

Myron H. Dembo
Keith Howard
*Advice about
the Use of
Learning Styles:
A Major Myth in
Education*

The authors' idea for this paper stems from John Stossell's (2006) book, *Myths, Lies, and Downright Stupidity*. Stossell is a consumer advocate and 20/20 anchor who has spent his career challenging consumer myths. As we talked about some of the ideas in his book we thought about common educational myths, and learning styles quickly appeared at the top of our list.

Although the use of learning styles has been challenged for years (see Curry, 1990; Doyle & Rutherford, 1984; Gutierrez & Rogoff, 2003; Kampwirth & Bates, 1980; Snider, 1990; Stahl, 1999), it seems as though the issues raised by these papers have had little impact on the continuing use of learning style instruction in education. In fact, there is a whole industry that has developed around learning styles that includes books, tapes, and consultants promoting its use in education.

Our goal in this paper is not to conduct another extensive review of literature in the area, but to initiate a dialogue among educators who continue to make assertions about the usefulness of identifying students' learning styles with little or no research support. We will discuss the status of learning style instruction and the unsubstantiated claims made by authors of learning style instruments and by instructors. Many of our comments are influenced by two recent comprehensive reviews of learning styles (Coffield et al., 2004a, 2004b).

To begin, let's look at the advice given by a sample of authors who have written professional development and study skills textbooks about the use and benefits of learning styles. We only quote a few textbooks,

but could have quoted dozens of textbooks. These statements represent the type of advice given by authors about learning styles and, in part, have been adopted by many instructors of study skills courses.

Nolting (2002) states, "Research has shown that students who understand their learning styles can improve their learning effectiveness in and outside of the classroom" (p. 46). Later in his book he also says, "Try to find an instructor who matches your learning style" (p. 57).

Van Blerkom (2006) advises students:

Understanding how you learn best can also improve your concentration. When you're working in your preferred learning mode, you probably find that you are better able to concentrate on your study tasks. Approaching a task from your preferred style results in a better fit or match—studying feels right. (p. 14)

Jenkins (2005) tells students that "If you discover that your learning style and the instructor's model of teaching clash, speak with your instructor about it" (p. 91). He goes further to suggest

If you are a left-brain (linear) learner, become an active listener in class. Lectures tend to provide information in the way that most linear learners prefer. If you are a right brain (global) learner, read any assigned material before attending a lecture or ask your instructors for a summary of what they will discuss in the next class (p. 96).

Finally, Coman and Heavers (1998) make numerous claims about the benefits of learning style instruction:

If you approach studies using your preferred learning style(s), you should be able to study for the same amount of time (or less), remember more, get better grades, raise your level of self-confidence, and reduce your anxiety as you tackle classroom life." (p. 9) Based on the advice of such authors, instructors typically either use learning style instruments identified in the literature or sometimes develop their own instruments for students to assess their learning styles. This latter practice is especially used in identifying modality preferences related to visual, auditory, or kinesthetic learners (e.g., Coman & Heavers, 1998; Jenkins, 2005). For example, Sprenger (2003) tells her readers that students have a preference for a dominant sensory pathway and "...*always* learn best if they begin with that strength" (p.33).

Based on the advice given by these writers, a number of key questions need to be explored:

1. Are learning style instruments valid and reliable?
2. Do students benefit when the type of instruction matches their preferred learning style?
3. More specifically, is there evidence that understanding one's learning style improves concentration, memory, self-confidence, and reduces anxiety, and leads to better grades?

Unsubstantiated Claims

Having alluded to the far-reaching claims that many textbooks attribute to the use of learning styles, we now turn a critical eye to the foundation upon which such claims are built. Any usefulness that might be derived from applying learning styles must be substantiated by valid and reliable instruments, as well as by evidence that, when used as prescribed, learning styles can affect learning outcomes.

Validity

Before tackling the question of whether or not instruments used to measure learning styles have validity, one must recognize that there are several dimensions to "validity" that researchers and statisticians concern themselves with. At the surface level, researchers are concerned with whether a test appears to be measuring what it purports to measure. Referred to as "face validity," this is an assessment based on a common-sense judgment of what appears to be valid to an untrained observer, but it is not a technical or statistical assessment. It is this dimension of validity that enables many supporters of learning styles to attract unquestioned acceptance for their respective models because it appeals to the intuitive sense of what "feels right."

However, critics of this blind faith approach argue that there are other dimensions to validity that ought to be considered when assessing whether a particular learning styles instrument is a truly valid evaluator of what it purports to measure. If a learning styles model has construct validity, meaning the instrument measures the construct (e.g., learning style, intelligence, motivation) it purports or claims to measure, it should not be influenced by other unrelated factors. Learning styles instruments are driven by forced-choice questionnaires that attempt to categorize respondents into one style or another. Stahl (1999) criticizes forced-choice learning styles inventories because for some of the questions, "people seem to make the same choices. Nearly everybody would prefer a demonstration in a science class to an uninterrupted lecture. This does not mean that such individuals have a visual style, but that good science teaching involves demonstrations" (p. 3). A choice of demonstration over uninterrupted lecture, on its face, can be interpreted as an indicator of a visual learner. However, if most respondents choose the same answer, then it does not really measure anything in particular except, perhaps, the ability to read the question. Furthermore, the question has little value in discerning possible distinctive characteristics of the learner.

What may be worse than not measuring anything in particular is measuring something completely different from what one intends to

measure. Stahl (1999) again cites learning style inventory questions that probe for students' difficulty remembering rules about sounding out words, or whether they mix up letters when attempting to write words. Poor or struggling readers will likely respond in the affirmative for both questions, but this is likely the result of their lack of reading proficiency rather than a learning style. Do these questions probe learning style or reading ability?

Coffield et al. (2004a) identified 71 different models of learning styles. The different theoretical perspectives behind the models result in instruments that attempt to measure different attributes, traits, characteristics, and/or preferences. With so many theoretical perspectives and instruments it becomes nonsensical to try to discuss the construct validity of "learning styles" in general, as construct validity would need to be assessed based on the theory and instrument for each of the models. The question as to whether the measure agrees with its underlying theory is going to be different for each model because each is based on its own theoretical framework.

Reliability

If, given a particular model, one were able to satisfy all questions as to validity, the second major hurdle to determining its usefulness is establishing whether the measurement instrument is reliable—that is, will it consistently produce the same or similar results when reapplied over time? Of the 13 major models subjected to full review by Coffield et al. (2004b), 10 were identified as having problems or questions related to reliability. In addition, the different perspectives as to the fixed or variable nature of the construct used will clearly influence views as to the expected reliability of any instrument devised to measure it. If the theory underpinning a model suggests that the style may change over time and in different situations, one would hardly expect that the instrument used to measure it would produce consistent results when reapplied over time. This reasoning led Coffield and his colleagues to conclude that

Some of the best known and widely used instruments have such serious weaknesses (e.g., low reliability, poor validity and negligible impact on pedagogy) that we recommend that their use in research and practice should be discontinued. On the other hand other approaches emerged from our rigorous evaluations with fewer defects and, with certain reservations we suggest that they deserve to be researched further (p. 55).

Application

The third and perhaps the most important hurdle to establishing the usefulness of learning styles is identifying empirical support for positive pedagogical impact on learning as a result of applying learning styles research. Just how learning styles research should be used to bring about these results is the subject of some debate. Should we attempt to match students' learning styles to pedagogical approaches that are user-friendly to those students? Or should we attempt to make learners more rounded in their ability to learn from an array of methods designed to tap different styles?

The idea of matching styles has a long history of empirical research. One critique of learning styles identified five different reviews on matching learning styles, spanning 14 years and examining over 90 studies (Stahl, 1999), and it failed to find empirical evidence that matching learning styles improves learning. One of those reviews (Arter & Jenkins, 1979) examined 14 studies and concluded that the use of remedial prescriptions based on differential patterns of ability strengths and weaknesses (so called Differential Diagnosis—Prescriptive Teaching) is an approach that cannot be justified, stating that "Children do not appear to profit from current applications of Differential Diagnosis-Prescriptive Teaching" (p. 517). They further stated, "...it is not surprising that DD-PT has not improved academic achievement, since most ability assessment devices have inadequate reliability and suspect validity" (p. 549). Coffield et al. (2004a) conclude that the evidence for matching is "...equivocal at best, and deeply contradictory at worst" (p. 40). Their view on deliberate mismatching does not offer much promise either, as they write, "deliberate mismatching has the status of an intuitively appealing argument which awaits empirical verification or refutation" (p. 42). With such a long and storied history of different approaches, one would expect that if matching learning styles could produce measurable and consistent improvements in learning we would have ample evidence to this effect. Nevertheless, textbooks and entrenched proponents continue to trumpet the virtues of various forms of learning styles-based approaches, seemingly unconcerned with the unimpressive track record that such approaches possess.

Clark (1982) reported that students often say they enjoy most those methods from which they learn the least, perhaps because they underestimate the amount of effort needed for success. That is, low-ability students prefer more permissive methods of instruction (e.g., independent study or small-group activities) because students can maintain a low profile that makes their failure less visible. However, these students need more direction and attention to achieve success in academic tasks.

High ability students on the other hand, like structured methods (e.g., lecture-recitation sessions), which they believe will help them learn more efficiently. However, the research indicates that students with high ability actually learn more from permissive methods, which allow them more independence in using their abilities.

Although this research is limited to structured and permissive environments and to students with high and low ability, it does suggest that an instructor should consider whether it is always advantageous to match student preferences and instructional environment—not only because the preferences may not lead to improved academic achievement but also because students simply may not benefit from certain instructional approaches whether they like them or not.

Although there does not appear to be much support for matching learning styles with instruction, no one can argue with the fact that instructors need to be more sensitive to the individual differences of students in the classroom and may be more successful if they try different teaching methods with different students. However, teachers must be aware of the danger of incorrectly categorizing any group of students according to a specific learning style.

The bottom line is that there is no consistent evidence that matching instruction to students' learning styles improves concentration, memory, self-confidence, grades, or reduces anxiety. An instructor may argue that he or she has found such studies. The problem is that most of these investigations are poorly designed. Coeffield et al. (2004a) state,

Our review shows that, above all, the research field of learning styles needs independent, critical longitudinal and large—scale studies to test the claims for pedagogy made by the test developers. The investigators need to be independent—that is, without any commitments to a particular approach—so that they can test, for instance, the magnitude of the impact made by the innovation, how long the purported gains last, and employ a research design which controls for the Hawthorne effect. (pp. 62-63)

What is the appeal of learning styles? First, many authors promise instructors a simple solution for solving educational problems related to improving academic achievement, motivation, and attitudes. Second, authors provide a reasonable explanation for why students do not achieve as well as they could. Instructors respond well to examining their own teaching and learning styles, which may lead to greater sensitivity to students whose learning styles are different. Third, a learning style approach focuses more on how students learn or fail to learn, and less on understanding how subject matter should be taught. Finally, for some learning style advocates, there is no special category of students who

cannot learn. The problem is simply that instructors have not learned that their teaching styles are not appropriate for a small percentage of students (Coffield et al., 2004a).

In summary, the answers to the three questions at the beginning of this paper indicate that learning style instruments have not been shown to be valid and reliable, there is no benefit to matching instruction to preferred learning style, and there is no evidence that understanding one's learning style improves learning and its related outcomes. This conclusion is based on the lack of well-designed investigations by researchers who are not committed to any particular framework, and replicated in numerous educational settings.

As a result, the assertions made by textbook authors quoted early in the paper are based on fiction and not fact. How can we maintain our professional status by neglecting important research findings regarding learning styles and continue to make unsubstantiated claims about its impact? We urge instructors to reconsider their instructional practices, especially the advice they give students about learning styles, and base their practices on sound research.

If a focus on learning styles doesn't work, what does? Educational research supports the teaching of learning strategies (e.g., Dembo, 2004; Dembo & Junge, 2005; Nist & Hoglebe, 1987; Simpson & Nist, 2000); systematically designed instruction that contains scaffolding features (e.g., Merrill, 2002); and tailoring instruction for different levels of prior knowledge (Clarke et al., 2005; Spires & Donley, 1998; Thompson & Zamboanga, 2004). The *best practices* approach to instruction can help students become more successful learners.

References

- Arter, J. A., & Jenkins, J. R. V. (1979). Differential diagnosis-prescriptive teaching: A critical appraisal. *Review of Educational Research*, 49, 517-555.
- Clark, R. E. (1982). Antagonism between achievement and enjoyment in ATI studies. *Educational Psychologist*, 17, 92-101.
- Clarke, T., Ayres, P., & Sweller, J. (2005). The impact of sequencing and prior knowledge on learning mathematics through spreadsheet applications. *Educational Technology Research and Development*, 53(3), 15-24.
- Coffield, F., Moseley, D., Hall, E., & Ecclestone, K. (2004a). *Should we be using learning styles?* Retrieved June 7, 2006, from the London: Learning and Skills Research Centre: <http://www.LSRC.ac.uk>.
- Coffield, F., Moseley, D., Hall, E., & Ecclestone, K. (2004b). *Learning styles and pedagogy in post-16 learning: A systematic and critical review*. Retrieved June 6, 2006, from the London: Learning and Skills Research Centre: <http://www.LSRC.ac.uk>.

- Coman, M. J., & Heavers, K. L. (1998). *How to improve your study skills* (2nd ed.). Lincolnwood, IL: NTC Publishing.
- Curry, L. (1990). A critique of research on learning styles. *Educational Leadership*, 48(2), 50-52, 54-56.
- Dembo, M. (2004). *Motivation and learning strategies for college success: A self-management approach* (2nd ed.). Mahway, NJ: Erlbaum.
- Dembo, M., & Junge, L. G. (2005). Learning strategies. In H. F. O'Neil (Ed.), *What works in distance learning: Guidelines* (pp. 41-63). Greenwich, CT: Information. Age Publishing.
- Doyle, W., & Rutherford, B. (1984). Classroom research on matching learning and teaching styles. *Theory Into Practice*, 23, 20-25.
- Gutierrez, K. D., & Rogoff, B. (2003). Cultural ways of learning: Individual styles or repertoires of practice. *Educational Researcher*, 32, 19-25.
- Jenkins, C. (2005). *Skills for success: Developing effective study strategies*. Belmont, CA: Wadsworth/Thompson Learning.
- Kampwirth, T. J., & Bates, M. (1980). Modality preference and teaching methods: A review of the research. *Academic Therapy*, 15, 597-605.
- Nist, S., & Hogrebe, M. (1987). The role of underlining and annotating in remembering textual information. *Reading Research and Instruction*, 27(1), 12-25.
- Nolting, P. D. (2002). *Winning at math: Your guide to learning mathematics through successful study skills* (4th ed.). Bradenton, FL: Academic Success Press.
- Simpson, M., & Nist, S. (2000). An update on strategic learning: It's more than textbook reading strategies. *Journal of Adolescent and Adult Literacy*, 43, 528-542.
- Snider, V. (1990). What we know about learning styles for research in special education. *Educational Leadership*, 48(2), 53.
- Spires, H. A., & Donley, J. (1998). Prior knowledge activation: Inducing engagement with informational texts. *Journal of Educational Psychology*, 90(2), 249-260.
- Sprenger, M. (2003). *Differentiation through learning styles and memory*. Thousand Oaks, CA: Corwin Press.
- Stahl, S. A. (1999). Different strokes for different folks? A critique of learning styles. *American Educator*, 23(3), 27-31.
- Stossel, J. (2006). *Myths, lies, and downright stupidity*. New York: Hyperion.
- Thompson, R. A., & Zamboanga, B. L. (2004). Academic aptitude and prior knowledge as predictors of student achievement in introduction to psychology. *Journal of Educational Psychology*, 96(4), 778-784.
- Van Blerkom, D. L. (2006). *College study skills: Becoming a strategic learner* (5th ed.). Boston: Thompson Higher Education.

Myron H. Dembo is the Stephen Crocker Professor in Education at the University of Southern California. Myron teaches an undergraduate course in self-regulation and graduate courses in learning and the social psychology of education. His research interests include self-regulation and the motivation of at-risk students. He is the author

of two textbooks and numerous research articles focusing on the teaching-learning process. He can be reached at the University of Southern California, 600 Waite Phillips Hall, Los Angeles, CA 90089-4036. E-mail: dembo@usc.edu. **Keith Howard** is an Assistant Professor of Clinical Education in the Psychology in Education concentration at the University of Southern California. Keith teaches several doctoral courses designed to help educational leaders apply research on cognitive learning processes to resolving achievement gap issues. He can be reached at the University of Southern California, Rossier School of Education, University Park Campus, Waite Phillips Hall, Suite 601C, Los Angeles, CA 90089. E-mail: khoward@usc.edu.