

## Learning styles as a basis for paddlesports instruction: A review of the literature and some alternatives to add to the conversation

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When I became certified as a whitewater kayak instructor, I was told I needed to consider students' learning styles. This point was emphasized by the ITs who taught my course and it was included as a main content area in my instructor manual. I felt as if I would be a terrible paddlesports instructor if I failed to teach to students' different learning styles.

I have a confession: I have never quite figured out how to do this. I've been teaching paddlesports for over ten years now, and other outdoor activities and content areas for nearly 20, and I still struggle with the idea of learning styles. Don't get me wrong: I have watched students doze off because I've talked too much and others flip their boats because I haven't sufficiently helped them acquire a 'feel' for a particular skill, so I know people have diverse aptitudes I need to address somehow. And I'm always trying to find better ways to reach them – it just doesn't seem possible for me to identify what people's learning styles are, and then use this knowledge to cater to them more effectively.

My situation isn't helped by the fact that I regularly work with a very talented and respected instructor who does seem to have this ability. She seems to be able to diagnose learning styles on the spot and adapt her instructional methods accordingly – a little more talking here, a slightly longer drill there, and some visualization exercises for others. We've debated about learning styles quite a bit and have basically agreed to disagree (respectfully) about their significance. Judging by her success with many fledgling paddlers, I have no doubt that *something* positive is happening. But, to my great distress, I seem to lack her ability to diagnose learning styles on the fly, no matter how hard I try or how many times I re-read my instructor manual. Instead, I've had to compensate by approaching paddlesports instruction in other ways. And, the pointy-headed academic in me wanted to get to the bottom of this learning styles issue from a scientific standpoint. That's the focus of this article – to examine the research on learning styles and to discuss alternative ways of approaching paddlesports instruction as suggested by the research.

In the first half of this article, I'll discuss recent reviews from the research literature on learning styles. I'll then summarize other perspectives that see learning differences not as 'styles,' but as aptitudes toward *modalities* that different activities involve. In the second half of the article, I explain what these shifts in thinking might mean for paddlesports instruction and discuss practical ways I've incorporated these alternative perspectives into my own instruction (which also work if you still find the idea of learning styles helpful, incidentally). My hope is to open a conversation in these pages about alternative ways people approach their instruction, besides *learning styles*.

*Evidence for learning styles and the 'meshing hypothesis.'*

The debate with my colleague – and the science of learning styles – revolves around two questions:

(1) Do learning styles exist?

(2) If so, does it make a difference if people with a particular style receive instruction that matches with that style?

In the past few years, researchers have given increasing attention to these questions because of their obvious importance to teaching all kinds of skills and subjects. Unfortunately, the evidence they've found suggests that the answer to both questions is *no*.

Two teams of educational psychologists have recently undertaken a comprehensive review of the literature focused on these two questions. The first team, Harold Pashler, Mark McDaniel, Doug Rohrer, and Robert Bjork (2008) were commissioned by the journal *Psychological Science in the Public Interest* to review the research out of a concern that a thriving for-profit industry has cropped up, selling expensive surveys and trainings to schools and colleges. Because educational budgets everywhere have been shrinking, they wanted to determine if these programs were worth the money in terms of scientific evidence behind the 'learning style' products being sold.

Pashler et al. defined learning styles as "the concept that individuals differ in regard to what mode of instruction or study is most effective for them" (p. 105). What they specifically investigated was the "meshing hypothesis," which is the view that "instruction is best provided in a format that matches the preferences of the learner (e.g., for a 'visual learner,' emphasizing visual presentation of information)" (p. 105). This claim is promoted by vendors selling learning style services and it seems to provide the rationale behind emphasizing learning styles in paddlesports instruction.

What Pashler et al. found was, in their words, "striking and disturbing" in that they found "virtually no evidence for the interaction pattern" (p. 105) expressed in the meshing hypothesis. Admittedly, they didn't focus on skill-based kinesthetic learning, but I think some of their points are worth considering.

First, they cited research that identified 71 different learning style frameworks across various articles and vendor catalogs. Although there is probably some overlap among styles in these frameworks, their abundance means it is nearly impossible to reliably assess a specific learning style since another framework might present other options. In other words, what learning style instructors think they're assessing is largely arbitrary, which leaves them relying mostly on their personal intuition. This seems OK since teaching will always involve this to some extent, but there are a couple problems; people who are able to intuit various learning styles (like my colleague) will always be more successful at identifying them than people who can't (like me), and two people who possess strong intuition might not be assessing the same style even if they think they are.

Second, as experimental psychologists, Pashler et al. stressed that diagnosing a learning style objectively is tricky business, even under laboratory conditions. It isn't just a matter of asking questions about what kind of information people prefer – visual vs. verbal vs. kinesthetic – since people don't necessarily even know what's best for them. "Basic research on human learning and memory, especially research on human metacognition ... has demonstrated that our intuitions and beliefs about how we learn are often

wrong in serious ways” (p. 117). Conversations with students and quick on-water assessments might provide rough clues about which instructional method to use, but aren’t definitive.

Third, Pashler et al. found only one study that came close to supporting the meshing hypothesis, and its research design had flaws. Most studies *did not* follow good experimental methods, and those that did found the *opposite* – that meshing style with instruction did not lead to better learning outcomes. They concluded, “these negative results, in conjunction with the virtual absence of positive findings, lead us to conclude that any application of learning styles in classrooms is unwarranted” (p. 112). This strong critique undermines the apparent value of catering to one style or another, or maybe even bothering with the concept.

The second team, James P. Lalley and J. Ronald Gentile (2009), came to essentially the same conclusion. Assertions about matching instruction with a presumed style, for example, the view that a “visual learner would benefit more from observing music being performed than from listening to a recording ... – no matter how apparently reasonable or satisfying they seem – are empirically incorrect” (p. 462). They cover most of the same ground as Pashler’s team, so I won’t summarize their whole article here. Lalley and Gentile *do* conclude that individual differences matter, but more important than focusing on ‘learning styles’ is (1) matching a current experience with learners’ past experiences, and (2) identifying the core *modality* of the skill or topic you’re trying to teach.

Daniel T. Willingham, a cognitive scientist, focused on this idea of modality. He asked in his article, “Do visual, auditory, and kinesthetic learners need visual, auditory, and kinesthetic instruction?” (2005a). Like the others, his answer was no. Actually, his answer was *sort of* – it depends on the kinds of cognitive demands that successful participation in an activity places on people, not what learning style they think they possess. He offers an example:

...if I ask you "Which is a darker green: a Christmas tree or a frozen pea?" you'll likely report that you would answer this question by visually imagining the two objects side by side and evaluating which is a darker green. If I ask you whether Bill Clinton or George W. Bush has a deeper voice, you will likely report that you would answer by generating an auditory memory of each. (section 1, para 7)

Willingham’s point here is that the way information is stored in memory depends less on an individual’s learning style, and more on the inherent modality – visual vs. auditory – of the information included in the task at hand. An example from paddlesports might be learning how to hold a boat on edge. Proficiency in his task requires a kinesthetic modality, and while it might help to talk about it or demonstrate it, ultimately people’s learning will depend on achieving the right pressure with their glutes and knees and a establishing balanced relationship between their torso and lower body. Talking about or watching this skill cannot replace sensing it. To isolate the modality of this task, I have found that I do not need initially to talk much about it or even show people, but tell them while in their boats to imagine sitting on a bench and trying to get their wallet out of their back pocket. For me this is the most

successful (and quick!) way to introduce edging, even if I want to add more information later. Then when they need to 'remember' it, they're relying on a kinesthetically matched modality and not a cognitively-based learning style, which is really beside the point.

After reviewing a considerable amount of research, Willingham concluded that a teacher's job is not to search (in vain, he says) for a student's best learning style, but rather determine (a) what modality is central to the information or skill to be learned, and (b) how modalities can reinforce each other to deepen understanding or expand skills. He argues that topics involve different modalities; a lesson on the civil war, he says, might involve reading primary documents, viewing art or photographs, and listening to music from the era. A teacher would not plan activities around these aspects because they cater to different learning styles, but because they each provide access to deeper meanings that students can take away from the lesson on the whole. He writes elsewhere, "If it's important that children know what something looks like, sounds like, or feels like, they should experience the object in that modality" (2005b, para 1).

Paddlesports instructors, then, might review courses and plan different activities for introducing a sweep stroke (which relies mostly on kinesthetic memory) versus teaching river features (which rely at least initially on visual memory). I'll break this down a bit more in the second half of the article.

*Where does the idea of learning styles come from?* If there's not much scientific evidence to support the idea of learning styles, where does it come from? Pashler et al. (2008) propose four related sources:

1. The idea of finding out 'what type of person one is' has some eternal and deep appeal;
2. People are concerned that they, and their children, be seen and treated by educators as unique individuals;
3. It is also natural and appealing to think that all people have the potential to learn effectively and easily if only instruction is tailored to their individual learning styles; and
4. Rather than attribute one's lack of success to any lack of ability or effort on one's part, it may be more appealing to think that the fault lies with instruction being inadequately tailored to one's learning style. (pp. 107-108)

In other words, the 'learning styles' industry seems to have origins in cultural beliefs about individualism and related views about how individuals ought to be treated in educational situations. These are very powerful – and apparently profitable – beliefs. Ironically, however, they might also undermine core goals and values held by paddlesports instructors. Points 3 & 4 especially open up the possibility of 'learned helplessness,' whereby making too much of learning styles could actually inhibit people taking responsibility for their learning, which could compromise a solid foundation for the lifelong pursuit of a challenging but fulfilling activity.

All this said, the authors of the above articles agree on a few points. First, different aptitudes among learners influence their mastery of skills and information; second, these seemingly innate differences matter less than the cognitive and physical demands of successful participation in an activity; and third, instructional environments should strive somehow to account for these factors so as to promote mastery by everyone. It therefore seems that the main value of emphasizing 'learning styles' in

paddlesports instruction has been to stress the importance of being creative and trying different methods for reaching as many students as possible. As Robin Pope (2011) has written in this journal, instructors should “create lesson plans that incorporate as many different learning styles as possible and then to provide individual feedback aimed at an individual’s preferred learning style at that moment” (pp. 3-4). This is good advice; to the extent it has helped instructors be creative and flexible, the idea of learning styles has had a very positive effect. But, their benefits might be enhanced by approaching learning in new ways that might afford a more systematic approach to paddlesports instruction. I’ll now discuss some possibilities other than ‘learning styles’ for guiding these efforts.

*Modalities and aptitudes.* Although they cast doubt on whether the concept of learning styles exists or is truly helpful, the researchers cited above generally agree that people have different aptitudes for acquiring information and mastering skills. What this means for instructors is that they should need to vary teaching methods in two ways: (1) throughout an entire clinic, and (2) from person to person in a given ‘lesson’ (again, see Pope, 2011). In other words, you should *plan on* using different instructional approaches at various times during your clinic and you should also find ways to reach students in whatever way you can as they need it. This isn’t a new insight and it matches with commonsense beliefs about learning styles, but *modalities* provides a couple new ways of approaching instruction.

Let me give a couple more simple examples in addition to the edging example above. First, in IDW classes I teach, a required piece of content is the steps needed to maintain certification. I convey this in two ways – one, in the form of a flowchart, and two (if possible), by actually finding the right forms and walking through steps on the ACA website. The flowchart diagram organizes the main bits of information to match the linear order of steps people follow to register courses and file paperwork over time, and the website relies on their familiarity with web interfaces and ‘rehearses’ how the steps are carried out in real life. What I am trying to do is identify the modalities involved in using information as instructors and then design exercises to isolate these modalities, with the goal of promoting independent mastery. Secondary in my thinking is whether the information is presented visually or verbally.

A second example: at the kayak school at which I teach, it is common for instructors to teach eddy turns and peel outs by using the acronym “SAVE,” which stands for *speed, angle, vision, and edge* (see Pope, 2011 for more comprehensive acronyms). This list helps people isolate elements of effective maneuvers. Now, the point here is not to get people to remember specific bits of verbal information, but rather, the acronym highlights the basic kinesthetic elements of the maneuvers that are crucial for success. In other words, the acronym acts as a tool for accessing a kinesthetic modality. This could be approached as a matter of teaching to different learning styles – an acronym for the verbal learners and a drill for the kinesthetic learners – but the research suggests what is actually happening is these elements of the lesson work together to emphasize the core kinesthetic modality of the maneuver. “The important idea,” Willingham writes, “*is that modality matters in the same way for all students*” (2005 b, section 3, para 8, emphasis in original).

I am not claiming that these are the only ways to teach these topics or skills, or even the best way. I am merely using them as examples to illustrate how the concept of modality can guide lesson design

instead of learning styles, in a way I have found helpful (given my apparent disability around diagnosing learning styles). I have also developed three strategies for integrating this knowledge into my lessons and guiding how I organize them across a program. I call these strategies *frontloading*, *diagnosing*, and *customizing*.

*Strategy 1: Frontloading.* I can always count on the fact that students in my group possess different aptitudes for different modalities. I have to trust this belief because I apparently lack the ability to identify who has what learning style. No matter: I just know that I need to (a) try to isolate the right modality most effectively and efficiently, and (b) vary ‘ways into’ this modality. As Pope (2011) suggests, trying to teach to different learning styles, in reality, probably amounts to this anyways.

To do this I imagine all my lessons in two main parts aim for what I call “80/80.” The first part of the lesson includes the introduction and main body, and my goal is for this part to get 80% of the students to a level of 80% proficiency. I don’t know which 80% of the students will get which 80% of the information, but I can worry about this later. Based on this formula, I know right from the start that I’ll need to work more closely with 20% of the people to understand much of what I am doing, and for the others, I might need to help them grasp the last 20% that they didn’t get during the first or ‘main’ part of the lesson. (Of course, these are also things they will need to continue to practice and integrate into more complex and advanced skills later.) So, in other words, I design lessons so its main body does most of the basic instructional work, and then I need to build in supported practice, refinement, and remediation.

An example: when I start introducing static draw strokes for the purpose of controlling turns, I tend not to teach these as isolated strokes: the gliding draw at the stern, the hanging draw at the hip, and the static draw at the bow (duffek). Mastering these ultimately depends on a kinesthetic modality, but before I set them loose to discover this on their own, I want them to grasp a core concept: blade position alongside the boat has an effect on the arc of a turn, and they can control and make choices about this depending on their goal. I have found that an effective way to convey this concept initially is through a visual modality. I steer clear of lengthy descriptions up front and simply say “watch me... what did you notice? Now try it on your own.” I sometimes insert some information about powerface deflection before practice starts, but for the most part, this is sufficient to get people partway toward mastering static draws at an introductory level. I then go around and provide more information, coach them in practice, and so on. In other words, it is not necessary to teach a skill that contains a core modality using that same modality – you can approach it from another modality that might provide a better ‘way into’ it and lead to greater success down the road.

### *Strategy 2: Diagnosing*

This is what my colleague does, and because I can’t seem to do it very well, I don’t have much to say about it. But I have developed a coping method for coming close to what she does. In this strategy, you’d make an effort to recognize people’s preferred way of receiving information. (We don’t have psychology labs handy so we’re stuck with making rough assessments in dynamic conditions.) She gives the example of ‘doers’ who are always the first out of the eddy and the first to stop paying attention

when she's getting too wordy. I struggle to identify these people but I know they're there, so what this means is that I need to vary how I deliver the main body of my lessons. Sometimes I talk more up front, sometimes start with a demonstration and no verbal information at all, and sometimes just say 'try this' so people get a sense of something through feeling it. I call this the 'diagnosing' method because, if you are talented like my colleague, you can design lessons around learning differences as they're happening, and if you aren't, you should simply vary your instructional methods in the main body of your lessons so to stick within the 80/80 guidelines.

### *Strategy 3: Customizing*

Paddling is always a mixture of modalities: textual and verbal information, kinesthetic sensation, visual information, and conceptual knowledge. As I've advanced in the sport, I've realized how these modalities work together to facilitate further mastery and enjoyment. For instance, as I learn more about deflection off the faces of the paddle in relation to its position around the boat, I experience new sensations that either enhance my success or give feedback that some kind of correction is needed (by feedback I mean missing an eddy or flipping over!). But, for novices, experiencing all of these modalities at once can, as the famous philosopher and psychologist William James said, be a "blooming, buzzing confusion" (Russell, 2012, para 1).

An instructor focused on learning styles might try to diagnose a student's style and present information according to that diagnosis. I've already discussed the difficulty with this, and the research suggests that instructors could be better served by focusing on the modality of the skill being learned. Because there are, in reality, multiple modalities at work in paddlesports, a fruitful approach might be to try to help a student gain access to the skill by approaching it from a different modality.

Let's return to the static draw example. Students who have trouble accessing the concept of blade position and deflection by observing might instead need to access the skill by feeling the arc of their boat change as the water deflects off the powerface of the blade. This is not a matter of matching instruction to a learning style, but rather identifying what modalities are prevalent in a skill and helping students approach the skill by trying out different, relevant modalities. It is a bit of a trial and error approach, and it behooves instructors to have different 'tricks' that provide access to the same skill, by way of different modalities.

*Why focus on modality and not learning style?* There might not seem like much of a practical difference between modality and learning style – you might say they're just two blades on the same paddle. In one sense this is true; the goal of either framework is to spur creativity and guide instructors to develop practices that help them teach more effectively. But I believe there are a couple important reasons to think beyond learning styles as the main framework for paddlesport education.

First, the research literature does not support the central claim that students are best served by matching instruction to a perceived learning style. Insofar as educational and recreational fields are striving to become more 'research-based,' beginning with major findings from the educational and psychological literature might be advisable. This is not to say that these findings cannot be challenged – after all, most of the studies I've reviewed here concern classroom instruction and not applied

kinesthetic areas like paddling – but any steps toward this goal should be based on the best available, current evidence (says the pointy-headed academic in me), so as to help track innovation and progress in a more systematic way.

Second, I've tried to be clear about my inability to make sense of instruction through the 'learning styles' framework. I'll never be as talented as my colleague in this respect. To my mind, focusing on modalities has the advantage of being relatively objective. In other words, what modalities are operating in any given topic or skill can be agreed upon, and are the same for all paddlers regardless of differences in aptitude. Learning styles on the other hand refers to a relatively mysterious and extremely variable (71 different frameworks!) psychological phenomenon whose interpretation is highly subjective based on an instructor's intuitive abilities. Another way to put this is that modalities reside in activities 'out in the world' and learning styles reside 'in the head.' It is easier to observe and discuss phenomena that are out in the world rather than in the head. In either case, using modality as basis for instruction might be a fruitful direction for experimentation and discussion, extending the 'work in progress' that Robin Pope (2011) has started in these pages. One practical way into this conversation might be to review the specific tips discussed in that excellent article from the viewpoint of modalities and aptitudes, rather than learning styles.

### *Conclusion*

The early 20th century German adventure educator Kurt Hahn (founder of Outward Bound) famously said, "your disability is your opportunity." I figured I might not be alone in my 'disability' around learning styles and saw an opportunity to share some other ways of thinking about learning that I've developed in order to compensate as an instructor. Plus, more broadly, if learning styles *don't* exist – at least in the way people think they do – the field of paddlesports instruction has an opportunity to look for alternative frameworks that could open up new ways of teaching. It would be great to exchange ideas and techniques for isolating modalities in different skill areas so students can master skills more quickly and effectively.

Learn more about Jayson [here](#).

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