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Changing Future Faculty's Conceptions of SoTL

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Abstract

Preparing Future Faculty (PFF) programs provide graduate students across all disciplines with professional development that addresses a range of faculty responsibilities. The scholarship of teaching and learning (SoTL) combines education research with the practice of teaching by implementing, disseminating, and applying research on educational practice and interventions. During a PFF program at a public university, we used a pre-post writing prompt to examine changes in future faculty's conceptions of SoTL. Pre-workshop responses included misconceptions that indicated unfamiliarity with SoTL. Post-workshop responses had an increased emphasis on sharing outcomes from educational interventions. Only 8% of pre-workshop responses included all main elements of SoTL, and this increased to 44% for post-workshop responses. We suggest that graduate programs should include training in SoTL so that future faculty are prepared to develop and advance their teaching programs using both existing pedagogical research as well as scholarly approaches to research in to their own teaching.

Keywords

SoTL, teaching, education, faculty, graduate student

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Preparing Future Faculty (PFF) programs provide graduate students across all disciplines with professional development that addresses a range of faculty responsibilities. The scholarship of teaching and learning (SoTL) combines education research with the practice of teaching by implementing, disseminating, and applying research on educational practice and interventions. During a PFF program at a public university, we used a pre-post writing prompt to examine changes in future faculty's conceptions of SoTL. Pre-workshop responses included misconceptions that indicated unfamiliarity with SoTL. Post-workshop responses had an increased emphasis on sharing outcomes from educational interventions. Only 8% of pre-workshop responses included all main elements of SoTL, and this increased to 44% for post-workshop responses. We suggest that graduate programs should include training in SoTL so that future faculty are prepared to develop and advance their teaching programs using both existing pedagogical research as well as scholarly approaches to research in to their own teaching.

INTRODUCTION

The scholarship of teaching and learning (SoTL) combines education research with the practice of teaching. Although there is debate about the specific set of characteristics that define SoTL, broad frameworks illustrate the continuum of teaching and research combinations used by faculty in higher education (e.g., Kern et al., 2015). Within the context of higher education, preparing current doctoral and postdoctoral students to be future faculty members is important for many educational institutions. To supplement training that future faculty get within their primary academic units, which is typically focused largely on developing disciplinary research skills, Preparing Future Faculty (PFF) programs and faculty learning communities have been developed at many research-intensive universities to address other areas of faculty work and to provide students with a more nuanced understanding of faculty responsibilities, including how educational research can be used to improve teaching in discipline-based classrooms (Richlin & Cox, 2004; Connolly et al., 2007; Hubball & Clarke, 2010).

PFF programs help future faculty understand how opportunities and expectations of educational institutions vary across a spectrum from teaching-intensive to research-intensive institutions, including relative expectations around teaching. PFF programs also provide an opportunity to advance our knowledge of what doctoral and postdoctoral students already know about SoTL in the absence of specific training, and how an educational intervention can change their understanding. The research questions this paper addresses are three-fold: 1. What are the *pre-workshop* conceptions of SoTL held by future faculty members? 2. What are the *post-workshop* conceptions of SoTL held by future faculty members? 3. What *changes* in these conceptions result from a two-hour active learning workshop in which future faculty explore SoTL? The larger goal of this research was to provide information that could be used to improve the workshop as well as to inform the larger community about conceptions and conceptual changes of graduate and postdoctoral students as they learn about SoTL.

METHODS

We used a qualitative descriptive design approach for this study. Qualitative descriptive research provides a comprehensive understanding of events in the everyday terms of those events (Sandelowski, 2000). Using a qualitative descriptive design is recommended when familiarity exists between the research and the data being collected (Adler & Clark, 2010). Qualitative descriptive studies focus on depicting the actual description of the phenomenon, and this approach is recommended when the research intends to provide themes related to the phenomenon being examined with the desired outcome to understand how individuals understand a particular type of phenomenon (Sandelowski & Barroso, 2007). We employed a thematic analysis to interpret and make meaning of the data. Thematic analysis is "a method for identifying, analyzing, and reporting patterns (themes) within the data" (Braun & Clark, 2006, p. 79). Thematic analysis allows researchers to identify common threads across multiple sets of data, and provides a nuanced, and detailed, interpretation of the data (Braun & Clark, 2006).

This qualitative study was conducted over the course of three years at a large, public, land-grant, Midwestern, research-intensive university. The purpose of this study was to determine the initial conceptions of SoTL held by future faculty members and to explore what changes in these conceptions occurred as a result of engaging in a two-hour active learning workshop in which future faculty explored SoTL.

Over the course of the three years, 151 graduate and postdoctoral students enrolled in a "Preparing Future Faculty" (PFF) graduate school course and participated in this study. There was a total of 5 Master's level students, 129 PhD level students, and 17 postdoctoral students. This group included 83 international students and 67 domestic students. Within the semester-long PFF program, a single two-hour workshop focused on SoTL. Participants completed pre- and post- workshop evaluations that included responses to the following prompts: *Write a brief (2-4 sentence) description of the "scholarship of teaching and learning". What is it? What does it involve? How would you recognize it?*

On the same piece of paper as the pre-workshop evaluation, participants also provided basic demographic information, including educational level, gender, and status as a domestic or international student. The post-workshop answers were written on the back of the sheet of paper, and so we are able to connect pre- and post-workshop responses for each participant.

The written short answers were converted into electronic text and analyzed both manually and with NVivo qualitative analysis software (Bazeley & Jackson, 2013). We began by manually coding all pre-workshop transcripts and we then coded the post-workshop transcripts. Initial coding focused on specific elements of SoTL that emerged from the transcripts (described in more detail below). Before analyzing the coding data, the researchers also classified each response as fitting one of the four quadrants of SoTL identified in the Kern et al., (2015) DART model (described in detail in a later section).

We began data analysis by coding for specific elements ("exploratory codes") found within the responses. Before these codes were analyzed, the researchers also coded each pre- and post- response holistically using the Kern model's quadrants ("quadrant codes"). In this way, the researchers were able to produce two subsets of data: one describing the number of responses that matched each quadrant of the Kern model for pre- and post- evaluations, and another set of data that describes the specific elements found within each quadrant (both pre- and post-workshop) of the Kern model, as used by the researchers in this study.

After reading through all data entries from all participants, the analysts agreed upon 8 codes that adequately described various components of SoTL described by the participant responses. These codes are (in alphabetical order) assessment, award, emotion, funding, mentoring, professional development, publish/communicate, theoretical understanding. We also coded each of the individual pre- and post- responses as belonging to one of the four quadrants of the Kern Model without specific knowledge

of which of the eight exploratory codes were identified within specific responses.

SoTL Workshop

A two-hour workshop on SoTL for future faculty was developed as part of a PFF program at a large, public, land-grant, Midwestern, research-intensive university by a professor who has integrated SoTL into a wide-ranging and productive faculty career. At the start of the workshop, an initial writing-prompt activity was used to collect information on participant characteristics and conceptions of SoTL. Then the participants were engaged in a series of activities involving individual reflection, small group discussion, and entire-class report back. This allowed each participant to think through their ideas and perspectives on a question, engage with a small number of peers through in-depth discussion, and then learn about the ideas that came up in the entire class. For each activity, the instructor then summarized class ideas and provided context from the research literature and from policies and practice at the university.

The set of discussion questions in the workshop first explored the participants' experiences in how teaching is evaluated at the university, how they thought teaching should be evaluated, and their conceptions of "scholarship". The instructor then led a discussion of how scholarship is defined in university policy, and how this compares to the key elements of SoTL as defined by the Carnegie Foundation (Cambridge, 2001). Small groups of participants worked together to design a hypothetical example of an activity based on teaching at the university that would also qualify as SoTL. Several groups then presented their activities to the entire class for discussion and feedback. The instructor

Figure 1. The Dimensions of Activities Related to Teaching (DART) conceptual model identifying four approaches to teaching (slightly modified from Kern et al., 2015)
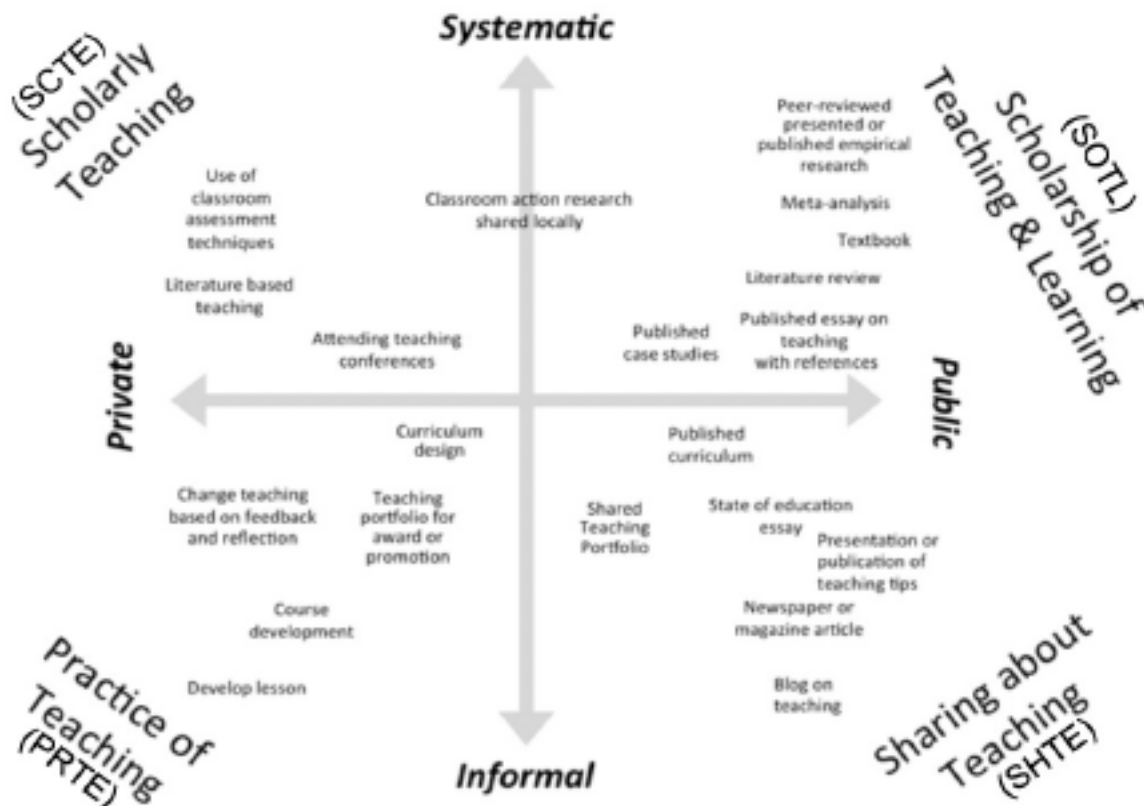
then shared examples of SoTL projects and publications. The final individual/small group/class activity focused on reasons why faculty members at a range of types of institutions would want to pursue SoTL as part of their work. At the end of the workshop, a section of the initial activity was repeated to collect information on participant conceptions of SoTL for comparison with their conceptions coming into the workshop.

RESULTS
DART Model and Quadrant Codes
(Kern et al., 2015)
The framework model we used to examine SoTL conceptions in this study is the Dimensions of Activities Related to Teaching (DART) model, which situates SoTL within a continuum across two dimensions: private to public and systematic to informal (Kern et al., 2015). The four quadrants in this model (figure 1) represent idealized versions of SoTL conceptions that are interpreted by Kern et al. (2015) to be incomplete representations of SoTL, except for the quadrant that represents an extremely public and systematic approach (upper right quadrant in figure 1). The other quadrants represent conceptions focused on the practice of teaching, scholarly teaching, and sharing about teaching. These four quadrants were the basis for our overall analysis of each participants' written work. Although we chose to keep the framework (both the continuum and the quadrants) of the DART model, we also decided that we needed to define the quadrants in our own terms in order to be more explicit about how our coding represented student perspectives along the continuum of SoTL. The following section describes the "idealized" quadrants of SoTL that are represented in the DART model based on our own understanding of the perspectives, activities, and deliverables that characterize each quadrant. We also include a quote from a participant that fits each quadrant.

Practice of Teaching, PRTE
The practice of teaching (PRTE) quadrant of the Kern model, for this study, designates a pragmatic perspective. Responses categorized as PRTE reflected primary emphasis on teaching without reflection, evaluation as a natural element of practices taken on by teachers, and little to no mention of communicating with peer instructors or reporting results of evaluations through more formal means (such as journal articles and conference presentations). Other responses categorized as PRTE focused on commonly held conceptions of common duties of teachers, such as lectures, homework, creating courses, and writing syllabi. This quadrant also captured instances of individualistic (i.e. personal) qualities that were attributed as necessary for someone to practice the scholarship of teaching and learning (e.g. well-organized, passionate).

An example of a response categorized as PRTE follows:

> The scholarship of teaching and learning: A faculty position more focused on teaching. Teaching and learning of students. Not sure what it is! Maybe depending on the institute and its mission's statement. Also, places where population of undergrads is more than graduates.
>
> – Student B

Before the workshop, Student B perceives that SOTL is characterized primarily by teaching and learning of students. There is no mention of communication between the instruc-

tor (e.g. faculty member) nor the broader academic community about how their teaching practices were received. Neither is there mention of incorporating current educational research into teaching practices. This response was not abnormal among the complete dataset of pre-workshop responses.

Scholarly Teaching, SCTE
The scholarly teaching (SCTE) quadrant of the Kern model, for this study, designates a teaching perspective grounded in teaching pedagogy, frameworks, and evaluative practices to test student progress, and a rich understanding of teaching styles. There was some mention of communicating results of pedagogical interventions or student evaluations of comprehension. Many responses categorized as SCTE focused on a "deliberate" approach to conducting research on educational interventions, potentially reflecting the deep understanding of teaching literature and necessary processes for quality educational research.

An example of a pre-workshop response characterized as SCTE follows:

> The scholarship of teaching and learning refers to the fact that teaching and learning are both scholarly endeavors rather than thinking of them as opposites on a continuum of faculty position types. Teaching and learning are as involved and complex as research thus needing the time and energy to study and develop the skills and knowledge necessary to be effective teachers. It involves deliberate planning and study of best practices and deep knowledge of your students and what their needs are. It is recognizable when teachers are clear about why they make certain decisions and are asked to adjust to student needs.
>
> – Student F

This student's pre-workshop response defines SOTL by relating teaching and learning to research practices. Deliberate planning and study of best practices emphasize the student's perception that SOTL must involve some knowledge of the current educational practices being undertaken within the academic community as well as an understanding of the learners within the educational context. However, there is no mention of disseminating the results of the scholarship undertaken by the teachers in this context.

Sharing about Teaching, SHTE
The sharing about teaching (SHTE) quadrant of the Kern model, for this study, reflects a teaching perspective focused on communication. Responses coded as SHTE reflected peer communication between instructors (both as mentor and mentee), and also reflected more formal communication through conference presentations, professional development activities, and publishing research articles about teaching practices.

Student G's pre-workshop response, which was categorized as SHTE follows:

> The scholarship of teaching and learning is focused on the intrinsic value of successfully communicating knowledge to someone else and adapting your communication style based on feedback. It involves elements of pedagogy, good speaking and listening skills, and attentiveness to the situation at hand. It can be recognized by its fruits: successful/conveyance about info., adaptive teaching style, and engagement by multiple parties.
>
> – Student G

Student G definitely makes it clear that communication between the instructor and third parties is a key component of SOTL. The student also implies that there should be communication between the instructor and the learners in order to promote formative feedback mechanisms which allow the instructor to adapt her/his teaching methods according to student needs. The student does mention pedagogy but does not elaborate on which "elements of pedagogy" are necessary for an educational intervention to be considered SOTL.

Scholarship of Teaching and Learning, SoTL

The scholarship of teaching and learning (SoTL) quadrant of the Kern model, is the most comprehensive quadrant of the Kern model, and it incorporates all of the aspects of the other three quadrants with emphases placed on incorporating results of teaching interventions into scholarly journals, strong evaluative practices within the classroom, and a well-developed literature review of previously published research on the relevant teaching models, assessment strategies, and theoretical frameworks.

The pre-workshop response from Student J was categorized as SOTL:

Scholarship of teaching and learning is the scientific approach to education. It involves research in regard to teaching and seeks to improve the ways in which we learn and educate. It also is an attempt to seek recognition and exposure for research and advances in teaching at the university.

– Student J

Student J describes SOTL as a "scientific approach to education". They explain further that teaching as research can be used to improve learning and teaching practices. We interpreted the last sentence to mean that seeking recognition and research exposure meant disseminating the results of the educational intervention. Although this pre-workshop response is not very detailed all of the components of SOTL are there, and this was the best pre-workshop example of an SOTL response from the 2016 dataset.

Exploratory Codes

Each code will have a description followed by abbreviated portions of responses that include examples of each code from the transcribed interviews (the most relevant parts of the text in the responses have been bolded by the authors).

Assessment

This code highlighted instances where participants mentioned "assess", "evaluate/evaluations", "feedback", and "exams". This code was used to show any sort of analysis of performance results of students (content exams) and/or instructors (peer-reviewed formats). Often these codes were juxtaposed next to sentences proclaiming improvement in scores/results was the purpose in administering assessment tools.

Examples of portions of responses coded as "assessment" (bolded words added by the researchers):

*This type of research is easily recognized in a simple act such as **evaluations** or **discussing strengths and weaknesses with students and teachers.***

– Student H

*It is the systematic process of identifying a problem related to teaching and learning, **evaluating innovative solutions to***

*the problem** and sharing it with a larger audience through publication in a peer-reviewed journal/conference.*

– Student C

Award

This code was used to identify transcript references to awards to individuals for superior achievements. This may or may not be associated with a monetary award. Examples from the transcripts include: "acknowledgement a teacher receives", "award faculty for their success in educating and mentoring students", and "honor/sponsor to support teaching and learning".

Examples of portions of responses coded as "award":

*A type of **award** for (faculty members, TAs) who are outstanding at teaching.*

– Student K

*The scholarship of teaching and learning is **some funds that give [sic] to excellent teachers or instructors**, which is an award to them **to reward their effort on teaching and instructing and mentoring students.***

– Student L

Emotion

This code indicated where participants claimed that the scholarship of teaching and learning depended, at least in part, on the demeanor and disposition of the instructor. Commonly identified excerpts for this code are "creative", "passion", "innovative", "organized", and "engaging".

Examples of portions of responses coded as "emotion":

*It's about teaching philosophy and procedure I assume, and an understanding of learning processes and how to facilitate learning. It involves knowledge, skills, practice, and **passion**.*

– Student N

*Knowledge of teaching may encompass anything from **basic classroom management skills to proper organization** and structure of a course.*

– Student O

Funding

This code indicated when participants associated the scholarship of teaching and learning with a source of financial resources. Typical words used in this coding node were "scholarships", and "grants".

Examples of portions of responses coded as "funding":

*I think a **financial support program** to support a faculty member to provide better teaching and learning.*

– Student M

Budget strategy. *Life plane and long-standing **budget allocation** [your salary, your income, your pocket money, your possessions].*

– Student P

Mentoring

This code illustrated when participants mentioned mentoring relationships between instructor and students, as well as peer mentoring between senior and junior faculty members. Examples of this code are "feedback between teacher and student", "active dialogue between the professor and the class", and "recognizing students' needs and addressing them".

Examples of portions of responses coded as "mentoring":

*By this, I mean that the experience of teaching and learning is simultaneous, and will always entail an identification of your strengths and weaknesses along with **mutual growth between student and teacher.***

–Student Q

*The scholarship of teaching and learning is the aspect of a faculty of education to be able to teach and **inspire others to learn**, a will as to strive in progressing towards their learning… I would recognize it as an educator who is passionate and through [sic] in helping his or her students learn their lessons but know **to motivate them to pursue success.***

– Student R

Professional Development
This code identified activities mentioned by the participants that imply continued education (e.g. pedagogical techniques, education research studies, learning to improve cultural relevancy). Often this code was identified by the words "conference", "workshops", and "continuing education".

Examples of portions of responses coded as "professional development":

***Continues education** regarding the delivery of knowledge to pupils. Conveying or disseminating knowledge to others (**education/enlightening others on a particular subject/ topic area**)*

– Student S

*Career advances can be made by investing time in teaching and **educating self**. It involves **continuing education.***

– Student T

Publish/Communicate
This code illustrated the many instances where participants mentioned "publishing", "journal articles", "peer-review", and "communication". Although this code is very broad, the component of communication (or public-ness) is of high importance across the vast majority of SoTL definitions. Publications continue to be a hallmark of academic credentials and SoTL researchers also use publication of education intervention results as a way to define SoTL.

Examples of portions of responses coded as "publish/communicate":

*It's a discipline taken up by **anyone needing to communicate and instruct information**.*

– Student U

*I have learnt from all the collective experiences as of my forefathers (immediate family and world at large), I desire to critically analyze, build up on it and **share my thoughts to the next generation**. This **cycle of knowledge** needs to go on for the collective wisdom of humanity.*

– Student V

Theoretical Understanding
This code required more nuanced interpretations of participant transcripts. Many participants did not directly mention that a theoretical understanding (e.g. of education research, pedagogical techniques) is required for the practice of SoTL, however many participants mentioned activities that promote theoretical

understanding, such as: "literature review", "pedagogy", "learning styles", "using education literature and research results from your courses to improve your teaching methods".

Examples of portions of responses coded as "theoretical understanding":

*The scholarship of teaching and learning is **the study of instruction and student learning**. It involves **collecting data on various teaching methods and the learning that may result from them.***

– Student W

*The scholarship of teaching and learning – effective, successful methods of teaching to support optimal learning. Involves a **variety of methods of teaching to address the needs of the students**, particularly due to differences in learning styles.*

– Student X

Research Questions Examined Through the Data
We report both the pre- and post-workshop data in the same format: For all 151 participants each of their responses was categorized into one of the DART quadrants (Kern et al., 2015), if possible. However, this does not preclude the possibility that each response could potentially mention all 8 of the exploratory themes, so our percentages reported for each exploratory theme are the percentage out of all 151 responses that had mention of that particular theme.

RQ1: What are the pre-workshop conceptions of SoTL by future faculty members?
The majority of the pre-workshop responses (n=151, 56%) fit the practice of teaching (PRTE) quadrant (Figure 2) of the DART model. The scholarship of teaching (SCTE) was the second most common quadrant, representing 19% of the pre-workshop responses. The SHTE and SOTL quadrants of the dart framework as well as those responses that were not classified into a quadrant, had similar percentages of the remaining responses (9%, 8%, and 8% respectively) (Figure 2).

"Theoretical understanding" was the most common exploratory theme (42% of responses) mentioned when future faculty members were asked to define SoTL (Figure 3) before they participated in the SoTL workshop. The second most fre-

Figure 2. The percentages displayed indicate the distribution of pre-workshop responses categorized using the DART model framework (Kern et al., 2015) (PRTE=56%, SCTE=19%, SHTE=9%, SOTL=8%).
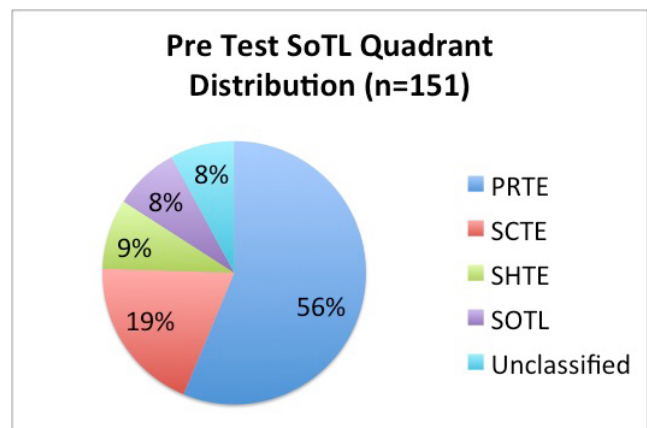

Pre Test SoTL Quadrant Distribution (n=151)

8%
8%
9%
19%
56%

■ PRTE
■ SCTE
■ SHTE
■ SOTL
■ Unclassified

Figure 3. Combined dataset (three years of data) displaying the frequency of eight exploratory themes identified in the pre-workshop responses.

			Assessment	Award	Emotion	Funding	Mentoring	Professional Development	Publish/ Communicate	Theoretical Understanding
2014	Pre	PRTE	3	3	7	0	6	2	2	8
2015	Pre	PRTE	11	1	10	4	10	1	2	13
2016	Pre	PRTE	11	5	8	8	6	3	0	12
		Total	**25**	**9**	**25**	**12**	**22**	**6**	**4**	**33**

			Assessment	Award	Emotion	Funding	Mentoring	Professional Development	Publish/ Communicate	Theoretical Understanding
2014	Pre	SCTE	9	0	3	0	1	3	4	8
2015	Pre	SCTE	4	0	1	0	0	0	0	6
2016	Pre	SCTE	0	0	1	0	1	0	3	7
		Total	**13**	**0**	**5**	**0**	**2**	**3**	**7**	**21**

			Assessment	Award	Emotion	Funding	Mentoring	Professional Development	Publish/ Communicate	Theoretical Understanding
2014	Pre	SHTE	1	0	1	0	1	1	1	0
2015	Pre	SHTE	1	1	0	0	3	1	1	2
2016	Pre	SHTE	2	0	1	0	0	2	5	3
		Total	**4**	**1**	**2**	**0**	**4**	**4**	**7**	**5**

			Assessment	Award	Emotion	Funding	Mentoring	Professional Development	Publish/ Communicate	Theoretical Understanding
2014	Pre	SOTL	4	0	0	0	0	1	5	3
2015	Pre	SOTL	4	0	0	0	1	2	4	2
2016	Pre	SOTL	0	1	0	0	0	0	0	0
		Total	**8**	**1**	**0**	**0**	**1**	**3**	**9**	**5**

	Pre	ALL	50	11	32	12	29	16	27	64

quent theme mentioned in the pre-workshop responses (33%) is "assessment". Very few of the pre-workshop responses mentioned the themes of "professional development", "funding", and "award" (11%, 8%, and 7%, respectively).

RQ2: What are the post-workshop conceptions of SoTL by future faculty members?

Post workshop responses (n=151, 44%) were predominantly in the SoTL quadrant (Figure 4) of the DART model. The SHTE quadrant described 29% of the post workshop responses. The PRTE and SCTE quadrants had 12% and 8%, respectively of the remaining post workshop responses. 7% of the post workshop responses were not classified into a quadrant of the DART framework.

"Publish/communicate" was the dominant exploratory theme described in the post workshop responses across the three years of this study (Figure 5). 70% of participants mentioned this theme in their post workshop responses. "Assessment" was the second most common theme with 40% of the post workshop responses mentioning assessment and/or evaluation(s). The exploratory themes mentioned least were "mentoring", "award", and "funding" (12%, 7%, and 3%, respectively).

RQ3: What are the changes in future faculty's conceptions of SoTL after a workshop on SoTL?

The most obvious changes in conceptions of SoTL indicate a greater emphasis on sharing outcomes of educational inter-

ventions (SHTE), indicated by an increase from 9% to 29% of the responses classified into the SHTE category of the DART model. The most significant change was the responses categorized as SOTL, which increased from 8% in the pre-workshop responses to 44% of the post-workshop responses. Additionally, the two most frequently mentioned themes in the pre-workshop responses change from theoretical understanding and assessment to publish/communicate and assessment. Themes that had a decreased emphasis in the post-workshop responses are the "theoretical understanding" theme and the "mentoring" theme. Changes in the major themes from pre-workshop responses to post-workshop responses are presented in figures 6 and 7.

Although the changes in conceptions found by comparing pre-workshop answers to post-workshop answers were varied, we chose to focus on a particular subset of responses of students whose pre-workshop response was categorized into quadrants PRTE, SHTE, or SCTE, but whose post-workshop was categorized within the SOTL quadrant of the DART model.

Student B's pre-workshop answer to describe SoTL was categorized as PRTE rather than SOTL. Their post-workshop answer to the same question was categorized as SOTL. The bolded text in the post-workshop responses indicates the missing components of SoTL that were mentioned in the post-workshop response but were not mentioned in the pre-workshop response from the same student. Student B's pre-workshop response focuses on teaching, but their post-workshop response includes evaluating the results of an intervention designed using "appro-

Figure 4. *Post-workshop response distribution by percentage of responses categorized using the DART model framework (Kern et al., 2015) (PRTE=12%, SCTE=8%, SHTE=29%, SOTL=44%).*

Post Test SoTL Quadrant Distribution (n=151)
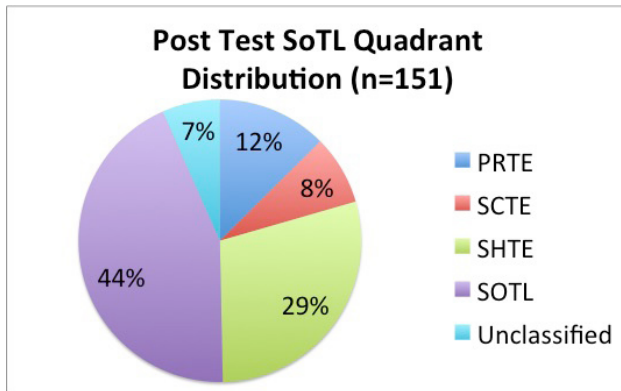
priate methods" as well as sharing the results of the intervention with others in their field by publishing their findings.

The scholarship of teaching and learning: A faculty position more focused on teaching. Teaching and learning of students. Not sure what it is! Maybe depending on the institute and its mission's statement. Also, places where population of undergrads is more than graduates.
— Student B pre-workshop response

*SoTL is the ability of an individual in a specific discipline to pose problems about an issue of T & L + study it by applying **appropriate methods**. Then apply the method to practice and evaluate the results. Such scholars should then **communicate the results with colleague in their field through peer-reviewed publication**. They are recognized based on*

the impact those individuals have on their field and teaching methods.
— Student B post-workshop response

Student F's pre-workshop answer describing SoTL was categorized as SCTE Rather than SoTL because they focus on teaching practices as well as using formative feedback to adapt their teaching practices to student needs. Student F's post-workshop answer to the same question was categorized as SOTL. The student amends their pre-workshop response to include communicating the results of an intervention created with the "intensity of research" among the academic community. We also interpreted the phrase "the goal is to improve teaching to affect learning results" to indicate that Student F was implying evaluation of the intervention as well.

The scholarship of teaching and learning refers to the fact that teaching and learning are both scholarly endeavors rather than thinking of them as opposites on a continuum of faculty position types. Teaching and learning are as involved and complex as research thus needing the time and energy to study and develop the skills and knowledge necessary to be effective teachers. In involves deliberate planning and study of best practices and deep knowledge of your students and what their needs are. It is recognizable when teachers are clear about why they make certain decisions and are asked to adjust to student needs.
— Student F pre-workshop response

*The scholarship of teaching and learning involves applying all the study and intensity of research to one's teaching. Teaching and learning, then, is the research subject and t**he goal is to improve teaching to affect learning results**. Should be*

Figure 5. *Combined dataset (three years) displaying the frequency of eight exploratory themes identified in the post-workshop responses. The bottom row is a tally of the exploratory themes mentioned in all post workshop responses across all of the DART framework quadrants of Kern et al., 2015.*

			Assessment	Award	Emotion	Funding	Mentoring	Professional Development	Publish/ Communicate	Theoretical Understanding
2014	Post	PRTE	3	0	2	0	2	0	1	0
2015	Post	PRTE	7	1	1	0	0	0	1	2
2016	Post	PRTE	1	0	2	0	3	0	0	1
		Total	**11**	**1**	**5**	**0**	**5**	**0**	**2**	**3**

			Assessment	Award	Emotion	Funding	Mentoring	Professional Development	Publish/ Communicate	Theoretical Understanding
2014	Post	SCTE	1	1	3	0	1	0	2	0
2015	Post	SCTE	2	0	4	0	0	0	0	1
2016	Post	SCTE	0	0	0	0	0	1	3	2
		Total	**3**	**1**	**7**	**0**	**1**	**1**	**5**	**3**

			Assessment	Award	Emotion	Funding	Mentoring	Professional Development	Publish/ Communicate	Theoretical Understanding
2014	Post	SHTE	9	1	3	1	2	0	13	4
2015	Post	SHTE	8	1	1	0	2	1	13	2
2016	Post	SHTE	4	0	2	0	1	3	8	2
		Total	**21**	**2**	**6**	**1**	**5**	**4**	**34**	**8**

			Assessment	Award	Emotion	Funding	Mentoring	Professional Development	Publish/ Communicate	Theoretical Understanding
2014	Post	SOTL	7	3	4	2	2	1	22	11
2015	Post	SOTL	7	2	3	0	1	4	15	3
2016	Post	SOTL	12	1	6	2	2	8	27	3
		Total	**26**	**6**	**13**	**4**	**5**	**13**	**64**	**17**

			Assessment	Award	Emotion	Funding	Mentoring	Professional Development	Publish/ Communicate	Theoretical Understanding
Post	**ALL**		61	10	31	5	16	18	105	31

shared and disseminated among peers and experts in educational practices. *Should be involved and/or consulted. Plus what I said first.*
— Student F post-workshop response

Student G's pre-workshop answer to describe SoTL was categorized as SHTE Rather than SoTL. The dominant theme in their pre-workshop response is communication as well as the practical teaching skills of the instructor. Student G's post-workshop answer was categorized as SOTL because they included the components of assessment, publishing, as well as a more formal method of devising an intervention whose learning outcomes can be measured.

The scholarship of teaching and learning is focused on the intrinsic value of successfully communicating knowledge to someone else and adapting your communication style based on feedback. It involves elements of pedagogy, good speaking and listening skills, and attentiveness to the situation at hand. It can be recognized by its fruits: successful/conveyance about info., adaptive teaching style, and engagement by multiple parties.
— Student G pre-workshop response

SoTL is the **systematic investigation** *of teaching strengths and tools and their impact on measurable learning outcomes to be critical analyzed,* **assessed, and published***. It involves identifying a problem or question regarding T or L,* **devising an experiment or study to test or probe that question,** *applying the results to future implementations of T and L, and* **publishing your findings** *in an academically rigorous manner, e.g. peer-rev. journals. I would look for the markers I just named to identity SoTL.*
— Student G post-workshop response

Another interesting comparison we were able to make was the perception that the word "scholarship" as used within the context of the "scholarship of teaching and learning" meant a monetary award. There were 8% (4 in 2014; 2 in 2015; 6 in 2016) of pre-workshop responses that included this concept of SoTL as a financial incentive of some kind for teaching.

Student L had a pre-workshop response that was categorized as PRTE because they focus on teaching and mentoring of students. However, the other perception is that the "scholarship of teaching and learning is some funds". This description is missing from Student L's post-workshop response but was replaced with other elements of SoTL such as designing an intervention, evaluating the results, and their response also includes an element of peer-review evaluation of the intervention. However, there is no mention of funding in the post-workshop response.

The scholarship of teaching and learning is some funds that give [sic] to excellent teachers or instructors, which is an award to them to reward their effort on teaching and instructing and mentoring students.
— Student L pre-workshop response

Scholarship of teaching and learning is a kind of research on how to improve your students' performance on the class. It involves in doing some comparison experiment among your students and investigate their performance under different situations. Based on student's evaluation or peer-review evaluation.
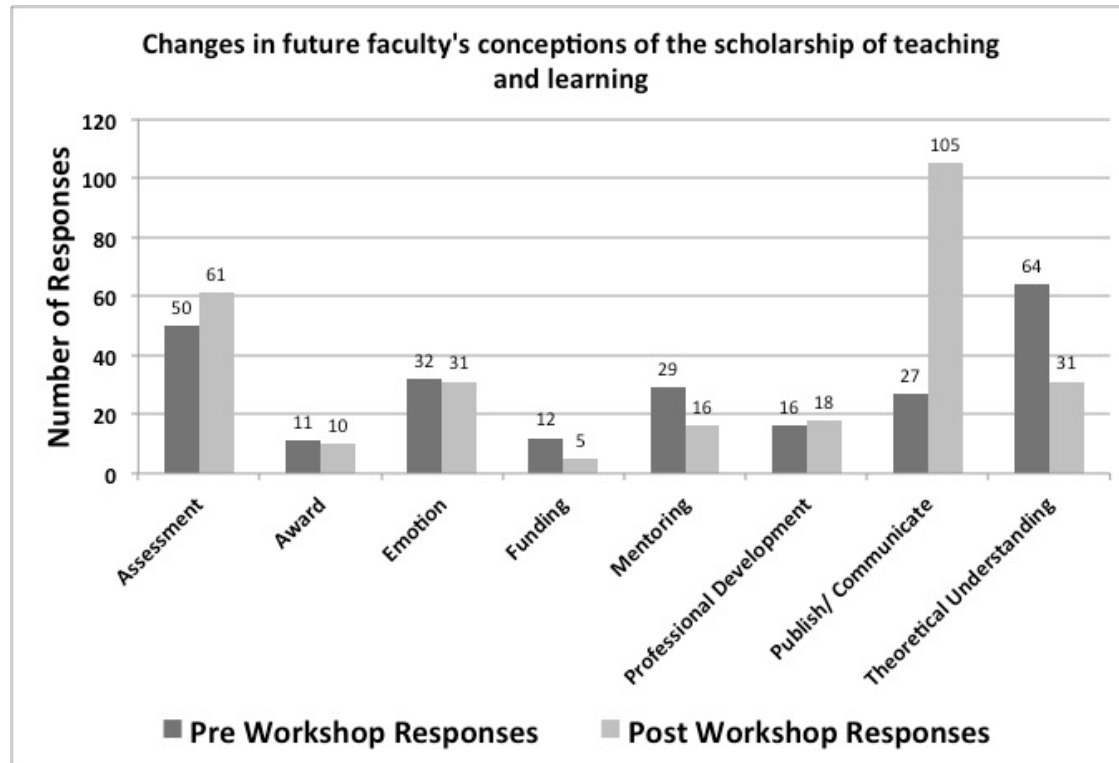— Student L post-workshop response

DISCUSSION

Participants' pre-workshop conceptions of SoTL emphasized assessment and a theoretical understanding of educational research and practice. Post-workshop conceptions continued to emphasize assessment as an indicator of SoTL practices but also included more responses that mentioned efforts to publish/communicate findings as a product of SoTL practices. Overall, conceptions of SoTL by future faculty members changed to emphasize the sharing of educational teaching interventions and their outcomes.

Our first claim is that the significant increase in responses categorized as SoTL (8% increasing to 44%) indicates that the scholarship of teaching and learning workshop embedded within the preparing future faculty program does have a significant impact on student conception of SoTL. Further, the two most dominant quadrants in the pre-workshop responses were the PRTE

Figure 6. Data table showing composite tallies of pre- and post-workshop responses for each of the eight exploratory themes. The bottom row is color coded- green to show an increase in the number of responses that mentioned a particular theme and the cell is colored red to indicate a decrease in the number of responses that represent that theme.

		Assessment	Award	Emotion	Funding	Mentoring	Professional Development	Publish/ Communicate	Theoretical Understanding
2014-2016 Pre Workshop Responses	PRTE	25	9	25	12	22	6	4	33
	SCTE	13	0	5	0	2	3	7	21
	SHTE	4	1	2	0	4	4	7	5
	SOTL	8	1	0	0	1	3	9	5
	Combined Quadrants	**50**	**11**	**32**	**12**	**29**	**16**	**27**	**64**
2014-2016 Post Workshop Responses	PRTE	11	1	5	0	5	0	2	3
	SCTE	3	1	7	0	1	1	5	3
	SHTE	21	2	6	1	5	4	34	8
	SOTL	26	6	13	4	5	13	64	17
	Combined Quadrants	**61**	**10**	**31**	**5**	**16**	**18**	**105**	**31**
Change (Post-Pre)		**11**	**-1**	**-1**	**-7**	**-13**	**2**	**78**	**-33**

Figure 7. A bar graph comparing the pre-workshop responses to post-workshop responses.

(practice of teaching) and SCTE (scholarly teaching), but the two most dominant quadrants in the post-workshop responses are the SHTE (sharing about teaching) and the SoTL quadrant (scholarship of teaching and learning). The underlying purpose of this workshop is to expose future faculty members to a more focused vision of how scholarship is perceived, evaluated, and shared within higher educational institutions. At a general level, our data shows evidence that this goal is being achieved by the PFF program.

Based on the data, we were left with the following question: Why weren't all of the responses categorized as SoTL in the post-workshop responses? The second largest proportion of responses, an increase from 9% to 29% of the responses, gives us more insight into how the workshop is helping form the conceptions of scholarship by future faculty members, and what might need more emphasis. The largest difference between a response categorized as SoTL and one categorized as SHTE is that SHTE responses did not mention education and/or teaching literature in the response, either as a way to inform pedagogy or as a means to disseminate the outcomes of their scholarly interventions. In this way, we see that a more integrated approach to teaching about SoTL in this workshop might improve students' understanding of the SoTL process within the larger higher education community, and this should include more emphasis on using the literature on educational research to inform their pedagogy, as well as explaining how publishing in education and teaching journals can allow other instructors access to a wider range of pedagogical practices.

The need for more transparent education of future faculty members about the actual duties of faculty members, beyond traditional research and teaching (e.g. service and outreach, mentoring, communication, educational research, and collaboration) has been recognized by previous researchers (e.g., Gaff & Lam-

bert, 1996; Austin, 2002; Lindholm, 2004). It appears that the PFF program in this study is helping to advance this intent by incorporating a focus on the sharing of educational intervention outcomes. The next challenge will be to demonstrate the relation between more abstract concepts (e.g. mentoring, motivation, work/life balance) and the everyday lives of faculty members, whether at a teaching- or research-intensive institution.

The methodology we used to complete this study was multifaceted and complex. It was a struggle to align our process with the very well-organized and described DART model quadrants. Our reasoning behind the method we used was to help explore what complexities in student conceptions of SoTL are not addressed within the DART model. We found that student perceptions of the emotional disposition of the instructor are seen as a valuable way to recognize SoTL practitioners. However, in the post-workshop responses this more emotional connection to the instructor was lost.

Future faculty members (graduate students and postdoctoral researchers) post-workshop responses show a reduction in emphasis on the relationships between abstract, subjective interactions (e.g. mentoring) and SoTL (Figures 3, 5, and 6). 19% of the pre-workshop responses mentioned mentoring as key aspect of SoTL. Only 11% of the total post-workshop responses included mentoring as a component and only 5 out of the 66 (8%) post-workshop responses that were categorized as SoTL included mentoring as a component (Figure 5). This is potentially a problem when future faculty members enter academia because undergraduates identify mentoring as important for successful learning relationships (Trammel & Aldrich, 2016). Equally important is the care that must be taken to ensure that underrepresented graduate students have effective models of faculty mentorship that embraces diverse perspectives and needs (Brunsma et al., 2017). One potential resolution is for the instructor of the SoTL

workshop to spend more time on establishing how the components of SoTL could help future faculty members in different ways, depending on their career objectives and professional strengths and interests. Currently, graduate students' perceptions of the potential benefits of the more abstract components of SoTL (such as a theoretical understanding of learning theories, mentoring relationships; 2015 had no "mentoring" mentions) are left unsupported.

The responses in the post-workshop responses included an increased number of SHTE-categorized responses (Figures 2 and 4). Many teachers might be deemed unscholarly because they do not currently publish results of their educational interventions. While wholly unpublished research may not fit the definition of SoTL, according to Kern et al. (2015) it should be noted that the majority of people who take a PFF class will probably *not* end up at an R1 institution where "publish or perish" is the ultimate end to a tenure-track, faculty career (Gaff & Lambert, 1996). This assertion is reflected in the post-workshop response of Student Y that was categorized as SoTL.

> *Serious study of how to effectively teach and learn. Pose a problem, study, evaluate results, communicate results + adjust to improve. It seems to involve try to answer a teaching + learning question through the scientific process and publish or perish.*
> – Student Y post-workshop response

Although seemingly inserted as a joke, the fact that Student Y references the "publish or perish" adage gives insight into the underpinning notions of academic scholarship for future faculty members on the verge of matriculating. By primarily emphasizing publishing in journals (which many community colleges, tribal colleges, and non-profit educational institutions do not have access to) future faculty who are not interested in research could disengage from potential SoTL collaborations. Perhaps by showing the potential individualized benefits to improved teaching, and the transboundary effects into facets beyond the classroom, career, and academia in general (e.g. personal relationships, networking, project development), students who do not see themselves as research-focused can begin to value SoTL as a way to improve their daily lives beyond the classroom. Also, the SoTL program could also emphasize the various routes of "publication" that could be identified as disseminating the results of the intervention. Examples of other ways to share results could be at technical conferences, community events, blog posts, and podcast appearances.

LIMITATIONS

This study was conducted at a large, public, land-grant, Midwestern, research-intensive university. A large majority of the graduate student and potential future faculty population are not from underrepresented groups in academia, thereby limiting the usefulness of this work to facilitate structural equity issues (e.g. culturally specific mentoring needs, racism, lack of sense of belonging) in the advent of PFF programs at the study institution as well as in academia broadly. Without a more direct connection to knowing whether future faculty members will begin their career at a teaching-intensive or research-intensive institution, it will remain difficult to balance the hierarchical values individual institutions set forth for their faculty members.

Additionally, the data for this study come from a single two-hour workshop focused on SoTL. This is hardly enough time for future faculty members to have long-term, reflexive introspection about how SoTL might be an influence on their future careers. Instead, this workshop is designed to reveal potentialities for enhancing the productiveness and intrinsic value of their professional duties as faculty members. It is our hope that the concepts introduced in the workshop are revisited by future faculty members as they then proceed to become senior faculty members within academia. Future work should include an expansion of the research to include longitudinal tracking of both participants and non-participants to determine if this single two-hour workshop has any long-term impact on how faculty engage in SoTL as part of their careers.

CONCLUSION

An educational intervention focused on communicating the concept of the scholarship of teaching and learning (SoTL) does have an impact on future faculty members' perceptions of the definition of the scholarship of teaching and learning. Pre-workshop conceptions of SoTL focused on assessment of educational interventions as well as a strong theoretical understanding of teaching practices. Post-workshop conceptions were dominated by references to publishing/communicating results of educational interventions but still included assessment as the second most referenced theme.

The SoTL workshop is effective in establishing that educational interventions should be well-thought out, assessed appropriately, and the results should also be shared with the greater academic community. Certainly, academic scholarship deserves a specific, respectful place among the criteria we use to define SoTL, but we also argue that informal means of communication (e.g. blog posts, social media posts) and abstract personal characteristics of instructors should maintain recognition as important facets of successful SoTL. In doing so, the academic community invested in SoTL can develop meaningful relationships with each other by communicating informally *as well as* formally, acknowledging personal attributes of quality instructors, and continuing to answer cutting-edge research questions about the relationship between teaching and learning within the higher education context. However, abstract relationships, which are necessarily a part of academic workplaces, are not as highly valued within current models of SoTL as more objective SoTL behaviors (e.g. publishing an article in a journal, formalized assessment of an educational intervention). This conflicts with data from Bieber and Worley (2006), who found that future faculty members are drawn to the profession many times by personal interactions with current faculty members. Therefore, we suggest changes to the SoTL workshop might include more emphasis on how more abstract practices (e.g. mentoring, organizational skills, personal disposition) relate to the components of SoTL as well as how those social skills can be used to strengthen the teaching practices of themselves both as educators and within their daily lives as faculty members (Golde, 2004).

In this context, previous researchers have studied the relative values placed on teaching excellence and research excellence (Fairweather, 2005), and found that the total number of refereed publications, at all types of institutions in the study, was strongly, positively related to faculty pay. This was in contrast to a significant, negative relationship between hours spent in the classroom per week and faculty pay rates at major research universities. This indicates a difference in value that institutions place

on teaching (lower) as compared to publishing research articles (higher). This "publish or perish" mentality is apparent even to those future faculty members who have not yet attained a faculty position. A potential negative outcome of this approach is the lack of recognition of a work/life balance. Increasingly, mental health studies focused on graduate students, especially PhD students, show that many future faculty members are experiencing increased rates of depression and anxiety compared to the general population (Evans et al., 2018). A SoTL model that incorporates more discussion about the social dynamics of the relationships held within an academic appointment and how those dynamics impact the delivery of SoTL could shift the culture in a more transparent direction where faculty members are not held to the "publish or perish" standard. In turn, this could lead to less disjunction "between what recent graduate students personally value and what they believe their employing institution values" (Bieber & Worley, 2006).

Educational approaches and interventions that seek to promote improved learning experiences for students/pre-professionals are part of the mission/goal of institutions which focus primarily on research (Hattie, 2011). Thus, teaching future faculty about SoTL is both a way to prepare future faculty to integrate SoTL into their careers, but it is also a way to help future faculty understand and value the roles of faculty members who focus on teaching within research-intensive institutions. Other universities might consider adopting a SoTL-focused workshop within their PFF program if it does not already exist, or as a separate standalone workshop if there is no PFF program already. Similarly, future faculty with an understanding of SoTL who take a position at a teaching intensive university will know that they can still find research collaborations that can benefit their students and their own careers.

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