An exploration of capacity development of journal reviewers through a mentored reviewer program

Teresa Hattingh[a], Sohum Sohoni[b], Ashish Agrawal[c], Sandeep Desai[d], Swaroop Joshi[e]

North-West University, South Africa[a], Milwaukee School of Engineering, United States[b] , National Institute of Technical Teachers Training and Research, India[c], Rajarambapu Institute of Technology, India[d], Birla Institute of Technology and Science, India[e]

Corresponding Author Email: teresa.hattingh@nwu.ac.za

ABSTRACT

CONTEXT

The Journal of Engineering Education Transformations (JEET) is a scholarly, peer-reviewed journal committed to the advancement of theory, research and practice in engineering education. The journal is international in its scope, inviting scholars and experts from across the globe to share their theoretical insights, research findings, and innovative practices to enhance and transform engineering education. In addition to publishing high-quality articles, the JEET editorial team is committed to developing authors as researchers through their review process. JEET is growing at a consistent rate and is actively seeking ways to increase its pool of reviewers, enhance the quality of reviews and build capacity amongst researchers and practitioners. To support this goal, in 2020, JEET started a mentored reviewer program modeled after a similar program that was run by the Journal of Engineering Education (JEE).

PURPOSE

The broader purpose of this study is to build capacity in engineering education research in India through a mentored reviewer program. The purpose of this paper is to outline the design of the mentored reviewer program, discuss anecdotal findings from the first round of delivery and describe the plans for a research study that will be employed to gather data from an upcoming second round.

APPROACH

Observations from the first round of the program were reviewed by the authors to find recurring themes. In addition, the authors, who were also the organizers of the program, reflect on their own experience.

OUTCOMES

Anecdotal evidence from the first offering of this mentored reviewer program suggests that besides providing training for becoming better reviewers, the program has successfully built a broader research community. Several participants expressed how the program has helped them to grow, not only as reviewers but also as authors and researchers.

CONCLUSIONS

This paper provides a comprehensive design of a mentored reviewer program to develop engineering education researchers. The paper also provides a critical evaluation of the first round of program delivery, highlighting opportunities for further refinement. The paper concludes with recommendations for a research study that will be carried out on the second round of the program to explore the experiences of mentees and mentors in relation to the community of practice framework. Furthermore, the study starts to challenge some of the existing paradigms in traditional review process, suggesting a more collaborative approach.

KEYWORDS

community of practice, engineering education research, mentoring, review process

Introduction

Background

JEET is a scholarly, peer-reviewed journal committed to the advancement of theory, research and practice in engineering education. Published in India, (the journal) is international in its scope, invites scholars and experts from across the globe to share their theoretical insights, research findings, and innovative pedagogical practices to enhance and transform engineering education. JEET is consistently growing and actively seeking ways to increase its pool of reviewers, enhance the quality of reviews, and build capacity amongst researchers and practitioners in this space. In addition to publishing high-quality articles, JEET's editorial team is committed to developing authors as engineering education researchers through their review process of articles submitted to the journal.To support these goal, in 2020, JEET started a mentored reviewer program modeled after a similar program that was run by the Journal of Engineering Education (JEE).

The JEE program (Mentored Reviewer Program, 2020) started in 2019, primarily designed to address the many challenges that exist in the reviewing space of academic journals (Benson, 2019). JEE recognized the frequently destructive (Benson, 2019) and toxic atmosphere (Silbiger and Stubler, 2019) that can exist in the peer review process for journals. They also acknowledged that the peer review process creates opportunities for fostering discussion amongst colleagues (Nature, 2020) and providing feedback that can strengthen and enrich academic work with the peer-review process forming a mentorship role (Martin, 2020). Therefore, the JEE program was designed to build up reviewers to provide constructive peer feedback (Benson, 2019). A reflection from mentees on the first round of the JEE mentored reviewer program highlighted additional benefits, describing the "ripple effect" that the program has more broadly on their identities as engineering education researchers and their contributions to the broader research community (Jensen et al, 2020).

Engineering Education Research (EER) is a relatively new field of research, particularly outside of Europe and the United States. It is also a complex field of research as the researchers in this field frequently transition from discipline-specific engineering research. Beddoes (2014) has identified the new disciplinary perspective that needs to be navigated as researchers enter the engineering education research community. Researchers need to develop a new identity as they make this transition, and developing and refining this identity is neither a straightforward nor a linear process (Gardner and Willey, 2018).

Engineering Education Research (EER) is also frequently misunderstood specifically by these transitioning researchers as they move from engineering education, through scholarly teaching and learning to scholarship of teaching and learning (SoTL) to engineering education research (EER) (Richlin, 2001). Understanding this evolution is an important aspect of the journey of most engineering education researchers.

Based on our experience working with the journal for a number of years, scholarly research itself seems new to a large portion of authors and reviewers of the journal. With an increase in the number of institutions over the last 30 years from about 300 to more than 2000 (All India Survey on Higher Education, 2019), as well as a shortage of qualified candidates, many institutions hire instructors with Masters in Engineering (ME) degrees. Government mandates and ranking systems are incentivizing faculty to pursue PhD degrees, but these are often viewed as end goals rather than the beginning of a career involving research and scholarship.Consequently, there is an opportunity and a need for capacity building in research in general, and research in engineering education specifically. This need spans the entire research spectrum from research planning, grant writing, paper writing to paper reviewing.

More broadly, Engineering Education Research (EER) itself is an emerging field of research in India. As a result, many of the papers published by (the journal) are considered "practice"

papers that engage in the engineering education and scholarly teaching and learning space. However, an increasing number of faculty at engineering institutions are becoming engineering education researchers, embarking on this journey across these various practitioner and research spaces.

Building on these thoughts,JEET saw the initiation of a mentored reviewer program as a unique opportunity to develop reviewers to provide constructive reviews while concurrently developing reviewers as engineering education researchers.

Anecdotal evidence from the first round of the program confirmed the findings by Jensen et al (2020) and again highlighted the emergence of identity development and the role that communities of practice played in this transition. The researchers identified an opportunity to explore these further through this research study in relation to established literature on communities of practice (CoP) (Wenger, 1998).

Purpose of the study

The broader purpose of this program is to enhance the research capacity of engineering educators in the field of engineering education research. This paper, in particular, will describe the development of the program and anecdotal feedback and evidence from the first round of the program. This evidence is then analysed in relation to literature and ends with the description of an interview protocol grounded in the CoP framework. This protocol will be used after the second round of the program, to be run in 2021, to explore the development of mentees and mentors as reviewers and educational researchers through participation in (the journal) mentored reviewer program.

The design of the JEET mentored reviewer program

In May 2020, JEET launched the mentored reviewer program. This process started with a small team drawn from the editorial board of the journal. Setting the program up for the first time required a number of steps to ensure that the necessary building blocks were in place and that appropriate engagement and buy-in was obtained before the launch. This section describes these preliminary steps, the design process used and the mechanics of the first round of the program that was run from November 2020.

Setting the stage

As noted earlier, the primary purpose of the program was to develop reviewers and improve the quality of reviews and submissions. To this end, a thorough review of supporting documentation was required before the program was launched. This included reviewing and updating the submission template, instructions for authors and reviewers, and the review criteria. This process took several months but the team felt that this was a critical first step to ensure that clear and consistent guidelines and expectations were available to associate editors, authors and reviewers before the program was launched. Furthermore, it was expected that this supporting information would reduce the potential for failure demand by minimising unnecessary misalignment and double work.

Developing the program

Although the program was modeled on the JEE mentored reviewer program, the team designed a tailored model that was able to meet the contextual needs of this journal. This model and the revised supporting review material was shared with the Associate Editors (AEs) from the journal for feedback and comment through two, one-hour, workshop sessions. The model and supporting material was revised over these two sessions based on input from the AEs. The team believes that this was also an important step in the design process to familiarize and orientate the AEs and gain their support but also to incorporate their thoughts on the practicality and suitability of the program for the context. The following sections introduce the model for the first round of the program including the purpose, format and content.

Purpose of the program

The primary purpose of the program was defined using the following objectives:

- To develop reviewers
- To develop authors (through the review process)
- To improve the quality of papers published in the journal

Secondary objectives included:

- To improve the quality of EER papers in the broader community
- To create an inclusive and supportive EER community

Format of the program

An overview of the format of the program is included in Figure 1. The program consists of the following elements: training workshops, the review of two journal submissions in mentor-mentee pairs, group feedback sessions and reflective assignments.

The program was designed to run over 3 months to allow sufficient time for workshops and engagement, give mentor-mentees time to review both papers and to maintain the momentum and energy that was built during the workshop sessions.

A learning management system site was created using Canvas to share resources and update mentors and mentees using announcements.
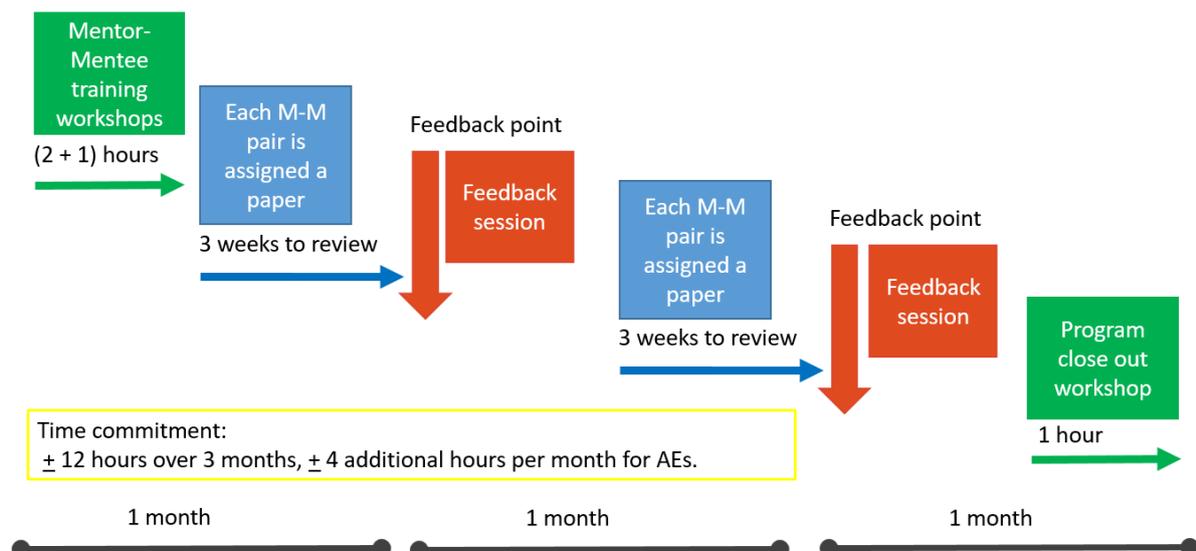

Figure 1: Overview of theJEET mentored reviewer program

The program started with two, one-hour workshops run on two successive Saturdays. All mentors and mentees were asked to attend these workshops although recordings were made available for those who were unable to attend. The workshops were designed to be interactive and centred around the following topics:

- Introduction
  - Introduction of mentors and mentees
  - The purpose of the JEET mentored reviewer program
  - Description of the logistics of the program
- Reviewing
  - Stakeholders in the review process

- ○ Purpose of reviewing
- ○ What makes a good review
- ○ Discussion of EER sample reviews
- ○ JEET reviewer guidelines
- Next steps and expectations on the program

Interestingly, the introductions of mentors and mentees on the program took a significant portion of the first workshop. It was found that this was a key activity on the program particularly in building networks and a community.

After the two training workshops, each mentor-mentee pair was then required to review one of the submissions to the journal. The process for this is included in Figure 2. Some flexibility was allowed in this process with each pair deciding how they would meet, discuss and write up the review. Pairs were also able to request feedback on their reviews from the program team. Group feedback sessions were held after all pairs had reviewed their first paper. These sessions provided a space for mentors and mentees to share their experiences and ask questions about the review process or the papers that they had reviewed. This process was then repeated for a second and new submission to the journal. A final close-out workshop was held at the end of the program to celebrate the contribution of everyone who participated in the program and to discuss any final feedback and experiences.

Two reflective assignment tasks were also assigned to the mentees on the program. Both of these tasks were completed using a GoogleForm. The first took place before the first training workshop and the second took place after the first submission was reviewed. Both of these tasks required mentees to reflect on their identity, sense of community in the EER space and their understanding of the review process.
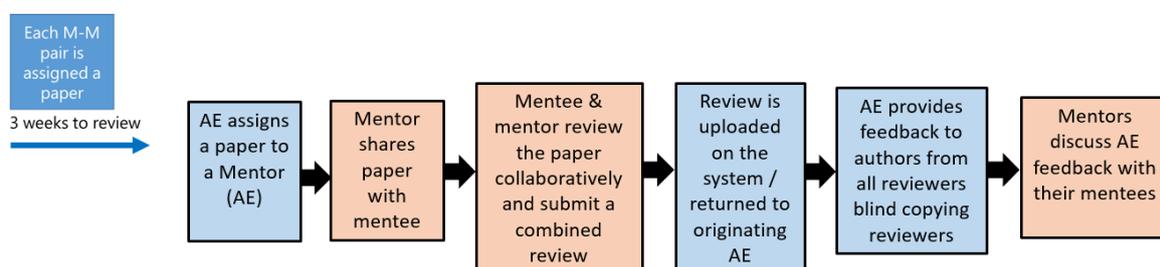

Figure 2: Overview of the program review process

Launching the first round

For the first round of the program, mentors were recruited from the pool of associate editors for the journal. After the initial workshops to set up the program, AEs were invited to participate as a mentor. AEs were also asked to recommend a current JEET reviewer or a new reviewer to be their mentee. Most mentors identified a mentee, for those mentors who did not, a mentee was assigned from the existing pool of reviewers. Identified mentees were then sent an invitation email, explaining the purpose of the program and expectations of participants. At the end of the recruitment process, ten mentor-mentees formally signed up for the first round of the program.

Practical observations from the first round of the program

It is noted that setting up the first round of the program did require a significant amount of time and effort from the core team which consisted of the five authors of this paper. As described however, much of this work was done to address matters that were of universal value to the journal. This was also once-off work that would not need to be repeated every time the program is run. The program was also designed in a way that materials were

created and curated so that future rounds would require less work on the part of the core team.

For the mentors and mentees, the time and effort that was required was again significant but this effort enabled mentors to tackle existing reviewers for their assigned papers and mentees were able to tackle actual reviews that were assigned to them. Furthermore, AEs acknowledged that the development of reviewers (mentees) has the potential to reduce the time spent on future submissions as they are a part of growing the quality and number of reviewers.

Indeed, the program does require commitment and dedication of the core team, mentors and mentees but because the extended value and purpose is communicated and understood, there is a sense that the program is actually enabling sustainability of the journal and the JEET community. Interestingly, we are about to launch the second round of the program and many mentors have signed up to be part of the program again and several mentees have agreed to participate in this round as mentors.

Reflections from the first round of the program

Participants (mentors and mentees) provided feedback on the program in two sessions, for a total of about one hour of discussion across the two sessions. All authors of this paper participated as mentors for the first round of the program. Below we summarize the observations and experiences of the authors. Note that the description below is anecdotal and is not a result of any data collection or analysis.

One of the the most frequent and thus important takeaways was how the program itself resulted in doing joint reviews and created a connection between the mentors (associate editors) and mentees (reviewers). Community building was not at the forefront when we planned the mentored reviewer program - our primary purpose was to improve the quality of the reviews. However, it was clear to the participants and the organizers that the human interaction, not just through the sessions of the program itself, but also from the meetings that occurred between mentors and mentees, some in person, some via video calls, some through phone calls, resulted in better reviews and more motivation for AEs and reviewers to complete their tasks. This prompted us to consider the community of practice framework as our theoretical framework for asking our research questions and setting up data collection for round two of the program. Another outcome from the observation of community building was to reconsider the relationship between the associate editor role and the reviewer role. Traditionally these roles operate in isolation, with the reviewer acting as a subject-matter expert. Indeed, the review process entails anonymity and impartiality, but why should there be an isolation of reviewers? As a direct result of the mentored reviewer program, the journal now offers monthly office hours from the Editor-in-Chief for all AEs. These have been fairly successful, and there is a proposal for each of the AEs to hold office hours for their existing and potential reviewers, where they might discuss specific reviews and overall improvements to the review process. In the months following the first round of this program, the Editor-in-Chief has held office hours each month. The office hours are open for anyone who wishes to discuss any issues in reviewing or editing a paper or bring up logistical issues on navigating the journal website for submitting reviews or communicating decisions to the authors. Given JEET is a relatively new journal, the office hours also serve as a forum for people to offer and discuss constructive suggestions on how to make the reviewing process smooth and useful for everyone involved. To accommodate different time zones, the EIC, who is based in Milwaukee, USA, has held the meeting at different times and sometimes on different days of the week.. Attendance has varied, and recordings of the meetings that had particularly robust and useful discussions were made available to all AEs.

Another idea that came up frequently during the feedback, especially from the mentees, was the idea of providing structured and constructive feedback. Most mentees commented on how they had earlier perceived a review to be a summary judgement of whether to accept or reject a paper, with relatively little feedback to the authors. However, the mentored reviewer

program altered their view about this, and taught them how to provide detailed constructive feedback, using the review as an opportunity to anonymously mentor the authors.

A third common observation was how useful the mentored reviewer program was in terms of the participants' growth not just as a reviewer, but as an author. A number of the participants, both mentors and mentees, pointed out that learning how to do more structured reviews, laying down expectations from each of the sections, and considering the logic model and flow from section to section from the perspective of a reviewer, immediately resulted in improvement in writing their own papers. One of the participants was in the final stage of writing a PhD dissertation, and applied these learnings to revise the dissertation with positive results.

Other observations were around better utilizing the time spent on the review process, writing reviews in a manner that would not insult, demoralize or demotivate reviewers, reviewing from the perspective of the reader of the journal article, and creating some sort of routine for both reviewing as well as carrying out the duties of an Associate Editor.

Design of the follow up research study

Theoretical framework

The anecdotal evidence from the first round of the program prompted the organizers to design a systematic study for the second round of the program to explore how the program develops both the mentors and the mentees as reviewers and engineering education researchers. For this future study, we decided to use the community of practice (CoP) framework (Wenger, 1998) as the starting point to design our data collection protocols. While the anecdotal evidence from the authors' observations point to the program participants learning about the process of review and engineering education research through participation in the community of other mentors and mentees, the literature on community of practice also supports our decision to use it.

Wenger's model consists of four interdependent components – community, practice, meaning-making, and identity. In our program, we can see all four being manifest. We are trying to build a community of reviewers and AEs in the field of engineering education. The new reviewers engage in the practice of conducting educational research reviews and learn about both conducting educational research and paper reviews from more experienced AEs in the process. As they are learning the practice of educational research and conducting reviews, they are also developing an understanding of what educational research is or how to write effective reviews. Finally, these experiences lead to an identity shift (or development) in the mentees.

This framework has been previously used by researchers to explore how novices learn the intricacies of a new profession. For example, Cuddapah and Clayton (2011) have used it to show how new teachers, through interaction within a cohort of other new teachers, learn about the practice of teaching, meaning making in the profession, develop their identity as teachers, and eventually start belonging to the community of teachers through interactions and providing support. Similarly, Jimenez-Silva and Olson (2012) present findings from a study about how a teacher-learner community helps shape english-language teachers' beliefs and perceptions about english-language teaching. In terms of learning professional engineering work, Gibuena et al. (2015) demonstrate how interactions with the engineering design coach help students have a better understanding of professional skills in engineering and provide them with insights into how disciplinary and industrial communities of practice function - thus improving their professional engineering competence. More recently, and relevant to our work, Pitterson et al. (2020) the CoP framework to explore the development of new engineering education researchers through a training program.

Proposed data collection

Guided by the CoP framework, we designed our data collection process to explore mentors' and mentees' development as reviewers and engineering education researchers. Data will be collected in the form of recordings of the meetings of the cohort, documents submitted by mentees on Canvas in the form of reflections and reviews and semi-structured interviews with mentors and mentees at the end of round 2 of the program. The recording and artefact data will be analyzed to understand how the participants engage in the four components of CoP - community, practice, meaning-making, and identity. Similarly, the interview protocol is designed to elicit participants' responses around these four components. Table 1 presents a selection of the proposed interview questions.

Table 1: Sample interview questions

Theme	Sample questions
Meaning making	• How would you describe a good review? Follow up: Has this understanding shifted through participating in the mentoring program (i.e., attending the sessions and conducting the reviews)? How? • What did this experience of participating in the mentoring program (i.e., attending the sessions and conducting the reviews) teach you about the purpose of review? How did you develop this understanding?
Practice	• Based on your learning from the mentoring program, how would you describe the role of the reviewer and the AE/editor? What led to you developing this understanding of your and editor's roles? • Is there something specific that you learned about the review process in education research? If yes, can you describe that? If no, can you tell me why?
Identity	• After this program, how do you see your role with respect to a paper that comes to you for review? • How do you see yourself as an engineering education researcher? How has the program helped shape the way you see yourself as an engineering education researcher?
Community	• How would you describe the connections that you made with your mentor, other mentees, and the organizers of this mentoring program? • What role do you believe that the community will play in your own EER career?

It should further be noted that this proposed study has been approved by the ethics committee at the North-West University in South Africa.

Conclusions

Anecdotal evidence from the first offering of the JEET mentored reviewer program suggests that besides providing the actual training for becoming better reviewers, the mentored reviewer program has been successful in building a broader research community. Several participants expressed how the reviewer training helped them to grow, not only as reviewers but also as authors and researchers. We expect that the results from the proposed future study will support this preliminary evidence and provide insights into the mechanisms that support the development of the community amongst this network of reviewers.

We believe that the findings of the study will make a valuable contribution to the peer-review process for academic journals in engineering education research. We anticipate the findings to reveal important characteristics of the journey of becoming an engineering education researcher and the role played by communities of practice. Furthermore, the findings from this study may also serve as the starting point for other journals to initiate similar programs to support their reviewers. Ultimately, we anticipate that this program and study will start to challenge many traditional review practices, provoking thinking that explores more

collaborative approaches to creating and building engineering education research communities.

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