

What Matters in the Scholarship of Teaching and Learning?

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Introduction

Our book opened with the phrase “You have chosen the path of a teacher,” and as you have been reading, that phrase encompasses knowing much more than just your subject matter. Over the course of this book you have read about student-centered learning; active learning; assessment, teaching, and learning in large classrooms, small discussion groups, and laboratory-based courses; technology; clinical precepting; and the myriad of duties associated with being a teacher. In this chapter we take you to a new place—a place that will bring all of these elements together in a way that will enrich your teaching, your students, your colleagues, and hopefully your institution and profession.

This chapter will help you answer the following questions:

- What is the scholarship of teaching and learning? What is the difference between scholarly teaching and the scholarship of teaching and learning (SoTL)?
- Why is SoTL important today?
- How do you conceptualize an SoTL project?
 - How do you frame a good SoTL question?
 - How do you choose methods?
 - What components are important in analysis?

The scholarship of teaching and learning . . . means viewing the work of the classroom as a site for inquiry.⁷

M. Huber,
P. Hutchings

- How do you disseminate SoTL?
- What ethical considerations are there in SoTL?

What Is the Scholarship of Teaching and Learning (SoTL)?

The scholarship of teaching and learning has its origins in the work of Ernest Boyer. His seminal text, *Scholarship Reconsidered*,¹ challenged higher education to think differently about what constituted scholarship. Beyond the traditional scholarship of discovery, Boyer added three other dimensions of faculty work that, in his experience, are examples of faculty scholarship: “The work of the professoriate might be thought of as having four separate, yet overlapping functions. These are: the scholarship of discovery, the scholarship of integration, the scholarship of application, and the scholarship of teaching.”¹

Boyer made the case that teaching, done in a scholarly manner, qualifies as a form of scholarship. There are many definitions of SoTL, but there are common elements that define the essence of SoTL.^{2–6} Huber and Hutchings, in their book *The Advancement of Learning: Building the Teaching Commons*, state it most succinctly: “Though employed in different ways and to different degrees, the scholarship of teaching and learning entails basic but important principles. . . . It means *viewing the work of the classroom as a site for inquiry, asking and answering questions about students’ learning in ways that can improve one’s own classroom and also advance the larger profession of teaching*”⁷ (emphasis added).

In general when considering SoTL, we are talking about study, application, and communication of results; deep reflection; and a public sharing of findings about teaching and learning. Although much has been written about SoTL, one point less often made that we would like to emphasize is the *learning* piece of SoTL. It is more about what improves student learning than a prescription for how to teach. Teaching is contextual; what works in one environment may not work in another. The composition of the course, the physical setting, the student demographics, and the teacher’s style all contribute to what makes a successful learning environment. Through SoTL, you can examine, question, and study if the input and process elements inherent in a course and the environment produce the desired learning. SoTL asks us to be open to trying change in our teaching and learning system, to be willing to critically evaluate the effectiveness of this change, to engage with others about teaching and learning, and to publicly share our findings.

What Is the Difference Between Scholarly Teaching and SoTL?

Many teachers take a scholarly approach to their teaching. They talk to colleagues, they read articles about new methodologies, they reflect on their classes and make adjustments as needed, they attend workshops, and

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they ask peers to give them feedback. These are all elements of good teaching, and as Richlin tells us, scholarly approaches to teaching and learning are important if we are to understand learning, enhance curriculum, and assess our student learning in a thoughtful manner.⁴ These activities of reflection and revision are the hallmark of scholarly teachers. However, SoTL takes the scholarly approach to a more rigorous level. According to Shulman, “an act of intelligence or of artistic creation becomes scholarship when it possesses at least three attributes: it becomes public; it become an object of critical review and evaluation by members of one’s community; and members of one’s community begin to use, build upon, and develop those acts of mind and creation.”⁸

There are a number of challenges inherent in this definition. First, to do SoTL you must be willing to challenge your assumptions about teaching and learning by publicly scrutinizing your own work. Next, defining one’s community can be complex. Traditionally, your discipline colleagues constitute your academic community. SoTL asks you to broaden that community to include those from other disciplines who might gain in wisdom and knowledge through your work, as you will from theirs. Last, you must find the appropriate venues to disseminate your work if others are to use and build upon your findings. A good example of this is the work done on cold calling.⁹ This was an interdisciplinary effort between communication studies and business faculty to study a teaching method that is now used universally in every discipline.

To be considered SoTL, then, the project must contain carefully crafted research questions, have appropriate methodologies to study the question, and have thoughtful analysis that leads to useful information about learning that can be employed across disciplines.

Research is formalized curiosity. It is poking and prying with a purpose.
Zora Neale Hurston

Reflective Exercise

Reflect on your last year and identify the scholarly elements of your teaching. For example, when did you talk to a colleague about teaching or invite a colleague to observe your class? When did you attend a session on a new idea or technique and then tried it in your course? When did you read anything about teaching or learning? Or when did you join colleagues to explore teaching and learning more deeply? Now reflect on your motivation to engage in scholarly teaching practices—what were the reasons that led you to seek information about your teaching?

If a child can't
learn the way we
teach, maybe we
should teach the
way they learn.
Ignacio Estrada

Why Is SoTL Important Today?

Much has been written about the Millennial student, Generation Y, and the Net generation.^{10,11} This literature was prompted when faculty noticed that students of various generations had different approaches to learning in and out of the classroom. Although the differences in the Millennial generation have led to a lot of complaining about classroom behaviors, the reality is that teaching and learning are evolving as technology and cognitive science advance. As teachers, we can entrench ourselves in our current practices and tough it out, or we can try to adapt our teaching to this generation of learners. Faculty must find ways to facilitate the achievement of the learning goals of their students while engaging today's students in a way that is relevant to them; in other words, teaching and learning are changing, and bridge building is necessary if we are to be successful.¹²

Another reason to engage in SoTL involves our professional responsibilities. As faculty we choose our own textbooks, design our own curricula, choose our own methodologies, and decide what content we are going to teach and what methods we will use to assess our students' learning. Because many of us have never studied the extensive educational research on these topics, we often make decisions and choices based on our experiences either as a learner or teacher. In many ways, although we are hired for our content expertise, our work is to teach and to bring the most evidence-based practices to this activity. We therefore have ethical obligations to be sure that what we choose to do results in student learning.¹³ One of the best ways to meet our professional and ethical responsibilities is to engage in SoTL.

Reflective Exercise

Reflect on the students you have taught this past year—did you notice anything different about their approaches to the classroom, their learning, or the subject? Were there particular classroom issues that you were concerned about or any challenges you have not faced before?

How Can I Do SoTL?

Because there is no one right way to teach, there is no one right way to examine learning. Faculty who are not trained as educational researchers often feel that they do not have the tools to do educational research. But as you

Generation Y, and then faculty noticed changes to learning in the Millennial generation behaviors, the technology and cognitive changes in our current teaching to this generation achievement of today's students in a teaching and learning are successful.¹² Professional responsibility in our own curriculum content we are assessing our students' extensive educational choices. In many ways, work is to teach and quality. We therefore do results in professional and

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will see, SoTL projects reflect the discipline in which they are conducted, and many of the elements of the skill set you bring to your discipline can be applied to the scholarship of teaching and learning. In the following sections, we will take you through a set of exercises and guide you in identifying an SoTL project in your area of expertise. These are based on the three-phase continuum of growth toward SoTL identified by Weston and McAlpine.¹⁴

Phase 1: Intention to Grow and Develop Knowledge About Your Own Teaching

Step 1: Identify a Possible Project

In the last two reflective exercises, you identified areas that you have either begun to explore or challenges that you are having with your classes. Now expand on these observations by reviewing your teaching evaluations and write down any patterns you see in the responses over the last three years. Then ask yourself which of these areas you are most interested in examining. Although you may want to answer the big questions in your discipline research, in your SoTL research you want to answer the questions that you think impede your students' learning. For new faculty, consult with a mentor during your first teaching experiences to identify questions that you could examine the next time you have a teaching assignment.

Step 2: Have Conversations

Because meaningful SoTL research has broad applicability and opens up the classroom, begin discussing this topic with colleagues from your discipline, from other disciplines, and from the teaching and learning center. These conversations will allow you to understand the importance of your inquiry, the resources that are available to help you, possible interdisciplinary connections to your idea, and colleagues in your discipline who may want to collaborate with you because they also have the same interests or challenges.

Phase 2: Transition from Thinking About to Discussing and Conceptualizing a Study

Step 1: Choose Your Research Topic

Because any rigorous discipline research begins with choosing topics that are important to the field, so too does SoTL research. Thompson and colleagues outlined two approaches to formulating good SoTL research.¹⁵ The first is the goal approach. Using this approach, you define a goal for your research, list the questions you wish to explore to answer that goal, and create a one- or two-sentence summary of the goal. The second approach is the issue approach. In this approach, you set criteria to study by asking questions, such as, Is the topic investigatable? or What is the

Somewhere, some-
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 known.
 Carl Sagan

significance of the topic? You then consider the length of time needed, the complexity of the procedures, the availability of subjects, and the availability of support. In reality, these approaches are intertwined, and both are necessary to define a project in which you are interested, that is important, and for which you have the resources to accomplish the work.

Reflective Exercise

Look back at your previous reflective writing in this chapter. Based on these writings, choose a topic that you think meets the criteria of both the goal approach and the issue approach. In other words, choose something you have identified that interests you and that you have the time and resources to investigate.

Step 2: Formulate Clear Questions

This may take some time, but the more focused your question, the easier it will be to determine how to study it and what resources you will need. There are many different kinds of questions to consider. Hubball and Clarke list four types of questions¹⁶:

1. *Context questions.* These questions focus on the critical structures that shape the educational experience, such as course admissions requirements, course prerequisites, or the conceptual framework for a course.
2. *Process questions.* These questions focus on periodic assessments of issues of importance, such as investigating the sequence of course activities or the use of technology.
3. *Impact questions.* These questions focus on results, such as the impact of an educational innovation.
4. *Follow-up questions.* These questions focus on issues resulting from longer-term initiatives.

Hutchings offers four types of questions as well but frames them in more direct language⁵:

1. *What works questions.* These questions seek to identify or validate approaches to learning.
2. *What is questions.* These questions are less about proving and more about describing what something looks like, such as documenting students' approaches to applying abstract concepts to concrete examples and situations.

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3. *Vision of the possible questions.* These questions seek to answer the what if scenarios. What if I try to get students to understand the ethical responsibilities in the field, or what if I teach in a way that makes students more empathetic with patients?
4. *Vision of the future questions.* These questions help to formulate new conceptual frameworks for shaping thoughts about teaching and learning practices.

What both approaches have in common is the desire to answer an important question about student learning that has significance for a wider audience: What are the conditions that can improve learning?

For example, perhaps in your earlier reflective exercises you identified that students seem to be having trouble with problem solving and critically analyzing clinical cases when patients have several comorbidities. From this, you ask yourself, What can I do to improve my students' analytic and problem-solving abilities? Although this is a good starting point, this question is not investigatable. So now you need to ask yourself, Will incorporating student response systems with embedded small-group discussions in my class improve the students' analytic and problem-solving abilities? From here you need to determine how you will know if better learning has occurred, so now the question becomes, Will incorporating student response systems with embedded small-group discussions in my class improve the students' analytic and problem-solving abilities as measured by their scores on the clinical case section of the examination?

Step 3: Determine the Context

As any good researcher knows, to answer a question you must know what has already been done in the field. The same holds true for SoTL. You need to see if there are any studies or relevant literature that will help you design your SoTL study. In the previous example, you may want to explore the literature on student response systems (clickers) to see if there are any useful studies that can help you plan your study. You might also want to look at literature on the development of critical thinking and problem-solving skills. Another avenue might be to explore the educational literature of other healthcare disciplines to see what strategies they have used to develop these skills. Because you are not an expert in these areas, now is the time to look for help. Find colleagues who may be experts in that field or who may be experts in education, cognitive science, teaching, and learning. Consult and collaborate with the staff in your teaching and learning center. By grounding your study in the literature and research, you will save yourself time and energy as you move down the road toward being an expert teacher.

I never teach my pupils; I only attempt to provide the conditions in which they can learn.

Albert Einstein

Reflective Exercise

From the previous exercises, refine your question until you have something you think you can study. Write that question (or those questions) down, and then find a colleague and discuss the question with him or her. Encourage your colleague to ask you questions about your study, the resources you might need, or any concerns he or she may have before you start reading the literature in the field.

Phase 3: Intention to Share Expertise and Develop Scholarly Knowledge About Teaching That Has a Significant Impact on the Institution and the Field

Although initially you may start your SoTL activity as a small internal project, the underlying goal behind the word *scholarship* in the phrase *the scholarship of teaching and learning* is that your findings will be shared. They may benefit colleagues in your institution as well as other members of the pharmacy and general educational communities. Therefore, your SoTL studies should be well designed so that they will meet publication guidelines, such as those set forth in 2009 by the *American Journal of Pharmaceutical Education (AJPE)*.¹⁷ You should consult these guidelines as you begin to plan, and pay particular attention to incorporating an assessment component into any study that attempts to improve student learning. As stated in the *AJPE* publication guidelines, “For scholarship to be truly revered as such, the outcomes of such efforts must be peer-reviewed and publically disseminated with the intention that the scholarly efforts could be reproduced by others.”¹⁷

Step 1: Design the Study

Now you are ready to begin designing your SoTL study. Your first task is to conceptualize how you will study your topic. You need to think about what kind of data you can gather to answer your question. Our suggestion is that you start with your own disciplinary models of research. Most SoTL research uses a mixed methodology of quantitative and qualitative data, so whatever mode you feel most comfortable with should be your starting point. As you will see, some designs are more difficult to implement than others, but initially, thinking in your discipline will get you started.

Qualitative information will allow you to understand the why behind your study question; it is a more flexible design and allows you to generate

a hypothesis. Quantitative data gathering will allow you to make comparisons, to conduct statistical evaluations, and to test your hypothesis. Thompson and colleagues express it this way,¹⁵ as summarized in **Table 14-1**.

As you can see from Table 14-1, most of the work you want to investigate will need both types of data if you are to have a study that captures the complexity of the teaching-learning environment. For example, to study how students use the podcasts of your lectures that you meticulously upload after every class, you would need quantitative data about the number of times the podcasts were listened to and how much of the podcasts the students listened to. You could then correlate these numbers with the test scores students received on the podcast topic. Does listening to the podcast and the amount of time listened relate to the students' test scores? However, to understand how students use the podcasts or why they do not listen, you would need to interview a student and perhaps observe a student listening to one of the podcasts.

Meaningful SoTL involves many methodological approaches from action research models, to case studies, to quasi-experimental design, to phenomenological studies, to an occasional control study. The point here is not to determine the superior design but to choose the design that will help you best answer your research question. However, be aware that research designs with evaluative components are preferred by journals such as *AJPE*.

Step 2: Practical Considerations

Now that you have some idea of the what and the how of the study, you need to be practical. How much time will the study take? What resources will you need to carry out the work? What resources are available on campus to assist you? What will you need to submit to your institutional review board (IRB) before you can start the study?

Here is an example. With the help of your institution's teaching and learning center, you are able to acquire student response systems (clickers). In class, you present a complex clinical case, and then using a series of clicker questions with increasing complexity (each one followed

Table 14-1 Comparison of Characteristics of Qualitative and Quantitative Research Approaches

	Qualitative	Quantitative
Sample	Small, purposeful	Large, representative
Measures	Interviews, observations	Scales, tests, surveys
Findings	Rich, deep	Precise, reliable

Source: Adapted from Thompson S, Nelson C, Naremore R. Toward coherence from alpha to omega in the scholarship of teaching and learning. Paper presented at: Professional Organization and Development Network in Higher Education (POD); October 2000; Vancouver, British Columbia.

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by small-group discussion), you lead the class through the deconstruction of the case into its important elements and finally guide them to identify therapeutic recommendations.

This practical approach only required the time to learn the clicker and discussion strategy and was relatively easy to add to your class. But did the students' learning improve? Did they gain the increased analytic and problem-solving skills that you intended? Isn't that the goal of your efforts—to improve the students' learning and analytic skills? What is missing? You do not have an assessment component. Without that component, you cannot determine if the clicker and discussion approach improved the students' learning. You have a descriptive study, but a more rigorous study design should be considered.

Step 3: Collaborate and Share

You identified your question, chose a research design, and did a pilot descriptive study. But now you realize that your study lacked an assessment component. Wouldn't it have been better if you had sought input for your design from the staff at the teaching and learning center or others who, based on their expertise, could collaborate with you to strengthen the study? Be sure to take advantage of the resources on campus or within your institution and collaborate with others in sister academic institutions who have similar interests.

Because it is difficult to conduct randomized controlled studies in the educational world, your collaborators suggest that you consider two quasi-experimental designs that both contain an assessment component. First, you could do a group comparison of the class performance with and without your clicker–discussion intervention. For example, within the same course and with the same group of students, what about using the traditional case analysis in one clinical area (e.g., hypertension) and then trying the new clicker–discussion method for the next clinical area (e.g., diabetes)? Did the students' problem-solving abilities increase with the use of the clicker–discussion approach? How was improvement in clinical problem solving measured or assessed? This design adds some rigor to your study; now you have a self-controlled pre- and postdesign. But it also leaves room for internal validity issues that could lead to other explanations, such as whether the students gained some problem-solving skills from the hypertension cases so that they were more prepared for, and hence performed better on, the diabetes cases (maturation effect). Be careful of assuming that the changes you observed relate only to your new teaching–learning methods.

If you had two sections of the class, you might be able to answer that question by doing a concurrent pre- and postcontrol study. But more likely, you have one large class, so that approach is not possible. Your collaborators

Experience does not ever err; it is only your judgment that errs in promising itself results which are not caused by your experiments.

Leonardo da Vinci

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suggest that if you taught this course last year, and if the cases and testing methods you used then were of similar complexity to this year's, and if you think the students' abilities are similar, you could consider a historical-controlled design. Notice that this design has a lot of ifs, each having an effect on the comparability of results between the two years as well as the internal validity of your conclusions. But if you are comfortable that the ifs hold true and that the two classes are similar, then your collaborators suggest that you could compare the test scores from last year's class to this year's class in both clinical areas.

Reflective Exercise

What other study designs could you use to answer the SoTL question in this example? Could you incorporate a qualitative component to answer your question?

Reflective Exercise

For your research question, outline the SoTL study process. Indicate the specific questions, study design and methodology, time line in the semester, resources needed, and colleagues with whom you will seek input or collaboration.

Step 4: Obtain Institutional-Specific IRB Guidelines, Write the Study Proposal, Submit It to Your IRB, and Wait for IRB Approval

Just as teaching is contextual, so too are the ethical considerations of SoTL. Conducting SoTL research raises many questions about the privacy of student data, the ability to share information, and the possibility of identification of courses, faculty, or students. But even more to the point, there is a question about the ethics of SoTL data collection. Think of the previous example where you measure the learning effect of a new method

that you sincerely believe will produce better learning for your students. As you conceptualize the project, you begin to wonder if you should use a control group. Is it right to introduce one group of students to something that might make their learning more efficient or effective? Conversely, it is right to try something with a group of students that might not produce the desired results? These are not easy questions. Students are not subjects; they are our professional responsibility, and determining what constitutes that responsibility is a deep and serious discussion.

Pharmacy faculty are familiar with the need to receive IRB approval for clinical trial protocols prior to the initiation of a clinical study, but you may not have a similar level of awareness that many SoTL studies require IRB submission and approval. The same U.S. Department of Health and Human Services (HHS) general regulations (45CFR46) apply to the protection of human subjects in research, independent of location and type.¹⁸ Although we do not want to consider students as subjects, for purposes of scholarly investigation of teaching and learning strategies, we must. If the study involves human subjects, defined as “living individuals about whom an investigator obtains data through intervention or interaction or obtains identifiable private information,”¹⁸ and if the study is classified as research, defined as “a systematic investigation, including research development, testing and evaluation designed to develop or contribute to generalizable knowledge,”¹⁸ then an IRB review will likely be needed. It does seem ironic that SoTL activities, intended for internal university purposes only, generally do not require IRB review, but as soon as you want to “contribute to generalizable knowledge”¹⁸ through a presentation of your findings at a meeting or a publication in the literature, you must have IRB approval for the initial study.

IRB approval is not retroactive. You cannot perform a course intervention to improve student learning, find that the intervention was successful, present it to your department head, who encourages you to publish the results, and then submit the protocol to the IRB for approval so that you can submit the study for publication. Although IRB approval is generally not needed for internal curricular improvement and evaluation purposes, when you generalize your results to share them with an external audience, IRB approval is needed. Therefore, the message is clear: if you are going to conduct a well-designed SoTL study, submit your protocol to the IRB for approval so that you can share your findings at the completion of the study.

Several suggestions may help you to become acquainted with these requirements. First, take the National Institutes of Health online course called Protecting Human Research Participants, which you can access at <http://phrp.nihtraining.com/users.login.php>. Second, learn the distinctions^{18,19} among exempt, expedited,²⁰ and full IRB review and what study design elements would trigger the more rigorous full reviews. Knowing these

If you plan to share your SoTL findings beyond your institution, obtain IRB approval before you begin the study.

distinctions is a valuable input as you design your study so that your IRB submission may be handled as efficiently as possible. Third, learn the purpose, content, and alternate methods of obtaining informed consent from students. And fourth, introduce yourself to the staff at your institution's office of human subjects and IRB and become familiar with institution-specific policies, regulations, IRB submission materials, and other documents, as well as the board's meeting dates. Remember that if you plan to present or publish your findings, no SoTL activity should start until you have an approval letter from your IRB.

Even if you believe your study is exempt, wait until you receive the IRB letter stating that the study is exempt before you start. If you proceed without IRB approval, you do so at your own peril. Scholars at one institution collected student data, believing that their data collection efforts were exempt from human subjects regulations as part of a national geriatrics curriculum evaluation. Although the investigators had sent a letter to the IRB requesting exempt status, the letter was not answered at the time of their study. Students complained to the IRB about some aspects of the data being collected. The IRB issued formal allegations of research misconduct against the involved faculty and stopped further data collection.²¹ The faculty's self-determination of an exemption status without the independent judgment of the IRB precipitated this unfortunate experience.²¹

Each institution is responsible for ensuring that the submitted educational protocol receives the appropriate level of review. But unfortunately, several studies indicate that institution-specific IRB decisions can be quite idiosyncratic, and the same protocol can lead to different decisions at different institutions. Three brief examples follow: two are in health services research and one is in medical education research. All involve multicenter studies with the same common study protocol, and all IRB submissions were made by the local principal investigator to the IRBs at the participating sites.

In the first instance, a multicenter study of the IRBs at 15 participating sites, 9 approved a common telephone survey protocol through an expedited process, but 6 sites required full IRB review. Several requested changes to the protocol (thus negating a common protocol across all 15 sites).²² The elapsed time between submission and the issuance of the IRB letter ranged from 5 to 172 days. In the second case, investigators designed a multicenter study to qualify for expedited review status by the IRBs associated with the 43 Veterans Administration primary clinics that were participating in the study. However, only 10 IRBs expedited the common protocol, 31 required full reviews, one rejected it, and one exempted it. Here the review process took between 52 and 798 days, with 23 IRBs requiring that the consent form be modified.²³ And in the third example, faculty at six medical schools proposed to invite medical students to participate in a Web-based

No longer can the educator or the institutional leadership make the determination that medical education data are exempt from the human subjects review process.²¹

J.M. Tomkowiak,
A.J. Gunderson

survey of the effect of medical school on the students' quality of life. Four IRBs expedited the review of the common protocol, and two gave it a full review; five IRBs asked for a median of 13 changes to the protocol, with 33 percent of these requests being made by only one institution.²⁴

The overall message is that if you are going to invest the time and effort to conduct an important and well-designed study involving your students that will likely be of value to the greater educational community, you owe it to yourself, your students, and your colleagues to submit the protocol to your IRB and gain its approval. However, given the variability within the IRB decision process, you would benefit from consulting with the IRB staff at your university prior to submission of your protocol so that institution-specific IRB issues are addressed in your study.²⁵

Reflective Exercise

Consult with the staff at your institution's office of human subjects protection and the IRB. Obtain the requirements for the format of your study protocol submission. Do you think your proposal meets the definition of exempt, expedited, or full review status? Determine if and how you will deal with obtaining informed consent from the students. Convert your study outline into a full proposal for IRB consideration.

Step 5: Conduct the Study and Analyze the Results

You have received IRB approval for your research design, and you have located the test results of the students in last year's class on the analytic questions in the hypertension and diabetes sections. Although informed consent was not required by the IRB, you have told students not only what you are doing, but *why* you are doing this type of work and the important role they play in this work. You start the study by presenting the hypertension content in the traditional way and then introduce the clicker-discussion approach with the diabetes unit. You administer the tests, compare this year's to last year's results, and summarize your findings in **Table 14-2**.

Last year's traditional class averaged a two-point improvement from hypertension to diabetes, and this year's clicker-discussion diabetes class had an eight-point improvement over the traditional hypertension teaching approach. Next, based on the sample size and standard deviations, you can determine whether the six-point difference between these teaching methods is statistically significant. With your new methodology, you have improved the design of your study and evaluated the effectiveness of your new teaching strategy.

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Table 14-2 Average Class Scores for Analytic Questions in Hypertension and Diabetes Clinical Cases with Traditional and Clicker-Discussion Teaching Strategies Across Two Years

	Hypertension Analytic Questions	Diabetes Analytic Questions	Change in Test Score	
Last year	Traditional approach Mean score = 80%	Traditional approach Mean score = 82%	2-point improvement	6-point improvement in the difference between differences
This year	Traditional approach Mean score = 81%	Clicker-discussion approach Mean score = 89%	8-point improvement	

You also have IRB approval to run a focus group of randomly selected students, and in coding the data you determined that the use of clickers created a more active learning environment. Triangulating your data from the quantitative and qualitative methods, you realized that introducing clickers improved both the actual learning and the learning environment of the course.

Step 6: Write Up the Study

This is the step that often differentiates SoTL from traditional scholarship. You have already been exposed to reflection as a key element of good teaching. Reflective practice is also a hallmark of SoTL work. Hutchings advises faculty to use a format that contextualizes the findings.⁵ SoTL is an ongoing process of reflection and improving practice; studies are seen as part of a continuum in which the results from one study often lead to a cycle of continuous course improvement, especially when conducted on a single class or a single segment of the curriculum. Hutchings also encourages faculty to think about the broader context or significance of the results.⁵ How does your study inform the larger world of higher education? In the spirit of collaboration that is a critical element of SoTL work, faculty are also encouraged to write about the benefits of their work and how it promotes student learning, then share the lessons learned with their colleagues. Remember, this is a newer form of scholarship, and we are all learning how to do this together.

Step 7: Get the Word Out

Getting SoTL work published can be challenging, but it is getting much easier. There are a number of journals devoted entirely to SoTL, such as the *International Journal for the Scholarship of Teaching and Learning*, *Excellence in Teaching Journal*, and the *Journal of Scholarship of Teaching and Learning*. However, as this form of scholarship has grown, so have the types of publications that will publish SoTL work. Within pharmacy education, the *American Journal of Pharmaceutical Education*, *Pharmacy Education: An International Journal for Pharmaceutical Education*, *Currents in Pharmacy Teaching and Learning*, and discipline-specific journals provide opportunities for publication. Check with your professional organization,

Follow effective action with quiet reflection. From the quiet reflection will come even more effective action.

Peter Druker

departmental colleagues, and teaching center personnel to find the appropriate journal. A particularly helpful Web site designed by Kathleen McKinney is located at <http://www.sotl.ilstu.edu/resLinks/sotlMats/getPub.shtml>. This Web site lists 22 excellent tips on getting your article published.

There are many other methods of disseminating your findings to improve teaching and learning. There are newsletters, such as the *Teaching Professor* or the *National Teaching and Learning Forum*. There are also educational conferences with workshops and poster sessions, such as the American Association of Colleges of Pharmacy annual meeting, the Teaching Professor national conference, the International Society for the Scholarship of Teaching and Learning, Lilly Conferences, and the London Scholarship of Teaching and Learning (SoTL) International Conference. In the spirit of SoTL, presenting your work to your home department, college, or campus is extremely valuable in promoting the concept of improving student learning as scholarship. As colleagues learn how this work will enrich their students' learning, a culture can be created that promotes and values SoTL and encourages further SoTL activities.

What Are Other Ethical Considerations in SoTL?

In addition to the IRB issues, what are other ethical considerations in SoTL? When you disseminate your information, you must be aware of your audience and tailor your work. For example, if you are presenting data from your course, be sure that you protect the identity of your students; especially in smaller settings, it is often too easy to identify outliers in your data. We recommend that you do not use SoTL to identify ineffective practice, but always think of your research in the positive light of identifying and improving practice. This approach will avoid the ethical dilemma of doing something you think will not work just to prove that point. For a more complex and complete description of the ethical issues in SoTL, we recommend that you read Hutchings's work, *Ethics and Aspiration in the Scholarship of Teaching and Learning*, from the Carnegie Foundation for the Advancement of Teaching.²⁶

Reflective Exercise

Take a moment to consider your SoTL project. What ethical issues can you identify in your project? Who will help you solve these issues?

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Summary

Teaching is difficult, fascinating, frustrating, rewarding, challenging, joy-ful, and mysterious. Yet as professionals we need to approach our teach- ing and our goal of improving student learning as we approach all of our professional responsibilities—as scholars. The scholarship of teaching and learning is one way to meet our professional responsibilities, grow and develop as teachers, and contribute to the larger higher education context.

References

1. Boyer E. *Scholarship Reconsidered: Priorities for the Professoriate*. San Francisco, CA: Jossey-Bass; 1990.
2. Cambridge B. What is the scholarship of teaching and learning? *AAHE Bull.* 1999;52(4):7–10.
3. Kreber C, Cranton PA. Exploring the scholarship of teaching. *J Higher Educ.* 2000;71(4):476–495.
4. Richlin L. Scholarly teaching and the scholarship of teaching. In: Kreber C, ed. *Scholarship Revisited: Perspectives on the Scholarship of Teaching and Learning*. San Francisco, CA: Jossey-Bass; 2001:57–68.
5. Hutchings P. Approaching the scholarship of teaching and learning. In Hutchings P, ed. *Opening Lines: Approaches to the Scholarship of Teaching and Learning*. Menlo Park, CA: Carnegie Foundation for the Advancement of Teaching; 2000:1–10.
6. Martin E, Benjamin J, Prosser M, Trigwell K. Scholarship of teaching: a study of the approaches of academic staff. In Rust C, ed. *Improving Student Learning: Improving Student Learning Outcomes*. Oxford, England: Oxford Centre for Staff Learning and Development, Oxford Brookes University; 1999: 326–331.
7. Huber M, Hutchings P. *The Advancement of Learning: Building the Teaching Commons*. San Francisco, CA: Jossey-Bass; 2005.
8. Shulman L. Taking learning seriously. *Change.* 1999;31:10–17.
9. Dallimore E, Hertenstein J, Platt M. Classroom participation and discussion effectiveness: student-generated strategies. *Commun Educ.* 2004;53:1–11.
10. Twenge J. *Generation Me*. New York, NY: Free Press; 2006.
11. Oblinger DG, Oblinger JL, eds. *Educating the Net Generation*. Washington, DC: EDUCAUSE; 2005. <http://www.educause.edu/books/educatingthenetgen/5989>. Accessed June 12, 2009.
12. Qualters, D. Building bridges to learning. Keynote address to the Learning Assistance Association of New England (LAANE); October 2007; Wellesley, MA.
13. Pecorino P, Kincaid S. Why should I care about SoTL? The professional responsibilities of post-secondary educators. *Int J Scholarsh Teach Learn.* 2007; 1(2). <http://www.georgiasouthern.edu/ijsotl/current.htm>. Accessed June 15, 2009.
14. Weston C, McAlpine L. Making explicit the development toward the schol- arship of teaching. *N Dir Teach Learn.* 2001;86:89.
15. Thompson S, Nelson C, Naremore R. Toward coherence from alpha to omega in the scholarship of teaching and learning. Paper presented at: Profes- sional Organization and Development Network in Higher Education (POD); October 2000; Vancouver, British Columbia.

16. Hubball H, Clarke T. Diverse methodological approaches and considerations for SoTL in higher education. http://www.cte.hawaii.edu/handouts/CJSoTL_Paper.pdf. Accessed November 16, 2009.
17. Poirier T, Crouch M, MacKinnon G, Mehvar M, Monk-Tutor M. Updated guidelines for manuscripts describing instructional design and assessment: the IDEAS format. *Am J Pharm Educ.* 2009;73(3):article 55.
18. US Department of Health and Human Services, Office for Human Research Protections. Title 45 part 46. Basic HHS policy for protection of human subjects. www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.htm. Accessed January 15, 2010.
19. US Department of Health and Human Services. Office for Human Research Protection (OHRP). Human subjects regulations decision charts. www.hhs.gov/ohrp/humansubjects/guidance/decisioncharts.htm. Accessed January 15, 2010.
20. US Department of Health and Human Services, Office for Human Research Protections. Categories of research that may be reviewed by the institutional review board (IRB) through an expedited review. www.hhs.gov/ohrp/humansubjects/guidance/expedited98.htm. Accessed January 15, 2010.
21. Tomkowiak JM, Gunderson AJ. To IRB or not to IRB? *Acad Med.* 2004;79:628–632.
22. Dziak K, Anderson R, Sevick MA et al. Variations among institutional review board reviews in a multisite health services research study. *Health Serv Res.* 2005;40:279–290.
23. Green LA, Lowery JC, Kowalski CP, Wyszewlanski L. Impact of institutional review board practice variation on observational health services research. *Health Serv Res.* 2006;41:214–230.
24. Dyrbye LN, Thomas MR, Mechaber AJ et al. Medical education research and IRB review: an analysis and comparison of the IRB review process at six institutions. *Acad Med.* 2007;82:654–660.
25. Henry RC, Wright DE. When do medical students become human subjects of research? The case of program evaluation. *Acad Med.* 2001;76:871–875.
26. Hutchings PA. Ethics and aspiration in the scholarship of teaching and learning. http://www.carnegiefoundation.org/elibrary/docs/ethics_of_inq-intro.pdf. Accessed April 6, 2010.

Additional Resources

1. A PowerPoint tutorial on SoTL with audio description supplements and faculty project examples is provided online by the International Society for the Scholarship of Teaching and Learning at <http://www.issotl.org/tutorial/sotltutorial/intro/intr01.html>.
2. Murray R, ed. *The Scholarship of Teaching and Learning in Higher Education*. Berkshire, England: Open University Press, McGraw-Hill Education; 2008.
3. US Department of Health and Human Services, Office of Inspector General. Institutional review boards: a time for reform. <http://oig.hhs.gov/oei/reports/oei-01-97-00193.pdf>. Accessed January 15, 2010.
4. Byerly WG. Working with the institutional review board. *Am J Health Syst Pharm.* 2009;66:176–184.