I have been battling the notion of “designing instruction for learning styles” in my own quixotic fashion for a couple of decades now. In my attempt to be a good steward of my clients’ shareholders’ equity I wished to help them avoid faddish instructional design practices that have been disproven by empirical research. I first learned back in the 1980s at NSPI (now ISPI) conferences that while self-reported learning style preferences do exist, that designing instruction to accommodate them has no basis.

When I posted yet again on this topic on my blog a couple of months ago and then sent a Tweet out about it—Jane Bozarth, EIC of this magazine, invited me to publish an article. I accepted and decided to reach out to the usual suspects, those in my professional crowd who know the research, for their inputs. As I am but a practitioner attempting to follow what I have learned over the years about the research, I am not steeped in that research and able to cite it, they can.

Here is some of what I got back that day and shared with Jane to show her I was “on it.”

Wisdom from This Crowd

From Harold Stolovitch:

There is so much press about learning styles. First of all, it’s hard to even pin down what this construct is. Is it preference, habit, or inborn trait? The general definition is that a learning style is a mode of learning that is most effective for a person. It helps the individual obtain superior learning results. However, more than 25 years of research on this and related themes have not provided any form of conclusive evidence that matching the form of instruction to learning style improved learning or even attention.

From Richard E. Clark:

Three major reviews of the research on learning styles have been published in top journals in the past decade. All of them have reached the same conclusion. Learning styles do not predict learning under different instructional conditions. There are no “visual” or “verbal” learners etc.

No reviews of the research on learning styles have reached a positive conclusion. There are studies of learning styles (many of them designed by advocates or sales people for different style measures) that reach positive conclusions but the reviews conclude that those studies are poorly designed (or at least designed to find positive results for favored style measures).

From Richard Pearlstein:

I first ran into the concept back in the late 1960’s when, while working on my doctorate, I took a job assisting the American Institutes for Research to conduct a large-scale study for the U.S. Navy. If any organization had a vested interest in determining whether attending to learning styles could improve skill acquisition or retention, it was the U.S. Navy, which routinely trains thousands of new recruits each year. My job was to run classrooms full of Navy enlisted men through aircraft identification training. Enlistees were
randomly assigned to classes that emphasized one style of training or another. However, all classes received equivalent amounts of practice and feedback. No significant differences in acquisition or retention were discovered across groups regardless of enlistees' preferences for particular learning styles. This finding, resulting from methodologically rigorous research—in which I played a long, boring supporting role—vividly illustrated to me the trouble with learning styles: They don't work.

Many hundreds of studies later, the concept of training styles won’t die. I encountered it in the 1980s when I ran a training department at the U.S. Senate. Occasionally, one Senator’s or another’s Chief of Staff would ask me if the training we developed and conducted took into account the learning styles of their Senator’s staff. I would tell them something like, “Yes, sir, it is designed to address all learning styles. We have lots of visual aids and the instructors make full use of auditory styles as well. What’s more, since the training is hands-on, your staffers receive a lot of kinesthetic learning, too.” That always satisfied them, though I cringed inwardly each time I said lines like that.

From Ruth Clark:

I’m sure you will get plenty of input from the team but if you need more, I tackled the myth of audio and visual learning styles in my book Evidence-based Training Methods pages 10-12. I still get a lot of reaction when I present the learning styles myth at conferences etc.

From Will Thalheimer:

The psychological science review is especially damning I think. While I have vigorously fought against the learning-styles fad (see my $1,000 challenge on my website), I think it would be unwise of us to send a message—intentionally or unintentionally—that individual differences or learner characteristics are not relevant always. Here are some clarifiers I would add:

- It seems clear from the research that learners who are new to learning sometimes need different instructional supports from learners who have had experience learning something.
- Intelligent tutors have shown that diagnosing a learner’s misunderstandings—and providing different feedback/guidance based on such a diagnosis creates faster understanding than not diagnosing those misunderstandings.
- Motivational differences may also require different interventions. For example, a trainee who is hungry to learn may engage in more self-directed learning activities than a trainee who doesn’t give a damn—so, while providing resources for the self-directed learner would work in one case, it would not work in the other.

From Allison Rossett:

Really useful revisiting of the learning styles discussion. Didn’t we do this last year? And maybe the year before too? I am going to teach a doctoral group in a few weeks, and I know that learning styles will come up and that they, a group of Ph.D. candidates in ED, ED with an emphasis in multiculturalism, will be keen on learning styles. What interests me is why. Why have generations of educators glommed on to learning styles when the research is settled or
pretty darn so? Seems to me that’s the interesting morsel here.

But Why Oh Why Won’t This Myth Die?

After sending these initial responses to Jane, she emailed me back writing: "You might want to think about addressing: WHY people cling to this despite all the evidence to the contrary?"

So I went to my files and pulled up an article by Sigmund Tobias published in my own prior firm’s quarterly newsletter in the summer of 2001. I invited Tobias to publish on this very topic after seeing him present at a Masie conference back in late 2000. I recalled his article’s attribution for the “why” of this, despite all of the evidence to the contrary. Here is what he wrote and I published in 2001:

Instructional designers are often urged to adapt instruction to students’ learning styles. The persistence of the learning style concept is amazing—a testament to the gullibility of even well-informed individuals who ought to know better. It seems that advocates of learning styles have never heard of the history of ATI research, which attempted to provide a database for adapting instruction to student characteristics and found many thorny problems. It is probably fair to say that the popularity of adapting instruction to learning styles is matched only by the utter absence of support for this idea.

Claims for adapting instruction to learning styles, of course, assume that there are stable, replicable interactions between measures of learning styles and instructional methods. A number of reviews of ATI research (Tobias, 1989; Corno and Snow, 1986; Gustaffson and Undheim, 1996) have reached fairly similar conclusions about the types of interactions that have been verified by research. These reviews suggest that students with limited prior knowledge of a domain, or lower ability, require substantial instructional support in such forms as better organization of the content, increased feedback, provision of prompts, and similar instructional augmentations in order to learn optimally. Students with higher levels of prior knowledge, or higher ability, are optimally instructed with lower levels of instructional support.

Unless I, and the other reviewers of research in this area, have missed the publication of tons of replicated findings, there is no evidence of stable interactions between learning styles and instructional methods. Why then do otherwise knowledgeable educators and educational researchers persist in making unverified claims for learning styles? I can only conclude that they adhere to what Jeanne Chall (2000) in her last book called a romantic, as opposed to rational, view of education. Chall cites other romantic notions that have little verified empirical support such as the whole-language approach to reading instruction, open education, and discovery learning, to name only a few. Sometimes an idea may appear so logical, and/or so deeply related to the values held by individuals, that it becomes an article of faith. Believers cling to their fancies irrespective of research findings. I wish they would develop a similar fixation about the Brooklyn Bridge, because I would love to sell it to them again and again[1].

So Tobias attributes this myth’s popularity and continuation to those who ignore the science due to their “romantic, as opposed to rational, view of
education."

What else might explain this?

Do people just fail in general to let data influence their opinions? Or is it mostly when the data contradicts what personally just seems logical and intuitive?

**Intuition Seems Intuitively Part of the Reason To Me**

In 1989 I was on the ski slopes west of Denver after an NSPI conference, taking ski lessons from an instructor who had done a presentation at the conference about the ski industry’s attempts to standardize ski instruction across the entire industry. Market research showed few new skiers were returning to the slopes after experiencing egotistical instructors and high variance in the instructional experience, one day to the next.

Poor instruction had led to bad transfer, which had led to potential customers’ decisions to go do something else for their winter vacations—according to the market research.

I was impressed—and as someone who had personally experienced that ego and varied instruction 10 years earlier at that same ski resort, and having already signed up for the post-conference ski outing—I made arrangements with this presenter to be my personal ski instructor just a couple of days later.

After some flat land instruction and one run on the bunny hill with some immediate, corrective feedback, we boarded the ski lift chair for the next level of the mountain's terrain. We made our first downhill run, my instructor skiing backwards while watching my every move and providing more of that corrective feedback.

He called a stop to our downhill run after just a minute or two and asked, "Do you water ski Mr. Wallace?"

"Why yes I do," I replied.

"That's it," he concluded. "You're leaning back on your skis when you should be learning out over the mountain on that downhill ski."

Well, yes that’s what he had told me to do back down on the bunny hill. But leaning out over that downhill ski on this steep slope was a totally different thing in practice. Yes, he had told me all about that leaning and how that is what gave one control on skis. But putting it into practice was another thing. It was scary to lean out over the mountain while rushing downhill. That was not intuitive. So this was going to take some time and practice.

All of this reminded me then as it does now, of my father on the first day after a big snow after I had gotten my driver’s license, teaching me to “turn into the skid” and not away from the skid—the latter being the intuitive thing to do.

I slowly learned to do this correctly, but only after he had told me what to do, commanded me to accelerate in the snow in that empty parking lot, and then stomped on the brake from the passenger side, almost breaking my foot on the accelerator. We started to skid and I, of course, turned away from the skid. He gave me some more of that constructive, corrective feedback—father style—and had me do the sequence again. And again. And some more. Until it became second nature to do the non-intuitive response. Later that evening on a date it paid off—but that’s another story.

**It's an Uphill Battle on that Downhill Ski Learning to Lean Forward and into the Skid**

In "The Science of Why We Don't Believe Science" author Chris Mooney quotes the celebrated Stanford University psychologist Leon Festinger, "A
man with a conviction is a hard man to change. Tell him you disagree and he turns away. Show him facts or figures and he questions your sources. Appeal to logic and he fails to see your point.” Mooney also writes, "It would seem that expecting people to be convinced by the facts flies in the face of, you know, the facts” [2].

In *Blink: The Power of Thinking Without Thinking* Malcolm Gladwell encouraged us to react “automatically from relatively little information.”

So if it makes sense to us—for whatever reason that occurs, it just makes sense. And we are prone to disregard all evidence to the contrary. And sometimes we are encouraged to do so by “thought leaders.”

Perhaps the ticket to escape the trap of evidence-contrary practice is to get an uphill, ahead of the curve/skid, start by learning the science before learning and then investing ourselves in myths that misguide. Just as Mom may have warned us about being careful who we hung out with when we were younger, it's still true now that we are older, and even more important as professionals, trying to be good stewards with our shareholders and other stakeholders limited resources.

**About the Author**

Guy Wallace has been an external performance improvement consultant since 1982 specializing in performance-based instruction, curriculum architecture design, ISD processes, qualification/certification performance testing, recruiting and selection criteria, and other non-instructional interventions. He is the recipient of ISPI’s Honorary Life Member Award (2010) and an inaugural member of ASQ's Influential Voices to Raise the Voice of Quality (2010). He is the co-founder and current President of ISPI Charlotte, and has served as President of ISPI International (2003-2004). He has been a Certified Performance Technologist (CPT) since 2002, and served as a Director on the ISPI International Board (1999-2001). He has been a speaker at more than 35 conferences (since 1985), and has published more than 12 books and has been published more than 80 times in numerous professional publications since 1984. You can connect with him via his [website](#) or via [email](#).

**Additional Resources**

Suggested by Harold Stolovitch:
- Massa, L.J. and Mayer R.E. Testing the ATI hypothesis: Should multimedia instruction accommodate verbalizer-visualiser cognitive style? *Learning and Individual Differences* 16, 4 (2006): 321-336. (The authors conclude that the value of matching instruction to a specific style or attribute was not much more than folklore, with no true evidence to support the belief or practice.)

Suggested by Will Thalheimer:

Suggested by Richard E. Clark:
- Stahl, S. Different strokes for different folks? A critique

From the Sigmund Tobias article:

From Guy Wallace's website:
- NPR covered this on August 29, 2011, "Think You're An Auditory Or Visual Learner? Scientists Say It's Unlikely." Read and listen to short recording.
- "Learning Styles - A Bridge to Nowhere"? Published in 2001 in the CADDI Newsletter: Pursuing Performance.
- Frank Nguyen's "Evidence-Based Training: Debunking the Myth of Learning Styles."
- "The Myth of Learning Styles" a detailed article from Cedar Riener and Daniel Willingham about why learning styles are a myth. See also "7 Resources Explaining The Learning Styles Myth."
- Will Thallheimer's "Learning Styles Reviewed by Association for Psychological Science AND FOUND WANTING."
  Will also is offering a $1,000.00 (US) reward to anyone who can "prove" impacting learning via designing for learning styles preferences.
- "Learning Styles as Fortune Telling" Cammy Bean has a nice summary of her findings as she tries to better understand the role of learning styles in eLearning.
- "Recent Neuroscience and Cognitive Research Findings on Cyber Learning" by Richard E. Clark
- Here is a page from a Google Search on "learning styles evidence."
- From the APS (Association for Psychological Science) a 2009 press release, "Learning Styles Debunked: There is No Evidence Supporting Auditory and Visual Learning, Psychologists Say."
- Video (2:11 minutes) of Rob Foshay at the ISPI 2000 Conference.
- Video (6:55 minutes) of Daniel Willingham on why "learning styles don’t exist."

References


Comment by William Kennedy-Long:

Looking at this from a work-life perspective isn't the truth of the matter, that for the global workforce of today and tomorrow, its more about performance than learning, by this I mean what do I need to do in order to improve my performance. Yes there will almost certainly be a learning element to that (formally and informally), but more importantly, its what exists in terms of performance support to help me achieve my (professional and personal) goals that is key. In the world of workplace learning and the ongoing debate over 70:20:10 (and yes as Charles Jennings quite rightly says its not about the numbers its about change), why should we focus on learning styles when it is only really applied to the 10%, (if that) and the reality is that we work with our colleagues every day, so we know them, we know how to approach them, we know how to ask them for help. We also have knowledge management systems either through the enterprises we work for or though our own personal knowledge management systems that we have created. We should be cognisant of learning styles not consumed or be driven by them!

Comment by Alia Solo:

Is the debate here over Audio / Visual / Kinesthetic (AVK) learning styles? They never held any credence for me in terms of design. But what about Kolb? I haven't seen him mentioned in this debate and his Learning Styles Inventory (LSI) or McCarthy’s Learning Type Measure (LTM). What are we really debating here? Clark only devotes a surface two pages to debunking the AVK myth, and mentions nothing about other learning styles information in usage in curriculum development and education today. Stirring the pot . . . hehe!!!!!

Comment by Luisa Formisano:

Searching in the posts I have found this article about learning styles. Any theory on different attitudes to learn hasn't been supported by a true experimentation on a solid, scientific approach. Human minds try to change their strategies and techniques in resolving problems and difficulties. It’s also emotionality responsible for learner's changing style. Emotions are not illogical but convey meanings too. I agree that rationality and planning help understanding taking away from any chaos the learners may cope with. With different domains also different strategies must be explored and taken into account. Evidence-based approach is the best one to apply.

Comment by Beth Sorichetti:

Certainly an interesting topic - definitely worthy of reflection. Is it a learning style or a learning preference and if a preference is it a result of conditioning or personality or what else? Does it matter? An activity shouldn't be used solely because it's cool and fun, but for the educational content and relevancy. If it's fun and cool too, then bonus! Personally, let me learn my way, with some short lecturetes, some discussion & q/a's, time for reflection, some reading, some hands on practice, and please include some entertainment value!

Comment by Ann Yakimovicz:

Learning styles is embedded in continuing professional education. My organization reviewed the criteria set up by ANSI/IACET to become an approved provider of continuing education. One of the standards is that the training materials are designed with consideration of learning styles.
Perhaps one of the best papers on learning styles is Coffield, Moseley, Hall, and Ecclestone’s, Learning styles and pedagogy in post-16 learning: A systematic and critical review (PDF). While the paper does dismiss some types of learning styles and the importance that the recognized learning styles actually have when it comes to learning, it does leave a lot of questions opened. One of the most profound statements in the paper, at least to me, is (p68): just varying delivery style may not be enough and the unit of analysis must be the individual rather than the group. That is, when you analyze a group, the findings often suggest that learning styles are relative unimportant, however, when you look at an individual, then the learning style often distinguishes itself as a key component of being able to learn or not. Thus those who actually deliver the learning process, such as teachers, instructors, or trainers and are responsible for helping others to learn see these styles and must adjust for them, while those who design for groups or study them see the learning styles as relative unimportant. In the next paragraph, the paper continues with this statement: For each research study supporting the principle of matching instructional style and learning style, there is a study rejecting the matching hypothesis (2002, 411). Indeed, they found eight studies supporting and eight studies rejecting the ‘matching’ hypothesis, which is based on the assumption that learning styles, if not a fixed characteristic of the person, are at least relatively stable over time. Kolb’s views at least are clear: rather than confining learners to their preferred style, he advocates stretching their learning capabilities in other learning modes. While many find this as a reason to dismiss learning styles, I find it quite intriguing in that why do learning styles play a key component is some situations or environments, but not others? I think part of the answer is within this finding study that was conducted in the U. S. and Israel, found that when students’ learning styles matched the teaching method they performed both more effectively and efficiently. But the authors of the paper seem too readily to dismiss it as the end the paragraph with this statement:But even this conclusion needed to be qualified as it applied only to higher-order cognitive outcomes and not to basic knowledge. (p67) It seems logical that higher-order cognitive outcomes need more individual support (in this case matching the learning style the the correct learning strategy) than basic knowledge. Thus in some situations learning styles are important, while in others they are not. Finally, in the paper’s conclusion the authors note (P132-133) that: Despite reservations about their model and questionnaire (see Section 6.2), we recognise that Honey and Mumford have been prolific in showing how individuals can be helped to play to their strengths or to develop as all-round learners (or both) by means, for example, of keeping a learning log or of devising personal development plans; they also show how managers can help their staff to learn more effectively. Thus the main take-away that I get from the paper if that if you are an instructor, manager, etc. who has to help the individual learners, then learning styles make sense. On the other hand, if you are an instructional designer or someone who directs her or his efforts at the group, then learning styles are probably not that important. Note that I am both a trainer and a designer so perhaps this is why my take-away makes sense to me.

Tue, 06 Dec 2011
Post by Guy W. Wallace
Hi Claudia! The last sentence of the first paragraph states: I first learned back in the 1980s at NSPI (now ISPI) conferences that while self-reported learning style preferences do exist, that designing instruction to accommodate them has no basis. So no - I don't think that they don't exist (as self-reported). They do. People have preferences. It's just that the science has not (yet) demonstrated that designing learning/ training for those styles makes a difference in learning. Maybe some day it will - but now - all of the evidence is against this. And there evidence has been there for decades now. Yet the myth persists. Dr. Richard E. Clark told me in a phone conversation a couple of years ago that some studies show that
being forced to learn outside one’s “preference” actually caused greater learning - as one had to work harder at it. Of course that takes a motivated learner. There are more important things for an ID/ISDer to work on than Myths that Mislead, such as authenticity of the content and applications/practice to the learner’s expected applications of the learning - plus dozens of other factors. Promoting and acting upon something proven to not be valid is not good stewardship for our clients and stakeholders - and does not help “average up” our professional networks. Cheers!

Mon, 05 Dec 2011
Post by Claudia Putnam
Meh. So, do you think that you don’t have a learning style or preference? I know that I can usually take notes and if I write something down, I will remember it and won’t have to study those notes. Is that true for everyone? If not, why not? In the case of my partner, if I want him to remember something we discuss, the best thing is usually to go for a walk. A conversation over dinner won’t do it. For him to remember something from a class--well, notetaking didn’t work, because he couldn’t take notes and listen at the same time. So he would tape the lecture and listen to it back while on a bike trainer. What was that? A learning... um... style? Or just some convoluted waste of energy that he happened upon (no one taught him this) and kept doing for no good reason? What accounts for the fact that I skip over graphs in most textual presentations of material? If there’s a picture, why do I read the captions first? Why did I like algebra better than geometry...did it have anything to do with the fact that algebra is the linear/sentence version of geometry? I’m not saying I couldn’t do geometry...when it got more conceptual...ie, calculus, then I liked it. That is, once there were WORDS around it. Why do some people like PCs better than Macs? Why do some people like a stylus and others like a touch screen? Why do some people like ball sports and some people like skiing? Come on. Of course there are preferences. Of course people have brains that are organized in different ways. Go back and read Mel Levine.

Wed, 30 Nov 2011
Post by Jane Bozarth
Hmm. My comment showed up out of order. I was responding to the post by "Done One". I love Guy’s work here and hope he will do more of this sort of thing for us in the future.

Mon, 28 Nov 2011
Post by Larry Nardolillo
SUPER ARTICLE, but I don't understand Jane's comment about "defending the value of learning styles in instruction by arguing that the volume of science may be wrong". It seems that Guy agrees with the volume of science, which says there is no value in designing for learning styles. Also, I was surprised to see so many learning industry thought leaders supporting the position that designing for learning styles has not been shown to improve learning or performance. I thought learning styles were a given, but perhaps I have been mislead, just like the Wall Street guys who told me that mortgage backed securities and derivatives were a great way to grow my portfolio...

Sun, 27 Nov 2011
Post by Jane Bozarth
Interesting perspective: defending the value of learning styles in instruction by arguing that the volume of science may be wrong. I direct anyone with a belief in the usefulness of learning styles in designing instruction to Will Thalheimer's longstanding challenge: $1000 US to anyone "who can prove that taking learning styles into account in designing instruction can produce meaningful learning benefits." He's waited 5 1/2 years so far. See http://www.willatworklearning.com/2006/08/learning_styles.html . JB
Sat, 26 Nov 2011
Post by Ryan Tracey
Hi Guy. I think there are a couple of aspects to the learning styles debate that are often over looked, which tend to muddy the waters for everyone involved. Firstly, my understanding of the research is *not* that it proves that learning styles don't exist, but that it doesn't prove that they do exist. This is a subtle but important distinction. Secondly, the point (for me, anyway) is not so much whether learning styles exist, but whether using them to inform instructional design makes a significant difference to the learning outcome. Personally, I think think learning "styles" are a confusing way of labelling learner "preferences". For example, when learning about a complex system, my preference is to see a diagrammatic overview, and then read the detailed text that explains it in depth. The professor can talk about it ad nauseum, but I shant truly "learn" until I get stuck into it for myself in my own time. Does that make me a V (Visual) / R (Reading) learner? I don't care frankly, I just want my picture and text! The BBC Documentary "The Unteachables" also shows how how changes to the pedagogy can make a difference for different learners. (I've read similar about Maori education in New Zealand.) Clearly the term "learning style" is an emotive one that generates a lot of heat. When we eliminate it from the conversation, what we are all really talking about is engagement, learner centeredness and authenticity.

Fri, 25 Nov 2011
Post by Done One
hola, nice article. although the implication that "science can be trusted" is in itself neither scientific nor wise. although we see science as "the truth," actually it's provisional truth, isn't it? if we "believed" science from 30 years ago that has been revamped, we would have been wrong, right? add to that the well-documented personal and increasingly corporate agenda driving science, and in my opinion it's still wise to doubt *everything* Although since it is the nature of the mind to believe, and necessary for life, it's an ongoing maintenance project.

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