Postdoc Academic Chat #5

Teaching and Learning Styles – What it Means for You as a New Professor

Wednesday, February 12, 2020

Readings

1. Learning Styles
2. Teaching Strategies for the 8 Different Learning Styles
3. 'Neuromyth' or Helpful Model?

1 Learning Styles

A lot of attention has been given in recent years to student learning styles, how they may differ from faculty teaching styles, and what to do about such differences. The excerpt below is a brief look at this issue written primarily for beginning faculty. It is from: The Adjunct Professor's Guide to Success: Surviving and Thriving in the College Classroom, Chapter 4 - Today's Undergraduate Students, pp. 41-42. By Richard E. Lyons, Marcella L. Kysilka, and George E. Pawlas, Allyn & Bacon, A Viacom Company, Needham Heigths, MA. Copyright ¿1999 Allyn & Bacon, reprinted with permission.

In recent years, mountains of data have been gathered to help educators more conclusively understand how students learn. Presenting a great deal of that information at this stage in your development as an instructor would probably be counterproductive, but a sample might provide insight to aid you in your initial teaching assignment.

One of the most interesting efforts, commonly referred to as "brain-based" research, seeks to understand learning from the perspective of where and how certain types of information are processed. It suggests there are two major types of learners - those in whom the "right brain" is dominant, and those with a dominant "left brain." Right-brained learners tend to be intuitive, imaginative, and impulsive; they prefer to start with a broad idea and then pursue supporting information. They learn best by seeing and doing in an informal, busy, and somewhat unstructured environment. On the other hand, left-brain learners tend to be analytical, rational, and objective; they prefer putting together many facts to arrive at a general understanding.

Right-brain learners prefer group discussions, simulations, panels, and other activity-based learning, whereas left-brain learners prefer traditional lectures, demonstrations, and assigned readings. Although there are many exceptions, females tend to be right-brain

dominant, while males tend to be left-brain dominant. The traditional lecture/demonstration approach is typically more effective with male learners rather than female students. At the same time, research indicates females are more effective in utilizing left-brain approaches than men are in utilizing right-brain approaches, and that females are more successful in transitioning from left-brain to right-brain approaches, and vice versa than males are.

Another view of learning styles categorizes learners by the types of activities from which they derive the greatest payoff. It yields "tactile learners," who respond to physical objects that can be handled while studies; "visual Learners," who facilitate their learning through us of charts, maps, and graphs, "auditory learners," who respond more effectively to the spoken rather than the written word, and others.

In this and other discussions related to teaching styles, the enlightened instructor probably will ask which of two major strategies is most effective. That is, should the professor initially adapt to the preferred learning styles of students or expect students to first adapt to his or her preferred methods? It is a highly complex issues with no instant answers. Each situation requires some study and individualized decisions to arrive at the "best" approach. Some professors can flex themselves quite effectively to the learning styles of students, while others would lose so much confidence in themselves in trying to do so that they might become totally ineffective in the classroom.

Having said all of this, remember that each student in front of you is in many ways unique. While it is useful to make yourself aware of the wide variety of issues impacting students today, there is risk in ever assuming you have heard or seen enough. Get to know each one of your students as well as you can, first by speaking with each one in the initial class, then asking each to complete the "Student Profile" form, located in Appendix 6-1.

Later, build an ongoing dialogue with diverse students that will markedly increase your insights and create an accessibility to you in the students' minds that will markedly improve their motivation, attention levels, and understanding of your perspective. One of the greatest rewards of teaching is allowing yourself to be sufficiently vulnerable that you empower students to share more of themselves with you and their peers than might at times be comfortable. It is critical that you regularly assess your values and predispositions, talk with veteran instructors from whose experiences you can learn, and reflect upon you teaching experiences.

2. Teaching Strategies for the 8 Different Learning Styles

APRIL 17, 2018 - RASOOL SOMJI - 6 MIN READ

https://virtualspeech.com/blog/teaching-strategies-different-learning-styles

It’s believed people processes information uniquely, so trainers and teachers should understand the different learning styles. With this knowledge, you’ll be able to tailor your teaching to suit your students or trainees.

In this article, we discuss methods of teaching for the eight different learning styles, as well as conflicting evidence which suggests these learning styles may not be as effective as once believed.

The learning styles

Everyone has a dominant learning style depending on the situation. There are eight in total:

1. Visual learners
2. Aural learners
3. Verbal learners
4. Social learners
5. Logical learners
6. Physical and tactile learners
7. Solitary learners
8. Naturalist learners

We’ll now go through each of these in detail.

1. Virtual learners

Visual learners retain information more effectively when visual aids are used, such as, pictures, images, film clips, colours and diagrams. They're also good at understanding visual data presented in maps, charts and graphs.

Strategies for teaching visual learners:

- Use visual aids - most other learners will benefit from visual elements as well.
- Provide visual analogies and metaphors to help with visual imagery.
- Sometimes graphics are not easy to use for specific topics but consider writing key points in front of the class as this provides visual cues.
- Substitute words for colours and pictures.
- Ask the students to write down explanations and take notes because this entails looking at your presentation or visualising what you’re presenting.
- Colour or emphasises key points in text.
- Avoid using large blocks of text.
- Include exercises where the students create mind maps.
- Use storytelling to help with visualisation.
- Colour-code and organise any materials you provide as this helps organise things in their minds.
- Get students to visualise using phrases, such as, "Picture this", "Let's see what you would do."

2. Aural learners

Aural learners respond to sound, music, recordings, rhymes, rhythms etc. They remember conversations well and music causes an emotional response in them.

Strategies for teaching aural learners:

- Encourage your students to participate in discussions.
- If reading is required suggest audio books if appropriate.
- Suggest for them to listen to music as they go over material.
- Allow recordings of your training sessions or make your lessons accessible online - this is also helpful for other learning types.
- Get students to pair up and explain concepts to each other.
- Encourage problem-solving aloud.
- Suggest rereading their notes back to themselves when they get home.
- Use mnemonic devices and rhyming.
- If you are explaining a story, play relevant sounds from your computer.

3. Verbal learners

Verbal learners favour using words and linguistic skills - in speech and in writing, such as, reading, writing, listening or speaking. They like word games, puns and rhymes etc and are often strong public speakers.

Strategies for teaching verbal learners:

- Use verbal teaching and writing activities.
- Ask them to discuss or present.
- Use acronyms or mnemonic devices.
- Get the class to read aloud. Try to get them to read in a varied way rather than in monotone.
- Role-playing, for example, practicing elevator pitches or interactions between employees and clients.
- Ask them to teach members of the class certain material..
- Suggest they reread and rewrite their notes, including summaries.
- Incorporate quizzes into your lessons.
- Show them or provide them with lists of key words.
- Providing these learners with a combination of information in a variety of verbal ways can assist their learning, for example, they may initially read about a concept, afterwards they listen to an audio to support what has been read, then they write notes and finally they partner up with someone and discuss the topic.

4. Social learners

Social learners process information by interacting with and relating to others. They enjoy working with others and are often strong leaders.

Strategies for teaching social learners:

- Be inquisitive and ask them what they think about a concept/topic/idea.
- Ask them to bounce ideas off of each other and compare their ideas with others'.
- Allow them to discuss and share stories.
- Include group work.
- Engage in a role-play.

5. Logical learners

Logical learners favour using logic and reasoning. They like to classify and categorise information and solve problems with numbers. Logical learners are especially good at analysing cause and effect relationships.

Strategies for teaching logical learners:

- Provide the class with problem-solving tasks.
- Challenge them to work things out for themselves.
- Ask them to interpret abstract visual information.
- Include critical thinking exercises.
- Provide statistics and facts.
- Ask them to suggest conclusions after providing them with evidence.

6. Physical and tactile learners

Practical learners process information effectively when they use their bodies and when they are actually doing something. They put their learning into practice.

Strategies for teaching physical and tactile learners:

- Use physical exercises and provide hands-on experiences.
- Exercises where they are standing and walking are very effective.
- Include activities where they use a pen and paper to map out their thoughts and problem-solve because writing is a physical exercise.
- Find a venue that provides these learners with large spaces so they can write and draw.
- Encourage them to draw diagrams, graphs and maps.

- Get them to interact with physical objects or solve puzzles.
- Role-playing.
- Provide real life examples, such as, case studies.
- Suggest reviewing their notes whilst they engage in physical activity.
- Ask them to teach other class members some of the lesson content.
- When you are asking them to visualise, explain the sensations that would be felt, such as, "The wind was forcibly hitting against the left side of my body."

7. Solitary learners

Solitary learners like to work and learn by themselves and self-study. They may come across as shy or cold as they keep to themselves. If you get solitary learners feeling comfortable during some of the training they are more likely to speak up during presentations or group work.

Strategies for teaching solitary learners:

- Ask questions so you know what they're thinking and how they're feeling.
- Provide individual problem-solving exercises.
- Explain why the lesson material is important as solitary learners are often interested in outcomes.
- Along with this, give the class ways to track their progress.
- Suggest links between what they have previously learned/should know and new concepts.

8. Naturalist learners

Naturalist learners process information by working with and experiencing nature. They learn by finding patterns in nature and using scientific logic for understanding.

Strategies for teaching naturalist learners:

- Include experiments in your lessons.
- Get them to imagine that what you're teaching is a new ecosystem that they can understand by finding patterns. This will help them link concepts together.
- Have exercises where they can identify and classify.
- Use examples linking to daily life, people or nature.
- Provide observational data, such as case studies.

Evidence against the different learning styles

The concept that people learn better when taught through their preferred learning style is very popular. However the evidence for this is lacking so we've included this section to make you aware of studies showing that different learning styles may not be that effective.

For a new paper in Anatomical Sciences Education, a pair of researchers at Indiana University School of Medicine have conducted an investigation into learning styles with hundreds of undergrads. The findings do not support the learning styles concept, reinforcing its reputation among mainstream psychologists as a myth.

The study showed that student grade performance was not correlated in any meaningful way with their dominant learning style or with any learning style(s) they scored highly on. Also, while most students (67 per cent) actually failed to study in a way consistent with their supposedly preferred learning style, those who did study in line with their dominant style did not achieve a better grade than those who didn't.

Additional evidence against the different learning styles:

- No evidence to back idea of learning styles
- Learning styles as a myth
- The myth of 'learning styles'
- Teachers must ditch 'neuromyth' of learning styles
- The concept of different "learning styles" is a myth

Despite the conflicting evidence for the effectiveness of different learning styles, it's good to know different teaching methods. By varying the methods of teaching, you'll keep the attention of your students for longer and make the learning experience more enjoyable.

3. 'Neuromyth' or Helpful Model?

Inside Higher Ed

https://www.insidehighered.com/news/2019/01/09/learning-styles-debate-its-instructors-vs-psychologists

> A nearly century-old idea about learning remains “ubiquitous” despite scant scientific evidence to back it up, many experts say. But others still see value in the concept.

By

Greg Toppo

January 9, 2019

A couple of years ago, the science writer Ulrich Boser wondered: Do educators still believe in learning styles?

The idea that some students are auditory learners, while others flourish by having information presented visually, through motion or otherwise is nearly a century old. It grew in popularity in the 1950s, then again in the 1970s, but for much of the past decade scientists have warned that it has little merit.

Boser, founder of the Learning Agency, a Washington consulting and communications group, had long followed the field. He was researching a book about learning strategies and knew that scientists had debunked learning styles, most notably in a widely discussed 2009 paper -- in it, they said building instruction around the concept was an “unwise and a wasteful use of limited resources.”

So he set up a Google alert for the term. He found that, far from being dead, learning styles were perhaps as popular as ever. “It is incredible how much it pops up,” he said recently.

Educators continue to invoke the idea, he said. Last October, as she embarked on a four-state “Rethink School” tour, U.S. education secretary Betsy DeVos said she planned to visit schools that are “working to ensure all children can have access to the education that fits their learning style.” During her 2017 confirmation hearing, DeVos thanked Senator Pat Roberts, a Kansas Republican, for displaying a chart in the hearing room that she could refer to during testimony, calling herself "a visual learner" -- despite the fact that the

U.S. Department of Education has discouraged the idea. It even funded a teachers' guide that warns, "Education research debunks the myth that teaching students in their preferred styles (e.g. 'visual learners,' 'auditory learners') is an effective classroom practice."

But interviews suggest that the two sides these days may be closer than they seem: even learning-styles devotees, who view the "debunkers" with suspicion, are beginning to consider teaching strategies that learning-styles critics would support.

Scott Barry Kaufman, a psychologist at Barnard College who wrote about the topic last month for *Scientific American*, calls learning styles an example of a "neuromythology" -- a popular idea that endures despite little evidence supporting it. This particular myth, he said, “is paved with good intentions, but that still doesn't mean it can't be harmful to students.”

Kaufman wrote that, paradoxically, catering to learning styles in the classroom “can actually foster a fixed mind-set, not a growth mind-set. This should create quite the cognitive dissonance for teachers who generally love both growth mind-set theory and learning styles.”

Even the mock-newspaper humor site *The Onion* has lampooned learning styles, publishing a satirical article in 2000 with the headline, "Parents Of Nasal Learners Demand Odor-Based Curriculum." Accompanying the piece was a photo of a forlorn girl, identified as a "nasal" learner, struggling to understand an "odorless" textbook.

Despite *The Onion*'s coverage, the styles are generally defined by three -- in some cases four -- adjectives: visual, aural or auditory, “read-write” (a preference for writing and reviewing carefully produced notes) and kinesthetic (a preference for moving around). The quartet are sometimes referred to as VARK.

A recent posting on Kansas State University’s Division of Biology website reminded students: “You like this page because the emphasis is on words and lists. You believe the meanings are within the words, so the talk was OK, but a

handout is better." It also advised kinesthetic learners, "Use all your senses to take in the information in the studio classroom. Volunteer for demonstrations or to answer questions using the visual presenter at the podium. Be active in setting up the experiments at your table (e.g. pipetting the solutions into the tubes, finding the cells in the microscope). Pay close attention to the demonstrations (e.g., pH, respiration, relative size of organelles) and go up and examine these when you have time during class."

The department advises students to complete a VARK questionnaire, developed in 1987 by a New Zealand researcher named Neil Fleming, who says on his website that he works not just with schools but with "elite sports coaches" and business clients.

In an email, Robbie Bear, a Kansas State biology instructor, said the department offers students who take introductory coursework "the ability to assess their learning using the VARK test. However, we do not put much emphasis on the students completing it."

Bear said the department is in the process of updating its website "to better reflect how the VARK relates to our teaching philosophy. Our basic philosophy is [that] if one way of presenting material does not work, try another. Once you have an understanding of the material in one format, try to understand it in a different format. In short, the best learners are multimodal thinkers."

Bear said the department uses VARK "because a good number of our students have seen this terminology before." That helps inform students as to "why we present information in many different formats and not just the traditional lecture. Getting students to 'buy in to' the studio format of learning is very important in making it all work effectively." Though he has no data on whether this helps student performance, in general, he said, students who take the introductory course -- which asks them to consider learning styles -- score "about a letter grade higher" in upper-level courses than those who transfer in.

But Daniel Willingham, a cognitive psychologist and professor at the University of Virginia, said the categories themselves "haven't been shown

to mean anything." Nonetheless, recent surveys have found that about 90 percent of Virginia students believe in them.

While it's true that some students may possess a better visual or auditory memory than others, Willingham said, that is in a sense a distraction for teachers, who want students not simply to ingest material but to make meaning out of it. Willingham has written widely on the topic, urging educators to focus on teaching different kinds of content in their best modality, rather than teaching different students in their perceived best modality. "All students learn more when content drives the choice of modality," he writes.

He and others said the persistence of learning styles likely stems from the fact that they're adjacent to a bedrock tenet of psychology: differences matter. People have different abilities, talents, goals, life experiences and motivations -- including better working memory or persistence -- and these play a key role in learning.

"The idea that people differ in their abilities is almost certainly right," Willingham said. "I think that gets confused with learning styles."

Kaufman, the Barnard psychologist, said one key issue is that while paying attention to these differences "comes from a place of caring for the students," teachers may misinterpret how to help students with different abilities flourish. Add to that a general "discomfort with differences that are perceived as immutable," he said, and you have the ideal environment for something fuzzy like learning styles to flourish.

Boser, the science writer, agreed: "There's something in America in general, and in education in particular: we don't like to talk about how people are different," he said. Teachers like to believe in students' unlimited potential, and anything that places constraints on it is problematic.

But he admitted, "Intelligence is a real thing." Different people have different levels of it. Talking about that "makes educators uncomfortable."

David Kraemer, a cognitive neuroscientist in Dartmouth College's education department, said decades of research have made one thing clear: "What seems

to be true, and is not in dispute, is that people differ in different domains," performing better in English class than in math class, for instance. “To me, that’s where some of these intuitions come from.” Teachers want to tailor instruction to students' strengths. But that could be counterproductive. “The point of school isn’t just to cater to what you do well already,” he said.

His research has shown that even people who believe that they better understand things one way -- spatially as opposed to detail oriented, for instance -- perform better in weak areas if they're given strategies to improve. But his students continue to ask him about learning styles. “I definitely tell students who come to me [that] it is more myth than reality -- and there isn’t really evidence to support those ideas, in terms of study strategies or pedagogical approaches.”

Richard Felder, a professor emeritus of chemical engineering at North Carolina State University who has written in support of learning styles, said psychologists have spent decades working to debunk the theory. “On the other side are literally millions of people who have used learning styles to design instruction” and to help students become better learners, he said.

Advocates who understand learning styles insist that they represent “preferences,” not hard and fast lines that can't be crossed, he said. “The debunkers paint it as a black-and-white thing, that you’re either this or you’re that.” Meanwhile, good instructors “don’t heavily overload on one side or the other of any of these dimensions.”

"The idea is balance," Felder said.

Asking students to consider their own strengths and weaknesses is different from teaching solely to their strengths. Actually, he said, much of the research finding that catering to learning styles is ineffective begins from that mistaken premise: "The learning-styles debunkers are starting with their own definition of what learning styles mean and then debunking that -- but their definition of what learning styles mean is wrong.”

He admits that educators in the past "did go overboard" in specializing instruction based on student preference, but no longer. Actually, Felder said, if most of his colleagues were still teaching auditory learners, for instance, solely in ways that play to that strength, "I'd be on the side of the debunkers."

'Astounding Capacity to Learn'

What good teachers understand, experts say, is that the different senses each have their own strengths and weaknesses. "We're all visual learners," Boser said. "Our vision is the best system to take in data." Likewise, we're all auditory learners -- when the material calls for it. Consider the advantages of hearing a story via audiobook: sequential information is ideal for this "style" of learning. But "auditory learners" who want to get better at soccer still lace up their cleats, run onto the field and practice their moves, Boser said. "You would never just listen to podcasts all day."

Scientists have long struggled to help educators understand this larger context. In 2009, a group of cognitive psychologists commissioned by the journal *Psychological Science in the Public Interest*assessed learning styles and found "only a few fragmentary and unconvincing pieces of evidence" that would validate them.

The group, led by University of California, San Diego, psychology professor Hal Pashler, noted that all humans, "short of being afflicted with certain types of organic damage," are born with "an astounding capacity to learn, both in the amount that can be learned in one domain and in the variety and range of what can be learned."

They concluded that the widespread use of learning-style measures in educational settings "is unwise and a wasteful use of limited resources." While the researchers agreed that instruction deemed "optimal" for a given student makes sense, assuming that people are "enormously heterogeneous" in their instructional needs could draw attention away from solid teaching practices. "Given the capacity of humans to learn, it seems especially important to keep all avenues, options, and aspirations open for our students, our children, and

ourselves," Pashler and his colleagues wrote. "Toward that end, we think the primary focus should be on identifying and introducing the experiences, activities, and challenges that enhance everybody's learning."

Willingham said the findings have made few inroads into the classroom. He likens learning styles to atomic theory -- a notion that most people take on faith, since they haven't seen protons and electrons firsthand.

Boser, a senior fellow at the Center for American Progress, noted a 2017 survey that the group conducted, which found that an "overwhelming share of the public" -- nearly 90 percent -- believe in "myths about teaching and learning" such as learning styles.

The topic has occasionally been the subject of serious if controversial research. Last summer, Canadian researchers found that surgical trainees' "learning styles" may affect their ability to acquire laparoscopic skill proficiency -- but the study had only 19 subjects. In 1995, researcher Rita Dunn of St. John's University published a meta-analysis supporting so-called "modality effects," but other researchers who examined her research found that only one of the studies Dunn cited had appeared in a peer-reviewed journal. The rest were unpublished doctoral dissertations -- 21 of them from St. John's, Dunn's home institution. Dunn passed away in 2009.

UVA's Willingham said more needs to be done to "inoculate future teachers against this idea when they are in teacher preparation programs." While education psychology textbooks don't propagate the idea of learning styles, he said, "I would also argue that they're not doing enough to say, 'There's nothing to support this idea.' When there's something that you know is widespread misinformation in teacher professional development, I think that's part of a psychologist's role, part of a scientist's role."

Howard Gardner, a longtime professor at the Harvard University Graduate School of Education, who in the 1980s popularized the idea of "multiple intelligences," has said the re-emergence of learning styles -- and a few

educators' insistence on lumping them in with his work -- has "driven me to distraction."

In a 2013 op-ed in *The Washington Post*, Gardner called learning-style theory "incoherent" and said he had proposed a very different scenario, one that said different parts of our brains compute different kinds of information -- linguistic, spatial, interpersonal, musical, etc. He has estimated that most people have seven to 10 "distinct intelligences." Learning styles, he said, are different. If teachers say a student's learning style is "impulsive," does that mean he's impulsive about everything he learns?

Gardner also said there's no clear evidence that teaching to a student's learning style produces better outcomes than a "one-size-fits-all approach." Insistence on learning styles, he said, "may be unhelpful, at best, and ill conceived at worst." Strength or weakness in one kind of intelligence "does not predict strength (or weakness) in any other intelligences," he wrote. "All of us exhibit jagged profiles of intelligences."

Gardner suggested that educators individualize teaching as much as possible, teach important materials "in several ways" (through stories, works of art, diagrams and role-playing, for example), and drop the term "styles" from their vocabulary.

"It will confuse others," he wrote, "and it won't help either you or your students."

Read more by

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