

Stefan T. SIEGEL¹ (St.Gallen)

Scholarship of Teaching and Learning (SoTL): What else? Why (not)? How to?²

Abstract

Scholarship of Teaching and Learning (SoTL) involves the scholarly study by educators of their own teaching or student learning and sharing their insights with others. Why is it even necessary to study one's teaching with SoTL? How is it done? What pitfalls should I avoid? These questions are the focus of this paper. First, the background of the concept, (ideal) typical forms, and the potentials and limitations of SoTL projects are discussed and illustrated with a current example.

1 SoTL – What else?

“I have a friend who's an artist and he's sometimes taken a view which I don't agree with very well. He'll hold up a flower and say, "look how beautiful it is," and I'll agree, I think. And he says, "you see, I as an artist can see how beautiful this is, but you as a scientist, oh, take this all apart and it becomes a dull thing." And I think he's kind of nutty. First of all, the beauty that he sees is available to other people and to me, too, I

¹ E-Mail: stefan.siegel@unisg.ch

² This article is based on my invited keynote *Professioneller durch SoTL!? Professionalisierung der eigenen Lehrtätigkeit durch Scholarship of Teaching and Learning [More professional through SoTL! Professionalizing one's own teaching through Scholarship of Teaching and Learning]* at the 12th D-A-CH Conference Inverted Classroom and Beyond 2023 in Chur, Switzerland. Here you can access the [recording of the keynote](#), the [slides](#), and the [overall documentation](#).

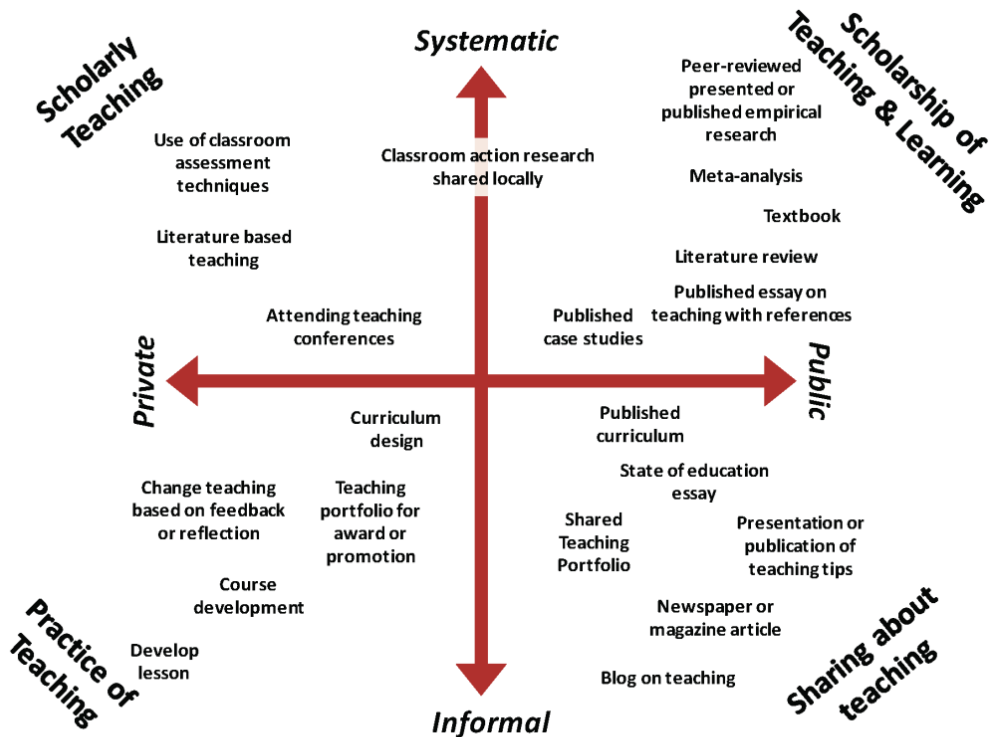
believe, although I might not be quite as refined aesthetically as he is. But I can appreciate the beauty of a flower. At the same time, I see much more about the flower that he sees. I could imagine the cells in there, the complicated actions inside which also have a beauty. I mean, it's not just beauty at this dimension of one centimeter: there is also beauty at a smaller dimension, the inner structure... also the processes. The fact that the colors in the flower are evolved in order to attract insects to pollinate it is interesting – it means that insects can see the color. It adds a question - does this aesthetic sense also exist in the lower forms that are... why is it aesthetic, all kinds of interesting questions which a science knowledge only adds to the excitement and mystery and the awe of a flower. It only adds“ (FEYNMAN, 1981).

With the *Ode to a Flower*, Richard Feynman, a former American physicist and Nobel Prize winner explained that scientific approach to nature not only deepens our understanding, but also expands our appreciation of its beauty (FEYNMAN, 1981). Just as science helps us to understand the biology of a rose and the colors of its petals, Scholarship of Teaching and Learning (SoTL) can help us discover and appreciate the beauty and complexity of teaching and learning.

The concept SoTL has its roots in the Anglo-American higher education system of the 1990s (BOYER, 1990) and is becoming increasingly popular in the communities of university lecturers and academic developers in many European countries. Among the pioneers who have contributed to the dissemination of the concept in the German-speaking world are Ludwig Huber, Adi Witeler, Marianne Merkt, or Robert Kordts, and the members of the SoTL network among others of the University of Paderborn, which was founded in 2017.

At its core, SoTL involves the scholarly engagement of (university) faculty with their own teaching and/or students' learning through more or less systematic inquiry. In doing so, they pursue two main goals: (a) to improve their own practice and (b) to make the results accessible to others – taking a scholarly stance (e.g., DEWAR et al., 2018; FELTEN, 2013; HUBER et al., 2014; HUBER, 2018; MCKINNEY, 2007).

What causes controversy is the delineation of SoTL from other concepts, such as scholarly teaching, evaluation research, or educational research in general. The following overview by Kern et al. (2015) attempts a classification concepts along the continua private and public and informal and systematic:



Kern, B., Mettetal, G., Dixon, M., & Morgan, R. (2015). The Role of SoTL in the Academy: Upon the 25th Anniversary of Boyer's Scholarship Reconsidered. *Journal of the Scholarship of Teaching and Learning*, 15(3), 1-14.

Fig. 1: The Role of SoTL in the Academy

The question of when SoTL ceases to be SoTL and where the boundary with (higher education) research lies is not easy to answer. One possible distinction might be that SoTL is primarily concerned with improving one's own teaching and student learning, whereas higher education research is more focused on generating generalizable findings (KORDTS & LESCHKE, 2020).

2 SoTL – Why (not)?

The primary goal of SoTL is to improve the quality of teaching by systematically examining and evaluating one's own teaching or student learning and sharing the insights with others. But what are the potentials and challenges of SoTL?

During my keynote address at the 2023 ICM Beyond conference, I asked the attendees (about 30 people, primarily (secondary and school) educators and academic developers; varying prior knowledge on the concepts of SoTL) to brainstorm on the benefits and pitfalls and to document their insights on a Padlet (text is in German).

The participants referred to multiple potentials which could also be found in the relevant SoTL literature (e.g., DEWAR et al., 2018; MCKINNEY, 2007):

- By systematically investigating and reflecting on their own practices, educators can improve their teaching, increase visibility and reputation, and foster a culture of sharing and learning from others.
- When practitioners publish their results, a collective knowledge base for theory and practice is formed, moving away from "guessing" which teaching formats are appropriate and encouraging evidence-based innovation.
- SoTL enables educators to professionalize their teaching, engage in exchanges with peers, and gain inspiration from others' experiences.

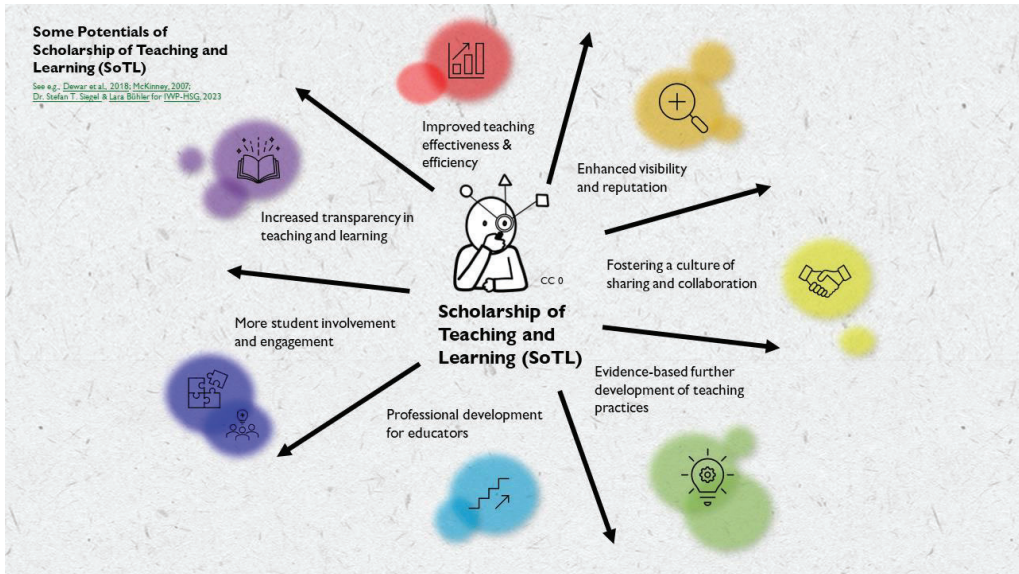


Fig. 2: Some Potentials of SoTL

The participants pointed to several challenges of SoTL projects that also are described in theory (e.g., DEWAR et al., 2018; MCKINNEY, 2007):

- Time constraints are a significant concern, as conducting SoTL research requires dedication and effort.
- Acquiring the necessary competencies and resources for SoTL projects may also be challenging, particularly for those who lack experience or technical support.
- Furthermore, the perceived lack of publication impact and the prioritization of research over teaching may discourage some educators from engaging in SoTL.

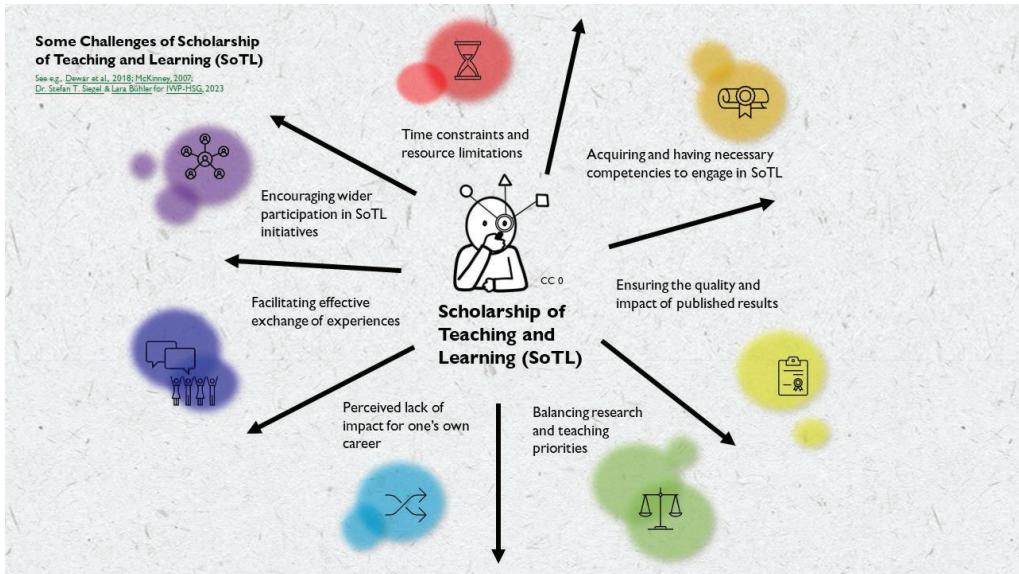


Fig. 3: Some Challenges of SoTL

3 SoTL – How to?

3.1 Types of SoTL and Typical Steps

The SoTL project does not exist, but there are different variants that manifest themselves in different types (HUBER, 2014):

Type	Description
Innovation report	Concept presentation and evaluation of innovative teaching and learning concepts as well as the description of the experiences with it including evaluation results
Substantiated innovation report	Innovation report with scientific support
Educational discussion	Review and discussion of educational discussions and findings of (pedagogical content) educational research with derivation of recommendations for action, development of teaching concepts or research instruments
Educational discussion and course concept	Educational discussion continued to justify and describe a course concept
Educational research	Teaching and learning research formats in teaching situations with students
Academic development	Teaching and learning research projects on the conception of a degree program up to for the theory- and research-based justification of course concepts or curricula

Tab. 1: Types of SoTL according to HUBER (2014; translation)

SoTL can be approached in a variety of ways, depending on the goals and context of the inquiry. In principle, educators can choose from the whole repertoire of empirical and non-empirical research methods. However, controversies exist in the SoTL community about what should and can be accepted as evidence (e.g., data from quantitative research vs. products of autoethnographic or hermeneutic research; KORDTS & LESCHKE, 2020).

The typical process of SoTL projects is similar to that of regular (educational) research. Typically, a SoTL project includes the following steps:

1. Formulating a question (questioning): The educator develops a research question that relates to his or her teaching or to student learning.
2. Development of a research design (gather and examine evidence): The educator selects appropriate data collection and analysis methods to answer the research question.

3. Trying new things (test and refine new findings): Based on the research findings, new approaches and methods are tried and refined in the classroom.
4. Sharing the process and results (going public and sharing knowledge): The teacher shares the results and findings with others to improve the overall practice of teaching and to contribute to knowledge building in higher education didactics (e.g., FELTEN, 2013; HUBER, 2018; MCKINNEY, 2007).

“While honoring the diversity of SoTL in its many forms across the globe, such principles can serve as a heuristic for assessing work in our field. These principles include (1) inquiry into student learning, (2) grounded in context, (3) methodologically sound, (4) conducted in partnership with students, and (5) appropriately public” (FELTEN, 2013)

In recent years, various tools have been developed, that can help educators in developing, implementing, and evaluating SoTL projects, e.g., guiding questions for SoTL project development and planning by PAWELLECK et al. (2020) or the Hopscotch 4-SoTL by JORRÍN-ABELLÁN & STEINER (2021).

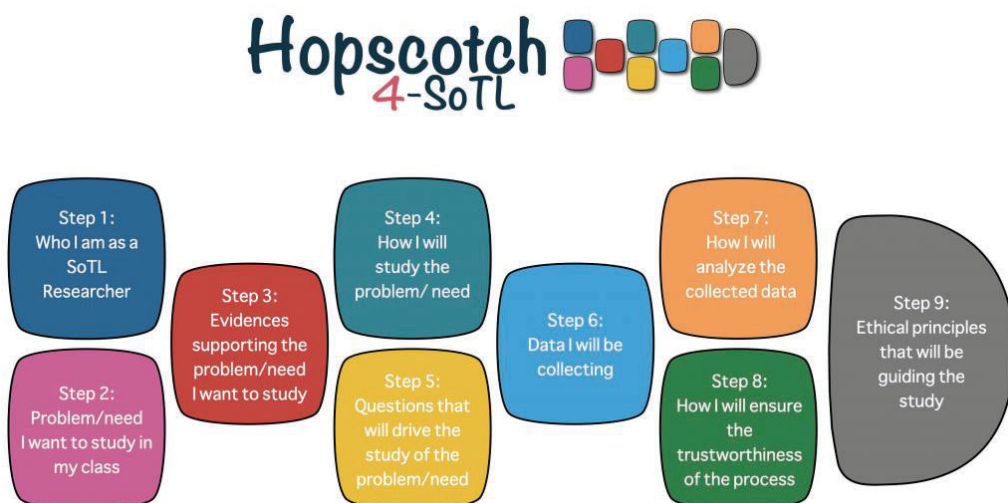


Fig. 4. Nine Steps of the Hopscotch 4-SoTL by JORRÍN-ABELLÁN & STEINER (2021)

3.2 A Recent Example: ICM in Pandemic Distance Mode

To illustrate what an SoTL project can look like in concrete terms, I will briefly describe a comparatively recent example using the Hopscotch 4-SoTL³. The exemplary SoTL project was conducted by Dirk Burdinski and colleagues Cologne University of Applied Sciences (Germany) and is described in a current open access edited volume by VÖING et al. (2022), in which selected SoTL projects from German-speaking countries are presented. I chose this project as it relates to the theme of the ICM beyond 2023.

Dirk Burdinski is Dean of Studies and a professor for materials science at the Faculty of Applied Natural Sciences at TH Cologne. His research interests entail educational research (SoTL): Development of digital teaching and learning concepts for chemistry, especially inverted classroom formats, activating forms of teaching, and e-learning as well as applied transition metal chemistry and materials science, lanthanide chemistry. His main teaching areas include materials science and inorganic chemistry (Step 1).

The investigated introductory course Inorganic Chemistry II was already offered the form of an ICM before the COVID-19-pandemic. With the onset of the pandemic, it was fully converted to an online format. The problem to solve or rather the aim of this SoTL study was to determine how the learning behavior of the students changed and whether and to what extent comparable learning outcomes were achieved (Step 2; BURDINSKI, 2022). Overall, robust learning outcomes with an increased need for timely feedback on students' individual skill development.

While Burdinski describes the teaching intervention in his contribution to the edited volume, (except for withing the introduction) he does not describe in detail whether he has explored the literature, i.e., previous studies to ground his SoTL study in context (Step 3; FELTEN, 2013).

³ A German version of the tool by Siegel & Troxler (2023) can be found here: <https://app.Lumi.education/run/S39JyM>

Concerning the research design Burdinski and his colleagues opted for a mixed methods design, including qualitative and quantitative methods to gather data both during the course and at the end of the course (Step 4).

Regarding the effects of changing the course Inorganic Chemistry II from an ICM with face-to-face sessions to a completely virtual ICM with simultaneous change of the examination form, the following research questions drove this SoTL project:

1. Does the learning behavior of students change?
2. Are comparable learning outcomes achieved? (Step 6)

Burdinski et al. collected multiple types of data via various methods such Teaching Analyses Polls (TAP), electronic self-learning tests, electronic practice exams, module final exams, and some forms of (learning) analytics (Step 6).

For analyzing the collected data, multiple methods such as content analysis for the TAP data, descriptive statistics, e.g., t-test for paired samples were utilized (Step 7).

To ensure the trustworthiness of the SoTL project the Burdinski et al. designed a mixed methods study and transparently documented their efforts in the form of the referenced edited volume contribution. There is no information on whether the studies have been pre-registered or on the reliability and validity of the final module exams (Step 8).

Regarding research ethics (e.g., data privacy, psychological safety) there is no concrete information in the text (Step 9).

4. Conclusion

Overall, SoTL represents an investigative approach and can be a challenging, however rewarding endeavor for educators. By using scholarly methods to examine and reflect on our own teaching practices and student learning, SoTL allows us to gain valuable insights into the teaching and learning process, to further develop and share your acquired teaching-related knowledge (SIEGEL et al. 2021, SIEGEL et al., 2022).

I encourage all active educators to initiate, advance, and share your own SoTL projects, to embrace, and celebrate the complexity and beauty of your teaching and your students' learning. Making connections within the SoTL community, such as through the German-speaking SoTL Network or by participating in events such as the annual conference of the International Society for Scholarship of Teaching and Learning (ISSOTL), can provide additional support and opportunities for collaboration.

There are many ways to share your SoTL research ranging from presentations in (local) teaching exchanges or communities of practice to publications in peer-reviewed journals (e.g., HEALEY et al., 2019). General higher education outlets such as the Neue Handbuch Hochschullehre or die hochschullehre may be appropriate. In addition, you might consider submitting your work to discipline-specific journals.

In summary, engaging in SoTL not only benefits individual educators, but also contributes to the collective knowledge of teaching and learning, ultimately improving the educational experience for all.

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Author



Dr. Stefan T. SIEGEL || University of St. Gallen (HSG), Institute of Business Education and Educational Management (IWP) || Dufourstr. 40a, CH-9000 St. Gallen, Switzerland

stefan.siegel.de

stefan.siegel@unisg.ch

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