



What Do SoTL Practitioners Need to Know about Learning?

ABSTRACT

What does someone embarking on a scholarship of teaching and learning (SoTL) project need to know about how students learn? And how can the SoTL novice reconcile their goals to improve teaching and learning with the vastness of the literature on the science of learning? In this article, we consider the complexity of this literature and its intersection with SoTL. We also review several popular books and websites that might be used by the SoTL novice as entry points for grounding their SoTL studies, informing the questions they ask and narrowing the literature they read. In these brief reviews, we offer practical tips and advice on how to use these resources effectively so that one does not have to become an expert in the science of learning to perform outstanding SoTL research.

KEYWORDS

science of teaching and learning, scholarship of teaching and learning, cognitive psychology, educational research, translational research

Addressing issues of teaching and learning fully requires a deep understanding of how the field has shifted over the last 20 or 30 years. To that end, Bass (2020) describes a world in which faculty¹ begin to consider the problem of teaching and learning as a “wicked problem.” Essentially, understanding teaching and learning and all the complexity that is involved requires a level of analysis that is multilayered, involving individuals with different academic backgrounds and different levels of experience. A “wicked problem,” by definition, is often intractable, has no real end point, and is far more complex than it appears on the surface. Teaching and learning are, in many ways, the epitome of a “wicked problem.”

Work in the field of the scholarship of teaching and learning (SoTL), however, does not hinge on knowing all that there is to know about the complexity of the problem in order to ask questions or to produce high-quality scholarship that will extend the knowledge base of the discipline. The primary goal of many faculty engaging in the scholarship of teaching and learning is simply to improve the classroom environment for students so that learning is more effective (Larsson et al. 2020). These faculty, however, are often not experts in the field of learning, and, pressed for time, may rely on strategies that contradict recent research on teaching and learning, even though, as Roxå (2018) notes, they are fully capable of finding and using research on learning when asked to do so.

With time and prior knowledge as constraints, the goals of better teaching and learning provide motivation for faculty to consider applying their existing skills and knowledge to the classroom as they

begin, with cautious steps, to engage in SoTL work. The purpose of this paper is to help guide those faculty who wish to engage in SoTL but are not sure how to identify what they might need to know about learning—and where they might need to stop—before they make a contribution of their own. Because although the “problem” of teaching and learning is “wicked” when viewed at the big-picture level, contribution to the body of knowledge is certainly possible with a much narrower focus.

Framed developmentally using the SoTL Scaffold model (Cruz et al. 2019), the SoTL novice described above might be in the “practice” stage: they have acted on their initial spark of interest in SoTL, perhaps devoting time to educating themselves about SoTL through professional development and maybe generating some preliminary ideas of their own as they ready themselves for a dive into the pedagogical literature. This can be a time of great excitement, where a SoTL novice is invigorated by being a learner again (Gayle et al. 2013). In short, the SoTL novice has become invested in learning more about research on teaching and learning and is excited about the potential new project. But with this investment can come a sort of anxiety when the novice starts reading and soon realizes the sheer breadth of literature in this field. As described by Sprague, Stuart, and Bodary (2012), we might call this stage *conscious incompetence*—that stage where one has enough knowledge of an area to know how much knowledge they *do not* have. This feeling may be more pronounced for research-focused faculty who are likely highly specialized in their fields. Therefore, while exciting, the leap into another discipline for those new to SoTL can be cause for unease when the new SoTL practitioner feels a fear of “novice-stry”: that “fear and loathing of being a novice again; of having to master new theories of and methodologies for investigating ‘learning’” (Tremonte 2011, 2). For a faculty member who has spent their career becoming an expert in a particular field, the learning curve may seem prohibitively high.

However, we argue that SoTL practitioners do not need to be fluent in all areas of the science of learning. Rather, they need to be good consumers of the literature and be aware of how to translate this work into classroom behavior. As Daniel (2012) and Roxå (2018) point out, translation of the science of learning does not always in itself lead to effective teaching. We make choices about which teaching literature we gravitate toward based on what is meaningful to us as teachers (Roxå 2018). Hence, by starting with what we know about how students learn and what we care about as teachers, we might be able to establish boundary conditions that help us refine and clarify the questions we have and dictate the approaches we might take as we begin to enter this world of inquiry.

SoTL contrasts with the science of learning in both the goal of the research and the rigor of the experimental design. In traditional science of learning research, we often use an artificial setting to examine how basic cognitive processes work, then begin to translate some of this to the classroom in ways that seem to make sense. However, the translation process does not always demonstrate that a particular strategy is effective. Rather, sometimes a method that works in the lab does not translate well to the classroom. Daniel and Chew (2013) argue that much of what we see in cognitive science are promising practices and ideas that *might* translate into functional teaching practices. The science of learning helps us better understand how students learn, but it is only after careful examination of these practices in ecologically valid environments (i.e., SoTL) that we are better able to not only make claims about the teaching practice, but also to begin to delineate boundary conditions under which some of those practices may or may not work.

Good quality SoTL is grounded in context (Felten 2013), both in the literature it references and the classroom scenario it describes. To adequately frame the situational context, a SoTL study might draw on three bodies of literature: 1) scholarship from the discipline, an area with which the SoTL

novice likely feels more comfortable; 2) scholarship on specific pedagogical topics; and 3) more general teaching and learning theory (i.e., science of learning). In order to decrease the barrier to SoTL for faculty outside the education and psychology disciplines we—as educational developers and faculty members situated in the teaching and learning disciplines—offer the following as suggested entry points. Some of our suggestions are translational in their presentation; some offer a more theoretical approach; some draw from disciplinary based SoTL; and others are a mixture of multiple categories.

As secondary sources, these books and websites can provide a base from which to explore primary works on topics of interest. Written for a multi-disciplinary audience, their lack of jargon and ample reference to further readings make them a great place to get started. In the resources below, consider that each is grounded in the context(s) (*Disciplinary-Based SoTL*, *Translational*, and/or *Science of Learning*) in which it originates. As Roxå (2018) notes, the SoTL practitioner (as learner) will likely draw from these sources that which they find meaningful and applicable, constructing knowledge of how their own students learn.

- *How Learning Works* (*Translational*; Ambrose et al. 2010). This classic, accessible book outlines seven principles essential to effective teaching and learning. Each chapter begins with familiar scenarios from the higher education classroom, identifies the principle of learning at work, then provides evidence from the literature that supports that principle. Not restricted to the cognitive psychology literature, the book draws from diverse sources to answer questions like “what makes students motivated to learn?” The book also includes several helpful appendices on how to use the specific tools (e.g., exam wrappers, checklists, etc.) mentioned in the chapters.
- *Make it Stick* (*Translational*; Brown, Roediger, and McDaniel 2014) and *How Humans Learn: The Science and Stories behind Effective College Teaching* (*Science of Learning*; Eylar 2018). These two books provide developers with extensive coverage of the science of learning and make the case for translating laboratory-based research into classroom practice. *Make it Stick* argues for more direct translations, claiming that what we know about memory from experimental studies can help us teach students how to be more effective learners of information in the classroom. *How Humans Learn* takes a more nuanced approach and uses narrative to describe examples of teaching that draw on the science of learning. Both books underscore the need for SoTL because the claims made are theoretical leaps from lab to classroom. SoTL can provide a platform to develop boundary conditions around when these practices lead to better teaching and learning and when they are not sufficiently able to benefit student learning.
- *Optimizing Teaching and Learning* (*Disciplinary-Based SoTL*; Gurung and Schwartz 2009). Written by two SoTL-active psychologists, this book can effectively serve as a how-to manual for the SoTL novice in the social sciences. The order of the chapters mirrors the SoTL process that many practitioners take from scholarly to scholarship. A section in the middle of the book provides lengthy summaries of research on common topics of interest in SoTL, such as metacognition and study skills, although it is restricted to the cognitive/educational psychology literature. The book differs from others in this list in that it provides direction on research design, data analysis, and outlets for dissemination.

- *Small Teaching (Translational; Lang 2016)* and *Small Teaching Online (Translational; Darby and Lang 2019)*. *Small Teaching* is one of the best-selling books in the field of educational development over the last five years. The book illustrates in clear and precise language how to use the science of teaching principles to make small changes in our classrooms to enhance student learning. The principles that are described in the book are grounded in much of the more recent science of learning literature, and Lang has done a terrific job of creating realistic scenarios to help the faculty member understand how to apply those concepts in the classroom. *Small Teaching Online* takes those very same principles and carries the same structure throughout to help faculty understand how to use these principles of the science of learning to maximize students' success in online environments. Both books are written by educators who are not trained in the scholarship of teaching and learning or the science of learning, but present the ideas in ways that are accessible to anyone interested in better teaching.
- *Applying Science of Learning in Education: Infusing Psychological Science into the Curriculum* ebook (*Science of Learning/Translational; Benassi, Overson, and Hakala 2014*). This edited ebook from the American Psychological Association's Society for the Teaching of Psychology is written by experts in psychology with the SoTL novice in mind. Chapters in the first part present research on a variety of topics, such as using feedback and active learning, while the second and third parts provide direction on applying the science of learning and examples of research studies where it was applied. This book can serve as a reference manual for the included topics, but more helpfully, as a window into how others have engaged in SoTL.

Perhaps less well known, but freely available, are several curated websites that may be useful to the SoTL novice exploring the literature.

- *Scholarship of Teaching and Learning Annotated Database (Disciplinary-Based SoTL/Translational/Science of Learning)* edited by Nicola Simmons; available at <http://sotlannotations.com>). This crowdsourced and curated annotated bibliography contains references for dozens of topics from "absenteeism" to "writing skills." A short summary of the topic is followed by a few key references submitted by readers, making it an ideal source for information on specific concepts.
- *Improve with Metacognition (Translational/Science of Learning)*; edited by Lauren Scharff and John Draeger, available at <http://improvewithmetacognition.com>). Winner of a Merlot Classics Award, this site provides information on the nature of metacognition, how to teach it, how to practice it as an instructor, and where to find more resources. Blog and article submissions from a variety of practicing instructors make this site a well-rounded source of information.
- *Retrieval Practice (Translational/Science of Learning)*; edited by Pooja Agarwal; available at <http://retrievalpractice.org>). With a focus on the important cognitive process of retrieval practice, this website contains suggested strategies for teaching, as well as research reports that summarize research on learning. New to the site this year is a database of educational research studies on retrieval practice, sortable by several markers, including discipline, providing useful examples of published SoTL studies.

- *The Learning Scientists (Translational/Science of Learning)*; edited by Megan Sumeracki, Cindy Nebel, Carolina Kuepper-Tetzl, and Althea Need Kaminske; available at <http://learningscientists.org>). The goal of this website is to make cognitive and educational psychology research more accessible. To this end, the editors offer podcasts, blogs, videos, and other resources on topics of interest in education. Especially helpful is the extensive FAQ section, which provides research-based answers to many of the most pervasive questions about learning.

One cannot be an expert in all things. As academics, we are often asked to work outside of our area of expertise, but mostly in areas that are at least adjacent to topics that we understand deeply. However, teaching and learning is not an area where many (perhaps most) of us have spent the bulk of our career. To ask faculty to be experts in a disciplinary area AND the pedagogical literature is a big ask. And, in the words of Randall Bass (2020):

What the volume's tangle of issues suggests is the growing sense in the discourse on improving higher education that no issue of learning is ever just about pedagogical practice, technique, or the simple application of evidence-based approaches. Any serious address of improving teaching, deeply and long term, will require the kind of understanding and action that can only come from shifting how we take on the problem of learning as a problem—and at every level of scale, from high-level learning research to educational development in a local institutional setting.

With that in mind, we would like to offer our colleagues the advice to give up the notion of *perfection* for the notion of *good, but not perfect* when it comes to an understanding of the teaching and learning literature. Use the resources, like the ones suggested here, that highlight findings and ideas that are essential for your work, and continue to delve into the messy, “wicked problem” that is higher education to find ways to impact your field and improve your teaching with your students at your institution. Once you have developed a question of interest, pursue the research specific to that topic, narrowing your focus to the substantive resources that are most germane (Cappello and Miller-Young 2020). Remember to always keep student learning at the center, and construct questions around the benefit that a pedagogical approach might have on your practice. We won't ever perfect the teaching and learning dynamic, but we can continue to add to the field and improve in meaningful, small ways that best serve the needs of our students.

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NOTES

1. We use the term “faculty” to describe employees in an institution of higher education who teach and conduct research.

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