



GRAND CHALLENGES FOR
SOTL

Table of Contents

The Grand Challenges for SoTL	1
SoTL's Five Grand Challenges.....	2
Structure of Each Grand Challenge Description.....	3
Grand Challenge for SoTL 1: How to Develop Critical and Creative Thinkers.....	4
Grand Challenge for SoTL 2: How to Encourage Students to Be Engaged in Their Learning	7
Grand Challenge for SoTL 3: The Complex Processes of Learning.....	10
Grand Challenge for SoTL 4: How Identities Affect Both Teaching and Learning	13
Grand Challenge for SoTL 5: The Practice, Use, and Growth of SoTL.....	15
Grand Challenges for SoTL in Action	18
ISSOTL & Other SoTL Organizations.....	18
SoTL Scholars.....	19
Public Outreach.....	20
History of the Grand Challenges for SoTL	21
The Grand Challenges Milestones Teams.....	21
References.....	24

About the Grand Challenges for SoTL Logo

Many thanks to Logo designers, Amber Thomas and Hyojung Lee from Illinois State University. As a dual metaphor, this logo symbolizes both an open book and a door. The book signifies the ongoing scholarly research activities of SoTL, emphasizing a commitment to continuous academic exploration. The door reflects the spirit of SoTL, always open to exploring and experimenting with new possibilities.



Recommended Citation

Scharff, Lauren, Holly Capocchiano, Nancy Chick, Michelle Eady, Jen Friberg, Diana Gregory, Kara Loy, and Trent Maurer. 2023. "Grand Challenges for SoTL." *International Society for the Scholarship of Teaching and Learning*, November 2023. <https://issotl.com/grand-challenges-for-sotl>



This work is licensed under a [Creative Commons Attribution-Noncommercial International 4.0 License](https://creativecommons.org/licenses/by-nc/4.0/). This license enables reusers to distribute, remix, adapt, and build upon the material in any medium or format for noncommercial purposes only, and only so long as attribution is given to the creator.

The Grand Challenges for SoTL

Education provides a foundation for the transformation and advancement of individuals and societies. Thus, it's imperative that we as a society commit to studying how to maximize learning and to share what is learned in order to provide excellent and equitable educational experiences around the world.

What Is SoTL?

The Scholarship of Teaching and Learning (SoTL) is "the systematic study of teaching and learning, using established or validated criteria of scholarship, to understand how teaching (beliefs, behaviours, attitudes, and values) can maximize learning, and/or develop a more accurate understanding of learning, resulting in products that are publicly shared for critique and use by an appropriate community" (Potter and Kustra 2011, 2)

Those engaged in SoTL strive to enhance postsecondary teaching and learning by investigating educational practices and contexts, including the work of SoTL itself. Evidence from SoTL scholars' work guides the establishment and maintenance of supportive educational environments, and helps address grand challenges of teaching and learning. A strength of SoTL is that its practitioners ask many different types of questions, drawing from many scholarly traditions, to build toward a more comprehensive understanding of how teaching and learning happen in a range of contexts.

What Are Grand Challenges?

Grand challenges are complex, global problems that have no simple solution across all contexts and that require inputs from diverse areas of expertise to provide solutions for given contexts at specific points in time. They are worth

investigating because, although specific to a local environment, solutions can be adapted for other contexts. In 2008, [engineering](#) led the identification of grand challenges for their field. Since then, a variety of other fields have also identified their grand challenges (e.g. [assessment](#), [social work](#), [public administration](#)).

Like grand challenges in these other realms, teaching and learning are inherently complex. Within this overarching complexity are even greater challenges that emerge from the diversity of learners and teachers, the influence of many dynamic contextual factors, and the gaps in the existing research that addresses these challenges. Evolving pedagogical tools and approaches offer possible opportunities to enhance teaching and life-long learning, but awareness, access, and implementation are not uniform across institutions and global settings.



Members of the International Society for the Scholarship of Teaching and Learning (ISSOTL) worked since 2018 with iterative input and feedback from people around the world to identify five Grand Challenges for SoTL, now being shared in 2023. Although these challenges are interdependent, they are described individually in this site to better support research efforts. Additionally, while aspects of the challenges have been studied for years, the inherent complexity and ever-changing contexts for teaching and learning will require ongoing investigations of all kinds.

Ultimately, these Grand Challenges for SoTL will provide a framework to support far-reaching collaborations, and they will communicate the value of and guide actions undertaken by ISSOTL, by SoTL scholars, and for the purpose of public outreach.

SoTL's Five Grand Challenges

SoTL practitioners study postsecondary teaching and learning to better understand and improve...



1. how to develop critical and creative thinkers.

Critical and creative thinkers recognize and use reliable, relevant information and synthesize ideas in new ways to better understand and imagine ways to address complex phenomena and problems. [Continue reading on page 4.]



2. how to encourage students to be engaged in learning.

Engaged learners are motivated to value how, why, and what they learn and to continue evolving as learners. [Continue reading on page 7.]



3. the complex processes of learning.

Learning is a holistic experience involving cognitive, affective, social, and cultural processes and influences, and is facilitated by understanding existing scholarship on learning and the individual experiences of learners. [Continue reading on page 10.]



4. how identities affect both teaching and learning.

People bring who they are and what they've experienced into educational contexts, informing both their own and others' perceptions and experiences. [Continue reading on page 13.]



5. the practice, use, and growth of SoTL.

SoTL practitioners explore, share, and translate the knowledge generated by its diverse research approaches in order to improve teaching, learning, and higher education more broadly. [Continue reading on page 15.]

Structure of Each Grand Challenge Description

The description of each Grand Challenge is organized similarly. The four sections are as follows:

“What is it?” defines the concept or concepts at the heart of the Grand Challenge.

“Why and how is this Grand Challenge important?” explains the broad significance of the concept and then, most importantly, how it’s a *Grand Challenge for SoTL* as described above, not just an important and challenging problem.

“What’s needed to address this Grand Challenge?” argues for the changes needed in higher education to support productive research and implementation of research findings.

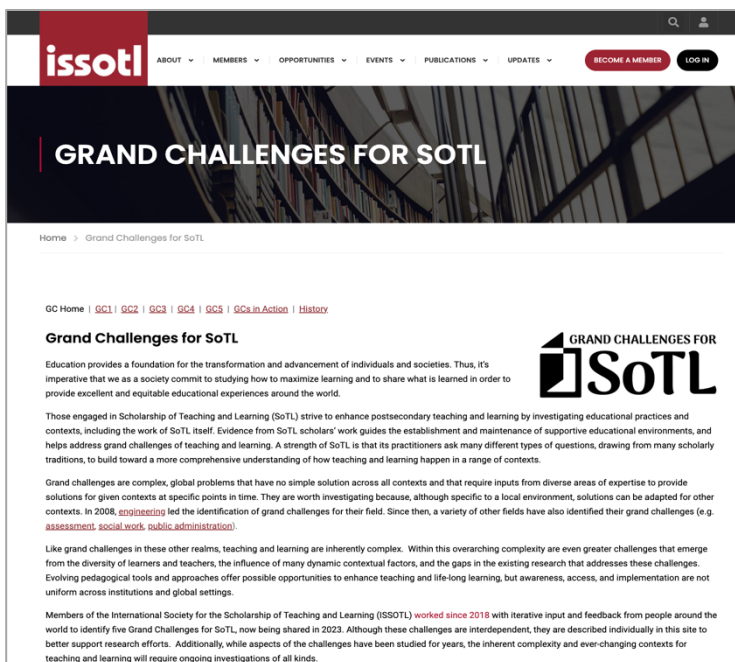
“How might SoTL practitioners study this Grand Challenge?” offers a few sample questions to illustrate the lines of inquiry that could guide SoTL projects about each Grand Challenge. To encourage a range of study types and areas of inquiry, the sample questions are mapped onto Pat Hutchings’s “taxonomy of [SoTL] questions” (2000, 4-5):

“what is” questions “describing what it looks like,”

“what works” projects “seeking evidence about the relative effectiveness of different approaches,”

“visions of the possible” projects that ask what might be

“new models and conceptual frameworks” that might “shap[e] thought about practice” by building theories and “global idea[s].”



<https://issotl.com/grand-challenges-for-sotl>

The Grand Challenges for SoTL Online

The Grand Challenges for SoTL are also part of the website of the International Society for the Scholarship of Teaching and Learning. Over time, these pages will expand to include examples of work related to each Grand Challenge, establishing ways that new SoTL practitioners might connect and collaborate with others working on the Grand Challenges of SoTL from around the world.

Grand Challenge for SoTL 1

How to Develop Critical and Creative Thinkers

SoTL practitioners study postsecondary teaching and learning to better understand and improve *how to develop critical and creative thinkers*. Critical and creative thinkers recognize and use reliable, relevant information and synthesize ideas in new ways to better understand and imagine ways to address complex phenomena and problems.

What is it?

“Critical thinking” and “creative thinking” are broad terms for complex concepts that resist simple definitions. They are generally understood as distinct and complementary ways of thinking. Most explanations of critical thinking point to the ability to discern before making a decision or the process of sorting, evaluating, and sharpening one’s thinking, such as the following:

- *“reasonable reflective thinking focused on deciding what to believe and do” (Ennis 2011, 10)*
- *“learning to recognise or develop an argument, use evidence in support of that argument, draw reasoned conclusions, and use information to solve problems” (ACARA)*
- *“a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion” (AAC&U)*



Creative thinking, on the other hand, is typically described as the ability to generate new ideas or the process of unleashing, experimenting, and expanding one’s thinking. A few examples are below:

- *“the development of ideas that are novel and appropriate” (Catarino et al., 2019, 7)*
- *“learning to generate and apply new ideas in specific contexts, seeing existing situations in a new way, identifying alternative explanations, and seeing or making new links that generate a positive outcome” (ACARA)*
- *“both the capacity to combine or synthesize existing ideas, images, or expertise in original ways and the experience of thinking, reacting, and working in an imaginative way characterized by a high degree of innovation, divergent thinking, and risk taking” (AAC&U)*

People who think both critically and creatively are able to both narrow and enlarge their thinking, or to make careful, informed decisions and produce new understandings. More importantly, they have integrated what began as practiced skills into habits of mind that guide them throughout their lives.

Why and how is this Grand Challenge important?

Critical and creative thinking are essential for responding to the complexities of the 21st century. The circumstances of this century are often described as “wicked problems” because they have multiple causes, are interconnected with other complex issues, are often understood incompletely, and thus defy clear solutions (Rittel and Webber 1973). Indeed, Randall Bass has even encouraged SoTL practitioners to recognize learning in the 21st century as a “complex, wicked problem” (2020, 5). The internet’s explosion of readily available information and the accompanying pervasiveness of misinformation are just two characteristics of this era that factor into complexity of learning and, more specifically, the importance of critical and creative thinking.

Critical and creative thinking are grand challenges for several reasons. The first is definitional. Despite decades-long recognition of the importance of developing critical and creative thinking, educators have struggled to agree on clear, consistent definitions (Heft and Scharff 2017; Blakey, Golding, and Wilkinson 2022). This lack of consensus around their basic meaning creates challenges for identifying effective teaching practices and for developing a body of research focused on these essential skills.

Next, critical and creative thinking are too often discussed separately and even hierarchically, rather than as complementary and equally essential skills. Critical thinking is often framed as the rational or logical approach of intellectual people, whereas creative thinking is seen as beneficial but simply the work of artists, writers, and composers.

Critical and creative thinking are also grand challenges because they are so difficult to teach. Logistically, they can’t be taught in a single class period, or perhaps even in a single course. They require ongoing practice and feedback, learning by doing, research, reflection, and the creation of learning environments that foster risk-taking. These approaches require time and resources, all of which are hard to implement through conventional pedagogies. Many postsecondary learning environments are based on models of instruction that envision teaching as transmitting information from teacher to student, prioritize content coverage, assess learning with just a few summative or high-stakes exams, and enroll high numbers of students. In these contexts, the time-intensive activities that foster critical and creative thinking are seen as inefficient.

What’s needed to address this Grand Challenge?

In light of these challenges, we need to be bold. If critical and creative thinking are 21st-century skills that take time to learn, and time-consuming learning activities are considered “inefficient” in the current model of higher education, we need to change that model. The deep teaching and learning necessary for practicing and internalizing these skills should be priorities. They should be broadly implemented and then given greater protection and support in educational contexts with limited resources and support. Course design approaches guided by essential ways of thinking or habits of mind should replace approaches that prioritize covering large amounts of content. Critical and creative thinking need to be

understood as teachable, made up of component skills or moves that students can practice and apply through various pedagogies. They also need to be integrated into all levels of learning across the curriculum, rather than relegated to upper-level courses and divided with critical thinking appropriate to some disciplines and creative thinking to others. Finally, postsecondary educators need ongoing professional development in these course design principles, pedagogies that support and scaffold critical and creative thinking, and the cross-disciplinary relevance of these habits of mind. In contexts with limited resources, these needs may seem out of reach.

How might SoTL practitioners study this Grand Challenge?

What is?

- What does the existing research tell us about critical and creative thinking? What are the component parts that make up critical and creative thinking, where is the overlap and complementarity?
- How do students experience developing critical and creative thinking? Do different students experience them differently?
- How is the development of critical and creative thinking informed by context (e.g., disciplinary, geopolitical, cultural, institutional)?

What works?

- What are the most effective pedagogies for critical and creative thinking? For instance,
 - Does problem-based learning support greater application of these skills in both the short and long term? What about integrating low-stakes experiences with failure? What about other common approaches to teaching critical and creative thinking?
 - What kinds of feedback are most effective for developing both critical and creative thinking?
- Do the approaches to teaching critical and creative thinking work differently for different students or in different contexts (e.g., disciplinary, geopolitical, cultural, institutional)?
- What are the most effective assessments for critical and creative thinking? How effective are existing assessment instruments?

What's possible?

- How might we scaffold the learning of critical and creative thinking across multiple years of higher education?

Conceptual Frameworks

- What does an integrated reconceptualization of critical and creative thinking look like, so that it's a more unified way of thinking?
- What can be done to change the model of higher education to support the deep teaching and learning required for this Grand Challenge?

Grand Challenge for SoTL 2

How to Encourage Students to Be Engaged in Their Learning

SoTL practitioners study postsecondary teaching and learning to better understand and improve *how to encourage students to be engaged in learning*. Engaged learners are motivated to value how, why, and what they learn and to continue evolving as learners.

What is it?

Engaged learning is intentional and active, a conscious process focused on making connections between or with whatever is being learned. Without this deliberate process, learning is passive and unlikely to lead to long-term retention.

Engaged learners are also metacognitive, aware and appreciative of the process of learning. In this way, engagement is closely related to motivation, which sustains the learner's willingness to continue with the effortful work of learning, ultimately becoming self-directed learners (Tekkol and Demirel 2018).



Why and how is this Grand Challenge important?

Encouraging students to be engaged in their learning, both the content and process of learning, is important because the goal of education is for students to be successful not only within the contexts of formal education, but also as they engage in life beyond academia. Deep learning that will be accessible as needed at a later time requires deep, engaged processing. Engaging in one's learning process provides a path towards self-directed and autonomous learning, which promotes success throughout life as new contexts and challenges present themselves.

Engaged student learning is a grand challenge for several reasons. First, there is commonly a disconnect between what educators consider to be the process of education and what students consider it to be. A common student perception is that learning is simply about remembering

information (McGuire 2015) and that educators' role is to convey that information. As information becomes increasingly available, the perceived value and motivation for the effort of learning information is reduced. In reality, becoming educated includes much more than learning information, and it requires engagement, effort, and energy to sustain the complex learning process – it is hard work (see also Grand Challenge 3). Learners are less likely to become engaged if they think differently about and don't value what it means to learn.

Second, encouraging learners to be engaged in their learning process is a grand challenge because learners are individuals who are motivated by different things, and their motivations change over time. However, educators typically teach multiple learners at the same time. Thus, any pedagogical

choices they make are likely to only motivate and engage some students some of the time (Hüvös 2023). As higher education becomes more accessible to a wider range of students, the diversity of motivations will also grow, increasing the challenge to educators.

Third, even if educators do their best to attend to and encourage student engagement, it is often difficult to discern when students are truly engaged in the learning process, many aspects of which are invisible (Bass and Eynon 2009). Thus, even though student engagement is often thought to be associated with observable activity and behaviors, that is not always true. For example, what can appear to be a passive experience of listening to a lecture can sometimes be a very engaging cognitive experience within a student's mind. Or an activity that seems to be engaging students might do so only in superficial ways with respect to deep processing and making connections with what is to be learned.

A final grand challenge of engaging students in their learning process is that it requires a

supportive learning environment. Such an environment promotes focused attention on and perceived value for what is to be learned rather than containing distractions that reduce resources to put toward learning. Distractions can be external (e.g. loud sounds, misbehaving classmates) or internal (e.g. daydreaming, social anxieties, or other worries). Supportive learning environments help students stretch their learning and feel comfortable taking risks, which results in increased student self-efficacy and ability to take ownership, as well as evolve as motivated, independent learners. Such supportive learning environments are essential to engaging students in their own learning, yet creating and maintaining them is non-trivial. They require physical resources, which might not be equitably distributed across different educational environments. They also require educators to navigate many social and psychological dynamics including interactions with their own and students' identities (see also Grand Challenge 4).

What's needed to address this Grand Challenge?

The multiple challenges above underscore the complex nature of meaningfully engaging students in the learning process. In order to address it, higher education needs to reconceptualize the goal of a higher education degree and what it means to become educated. It is not just about obtaining a degree. Deep and sustained learning is the goal, which requires engagement and effort on the learner's part.

Modifications will also need to be made to traditional course designs, programs, and learning environments, which assume mostly homogeneous learners. While common learning outcome expectations can be established within our courses and programs, a variety of paths should be created to achieve those outcomes in order to create and sustain engagement across the

broad spectrum of learners entering higher education. These flexible pathways should occur within supportive learning environments so that learners are not unnecessarily distracted and they feel encouraged to explore and engage in their learning in new ways. One avenue to explore for creating more effective and engaging learning environments is to involve students in shaping their own learning experiences in higher education (Mercer-Mapstone and Abbot 2020).

Finally, educators need to investigate ways to make the invisible (e.g. motivation and deep engagement) visible for both students and teachers (Bass and Eynon 2009). Part of this effort will interleave with Grand Challenge 3 to better understand the learning process, including affective and social components.

How might SoTL practitioners study this Grand Challenge?

What is?

- What does deep engagement in learning look like?
- What are reliable indicators of deep engagement in learning?

What works?

- What are effective pedagogical strategies for providing flexible paths toward common learning outcomes in order to engage a wide variety of students?
- How can metacognitive practices be implemented to help students track their engagement and use that awareness to refocus their attention when it shifts from the desired learning goal?
- What are the key characteristics of supportive learning environments with respect to student engagement in learning?

What's possible?

- Adaptive technology and AI tutoring can provide individually-paced and tailored instruction. But this individual approach may not tap into the powerful social and motivational aspects of learning. How might learning technologies become more personally engaging and motivating for individual learners?
- How would students design their learning environments and course structures to maximize their engagement?

Conceptual Frameworks

- What new models of engagement emerge if we move beyond traditional cognitive-behavioural-emotional taxonomies to embrace cultural ways of knowing and being?
- How might AI's capacity to personalise and adapt force us to rethink our conceptual models of the relationship between teaching, learning, and engagement?
- How might decolonial perspectives force us to reconceptualise the relationship between power, knowledge creation, and engagement in learning?

Grand Challenge for SoTL 3

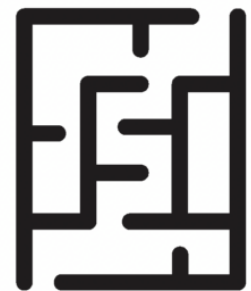
The Complex Processes of Learning

SoTL practitioners study postsecondary teaching and learning to better understand and improve *the complex processes of learning*.

Learning is a holistic experience involving cognitive, affective, social, physiological, and cultural processes and influences, and is facilitated by understanding existing scholarship on learning and the individual experiences of learners.

What is it?

Learning involves long-term changes to one's behavior, knowledge, skills, or awareness. Learning is constructive in that it doesn't involve a simple, exact transmission of information from an educator to a student. Rather, as a student learns, their prior knowledge, beliefs and abilities, physiological state (e.g. blood sugar levels, amount of sleep) and current context influence the ultimate form and content of what is learned (National Academy of Sciences 2018). Thus, learning cannot be considered simply a cognitive (thinking) process, but one that is holistic and is influenced by all aspects of an individual.



Why and how is this Grand Challenge important?

Learning is the goal of education, which provides a foundation for the transformation and advancement of individuals and societies. The better both learners and educators understand the processes of learning, the more effectively all can support and engage in learning. Thus, understanding the learning process is worthy of resources and research.

There are many aspects of the process of learning that lend it to being a grand challenge. To start, learning is complex – there are several domains of learning (cognitive, affective, psychomotor, physiological) and many levels of learning, such as memorization, comprehension, and evaluation (Wirth and Perkins 2013). Although what happens in the brain when people learn is not fully understood, deep and lasting learning typically requires multiple opportunities to practice and

meaningfully engage with the materials, coupled with feedback (Lovett, Bridges, DiPietro, Ambrose and Norman 2023), all of which require time and resources. Further, while there are commonalities across learners, there are individual differences in what and how people learn due to different prior experiences, social and physical contexts, and current motivations (see also Grand Challenges 2 and 4). Thus, there is no approach to teaching that will guarantee the same learning for all students in all contexts.

Additionally, while researchers have made great gains in our knowledge of the learning process itself, it is still not fully understood. Understanding learning is made more difficult because the processes underlying learning are not directly visible (Bass and Eynon 2009). Educators rely on externally observable behaviors or demonstrations

to indicate that learning has occurred (e.g., performance on exams, performance of a task, or self-assertions). Sometimes behaviors suggest learning has occurred but, in reality, the learning was superficial or not lasting. Conversely, sometimes learning has occurred but isn't demonstrated at a particular time and educators conclude it hasn't occurred. The necessity for effective measures of learning pose a grand challenge for the assessment and study of learning.

Another ongoing aspect of this grand challenge is that, in most cases, educational systems have not prioritized "learning how to learn." Consequently, neither learners nor educators have been given opportunities to develop expertise in understanding the learning process or in becoming metacognitive about their state of learning. Thus, they may use or recommend

approaches that are less effective for learning (Dunlosky and Rawson, 2015), and educators may be less able to effectively adapt their teaching to the variety of learners and contexts they encounter when teaching.

Finally, technology-supported learning brings promise but also further complicates this grand challenge related to the complex process of learning. On the positive side, it can provide individually-paced instruction that embeds best practices (e.g. spaced retrieval, gaming incentives) that were determined from studying the learning process. Less positively, educational technologies and the training to use them effectively are not equally available to all teachers and learners, and their availability is directly influenced by larger geopolitical contexts (Alam 2022; Baum and McPherson 2019).

What's needed to address this Grand Challenge?

Given the above challenges, educational institutions need to find ways to provide opportunities for educators and students to learn about the processes of learning and support efforts to incorporate effective pedagogies and student learning strategies that deepen learning and promote life-long learning. Educators need to explore adaptive ways of educating in order to

maximize learning for larger numbers of students while accommodating individual experiences and neurodiversity, different backgrounds, and varied educational contexts. Technology should be leveraged to expand teaching and learning opportunities, with care given to provide equitable access.

How might SoTL practitioners study this Grand Challenge?

What is?

- What does the existing research say about learning, in all of its complexities? (How does the brain change? How does an individual's conscious awareness of the process of learning occur?)
- What does learning look like in different contexts?
- In individual SoTL projects, what aspect or conception of learning is being addressed (Manarin et al., 2021)?

What works?

- How can educators draw from existing knowledge about how learning happens to teach all of their students (i.e., an entire class) and each of their students (i.e., individual students)?

- Given the complex nature of learning, how can educators promote the unlearning of misconceptions and its replacement with updated information?
- What are accessible ways to leverage and incorporate technology to promote learning?
- How can educators help students build metacognition about their learning so they can better self-regulate their learning efforts?

What's possible?

- What are some new ways to assess learning and better differentiate superficial learning from deep, long-lasting learning?

Conceptual Frameworks

- How might the emergence of AI challenge our theoretical understanding of what constitutes 'original thinking' and 'authentic learning'?
- How can we reconceptualise the relationship between teaching and learning?
- What new conceptual frameworks might emerge if we view learning as an ecological process rather than an individual cognitive one?

Grand Challenge for SoTL 4

How Identities Affect Both Teaching and Learning

SoTL practitioners study postsecondary teaching and learning to better understand and improve *how identities affect both teaching and learning*. People bring who they are and what they've experienced into educational contexts, informing both their own and others' experiences and interpretations.

What is it?

Identity is one's internal, subjective, multi-faceted perception of self that is informed by an individual's ongoing experiences with family, close friends and social groups, the broader society and culture, and more. These experiences are shaped by multiple facets, such as one's gender, race, socio-economic status, and other demographic characteristics, as well as individual interests and goals. Identity not only shapes one's sense of self; it also shapes (often unconsciously) how people interpret and respond to information and what is happening to and around them. One's identity also informs how others interpret and respond to them.



Why and how is this Grand Challenge important?

Teaching and learning are simultaneously individual and social experiences. The role of identity in teaching and learning is important because identity shapes learning through the interactions between educators and students, among students, and between students and what is being learned.

There are many aspects of identity and its influence on teaching and learning that make it a grand challenge worthy of SoTL research. First, understanding identity in any context is challenging because identity itself is internal and multifaceted. Even though some identity characteristics are frequently inferred through observation (e.g. gender, race, age), leading others to make assumptions (see, for example, MacNell, Driscoll and Hunt 2015), as a whole, identity is not directly visible to others, and aspects of identity may even be outside of an individual's awareness

because they are so internalized. As a result, one's actions and interactions are influenced by identity in ways that they may not recognize.

Understanding identity in teaching and learning, then, is a Grand Challenge for SoTL because each person—educators and students—brings their unique, multifaceted identities into the higher education context, and they interact in dynamic and complex ways. Depending on their own identities, students may feel included or excluded based on a variety of factors related to identity, including the educator's assumed identity, choices of learning materials and actions, as well as peers' visible identities and actions (see, for example, Blackburn 2017). At the same time, educators' sense of efficacy can be affected by how students respond to them, which in turn is affected by both their own and students' identities. This is further complicated by the fact that, because identity is

multifaceted, its impact will vary depending upon which facet is most prominent for each individual within any given context.

These complexities multiply when local and broader cultures are considered, creating another aspect of this grand challenge. In addition to culture influencing an individual's identity, it influences educator and student perceptions of what learning means and what learning is valued (Chng and Looker 2013). Educational systems

themselves are influenced by culture as they are designed based on assumptions about the identities of who is or should be a part of higher education (Chng, Leibowitz, and Mårtensson 2020; Moriña 2017; Tomlinson 2017). These assumptions also influence the location of institutions, the architecture of the classrooms, the required technologies and more, all impacting who feels welcome and able to fully participate based on their identities.

What's needed to address this Grand Challenge?

In order to improve higher education, there is value in learning more about how we (educators and learners) might become more aware of our identities, how they dynamically impact our interactions, and how they impact teaching and

learning. We also need to examine identity-based assumptions to become more inclusive, including the locations and designs of learning spaces and access to other educational resources that may vary based on identity.

How might SoTL practitioners study this Grand Challenge?

What is?

- What is known about how the identities of educators and learners interact to impact learning?

What works?

- How can educators draw from existing knowledge about how identity impacts learning to teach all of their students (i.e., an entire class) *and* each of their students (i.e., individual students)?
- How can learners and educators grow their awareness of their own identity and mitigate the possible negative impacts from identity-based assumptions?

What's possible?

- What are characteristics of higher education institutions and learning spaces that are most inclusive to individuals of all identities?

Conceptual Frameworks

- How do concepts of 'mattering' and 'belonging' intersect with existing and nascent student identities?
- How might the distinctive context and transformative mission of higher education demand new theoretical frameworks for understanding identity?

Grand Challenge for SoTL 5

The Practice, Use, and Growth of SoTL

SoTL practitioners study postsecondary teaching and learning to better understand and improve *the practice, use, and growth of SoTL*. SoTL practitioners explore, share, and translate the knowledge generated by its diverse research approaches in order to improve teaching, learning, and higher education more broadly.

What is it?

Unlike the previous four, this final Grand Challenge isn't focused on doing SoTL or identifying topics for SoTL projects. Instead, it's about the field of SoTL, specifically its practice, use, and growth.

The Practice of SoTL

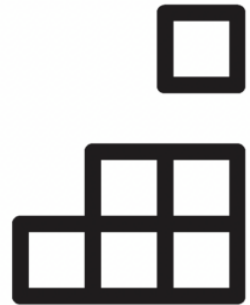
As the multidisciplinary field that strives to enhance postsecondary teaching and learning by investigating educational practices (including SoTL) and contexts, SoTL is practiced by members of the educational community, most often disciplinary experts who teach classes and conduct SoTL projects in their classes by drawing on their disciplinary expertise. Although plenty of SoTL projects are conducted individually, a common practice in SoTL is collaboration or partnership, often with other instructors, students, academic developers, librarians, instructional technologists, and other members of the educational community.

The Use of SoTL

What practitioners learn from SoTL projects is meant to be used to improve teaching practice and, most importantly, student learning experiences. On one hand, since SoTL typically emerges from an instructor's own teaching practice, its results are used to inform that instructor's immediate context. On the other hand, as scholarship and "the mechanism through which the profession of teaching itself advances," SoTL is also meant to contribute to broader knowledge and be used by other educators (Hutchings and Shulman 1999, 14).

The Growth of SoTL

As an academic field, SoTL is relatively young, so efforts to grow the field tend to focus on 1) increasing the diversity and breadth of who practices SoTL, 2) expanding the questions asked, the aspects of learning it focuses on, and the methods by which it's conducted, and 3) strengthening its ability to effect change in higher education and extending its influence more broadly.



Why and how is this Grand Challenge important?

The practice, use, and growth of SoTL is important because of its potential to effect change within and beyond higher education. SoTL is an evidence-informed approach to understanding and improving postsecondary teaching and learning. Educators become more knowledgeable and reflective by learning from SoTL—their own and others’ work—rather than simply replicating traditional ways of teaching or relying on potentially incorrect beliefs informed by faulty assumptions (Poole 2013). As educators become better teachers, they more effectively facilitate the learning experiences of all of their students, who carry what and how they’ve learned into their important roles beyond these learning contexts. Students are, after all, family members, voters, community activists, artists, neighbors, politicians, reporters, and more. Through this trajectory, SoTL has the potential for “creating a better world *in and through* higher education” (Kreber 2013, 866).

This SoTL-facing Grand Challenge has its roots in the birth of SoTL. Although some disciplines have long included research on postsecondary teaching and learning, the overarching field that brings together academics from all disciplines was given a name and an identity in 1990 when Ernest Boyer described “the scholarship of teaching.” The central argument in his book *Scholarship Reconsidered: The Priorities of the Professoriate* is that “the most important obligation now confronting the nation’s colleges and universities is to break out of the tired old teaching versus research debate and to define, in more creative ways, what it means to be a scholar” (Boyer 1990, xii). (Although he was writing about the United States, his argument has resonated more broadly.) He explained that institutional reward and recognition, which are tied to “how faculty should, in fact, spend their time,” need to be extended to activities or “scholarships” beyond traditional disciplinary research, or what he called “the scholarship of discovery” (1, 17). (He also presented two others: the “scholarship of integration,” which crosses disciplinary boundaries, and “the scholarship of application” or “engagement,” which connects with broader communities.) Boyer’s call for opening up the priorities of the professoriate is part of his broader

claim that higher education’s purpose is “to meet today’s urgent academic and social mandates” (13). More than three decades later, however, the privileging of traditional disciplinary research continues, though it varies across contexts (e.g., different institutions, institution types, countries, within individual institutions).

This enduring challenge for higher education is a Grand Challenge for SoTL. First, it has implications for the practice of SoTL. If SoTL isn’t valued highly enough (or at all), educators who do any work in SoTL will have to treat it as above and beyond their regular workload, and it will go unrecognized and unrewarded. This is perhaps the greatest barrier to the practice of SoTL.

This model of higher education also has implications for the use or impact of SoTL. Institutions that devalue teaching discourage efforts to change or improve it by disincentivizing not only learning from one’s own SoTL practice but also learning from existing SoTL-produced knowledge about effective teaching and learning. An institutional culture that discourages this use thus encourages the status quo of potentially ineffective teaching approaches and practices. Use of SoTL is already challenging, as it requires time and effort to implement new approaches, and it also often requires educators to translate the lessons of highly contextualized SoTL projects to their own contexts. This translational challenge is increased by differences between contexts. For instance, centering key ideas (e.g., conceptions of learning, higher education’s purpose, assumptions about influence of context in SoTL) and language in the English-speaking West and the Global North limits SoTL’s use and growth beyond these regions (Chng and Looker 2013; Looker 2013; Chng, Leibowitz, and Mårtensson 2020).

Institutional inertia around the value of teaching—and the value of improving teaching—also inhibits the growth of SoTL. This kind of educational culture limits the number and variety of people who do SoTL, as well as the extent of their involvement. It also limits practitioners to those who see SoTL as aligned with their current situation (e.g., discipline, institutional priorities,

conception of learning, language, geopolitical context) and thus easier to do, in effect homogenizing SoTL's practitioners and practices (Looker 2011; Chng and Looker 2013; Chng, Leibowitz, and Mårtensson 2020; Felten and Geertsema 2023).

Ultimately, this Grand Challenge for SoTL is particularly knotty because the practice, use, and growth of SoTL are intertwined, and each depends upon changing entrenched institutional cultures and models of higher education.

What's needed to address this Grand Challenge?

Like the previous Grand Challenges for SoTL, what's needed here is a paradigm shift in higher education. The Boyer model of four scholarships is just one vision for transforming what's expected,

valued, and rewarded in a way that will include SoTL as both a practice and a driver of change within higher education and beyond.

How might SoTL practitioners study this Grand Challenge?

What is?

- What does the existing scholarship tell us about the practice, use, and/or growth of SoTL?
- In what ways are other challenges for SoTL related to this Grand Challenge for SoTL?
- What does the practice, use, and/or growth of SoTL look like in your specific context(s)?
- How are the practice, use, and growth of SoTL informed by context (e.g., disciplinary, geopolitical, cultural, institutional)? How are they different for different practitioners?

What works?

- How can educators translate highly contextualized SoTL studies into use in another specific context?

What's possible?

- What can be done to change the model of higher education to support the practice, use, and growth of SoTL?

Conceptual Frameworks

- What models beyond Boyer would effectively integrate SoTL into higher education's systems of reward and recognition?

Grand Challenges for SoTL *in Action*

SoTL's Grand Challenges are meant to be put into action. Their five-year development process wasn't simply an intellectual exercise: it was a collaborative effort to identify SoTL topics that are "both universally important and relevant to specific situations" and complex enough that "identifying and addressing them will require long-term efforts involving diverse and divergent voices" (Scharff and Hamshire 2022, 63). This section features some of the "long-term efforts" required to address SoTL's Grand Challenges.

For these actions to "involve diverse and divergent voices," there are three key areas of influence and implementation:

- ISSOTL and other professional SoTL organizations,
- SoTL scholars more broadly, and
- public outreach.

Of course, these three areas overlap, as ISSOTL and other SoTL organizations serve SoTL scholars and the work of SoTL, many SoTL scholars are members of SoTL organizations, all engage in public outreach, and all are informed by what happens in public spheres, including but not limited to educational contexts. (See Figure 1.) At the same time, it's helpful to distinguish how SoTL's Grand Challenges can guide relevant action in and across these areas, so the sections below identify specific activities that may be undertaken by ISSOTL and other SoTL organizations, by SoTL scholars, and for the purpose of public outreach.

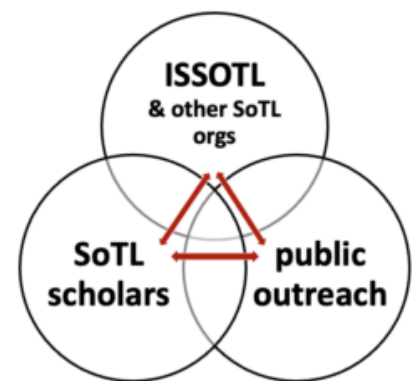


Figure 1

The actions listed below reflect many of the recommendations collected from panelists and participants in a session entitled "Grand Challenges of SoTL Phase III: Promoting A Way Forward" at the 2022 ISSOTL conference in Kelowna, BC, Canada (Scharff et al. 2022). The lists are meant to be generative rather than comprehensive.

ISSOTL & Other SoTL Organizations

There are many ways organizations that support or promote teaching, learning, and/or SoTL can support and promote the Grand Challenges of SoTL. To illustrate, as the international, multidisciplinary professional organization for the scholarship of teaching and learning, ISSOTL can play a key role in putting SoTL's Grand Challenges into action:

- The annual ISSOTL conference can feature one or more of SoTL's Grand Challenges as a thread within the larger conference theme, and/or tag presentations related to the GCs to recognize the work and allow searchability and tracking.
- ISSOTL Vice Presidents can sponsor conversations about SoTL's Grand Challenges in their specific contexts, addressing what each GC looks like and what's being done in these contexts.



- Each of ISSOTL's four standing committees can review SoTL's Grand Challenges as they apply to their specific charge and develop projects to promote relevant GCs.
- ISSOTL Interest Groups can review SoTL's Grand Challenges as they apply within their specific areas of interest and develop projects to explore relevant GCs.
- Cohorts of ISSOTL's International Collaborative Writing Groups (both the ICWG-Academic and the ICWG-Public) can focus on SoTL's Grand Challenges.
- *Teaching & Learning Inquiry* can feature a special section on submissions that address SoTL's Grand Challenges.
- *Teaching & Learning Inquiry* can also encourage the use of "SoTL's Grand Challenges" as a keyword for relevant pieces and develop a tag/category that would capture pieces that less explicitly (but still meaningful) connect to the GCs.
- The ISSOTL blog can feature posts focused on SoTL's Grand Challenges, and tag them for searchability.
- The ISSOTL newsletter's "Catch Up with *Teaching & Learning Inquiry*" section can feature an annual collection of all of the year's *TLI* articles with the GCs tag.
- The ISSOTL website can feature a special section on SoTL's Grand Challenges that includes these explanations, ongoing news about how ISSOTL is addressing them (see above), relevant resources, and relevant social media feeds.

The above actions collectively achieve a few key goals. First, they elevate SoTL's Grand Challenges as a strategic priority for ISSOTL by making them and the work on them visible to both ISSOTL members and external audiences. Next, they demonstrate this priority by intentionally and publicly recognizing (and thus valuing) relevant work. Finally, they facilitate the data collection to track, analyze, evaluate, and showcase Society-wide efforts to address the GCs.

SoTL Scholars

Individually or collaboratively, SoTL scholars can put SoTL's Grand Challenges into action by doing the following:

- develop SoTL projects that address or inform one or more of SoTL's Grand Challenges.
- highlight their existing work that addresses any of SoTL's Grand Challenges by explicitly identifying that connection. These could be identified by using "SoTL's Grand Challenges" as a keyword in journal publication and a tag for social media and blog posts, and by featuring this connection in a post on the ISSOTL blog.
- conduct reviews (e.g., [literature reviews](#), [scoping reviews](#), [systematic reviews](#)) to summarize and present the existing research and scholarship about one or more of SoTL's Grand Challenges.
- develop (individually, collaboratively, or crowdsourcing) annotated bibliographies on one or more of SoTL's Grand Challenges.
- write about one or more of SoTL's Grand Challenges.
- write or edit books focused on one or more of SoTL's Grand Challenges.
- develop keywords and search terms related to each of SoTL's Grand Challenges to make relevant research and resources easily findable.
- point to SoTL's Grand Challenges (as relevant) when presenting their SoTL work to review committees, administrators, and other evaluative groups.
- identify similarities or intersections between SoTL's Grand Challenges and the Grand Challenges of other disciplines to facilitate cross-pollination of ideas, approaches, and potential solutions.
- share SoTL's Grand Challenges with other SoTL scholars, colleagues outside of SoTL, and relevant audiences who might be interested in the existence of this work.

In the actions outlined above, SoTL scholars advance what is known about each of SoTL's Grand Challenges, facilitate ongoing research and scholarship by other scholars, and advocate for SoTL that's attentive to the GCs.

Public Outreach

Both ISSOTL as an organization and SoTL scholars as individuals can put SoTL's Grand Challenges into action by reaching out about SoTL's Grand Challenges or what's currently known (and not known) about each in the following ways:

- develop and distribute white papers for university presidents, administrators, and policy makers.
- develop talking points for SoTL scholars to draw on when being interviewed in major news media, podcasts, community panels, and other public venues.
- write opinion pieces, press releases, and other materials for major news media.
- develop infographics, short videos, social media campaigns, and other media for public audiences.
- identify public partners to explore SoTL's Grand Challenges more broadly.

These actions support efforts to advocate for greater understanding of the work undertaken by SoTL scholars to effect meaningful change in higher education and beyond.

The ultimate aim of all of the actions described above is to help educators better understand and improve the complex, wicked challenges in postsecondary teaching and learning today.

History of the Grand Challenges for SoTL

SoTL's Grand Challenges were determined following five years of global outreach, including three anonymous international surveys with thematic analyses, a Delphi process that provided feedback from twelve global SoTL experts on a group of eleven possible grand challenges, and a final round of anonymous global inputs on wording of the five final challenges.

The infographic to the right illustrates key steps in the timeline, followed by a more detailed summary of the events and who was involved. Many thanks to those who were on the team, served as experts, or otherwise helped support this grand endeavor!

The Grand Challenges Milestones Teams

Many thanks to all contributors for their time and valuable contributions to this project, including all those around the globe who anonymously responded to the surveys or provided inputs during the conference sessions!! Click the image to view a larger, printable version of the infographic, designed by Hyojung Lee (Illinois State University).

SoTL's Grand Challenges Outreach began in Bergen, Norway at the 2018 annual conference for the International Society for the Scholarship of Teaching and Learning (ISSOTL). **Lauren Scharff** (USA), **John Draeger** (USA), **Arshad Ahmad** (Pakistan), and **Jennifer Friberg** (USA) presented a poster and collected anonymous post-it-note inputs from session attendees. These inputs were thematically coded by **Lauren Scharff** and **Drew Scott** (USA) in early 2019. The second major step during mid-2019 was the creation and implementation of an online survey (English only) that requested respondees to share up to five suggestions for

Grand Challenges for SoTL DEVELOPMENT TIMELINE

2018

- Advocacy & Outreach Committee discussions
- Poster presentation & survey – ISSOTL conference in Bergen, Norway
- Thematic analysis

2019

- First international online survey (English only), August
- Thematic analysis with interrater reliability
- Panel presentation – ISSOTL conference in Atlanta, USA

2020

- Second international online survey (English, Chinese, and Spanish), November

2021

- Chinese and Spanish translations and begin thematic analysis

2022

- Book chapter in *Going Public Reconsidered*
- Finish thematic analysis with interrater reliability
- Workshop presentation – ISSOTL conference in Kelowna, Canada
- Delphi Technique – 2 rounds of inputs from 12 global SoTL experts, October – December

2023

- Final determination & wording feedback from global experts, June – August
- Webpages writing & posting on ISSOTL website, September – October
- Workshop presentation – ISSOTL conference in Utrecht, Netherlands

issotl

Grand Challenges for SoTL

<https://issotl.com/grand-challenges-for-sotl>

grand challenges for SoTL. Survey creation and ethics review approval was overseen by **John Draeger** and **Lauren Scharff**, and members of the ISSOTL Committee sent survey links to several international listservs (e.g. POD, ISSOTL, STP) and informally shared with colleagues. Respondee were primarily from the United States of America (59%), Canada (13%), Europe (13%), Australia (9%), and Asia (5%). South America, the Middle East, and Africa each had 1% or fewer respondents. These inputs were thematically coded with interrater reliability checks by **Lauren Scharff** and **Regan Keener** (USA) in early 2019.

Results summarizing responses from the Bergen poster and the online survey were shared as part of a panel for the ISSOTL Advocacy & Outreach Committee at the 2019 ISSOTL conference in Atlanta, USA. As part of the panel, audience feedback was gathered as part of an open discussion. Panelists were **Lauren Scharff, John Draeger, Arshad Ahmad, Jen Friberg, Claire Hamshire** (UK), **Trent Maurer** (USA), and **Diana Gregory** (USA).

A final survey was disseminated in 2020 in order to increase the number and global representation of the responses. This survey was disseminated in English, Chinese, and Spanish. In addition to the individuals listed below as translators and thematic coders, the following individuals helped disseminate the survey: **Mills Kelly** (USA), **Kelly Mathews** (Australia), **Nicola Simmons** (USA), **Mick Healey** (UK). Survey creation and ethics review approval was again overseen by **John Draeger** and **Lauren Scharff**; **Kara Loy** (CAN) provided the Spanish translations of the survey questions and responses, and **Qi Gao** (China) provided the Chinese translations of the survey questions and responses. Respondee were from Asia (44%), the United States of America (22%), Europe (13%), Canada (12%), and Australia (6%). South America, the Middle East, and Africa each had 1% or fewer respondents, and 1% didn't specify. Several members of the ISSOTL Advocacy Committee provided thematic coding with interrater reliability checks: **Holly Capocchiano** (Australia), **Michelle Eady** (Australia), **Diana Gregory** (USA), **Claire Hamshire, Jennifer Friberg, Kara Loy**, and **Lauren Scharff**.

During 2020, **Lauren Scharff** and **Claire Hamshire** wrote a book chapter, "Determining SoTL's Grand Challenges: Advocating for the Broader Endeavor of the Scholarship of Teaching and Learning," that overviewed the need and summarized the Grand Challenges for SoTL project up to that point. It was published in *Going Public Reconsidered: Engaging with the World Beyond Academe Through the Scholarship of Teaching and Learning* with Nancy L. Chick and Jennifer Friberg as the editors in 2022.

Results from all three data collections were shared in a workshop presentation at the 2022 ISSOTL conference in Kelowna, Canada. (See photographs below.) These results included 11 themes that were strongly apparent in the responses. As part of the workshop, participants discussed and shared ideas for how ISSOTL and SoTL practitioners might use the Grand Challenges and how they might be used for public outreach. These inputs have informed our current suggestions for the "SoTL's Grand Challenges in Action" section. Workshop presenters were **Lauren Scharff, Holly Capocchiano, Michelle Eady, Jen Friberg, Diana Gregory, Claire Hamshire, Kara Loy**, and **Trent Maurer**.

In the latter part of 2022 and early part of 2023, a final outreach step was initiated to bring expert SoTL perspectives to the finalization of SoTL's Grand Challenges. Twelve global SoTL experts agreed to participate in two rounds of a Delphi process. They were each given an overview of the project and the list of 11 themes shared at ISSOTL 2022. They were asked rate each possible them with respect to how strongly they believed it should be a Grand Challenge for SoTL and provide a rationale. These were shared anonymously with the other experts, and in round two, they were asked to review the inputs from the other experts and then again rate the possible grand challenges and provide rationales. Many thanks to the following experts for their participation in this step: **Kasturi Behari-Leak** (South Africa), **Nancy Chick** (USA), **Mick Healey** (UK), **Pat Hutchings** (USA), **Qi Gao** (China), **Zhao Juming** (China), **Katarina Mårtensson** (Sweden), **Kelly Matthews** (Australia), **Jessica Riddell** (Canada), **John**

Willison (Australia), **Hugo Burgos Yanez** (Ecuador), and **Michelle Yeo** (Canada).

While the Delphi process resulted in some clearly agreed-upon perspectives regarding the possible Grand Challenges for SoTL, there were also some areas where there were clear differences of opinion. The following individuals provided inputs, met several times to discuss, collected additional feedback from anonymous global SoTL practitioners, and ultimately finalized the five Grand Challenges for SoTL: **Lauren Scharff, Holly Capocchiano, Nancy Chick, John Draeger, Michelle Eady, Jen Friberg, Diana Gregory, Claire Hamshire, Kara Loy, and Trent Maurer.**

This group then drafted the ISSOTL webpage content, with **Lauren Scharff** and **Nancy Chick** serving as the final editors.

The final Grand Challenges for SoTL were officially published on the ISSOTL website and shared at ISSOTL 2023 in Utrecht, Netherlands. As a first step in engaging SoTL practitioners with the SoTL's Grand Challenges, participants at the conference workshop shared ideas for additional SoTL practitioners might study the Grand Challenges and identified projects with possible collaborators they would like to work on. Workshop leaders were **Lauren Scharff, Nancy Chick, Michelle Eady, Jen Friberg, and Diana Gregory.**



Grand Challenges Workshop Facilitators, ISSOTL22



Grand Challenges Workshop, ISSOTL22

References

- AAC&U. "VALUE Rubrics – Creative Thinking." American Association of Colleges & Universities. <https://www.aacu.org/initiatives/value-initiative/value-rubrics/value-rubrics-creative-thinking>
- AAC&U. "VALUE Rubrics – Critical Thinking." American Association of Colleges & Universities. <https://www.aacu.org/initiatives/value-initiative/value-rubrics/value-rubrics-critical-thinking>
- ACARA. Critical and Creative Thinking (Version 8.4). Australian Curriculum, Assessment and Reporting Authority. <https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/critical-and-creative-thinking/>
- Alam, Ashraf. 2022. "Employing Adaptive Learning and Intelligent Tutoring Robots for Virtual Classrooms and Smart Campuses: Reforming Education in the Age of Artificial Intelligence." In *Advanced Computing and Intelligent Technologies, Proceedings of ICACIT*, edited by Rabindra Nath Shaw, Sanjoy Das, Vincenzo Piuri, and Monica Bianchini, 395-406. Singapore: Springer. <https://doi.org/10.1007/978-981-19-2980-9>
- Bass, Randall. 2020. "What's the Problem Now?" *To Improve the Academy* 39 (1): 3-30. <http://dx.doi.org/10.3998/tia.17063888.0039.102>
- Bass, Randy, and Brett Eynon. 2009. "Capturing Visible Evidence of Invisible Learning." *Academic Commons*, January, <https://academiccommons.org/january-2009/capturing-the-visible-evidence-of-invisible-learning/>
- Baum, Sandy and Michael McPherson. 2019. "The Human Factor: The Promise & Limits of Online Education." *Daedalus* 148 (4): 235–254. https://doi.org/10.1162/daed_a_01769
- Blackburn, Heidi. 2017. "The Status of Women in STEM in Higher Education: A Review of the Literature 2007–2017." *Science & Technology Libraries* 36 (3): 235-273. <https://doi.org/10.1080/0194262X.2017.1371658>
- Blakey, Althea Jane Gamble, Clinton Golding, and Tim J. Wilkinson. 2022. "The Scholarship of Teaching and Learning Critical Thinking: Finding a Way Forward with Evidence from a Medical Teaching Context." *International Journal for the Scholarship of Teaching and Learning* 16 (3): 1-9. <https://doi.org/10.20429/ijstl.2022.160307>
- Boyer, Ernest L. 1990. *Scholarship Reconsidered: Priorities of the Professoriate*. Menlo Park, CA: Carnegie Foundation for the Advancement of Teaching.
- Catarino, Paula, Paulo Vasco, José Lopes, Helena Silva, and Eva Morais. 2019. "Cooperative Learning on Promoting Creative Thinking and Mathematical Creativity in Higher Education." *REICE. Revista Iberoamericana sobre Calidad, Eficacia y Cambio en Educación* 17 (3): 5-20. <https://doi.org/10.15366/reice2019.17.3.001>
- Chng, Huang Hoon, Katarina Mårtensson, and Brenda Leibowitz. 2020. "Leading Change from Different Shores: The Challenges of Contextualizing the Scholarship of Teaching and Learning." *Teaching & Learning Inquiry* 8 (1): 24-41. <https://doi.org/10.20343/teachlearninqu.8.1.3>
- Chng, Huang Hoon, and Peter Looker. 2013. "On the Margins of SoTL Discourse: An Asian Perspective." *Teaching & Learning Inquiry* 1 (1): 131-45. <https://doi.org/10.20343/teachlearninqu.1.1.131>
- Dunlosky, John and Katherine Rawson. 2015. "Practice Tests, Spaced Practice, and Successive Relearning: Tips For Classroom Use and For Guiding Students' Learning." *Scholarship of Teaching and Learning in Psychology* 1 (1): 72–78. <https://doi.org/10.1037/stl0000024>
- Ennis, Robert. 2011. "Critical Thinking: Reflection and Perspective." *Part I. Inquiry: Critical Thinking Across the Disciplines* 26 (1): 4–18. <https://doi.org/10.5840/inquiryctnews20112613>.
- Felten, Peter, and Johan Geertsema. 2023. "Recovering the Heart of SoTL: Inquiring into Teaching and Learning 'As If the World Mattered.'" *Innovative Higher Education* 48: 1095-1112. <https://doi.org/10.1007/s10755-023-09675-4>
- Heft, Ilea E., and Lauren Scharff. 2017. "Aligning Best Practices to Develop Targeted Critical Thinking Skills and Habits." *Journal of the Scholarship of Teaching and Learning* 17 (3): 48-67. <https://doi:10.14434/josotl.v17i3.22600>
- Hutchings, Pat, ed. 2000. *Opening Lines: Approaches to the Scholarship of Teaching and Learning*. Menlo Park, CA: Carnegie Foundation for the Advancement of Teaching.
- Hutchings, Pat, and Lee S. Shulman. 1999. "The Scholarship of Teaching: New Elaborations, New Developments." *Change* 31 (5): 10-15. <https://doi.org/10.1080/00091389909604218>
- Hübös, Anna. 2023. "Teaching Students How to Learn." *Educational Utopias: Liber Amicorum Alkeline van Lenning*. <https://openpresstiu.pubpub.org/educational-utopias>
- Kreber, Carolin. 2013. "Empowering the Scholarship of Teaching and Learning: An Arendtian and Critical Perspective." *Studies in Higher Education* 38 (6): 857-869. <https://doi.org/10.1080/03075079.2011.602396>

- Looker, Peter. 2011. "Globalising the Local: The Scholarship of Teaching and Learning in a Larger Context." *Journal of the NUS Teaching Academy* 1 (1): 21-31.
- Lovett, Marsha C., Michael W. Bridges, Michele DiPietro, Susan A. Ambrose, and Marie K. Norman. 2023. *How Learning Works: Eight Research-Based Principles for Smart Teaching, 2nd Edition*. San Francisco, CA: Jossey-Bass.
- MacNeill, Lillian, Adam Driscoll, and Andrea N. Hunt. 2015. "What's in a Name: Exposing Gender Bias in Student Ratings of Teaching." *Innovative Higher Education* 40, 291–303, <https://doi.org/10.1007/s10755-014-9313-4>
- Manarin, Karen, Christine Adams, Richard Fendler, Heidi Marsh, Ethan Pohl, Suzanne Porath, and Alison Thomas. 2021. "Examining the Focus of SoTL Literature—Teaching and Learning?" *Teaching & Learning Inquiry* 9 (1): 349-64. <https://doi.org/10.20343/teachlearning.9.1.23>.
- McGuire, Sandra Yancy. 2015. *Teach Students How to Learn: Strategies You Can Incorporate into Any Course to Improve Student Metacognition, Study Skills, and Motivation*. Sterling, VA: Stylus.
- Mercer-Mapstone, Lucy, and Sophia Abbot. 2020. *The Power of Partnership: Students, Staff, and Faculty Revolutionizing Higher Education*. Elon, NC: CEL Press. <https://doi.org/10.36284/celelon.oa2>.
- Moriña, Anabel. 2017. "Inclusive Education in Higher Education: Challenges and Opportunities." *European Journal of Special Needs Education* 32 (1): 3-17. <https://doi.org/10.1080/08856257.2016.1254964>
- Museus, Samuel, Varaxy Yi and Natasha Saelua. 2017. "The Impact of Culturally Engaging Campus Environments on Sense of Belonging." *The Review of Higher Education* 40 (2), 187-215. <https://doi.org/10.1353/rhe.2017.0001>
- National Academies of Sciences, Engineering, and Medicine. 2018. *How People Learn II: Learners, Contexts, and Cultures*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/24783>.
- Poole, Gary. 2013. "Using Intuition, Anecdote, and Observation: Rich Sources of SoTL Projects." In *SoTL in Action: Illuminating Critical Moments of Practice*, edited by Nancy L. Chick, 7-14. Sterling, VA: Stylus.
- Potter, Michael K., and Erika Kustra. 2011. "The Relationship between Scholarly Teaching and SoTL: Models, Distinctions, and Clarifications." *International Journal for the Scholarship of Teaching and Learning* 5 (1): 1-18. <https://digitalcommons.georgiasouthern.edu/ij-sotl/vol5/iss1/23/>
- Rittel, Horst W. J. and Webber, Melvin M. 1973. "Dilemmas in the General Theory of Planning." *Policy Sciences* 4 (2): 155-169. <https://www.jstor.org/stable/4531523>
- Scharff, Lauren, and Claire Hamshire. 2022. "Determining SoTL's Grand Challenges: Advocating for a Broader Endeavor for the Scholarship of Teaching and Learning." In *Going Public Reconsidered: Engaging with the World Beyond Academe Through the Scholarship of Teaching and Learning*, edited by Nancy L. Chick and Jennifer C. Friberg, 62-75. Sterling, VA: Stylus.
- Scharff, Lauren, Holly Capocchiano, Michelle Eady, Jennifer Friberg, Diana Gregory, Claire Hamshire, Kara Loy, and Trent Maurer. 2022. "Grand Challenges of SoTL Phase III: Promoting a Way Forward." Panel presented at ISSOTL Annual Conference: At the Intersections of SoTL: Transfer and Transformation, Diversity and Inclusivity, Kelowna, Canada, November 3, 2022.
- Tekkol, İlkay Aşkin, and Melek Demirel. 2018. "An Investigation of Self-Directed Learning Skills of Undergraduate Students." *Frontiers in Psychology* 9: 1-14.
- Tomlinson, Michael. 2017. "Student Perceptions of Themselves as 'Consumers' of Higher Education." *British Journal of Sociology of Education* 38 (4): 450-467. <https://doi.org/10.1080/01425692.2015.1113856>
- Wirth, Karl.R. and Dexter Perkins, D. 2013. *Learning to Learn*. Retrieved from https://www.montana.edu/rmaher/barrier_courses/Learning%20to%20Learn%20Wirth.pdf

GRAND CHALLENGES FOR SoTL

Recommended Citation

Scharff, Lauren, Holly Capocchiano, Nancy Chick, Michelle Eady, Jen Friberg, Diana Gregory, Kara Loy, and Trent Maurer. 2023. "Grand Challenges for SoTL." *International Society for the Scholarship of Teaching and Learning*, November 2023.
<https://issotl.com/grand-challenges-for-sotl>

This work is licensed under a [Creative Commons Attribution-Noncommercial International 4.0 License](https://creativecommons.org/licenses/by-nc/4.0/). This license enables reusers to distribute, remix, adapt, and build upon the material in any medium or format for noncommercial purposes only, and only so long as attribution is given to the creator.

