with intrinsic molecular mechanisms alone. This external information is even more important for later cognitive development. The more a person interacts with the world, the more a person needs information from the world incorporated into the brain structures. Synapse overproduction and selection may progress at different rates in different parts of the brain Huttenlocher and Dabholkar, In the primary visual cortex, a peak in synapse density occurs relatively quickly. In the medial frontal cortex, a region clearly associated with higher cognitive functions, the process is more protracted: The selection process, which corresponds conceptually to the main organization of patterns, continues during the next 4â€”5 years and ends around early adolescence. This lack of synchrony among cortical regions may also occur upon individual cortical neurons where different inputs may mature at different rates see Juraska, , on animal studies. After the cycle of synapse overproduction and selection has run its course, additional changes occur in the brain. They appear to include both the modification of existing synapses and the addition of entirely new synapses to the brain. Research evidence described in the next section suggests that activity in the nervous system associated with learning experiences somehow causes nerve cells to create new synapses. Unlike the process of synapse overproduction and loss, synapse addition and modification are lifelong processes, driven by experience. This process is probably not the only way that information is stored in the brain, but it is a very important way that provides insight into how people learn. Animals raised in complex environments have a greater volume of capillaries per nerve cellâ€"and therefore a greater supply of blood to the brainâ€"than the caged animals, regardless of whether the caged animal lived alone or with companions Black et al. Capillaries are the tiny blood vessels that supply oxygen and other nutrients to the brain. Using astrocytes cells that support neuron functioning by providing nutrients and removing waste as the index, there are higher amounts of astrocyte per neuron in the complex-environment animals than in the caged groups. Overall, these studies depict an orchestrated pattern of increased capacity in the brain that depends on experience. Other studies of animals show other changes in the brain through learning; see Box 5. The weight and thickness of the cerebral cortex can be measurably altered in rats that are reared from weaning, or placed as adults, in a large cage enriched by the presence both of a changing set of objects for play and exploration and of other rats to induce play and exploration Rosenzweig and Bennett, These animals also perform better on a variety of problem-solving tasks than rats reared in standard laboratory cages. Interestingly, both the interactive presence of a social group and direct physical contact with the environment are important factors: Thus, the gross structure of the cerebral cortex was altered both by exposure to opportunities for learning and by learning in a social context. Are the changes in the brain due to actual learning or to variations in aggregate levels of neural activity? Animals in a complex environment not only learn from experiences, but they also run, play, and exercise, which activates the brain. The question is whether activation alone can produce brain changes without the subjects actually learning anything, just as activation of muscles by exercise can cause them to grow. To answer this question, a group of animals that learned challenging motor skills but had relatively little brain activity was compared with groups that had high levels of brain activity but did relatively little learning Black et al.

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3: Different Brains, Different Learners: How to Reach the Hard to Reach by Eric Jensen

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Learning styles are often categorized and explained in the following way: You learn well when aided by images, pictures, and spatial organization of elements Auditory: You learn well by reading or writing the material you want to learn Kinesthetic: Writing or drawing diagrams are physical activities that can fall into this category as well. These categories of learning styles were identified by Dr. Other educators and researchers have identified additional learning styles, with some models showing as many as 70 different styles. Critics of the learning style models The idea of learning styles came about as a way of explaining a legitimate dilemma in the classroom, which is the fact that in the context of any given teaching style, curriculum, or effort, some students learn and some do not. Every student sometimes gets stumped by methods that work for everybody elseâ€¦Neuroscientists agree that every brain is uniqueâ€”more singular in structure than DNA or fingerprints. It may be a preference, but why? Is the driving factor biological? Contributing to the debate is research indicating that there is no real evidence showing that academic outcomes are improved when learning styles are accommodated in the classroom. Cognitive skills are the core skills the brain uses to think and learn, and explain why some students struggle to learn in various settings. Cognitive strengths and weaknesses can even explain learning style preferences. Cognitive profiles vary greatly person-to-person. For example, look at the differences in these cognitive profiles: The differences in cognitive performance play a huge role in learning preferences. For example, it makes sense that someone with strong auditory processing and word-attack skills might learn exceptionally well through reading, while someone who struggles with reading as a result of weak auditory processing and word-attack skills would prefer to learn kinesthetically or audibly. Learning styles, cognitive skills, and brain training Cognitive training, also known as brain training, is a method by which cognitive weaknesses can be strengthened. In the chart below, you can see the improvements that brain training made in the cognitive performance of 17, children and adults. The scores are represented in percentiles, which show where someone ranks compared to of their peers. To learn more about brain training results, visit www. If you or someone you love is struggling with learning, reading, attention, or memory, you can at least find out why. The first step is to take a Cognitive Skills Assessment to identify weak cognitive skills. If weak cognitive skills are at the root of struggles with learning or life, brain training may offer a life changing solution.

4: Different Brains, Different Learners | Open Library

Updated throughout and packed with powerful strategies to help students improve brain function, this second edition presents a concise outline for identifying the symptoms and causes of prevalent impairments such as oppositional disorder, learned helplessness, attention deficit disorder, dyslexia, dyscalculia, depression, auditory processing deficits, and more.

Gardner defines intelligence as "the capacity to solve problems or to fashion products that are valued in one or more cultural setting", and were different than thinking style, which remains relatively constant across domains. Neurobiology investigations have supported that these are cognitive functions that take place in distinct brain areas. Hemisphere Laterization The human brain is a complex organ with extensive specialization and adaption capabilities. Researchers are still learning. The human brain is divided into two cerebral hemispheres with differing specialization, referred to as lateralization. The cerebral hemispheres function more efficiently as relatively independent processors on simple tasks, whereas communication between the hemispheres improves performance when processing demands are heavy or complex. Current research indicates that social vertebrates have cerebral lateralization. Some tasks are performed bilaterally, while others are specialized to one hemisphere. Distribution of processing in Brodmann Area 10 illustrates common and specialized function. The left hemisphere specializes in group coordination and communication, and slower linear thinking and goal-directed planning. Whereas, the right hemisphere specializes in environmental awareness and survival, rapid sub-conscious non-linear thinking, mental manipulation of relationships, complex or emotional decisions, risk assessment, error detection, and humor. The right hemisphere is dominate in processing novel stimulus. Complexity of processing and inter-hemisphere connectivity increases from the back of the brain to the front. Intelligences at higher levels require an integrated brain, even though one hemisphere will dominate. Thinking Dominance People learn through their six senses with their eight primary intellence networks, but think primarily in two different styles depending on cortex hemisphere dominance. People think in both words and pictures. People with left-brain dominance think primarily in words verbal-sequential. People with right-brain dominance think primarily in pictures visual-spatial. Tools to examine the brain are new. Teaching approaches and ideas about learning disorders were developed long before the neurobiology of learning was examined. This led to furthur examining visual thinkers and the discovery that there are at least two types of visual thinkers. Visual-spatial and visual-object thinking has been shown to have distinctly different patterns of brain activation. The Two Halves of the Brain: Information Processing in the Cerebral Hemispheres reported that people with Autism, ADHD, and dyslexia have right brain dominance combined with a reduction in cross-hemisphere connection. These recent discoveries mean that teaching approaches and ideas about learning disorders need to be revisited. All children need to be guided. Different brains need different guidance. People labeled with ADHD are 4 times more likely to have smaller short term memory buffers than average. Continuous specialized training can extend the buffers. Due to a mismatch of the teaching styles and thinking styles, visual thinkers often get labels of learning disabled. To often the educational system encourages parents to have low expectations, and the children can end up educational system throw-aways. Both strong verbal and visual thinkers have hemisphere connectivity challenges, whether from natural brain architecture or disuse. Both need to build on their strengths while doing exercises to develop sensory and cognitive integration pathways. Arul Lawrence showed a different distribution of brain dominance for high school teachers in his book Brain Dominance and Leadership Style. SE Shaywitz indicates that the "prevalence of dyslexia is estimated to range from five to 17 percent of school-aged children, with as many as 40 percent of the entire population reading below grade level. Dyslexia or specific reading disability is the most common and most carefully studied of the learning disabilities, affecting 80 percent of all individuals identified as learning disabled.

5: 4myLearn â€“ Different Brains, Different Learning - Neurodiversity

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Different Brains, Different Learning - Neurodiversity Multiple intelligences. In the 's, Harvard researcher, Howard Gardner, developed a theory that people possess at multiple intelligences, and that a person can develop in all the intelligences, but to different levels of competence.

6: Brain pattern learning is different from other kinds of learning, study shows

Transcript of Different Brains, Different Learners The Argumentative Learner "Oppositional defiant disorder (ODD) is a collection of chronic, negative, and hostile behaviors rather than a single coherent brain disorder, according to the U.S. Surgeon General's mental health report.

7: Different Brains, Different Learners by on Prezi

Give hard-to-reach students the tools for lifelong success and watch test scores improve! Updated throughout and packed with powerful strategies to help students improve brain function, this second edition presents a concise outline for identifyin.

8: Different Brains, Different Learners: How to Reach the Hard to Reach - Eric Jensen - Google Books

Different learners have different ways of learning, but when students are exposed to chronic stress, trauma, or drugs, or when a studentâ€²s brain is impacted by developmental delays, abnormality, or chemical imbalances, academic achievement is threatened.

9: Different Brains for Different Learners by Maria Loewen on Prezi

A Reflection on Different Brains for Different Learners by Eric Jensen The Resigned Learner Also known as "Learned Helplessness (LH) " A condition (not disorder) that is.

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