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From the Editor: Learning Styles and Pathways

When we think of those who have most influenced engineering education and instruction over the last three decades, arguably the first name that comes to mind is Richard Felder. A successful chemical engineering researcher, Rich, concerned with the current state of engineering instruction, including his own teaching, and, in particular, student learning, made a major career change in the early 1980s, and we are all better for it. During a sabbatical at the University of Colorado in 1982, Rich became reacquainted with educational psychologist Linda Silverman who introduced him to learning styles. The result of their collaboration was the widely cited 1988 paper “Learning and Teaching in Engineering Education.”

A lot has changed since the paper was written. In particular, serious questions have been raised, especially by learning scientists and educational psychologists, concerning the value and validity of learning styles, and even the advisability of using them to inform modes of instruction.

There are at least two major objections to the use of learning styles – the lack of empirical evidence that the so called “meshing hypothesis” is valid, as well as the validity of the methods of determining one’s preferred learning style. The “meshing hypothesis” or the belief that addressing a learner’s preferred sensory preference (i.e., learning style) will improve learning has yet to be empirically supported. Ten years ago, Pashler and colleagues reviewed the literature and concluded that there was little empirical evidence to justify the value of learning style assessments in educational contexts (Pashler, McDaniel, Rohrer and Bjork, 2009). They did note that given the lack of methodologically sound studies, it would be an error to conclude that all possible learning style versions have been tested. “Further research on the use of learning-styles assessment in instruction may in some cases be warranted, but such research needs to be performed appropriately” (pp. 105-106). In a follow up study, Rogowsky and colleagues conducted an experiment as proposed by Pashler et al. to test the “meshing hypothesis” but did not obtain statistically “significant findings that showed that providing instruction to individuals in a mode that meshed with their preferred learning style resulted in better learning or retention of information compared with instructing them in their nonpreferred mode” (Rogowsky, Calhoun and Tallal, 2015, p. 76)

Relative to the second concern, Willingham and colleagues pointed out that although there are a large number of inventories and models for assessing learning styles, most are unreliable (Willingham, Hughes, and Dobolyi, 2015). They noted a survey of 94 learning styles researchers that found problems of reliability were hindering research in the field.



Not one to avoid controversy, Rich has written an opinion piece that describes his educational journey with learning styles and proposes how he sees their educational value today and moving forward. Rich does not propose that the “meshing hypothesis” must be valid. Rather, he claims that the meshing hypothesis does not underlie the validity and utility of learning styles in engineering education. Rich has provided a number of references; we have included several others here.

We encourage you to carefully read Rich’s piece. You may then want to read some of the references cited both here and by Rich. Finally, we invite you to submit reasoned comments on this piece directly to *Advances* by going to our website: <https://mc.manuscriptcentral.com/advances>. Make sure to indicate in the “cover letter” section that this is a comment on the Felder opinion piece.

REFERENCES

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In addition to Rich Felder’s opinion piece, this issue features nine papers, each describing a project funded under the NSF sponsored Pathways to Innovation Program. Victoria Matthew and Thema Monroe-White from VentureWell and Berry College respectively have edited these papers. Please see their overview paper “Collective Impact in Action: Implementation and Evaluation of a Multi-Institutional Network of Change Makers.” This is the third special issue devoted to the Pathways project and entrepreneurship. The first was the Winter 2016 issue (volume 5, number 1) guest edited by Phil Weilerstein and Tom Byers, the principle investigators of the Pathways project (<https://advances.asee.org/2016/02/>). That was followed by a special issue on the Entrepreneurial Mindset, Fall 2018 (Volume 7, number 1) guest edited by Ann McKenna, Gary Lichtenstein, Phil Weilerstein and Thema Monroe-White (<https://advances.asee.org/2018/11/>).