A Practical Guide for Conducting Scholarship of Teaching and Learning (SoTL): An Approach to Developing the Innovative Educational Process

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Abstract

Background: Planning and conducting successful scholarship of teaching and learning or educational scholarship in medical education is essential. The guidelines for faculty members can be significant.

Objectives: This study aimed to develop a practical guide for teaching and learning scholarship activities.

Methods: The present study was a research synthesis conducted in six steps, including formulation of problem or question, literature search, data extraction and analysis, interpretation of results, and public presentation. The extracted publications were independently analyzed, and a consensus was reached on each paper's stated definitions of the educational scholarship steps.

Results: The results were classified into 12 steps, including recognizing an educational problem, reviewing the literature, analyzing the context, creating a goal-oriented team of stakeholders, determining objectives and planning the SoTL project, finding supportive resources, considering ethical issues, implementing the scholar activities and analyzing evidence, critical appraisal of the SoTL project, reflecting on the SoTL project, documenting the details of the SoTL project, and going public and disseminating the experiences.

Conclusion: Scholars must be able to provide a clear, complete explanation of the innovativeness of their scholarly ideas and the need for this kind of content for their audiences. However, studying and reviewing relevant journals, reflecting on the issues or questions posed, and exchanging ideas with your colleagues are recommended for reviewing and refining scholarly and idea-generation questions.

Keywords: Scholarship, Teaching, Learning, Education, Scholarship of Teaching and Learning, Educational Scholarship

Background

Reviewing the subject of scholarship in higher education in the world is a matter that has been discussed seriously since the publication of the Carnegie Foundation's research results, Ernest Boyer and Rice's work in 1990. At the same time, people were hired at universities with the purpose of education, but the only basis for their assessment was their ability and performance in the field of research (1, 2). In a report published by Boyer and Glasick (1990) (1), a new approach to research was suggested in the field of education. Scholarship can be divided into four areas: First, scholarship of discovery: This kind of scholarship is the same as original research that is interpreted as the discovery of new knowledge to achieve a better understanding of the world as an essential component of academic environments (1, 3, 4). Second, scholarship of integration: In this form of scholarship, the faculty member surpasses limited research and seeks to find a link between research within a discipline or even among different disciplines. (1, 5).

Third, scholarship of service: this form is based on using the generated knowledge and the general utility that knowledge can possess. The scholarship answers how the acquired knowledge can be used in practical fields (1, 4, 6). Finally, scholarship of teaching and learning: "a systematic study of teaching and learning and the public sharing and review of such work through presentations, publications or performances" (7). The main activities of the scholarship of teaching included the engagement with the existing knowledge on teaching and learning, self-reflection on teaching and learning in one's discipline, and public sharing of ideas about teaching and learning within the discipline (7).

Educational activities can fit into five areas "Teaching, curriculum development, study guidance, education leadership and management, evaluation and assessment of learners." Educational scholarship activities can take place in each of these domains, and faculty members may work in one or more domains (8). It can be argued that, firstly, the level of interest of

faculty members and researchers in this area has increased, and more opportunities have been gained for experimentation over time. Secondly, most scholars and researchers in this field often start with their background and prior knowledge of this field or scientific discipline and are unaware of the scientific steps. Therefore, it is essential to provide a systematic guideline for scholarship activities for faculty members to achieve their goals (8).

Since the direction of faculty members is essential for reflecting on the teaching and learning process and implementing scholarly projects to answer their teaching questions and considering that scholarship is a time-consuming process in the field of teaching and learning, it is possible to guide the implementation of this critical task by proper planning, implementation, and evaluation of the faculty members and helping them to disseminate their experiences. Therefore, this study aimed to develop a practical guide for a teaching and learning scholarship project by reviewing and synthesizing literature.

Objectives

This study aimed to develop a practical guide for teaching and learning scholarship activities.

Methods

The present study is a research synthesis. A research synthesis aims to combine the literature results with building a new concept and explaining its components. Research synthesis aims to generate new knowledge or concepts by clarifying the relationships, commonalities, and discrepancies among different reports (9). The research synthesis does not merely gather previous knowledge but combines various findings to explore new concepts and their relationships within a meaningful framework (10). In the present study, we have conducted a research synthesis approach introduced by Hedges and Cooper (11). We explained the steps below:

Formulation of question: In the first step, we formulated a question; "What are the practical steps for conducting an educational scholarship?"

Literature search: We searched PubMed®, Science Direct®, CINAHL®, and Embase®. Search terms included a combination of (a) scholarship, scholar, scholarly, (b) teaching, (c) learning, and (d) education. Database searches were conducted in December 2020 without any limitations related to the authors' country of origin, the authors' affiliation, or the place of publication of the research. Eligibility criteria were defined in articles that 1) included the practice of SoTL or teaching and learning research in the educational system; 2) focused on the definition of the concept of educational

scholarship; 3) described the process of SoTL; 4) described the practical recommendations for conducting an educational scholarship. Articles that focused specifically on 1) educators' or students' attitudes and perceptions toward teaching and learning activities; 2) educational intervention of faculty development or residency program related to SoTL; 3) the dissemination of SoTL through journals or other platforms were excluded. In addition, Publications were excluded if they were non-English and were not published in a scholarly journal (PRISMA flow diagram in figure 1). Two researchers (F.K, M.M) performed the identification and screening review process.
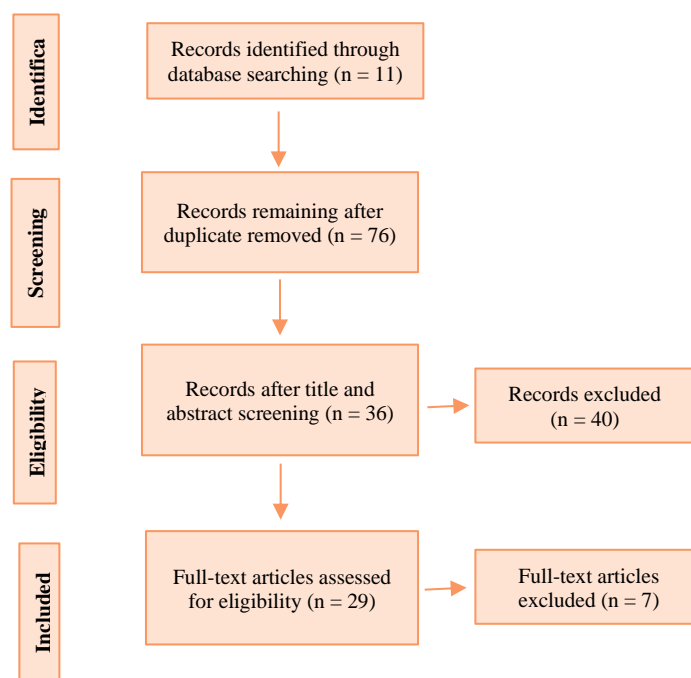

Figure 1. PRISMA flow diagram

Search strategy

- (Scholarship of teaching and learning" OR SoTL OR "educational scholarship" OR "teaching and learning scholarship")
- (Scholarship OR scholar OR scholarly OR inquiry)
- (Scholarly teaching OR excellence teaching OR education research OR teaching and learning research OR research on teaching and learning)
- Teaching and learning" OR education OR "Learning and scholarship")
- (Teaching OR learning OR education)

Data extraction and analysis: In the next step, these extracted articles were screened by scanning the titles and abstracts to identify relevant studies based on the inclusion and exclusion criteria and to remove any duplicates. Title, abstract, and methods screened the

remaining publications, research question, and whether the method or results usefully contributed toward answering the synthesis question. In the data extraction step, to identify the publications eligible for inclusion, researchers (H.A., M.M., F.K.) categorized the following data from each publication: definition of educational scholarship steps and an educational scholarship process.

Synthesis and interpretation of results: In this step, the researchers (H.A., M.M., F.K.) independently analyzed the publications to extract the practical steps of educational scholarship and then reached a consensus on each paper's stated definitions of the educational scholarship steps using a thematic synthesis approach (12). The three-step approach included the free line-by-line coding of the results of studies, the organization of these 'free codes' into related categories to construct 'descriptive' themes, and the development of 'analytical' themes (12). The extracted codes were classified into three categories (a) planning, (b) implementation, and (c) dissemination of findings. A consensus-based approach resolved disagreements in coding.

Public presentation: Finally, a twelve-step practical guide was developed by synthesizing and interpreting the information obtained from the studies. Each step synthesized the extracted codes to clarify the process of conducting the educational scholarship. The steps are explained in figure 1.

Results

In this study, the following twelve-step guide in the three areas of planning, implementation, evaluation, and publication is offered in the field of the scholarship of teaching to direct academic faculty members in the process of conducting a scholarship program (Table 1). The steps are organized into three phases:

-Planning phase includes recognizing an educational problem, reviewing the literature, analyzing your context, creating a goal-oriented team of stakeholders, determining objectives and planning the SoTL project, finding supportive resources, and considering ethical issues.

-Implementation phase consists of implementing the scholarly activities and analyzing evidence, critical appraisal of the SoTL project, reflecting on your SoTL project, and documenting the details of the SoTL project.

-Dissemination of the finding phase includes going public and disseminating the experiences.

Table 1. The extracted steps of SoTL

Phase	Extracted steps of SoTL	Articles
First phase: Planning	Step 1: Getting started with recognizing an educational problem and/or a new idea	(Cranton, 2011) (13)
		(De Courcy et al., 2017) (14)
		(Rowland and Myatt, 2014) (15)
		(McKinney, 2010, Kenny et al., 2017, Van Melle et al., 2012) (7, 16, 17)
		(Murnaghan et al., 2017) (18)
		(Cranton, 2011) (13)
	Step 2: Reviewing Literature and Finding Evidence	(Potter and Kustra, 2011) (19)
		(Kanuka, 2011) (20)
		(McKinney, 2010) (7)
		(Rowland and Myatt, 2014) (15)
	Step 3: Analyzing your context	(Rowland and Myatt, 2014) (15)
	Step 4: Creating a goal-oriented team of stakeholders	(Chan et al., 2017) (21)
		(McGaghie, 2009) (22)
		(De Courcy et al., 2017) (14)
		Webb 2019, McGaghie 2009 (22, 23)
	Step 5: Determining Objectives and Planning SoTL project	(Murnaghan et al., 2017) (18)
		(McKinney, 2010, McGaghie, 2009, Crites et al., 2014, Alison Stull MSN and Cheryl Lantz MSN, 2005) (7, 22, 24, 25)
		(Rimal, 2017, Rowland and Myatt, 2014) (15, 26)
	Step 6: Finding supportive resources and infrastructure	(Musolino and Mostrom, 2005) (27)
		(Simpson et al., 2007) (28)
		(Haigh et al., 2020 (29)
	Step 7: Considering ethical issues	(Rowland and Myatt, 2014) (15)
Second phase: Implementation	Step 8: Implementing the scholarly activities and analyzing evidence	(Rowland and Myatt, 2014) (15)

	Step 9: Critical appraisal of the SoTL project	(Glassick, 2000) (30)
	(Rowland and Myatt, 2014) (15) (Aronson, 2011) (31)	Step 10: Reflecting on your SoTL project
	(Mezirow, 1990) (32)	
	(Rowland and Myatt, 2014) (15) (Aronson, 2011) (31)	
	Step 11: Documenting the details of the SoTL project	(Simpson et al., 2007) (28)
Third Phase: Dissemination of findings	(Glassick, 2000) (30)	Step 12: Going public and disseminating the experiences
	(O'Loughlin, 2006) (33)	
	(Hall et al., 2018) (34)	
	(McGaghie, 2009, Chan et al., 2018, Cook, 2010) (22, 35, 36)	

Discussion

In this study, the following twelve-step of conducting a SoTL project was organized in the four areas of planning, implementation, evaluation, and publication.

The first phase: planning

Getting started with recognizing an educational problem and/or a new idea: SoTL projects are started by identifying a problem or area of interest in context and developing a research question from that problem.

Faculty usually become interested in a SoTL project by reflecting on the teaching-learning process, something in their own classroom experience as an instructor, and its determinants. It is helpful to start by thinking broadly about a teaching or learning issue, an assignment, a pedagogical strategy, or something of that nature (14). Holding brainstorming sessions between scholars and educational stakeholders to provide opportunities to talk honestly about the issues and problems in their field of study through group discussions was suggested to achieve a new idea for a scholarship. They can also express their views and experiences and get to valuable topics and ideas (19).

The next step would be to put the problem into a question form. These questions can be developed based on teaching-learning background, process, or consequence questions. At the stage of idea generation and design of the question, ask yourself: "What is already known?", "What information is needed?", "What are some possible data collection strategies?", "What resources are needed, and what would the timeframe be?". Three categories of scholarship questions can be formulated as follows:

A. Questions taken from the nature of the problem or topic: An attempt to answer such questions leads to a more precise picture of the nature of the problem, subject, or phenomenon in question. For example, How and to what extent is students' level of understanding and cognition about theoretical concepts in a scientific major or area? (14).

B. Questions based on the magnitude of the effectiveness, usefulness, or efficiency of strategies, approaches, or interventions: In these types of questions, the effectiveness and efficiency of different methods are questioned. For example, "To what extent can a new practice, method or assignment be effective in learning the educational skills?" (15).

C. The questions are based on a hypothesis, which includes possible scenarios that may result if a specific context is provided. These questions have a preliminary assumption and a result based on the initial conditions in the assumption premise. Mostly, these questions have the conditional format "If ... Then," which measures the hypothesis. For example, "What results will be achieved if a specified approach is used to develop students' thinking and creativity skills during the course?". Table 2 shows the resources for creating a question and idea for scholarship activities.

Scholars must be able to provide a clear, complete explanation of the innovativeness of their scholarly ideas and the need for this kind of content for their audiences. However, studying and reviewing relevant journals, reflecting on the issues or questions posed, and exchanging ideas with your colleagues are recommended for reviewing and refining scholarly and idea-generation questions.

Reviewing Literature and Finding Evidence: After explaining the problem, it is necessary to seek a solution using the informed decision-making approach. Reviewing literature and collecting expert opinions and experiences were recommended in the informed decision-making process (19, 20). Reviewing the literature is vital in each scholarship project (20). It is recommended to find more studies/articles related to your research problem in similar studies or settings and consider them in finding a solution to that problem.

Table 2. The resources for creating a question and idea for SoTL activities (7, 13, 14, 16, 17)

1- Thinking about the teaching-learning process in a classroom or learning environment.
2- Thinking about how to transfer the theory to the teaching-learning function.
3- Attention to the influence of the role of the teacher in the process of the teaching-learning process.
4- Reflecting on new, beneficial, and innovative techniques for teaching a lesson to eliminate past constraints.
5- Using the knowledge gaps in existing evidence, taking into account the limitations in the literature.
6- A critical perception concerning the usefulness and effectiveness of teaching methods.
7- Reflecting on individual performance in the teaching-learning process and exploring possible ways to improve it.
8- Attention to the broad concept of learning (beyond knowledge and skill development) and critical search concerning different aspects of learning (such as the development and reproduction of attitudes or learning-related habits).
9- Review valid evidence regarding evaluation tools and methods for a deeper understanding of the reasons for the effectiveness of educational interventions.
10- Reflecting during and after professional activity, emphasizing critical questions about individual performance.
11- Thoughtful, informed, and systematic research on the teaching and learning of learners.
12- Reviewing available courses and curriculum.
13- Reflection on innovative, evidence-based strategies.
14- Thinking about the teaching-learning process in a classroom or learning environment.

In general, articles, books, and peer-reviewed journals may offer valuable information to find the proper solution. It is also suggested to search the resources in different databases, such as PubMed, Google Scholar, ERIC, Web of Science, and JSTOR (7). Using existing bibliographies and experienced colleagues can be helpful (15).

Analyzing your context: "Identifying context" is obvious and very important for project implementation. In this step, finding the appropriate context for carrying out the activities of the science-research project is considered an influential factor in the planning stage (15). Notably, if the instructor implements the scholar project in owner educational activities, it is more successful because she/he can manage the planning and guidance of training activities. Working in courses responsible for other faculty members can create challenges in implementing and evaluating the scholar process details. An unpleasant feeling in the poor implementation of an innovative project, especially when faculty members are forced to cooperate, has adverse effects on colleagues and students. Therefore, implementing the scholarship project must be carried out more cautiously in courses where you are not responsible.

Create a goal-oriented team of stakeholders: Consultation and collaboration with various stakeholders in implementing any scholarship project is a critical activity. In scholarly projects, forming a team of members, peers, and collaborators, creating a cooperative atmosphere, and expanding scholarship culture in the system play a significant role (21).

The following principles can be effective in creating a successful team:
Developing common goals and missions.
• Determining the team leader.

• Recognizing team members' roles, expectations, and responsibilities and division of responsibilities.
• Determining standards for achieving expected goals.
• Minimizing the difference between team members.
• Building trust and friendly relationships between team members.
• Promoting joint activities.

Moreover, the establishment of collaboration among team members makes it essential to create mentoring relationships with persons who can lead the design and implementation of a scholarly project. Establishing a mentorship relationship, consultation, cooperation, and communication with the mentor, peers, and colleagues and leadership skills are recommended (22, 23). Furthermore, it is recommended for learners to participate in the scholarly work not only as a subject or examinee but also to conduct research methods (e.g., focus group technique) and analyzing method (e.g., content analysis approach) (14).

Determining objectives and planning the SoTL project: After finding a solution, you must consider the project's purpose, how to achieve it, and how to evaluate it. Questions, objectives, and context are three essential subjects that should be considered in designing a scholarship project.

Proper planning is one of the essential activities of scholarship (18). The following activities are proposed at this stage:

✓ Determining the objectives and population of the SoTL project.

✓ Identifying ways to attract stakeholder participation, especially learners in the scholarship process.

✓ Using conceptual theories and conceptual frameworks in the SoTL project.

✓ Using literature to integrate with scholarship programs.

✓ Developing innovative and evidence-based teaching strategies.

✓ Considering the appropriate methodology for designing scholarship, collecting and analyzing evidence and data.

✓ Attention to the proportion between the research method, goals, and objectives of the scholarship project.

✓ Flexibility in changing the methods used in scholarship design in the event of a change of position.

✓ Locate the research site, for example, a course, a class, a cohort, homework, or a database.

✓ Considering time management skills.

✓ Taking into account project registration for ethics review and approval of organizational ethics.

✓ Finding the project budget and attracting sufficient resources to carry out the project (such as internal and external funds) (7, 22, 24, 25).

The desirable function of the project requires a powerful application of research methodologies to create a link between scholarly questions and learners' learning at the heart of the project (15, 26). The principles of methodologies in designing, specifying the target population, determining the criteria for inclusion/exclusion of the participant and sampling, collecting data, analyzing the data, and the publication process must be considered in this step. In scholarly projects, quantitative or qualitative methods can be used proportionally. It is recommended to use the mixed method in scholarship projects so that qualitative methods (such as grounded theory, ethnography, narrative analysis, phenomenography, and classroom observations) are combined with quantitative methods (quasi-experimental and descriptive) to generate richer data.

You should note that you encounter a set of limitations, such as ethical constraints in conducting any research, which should be considered when choosing the appropriate method for your project. Scholars must consider flexibility in scholarship design even if it may be necessary to redesign the project, and you must be prepared to do this.

Finding supportive resources and infrastructure: Different supportive sources such as resources and organizational support are needed to design and implement scholarly activities. It should be noted that the planning for allocating human resources, developing political support, and carrying out symbolic activities (including awards for educational activities to create a supportive environment for the development of scholarship activities) should be considered (27). Furthermore, establishing forums as a supportive source can provide opportunities for sharing scholars' experiences with colleagues; consultation with their peers can be considered faculty development situations (27). The organizational infrastructure can be incorporated to support the development, critical appraisal, and publication of scholarly activities (28, 29).

Considering ethical issues: It is advisable to think about ethical considerations when designing a scholarship project. The three categories of ethical issues are:

a) Ethical issues about using the students' research results. For instance, applying the results of a scholarship or research without permission from participants or students may cause inconsistency with ethical research principles.

b) The ethical aspects of choosing the methods or strategies for conducting a scholarship project, such as what methods or tools have to be used to collect, extract or analyze data.

c) Ethical aspects of disclosure of the results of a scholarship project and general report as the importance of adherence to the ethical principles of respecting the privacy of individuals in a report (15).

In general, it is vital to consider three ethical criteria for evaluating the ethical aspects of a scholarship project.

a) Obtaining informed consent from participants in the SoTL project: All subjects or participants in the SoTL project have the right to be aware of the title, subject, and purpose of the project, as well as the tools or methods of research and how to disseminate the results of the work, and where and for which purpose the research findings will be used.

b) The right of all participants in the research concerned to have their privacy and/or personal information protected. Participants in a scholarship project expect their privacy and personal information or demographic information or data to be respected anonymously. Data should be used in the analysis process or the assessment of research hypotheses.

c) Protecting participants against physical, emotional, and social harms or defects (15).

The second phase: implementation

Implementing the scholarly activities and analyzing evidence: It is crucial to adhere to the principles of methodology associated with each method. The implementation of procedures and tools must be accurate in each method and data analysis and interpretation at this stage.

In addition, no matter which method is supposed to be used, you must comply with ethical principles such as

obtaining informed consent in various steps from implementation to interpretation of data (15). A good scholar requires different stakeholders' involvement in the educational project process. Therefore, it is essential to engage stakeholders in the process of implementation. It is recommended that the learners participate in different project stages (15).

Critical appraisal of the SoTL project: It is necessary to carry out a systematic evaluation. In order to evaluate systemically, Glassick et al. defined the six criteria for evaluating a scholarly project (30). Based on these criteria, scholarship is an innovative activity in solving a problem, extending the boundaries of knowledge, and entering new areas that have clear objectives, sufficient preparation, using appropriate methodology, significant outcomes, the appropriate presentation of the program, and critical appraisal toward it (30).

According to Glassick's study (30), scholarship activities should:

1. Have clear, meaningful, and realistic objectives.

2. Be prepared enough.

3. Have an appropriate methodology for its implementation.

4. Have significant and considerable results.

5. Be publicly available in an appropriate manner.

6. Be appraised critically.

Reflecting on your SoTL project: Reflecting on the process of scholarship, summarizing the personal experiences of scholars concerning the use of specific teaching methods, or the application of a specific learning model, and the expression of its results and outcomes in a practical manner can help document and revise the process of the project (15). Although reflection is not a cure, it helps the scholar assess the different practical and ethical aspects and dimensions of the scholarship activity (31). Scholars have a conscious and integrated understanding of their experience by reflecting on the activities. Hence, the reflection consequence will reach positive and negative points of the selected activity. Reflection will ultimately provide practical recommendations for the continuation and development of selected measures for other scholars (32). Critical appraisal, reflection, and application of their results for designing future scholarship projects are defined as the foremost step in the scholarly field (37).

Documenting the details of the SoTL project: Note that scholarship is an evidence-based activity (28). You must adhere to the principles of reporting each method used in scholarly activities. Table 3 shows the principles of reporting scholar activities.

Table 3. The principles of reporting SoTL activities (7, 18, 28, 34, 35, 38)

1- Emphasizing innovation in your field.
2- Focusing on scholarly activities.
3- Use a conceptual framework and existing theories to guide or introduce your scholarship.
4- Determining your goal(s) or question(s) clearly.
5- Considering the generalization to the existing activities and policies while compiling the research question and the conclusion, as well as suggesting further research to solve the existing questions and challenges.
6- Ensure that goals or questions are timely, relevant, standard, and necessary.
7- Considering that scholarship evidence should be acceptable in support of new policy formulation or policy change.
8- Using common terminology and readable format, as well as tables, shapes, and graphs, if possible, in reporting documents.
9- Provide some indicators of the effectiveness of the implemented innovation or essential points from the class performance in the documentation.
10- Make sure that evidence from scholarship shows a causal relationship between proposed teaching methods, methodologies, students' outcomes, or at least comments related to perceived effectiveness associated with the proposed methodology. The opinions associated with the process and teaching mechanisms, the outputs of students, or their behaviors are considered valuable outcomes.
11- Documenting yourself systematically and consciously through available literature and "best practice."
12- Presenting all documentation related to scholarship effectively and accurately.
13- Assuring that the documentation provides evidence of the quality and quantity of educational activities.
14- Make sure that publications of scholarly activities are retrievable, documented, and archived to allow them to be repeated by other researchers.
15- Emphasizing innovation in your field.

The third phase: dissemination of findings

Going public and disseminating the experiences": According to Glassick's criteria, sharing scholarly results with peers is essential for evaluating scholarship activities (30). Although publishing the achievements of scholarship activities is not the primary goal, most scholars are interested in publishing their scholarly projects in related journals to present them to other scholars. Peer review and public dissemination defined the common elements of SoTL (39).

Scholarly project journals are good tools to help disseminate educational scholarship processes (33).

Typically, printing scholar activities are time-consuming because the process of reviewing, accepting, and publishing articles is long. Therefore, adhering to the publication rules and familiarity with the selected journal when submitting is crucial. Also, scholars must check the text of the article in literary, grammatical, and lexical terms before publishing the scientific article (34). Scholarly processes can be published in journal articles, presentations at conferences, publications (for example, books, monographs, chapters in books), other written works (for example, financial contributions, educational instructions, assessment reports for foreign institutions/organizations), reporting academic activities related to teaching (for example, new courses, new programs, student/program, textbooks, interdisciplinary program) (22, 35, 36).

Conclusion

SoTL project is one of the critical concepts in the field of education, which can affect the quality of teachers' teaching and learning process. The present study developed a practical guide for conducting a SoTL project. We outline how to conduct the essential components of successful scholarship of teaching and learning. Scholars must be able to provide a clear, complete explanation of the innovativeness of their scholarly ideas and the need for this kind of content for their audiences. Nevertheless, studying and reviewing relevant journals, reflecting on the issues or questions posed, and exchanging ideas with your colleagues are recommended for reviewing and refining scholarly and idea-generation questions.

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