

Research

Utilization of the Transparent Peer Review Policy to Train Graduate Pharmacy Students on Scientific Critique

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ABSTRACT

Objective: Recognizing the importance of training graduate students in scientific critique and peer review, we introduced an innovative instructional strategy using the transparent peer review policy (TPRP). This study aimed to explore students' feedback and reflection on how published peer review reports influenced their scientific critique skills and thought process.

Methods: We used TPRP-adopting journals' publicly available peer review reports for Master of Science in Pharmacy students, who analyzed real cases, including author submissions, reviewer comments, author rebuttals, editorial decisions, and final publications. A reflection assignment required students to share their insights on the TPRP-adopting journals' review processes and how these influenced their scientific reviewing skills. Qualitative content analysis of the submitted reflections was conducted by two instructors not involved in developing or delivering this aspect of the course.

Results: Eleven students submitted reflections on their learning experiences through this public-facing peer review process. The analysis revealed that TPRP increased the students' awareness of the peer review process and fundamental principles of scientific critique. Five key themes emerged: understanding research content, inspiring ideas, fostering objectivity, enriching peer review comprehension, and evaluating transparent peer review pros and cons. Students showed a positive attitude toward this pedagogical approach for acquiring the targeted skills.

Conclusion: We utilized peer review reports from TPRP-supporting journals as an educational tool, providing training on the fundamentals of peer review and scientific critique. This study suggests recommending TPRP-supported journal reports as a valuable educational tool for teaching scientific critique and peer review skills among graduate students.

1. Introduction

Scientific critique and peer review are viewed as fundamental scholarly transactions to maintain the integrity and quality of scientific literature.¹ Training graduate students in scientific critique and peer review is essential for developing competent researchers. However, many institutions lack formal training programs for this. Typical academic settings include peer review activities to address this training gap,²⁻⁶ in which students act as reviewers and provide critical peer reviews for other students' writing. Journal clubs, where students critique and discuss scientific publications, are effective in teaching critical appraisal and manuscript writing skills in undergraduate pharmacy and medical education.⁷⁻¹⁰ Recently, and in an active use of preprints, a novel approach was reported in which students select a

preprint, discuss major study findings, provide critical evaluations, and communicate a final referee report on the preprint to the corresponding author of the manuscript and post the same on an online platform such as PRReview or The Winnower.¹¹⁻¹³ In another recent and innovative approach, An and colleagues¹⁴ reported the utilization of the eLife peer review framework to train graduate and postdoctoral students on how to perform peer review in a collaborative formal activity, in which the graduate students teamed up and played the role of reviewers and editors to provide review reports to preprints submitted to bioRxiv but not yet having undergone formal peer review.

Although activities such as journal clubs offer great learning opportunities for students to practice scientific critique and peer review, they pose a fundamental challenge: can students act as peer reviewers without adequate training and experience? Simpson and Clifton

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reported that students often struggle to judge the quality of referencing and critical analysis.¹⁵ We agree with Simpson and Clifton's findings, observing that students struggle to act as peer reviewers in activities such as journal clubs. Thus, we adopted a new approach, exposing students to publicly available real-life examples, including submitted publications, peer review reports, editorial decisions, and final revised manuscripts for discussion and learning.

Based on our experience, we utilized publicly available peer review reports from journals with a transparent peer review policy (TPRP) to train graduate students using real-life cases. In this model, authors submit their research work, peer reviewers provide critical reports, authors respond with rebuttals, editors make decisions, and accepted manuscripts are published online with all reports available at no cost. Journals such as *eLife* and *Nature Communications* are pioneers in adopting TPRP.^{16–19} Herein, we describe the utilization of the actual peer review reports in journals that support the TPRP as an educational activity to train graduate students on the fundamentals of the peer review process and scientific critique and we requested the students to provide a reflection on this activity.

2. Study Objectives

The primary objective of this study was to explore the Master of Science (MSc) students' feedback and reflection regarding the benefits (or lack of benefits) of the published peer review reports on improving their awareness and skills regarding scientific critique.

3. Methods

3.1. Study Design and Setting

This report describes a new method for training graduate students about peer review and scientific critique, along with a qualitative content analysis of student reflections on this approach. Conducted at the College of Pharmacy, Qatar University, the study involved first-year MSc students reflecting on published peer review reports from TPRP-adopting journals. The qualitative approach was chosen because it suits early-stage empirical research, prompting students to share in-depth reflections, feelings, and thoughts.¹⁷ The study was approved by the Qatar University Institutional Review Board (approval number: QU-IRB-1868-E/23).

3.2. Study Population and Subjects

The study population comprised all full-time first-year MSc Pharmacy students who were enrolled in a graduate (MSc) course on scientific writing skills called English-based Communication Skills for Graduate Students (PHAR650).

3.3. Sample Size and Sampling

A nonprobability convenient sampling approach was implemented, where participants were chosen because they were accessible, approachable, and available to the researchers. Eleven students ($n = 11$) registered for the PHAR650 course. We utilized whole population sampling because the population was small and this study was a content analysis of a submitted reflection assignment.

3.4. Description of the New Instructional Activity and the Study Procedures

At the outset, we engaged in active discussions with the students about our past formal submissions and the corresponding peer review communications. This allowed the students to observe firsthand how professional peer reviewers and editors managed our submissions. Despite positive feedback from the students on this approach, we encountered a significant challenge: our publications may not align with each student's field of interest. The MSc program in pharmacy includes

students from diverse educational backgrounds (pharmacy, chemistry, biology) and various research interests (clinical pharmacy, pharmaceuticals and drug delivery, nanotechnology, natural products chemistry, pharmacology). This diversity made it challenging to select a publication that would be comprehensible, engaging, and relevant to all students. Consequently, this impacted their ability to justify and debate reviewer comments, which is essential for learning the fundamentals of scientific critique and peer review.

As a result of the mentioned challenges, we developed a self-directed learning activity where students individually searched for journals that adopt the TPRP and selected publications within their fields of interest. Students were instructed to find a published research paper relevant to their research field within pharmacy in a TPRP-adopting journal. This approach aimed to ensure familiarity with the selected field, enhancing their understanding of the peer review process. The selected publication had to include published reviewers' reports, authors' rebuttal reports, and the editor's decision to provide real-life examples of this process. Next, participants critically and thoroughly read the published paper and associated reports at home. Each student then presented their selected research paper and associated reports, critiqued them, and reflected on their experiences through oral presentations (PowerPoint, 15 min each) and in-class discussions facilitated by the third and fourth authors. They were also asked to provide written feedback about this learning experience through a structured reflection assignment comprising 6 questions. [Figure](#) summarizes the activity stages and requirements. The instructions for the activities (self-directed home reading, in-class activity, and take-home reflection assignment) were in English and were completed at a convenient time for the participants. The self-reflection activity involved 6 open-ended questions related to the transparent published peer review reports, focusing on their benefits, understanding of the process, strengths and weaknesses, arguments, pros and cons, and future research inspiration ([Table 1](#)). Participants were asked to provide detailed information about their experiences with the TPRP learning initiative.

3.5. Data Analysis

The study used qualitative content analysis of the submitted reflection assignment of the students. The long qualitative approach of data analysis proposed by McCracken was applied in this research.²⁰ The content analysis was done by 2 authors (RA and OR) who were not involved in the development and the delivery of the learning activities and the reflection assignment. To ensure rigor in theme derivation, the study followed Braun and Clarke's thematic analysis framework.²¹ Two authors (RA and OR) independently coded a subset of data, identifying preliminary themes. They then compared and discussed these codes to reach consensus and refine themes. The final thematic framework was developed through iterative review and validation against the data. Discrepancies were resolved through discussion until agreement was achieved. Detailed documentation of the coding and theme development process was maintained to ensure transparency and reliability.²¹

Data processing was carried out manually utilizing the thematic approach²² using Excel and Microsoft Word spreadsheets. Color-coding was used to categorize the content of the participants' written responses. Each student's self-reflection content was coded and labeled according to terms and concepts related to the transparent publishing policy. The derived codes were articulated and labeled in terms and concepts close to those reported by the participants. Then, codes and labels were compared to verify their descriptive content and to confirm that they were based on the collected data.²³ In the second stage of the data analysis, the codes were classified into different categories. Then, the resulting categories were grouped into related superior categories. Finally, associated categories were combined and aggregated into micro themes, and, consequently, micro themes were grouped into macro themes. In addition, exact quotes and words extracted from the transcripts were reported in the results to ensure an accurate reflection of the participants' ideas.

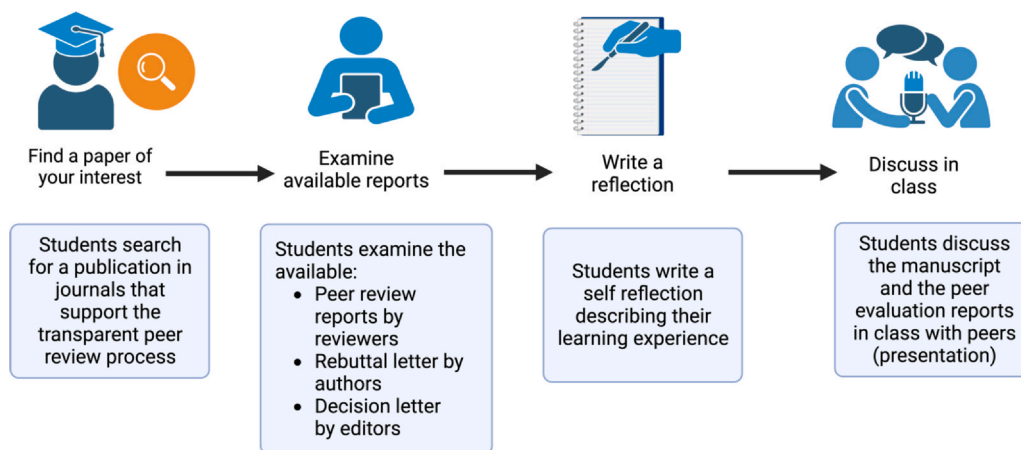


Figure. The Sketch Summarizes Stages Involved in the Developed Educational Activities to Train Students on Peer Review Critique Using Available Peer Review Reports Form Journals Adopting TPRP

Table 1

Main Questions Involved in The Take-Home Reflection Assignment to be Answered by Students After They Went Through the Available Peer Review Reports From Journals Adopting TPRP.

Question Number	Question
1	Was the available peer-review material beneficial in digesting and understanding the research work reported in the article? Please explain in details and provide specific examples.
2	Was the available peer-review material helpful to identify the strengths and weaknesses of the research work reported in the article?
3	Did this self-directed learning activity enrich your understanding of the process of peer review and the publication cycle? Please explain how?
4	Did the available peer-review inspired you to initiate new research or conceived a new research idea in the field? Explain how?
5	Was the discussion/argument provided by the editors/reviewers/authors in the available peer-review material objective and constructive?
6	After going through this experience, please discuss the “pros” and “cons” of transparent peer review policy and tell us if you will select this type of peer review for your next submission.

4. Results

Eleven students submitted their reflections on this public-facing peer review approach. The analysis yielded 5 main themes, which were further categorized into subthemes (Table 2). Each theme is detailed in the following subsections (4.1 to 4.5).

4.1. Theme One: Understanding Research Content

The first theme that emerged by examining the participants' feedback was how the TPRP helped them to digest the content and the crux of the reviewed research work. The published peer review reports help to understand the aim, rationale, and methodology of the research. As 1 participant noted that published peer review reports “explained the paper in a simpler, clearer, and comprehensive way, the main essential points.” Another participant noted that published peer review reports are critical to provide “reviewers’ overall opinion about the paper comprehensively and concisely.” The TPRP enhances the understanding of the research work as stated by 1 of the participants: “I strongly believe that the suggested modifications by reviewers increase the clarity of the presented study.” Similarly, another participant noted that published peer review reports “opened my eyes on points I have gone through quickly, without having a critical appraisal of them.”

On the other hand, some participants mentioned that the published peer review reports do not always produce a better understanding because some comments make no sense. For example, 1 of the participants stated that “the peer review report did not result in better understanding as some comments seemed irrelevant to the topic.” Another participant explained why published peer review reports do not necessarily lead to a better understanding by arguing that authors usually

respond to the reviewers’ comments and questions that often do not cover everything about the research work. The participant added that “here is a need to read the article itself, and if you are not familiar with the subject, there is a need to read further on the topic.”

4.2. Theme Two: Inspiring Ideas

Based on the feedback from the self-directed learning activity, the second emerging theme was how the published peer review reports inspire the participants to initiate or conceive new research ideas. In addition, reading published peer review reports often helps researchers keep up to date with the state-of-the-art developments in their discipline. As indicated by the students, examining the research work limitations indicates the gap that should be addressed in future research.

One participant, who selected a paper about individuals’ vaccination hesitancy indicated that the published peer review reports “made me think about research to conduct and identify whether educating people about the side effects of vaccines would have an impact on their willingness to take the vaccine and if so which type of information or educational material is more helpful to achieve this goal.” Another participant who selected a paper about the role of aspirin in reducing brain infarcts reported that: “Reading the article and then the peer review has inspired me a lot to further think outside the box and to think if we were to repeat this trial how will I do it taking in consideration the peer review comments.” The same participant was inspired by saying: “In my new research ideas, I might include patients with HIV-positive and TBM to assess the efficacy of aspirin further.” Moreover, researchers might propose new or opposite hypotheses or refine the framework to examine the study variables. For example, one of the participants stated that: “This hypothesis could be studied using different statistical analysis designs.”

Table 2
Main Themes, Subthemes, and Participants Quotes Related to the Students' Reflections on the Transparent Peer Review Policy.

Themes	Subthemes	Examples of participants' quotes
1- Understanding research content	a- Comprehensive understanding	<ul style="list-style-type: none"> • “Explained the paper in a simpler, clearer and comprehensive way, the main essential points.”
	b- Overall opinion	<ul style="list-style-type: none"> • Providing “reviewers’ overall opinion about the paper comprehensively and concisely.”
	c- Adequate review material	<ul style="list-style-type: none"> • “The peer review material was adequate in directing the readers to which sections were weak and needs improvements”
2- Inspiring ideas	a- Think out of the box	<ul style="list-style-type: none"> • “Reading the article, then the peer review has inspired me a lot to further think outside the box and to think if we were to repeat this trial, how will I do it taking in consideration the peer review comments.”
	b- Research refinement	<ul style="list-style-type: none"> • “This hypothesis could be studied using different statistical analysis designs, such as a more constrained model.”
3- Fostering objectivity	a- Professional objectivity	<ul style="list-style-type: none"> • “Peer reviewers were professionally objective in their evaluation process, and they presented constructive criticisms in their report.”
	b- Impersonality	<ul style="list-style-type: none"> • “All comments provided by the reviewers were very objective, as they did not show any of their personal opinions in the project. All the comments focused on the methodology of doing an appropriate implementation.”
4- Enrichment of peer-review comprehension	a- In-depth explanation	<ul style="list-style-type: none"> • “Helped me understand how the reviewers show an in-depth explanation of the method in which it is reproducible and whether the author has thought to conduct the research in a different way or add more information.”
	b- “Know how walk the walk and talk the talk.”	<ul style="list-style-type: none"> • “Prepares us as students to critically appraise our manuscripts (think like a reviewer, expert in the field) and others’ publications as well ‘know how walk the walk and talk the talk.’”
5 - Evaluating transparent peer-review pros and cons	a- Accountability	<ul style="list-style-type: none"> • “Providing more accountability for authors, reviewers, and editors during the peer review process.”
	b- Learning opportunity for future researchers	<ul style="list-style-type: none"> • “Provides educational opportunities for new and early-career researchers to learn from constructive reviews and responses to reviewer comments.”
	c- Costly	<ul style="list-style-type: none"> • “The process itself is time-consuming and expensive for the journals.”

4.3. Theme Three: Fostering Objectivity

Participants reflected on reviewers' objectivity, systematic approach, and constructive comments to authors. For example, 1 participant stated that “peer reviewers were professionally objective in their evaluation process, and they presented constructive criticisms in their report. For example, they emphasized the good points like the importance, the novelty, and the quality of the work and findings of the research.” Another participant reported that “In my opinion, the argument is objective and constructive.” Another participant stated: “All comments provided by the reviewers were very objective, as they did not show any of their personal opinions on the project. All the comments focused on the methodology of doing an appropriate implementation.” Moreover, one of the participants explained that the published peer review was constructive by saying, “The tones of critique were soft and respectful. The authors' responses were detailed and explanatory, as well as they responded to all the revisions.”

Interestingly, a few participants felt that reviewers could be authoritative by asking the authors to do things using a strong tone. For example, 1 participant said that “The reviewer appeared to be aggressive and his/her argument was: remove the word innovative as this approach has been used previously and the level of the innovation has been substantially reduced.” Similarly, another participant reported “The reviewer appeared to be less constructive and accusing at some points.”

4.4. Theme Four: Enriching Peer Review Process Comprehension

The fourth theme that emerged from the experience of the self-directed learning activity was related to the contribution of the published peer review reports in enriching the students' understanding of the fundamentals of the peer review process. The peer review process is critical for all research papers because it allows further refinements in their research work. Based on this activity, the participants reported that the TPRP enhanced their extensive understanding, insights, and scholarship to the peer review process. For example, 1 participant explained that the self-learning activity provided “an insight of real-life examples for the complete reviewing process, as how communications between the author and journal occur and what type of language is used.” In addition,

he/she added that “the process prepares us as students to critically appraise our manuscripts (think like a reviewer, expert in the field) and others' publications as well. Know how walk the walk and talk the talk.” Similarly, another participant stated, “It was helpful to read the reviews and explore or familiarize myself on what reviewers look for in order to consider them during my next publication or project.”

Researchers strive diligently to enhance the prospects of their manuscripts being published in a well-regarded journal. Regarding that, 1 participant said that examining the published peer review reports “helps researchers to produce high-quality papers and avoid rejection in the future.” Another participant reported that “This activity highlighted and provided a better picture on the publication process dynamics and to help in what to expect during applying for any publication in that matter.” Comments such as these were frequent among participants and reflected the importance of TPRP in enhancing and enriching the quality of submissions and, thus, published papers.

4.5. Theme Five: Evaluating Pros and Cons of TPRP

Participants discussed the pros and cons of TPRP. Table 3 summarizes their main points, noting more advantages than disadvantages. Regarding the advantages, participants stressed factors of accountability, constructive feedback, objectivity, impersonality, and high research quality. For example, one of the participants stated that the most prominent advantage of transparent peer review is “providing more accountability for authors, reviewers, and editors during the peer review process.” Another participant added that transparent peer review enhances “transparency in science communication and encourages constructive critique.” In addition, 1 participant reported that “transparent peer review will lead to greater accountability and a lower chance for review fraud, bias, or subjective evaluation as the editor's and reviewers' reports will be published to the public.” Another advantage of the TPRP, as mentioned by one of the participants, was “broadens the reader's scope of view and help to increase the reader's knowledge by looking at different points of view or different angles of the same topic.” Some participants appreciate the time and effort spent by the reviewers in critiquing the paper and writing their reports by saying that this policy “provides a mechanism for reviewers to obtain

Table 3
Pros and Cons of Transparent Peer Review as Reported by the Participants.

Pros	Cons
1- Encourages peer reviewers to review research papers carefully and be accountable	1- Increases time, cost, and efforts of editors in managing the reviews
2- Provides clear and constructive criticisms from different perspectives	2- Restricts reviewers' comments to the technical aspects, not to the novelty of the concept or the rationale behind the study
3- Broadens the reader's scope, insights, and knowledge of the topic	3- Requires highly qualified and experts reviewers
4- Provides educational opportunities for new and early-career researchers in running and defending their research work	4- Sometimes, the open peer reviews provide destructive feedback without offering helpful advice
5- Appreciates the reviewer's roles and offers credit for their efforts	5- Harsh or destructive comments will not benefit authors and might get them demotivated to go beyond
6- Discourages harsh tone used by some reviewers in their reports	6- Require longer publishing time
7- Develops a systematic, comprehensive, and thoughtful review process	7- Not many authors prefer this type of reviewing since it requires confidence and courage
8- Increases the transparency of the research work	
9- Enhances the researcher's confidence and avoid committing blunders in the research works	
10- Innovates and improves the way research is communicated	
11- Enforces a fairer way to publish research	
12- Trains researchers to be open to feedback and not to take negative comments personally	
13- Allows readers and researchers in the field to conceive new future research ideas	
14- Provides a better understanding of the editor's decision-making process	
15- Generates higher quality papers and credible reviews	

credit for their efforts." Some participants reported that the transparent peer review policy is a good opportunity to develop potential future researchers. For example, 1 reviewer said it "provides educational opportunities for new and early career researchers to learn from constructive reviews and responses to reviewer comments."

Regarding the disadvantages of the TPRP, participants raised several points in terms of cost, reviewing time, efforts, publishing time, and others. For example, 1 participant stressed the cost and time factors that the journal would probably bear by saying, "the process itself is time-consuming and expensive for the journals." One of the participants mentioned that "an organization using transparent peer review stated that it uses an additional 30 min of additional time per paper." Some participants felt this policy might provide harsh, destructive, or biased feedback that would disappoint and frustrate authors. For instance, one participant said, "Some reviews may be destructive or biased for some reasons, leads to some cases wholeheartedly embraced transparent peer review."

5. Discussion

The main objective of this paper is to explore the educational utilization of TPRP and the available peer review process to train students on the fundamentals and process of peer review and evaluate their reflections and experiences. Transparent and open peer review, now widely regarded in academia as a crucial element of open science, has facilitated the generation of a wide array of research, allowing the academic community to collectively assess and evaluate the different phases of the peer review procedure.^{16,19} The content analysis indicates that peer review reports published in journals that use TPRP serve as valuable resources for instructing graduate students about the peer review process and achieving significant educational objectives related to understanding its fundamentals and engaging in scientific critique. Our results indicate that TPRP helps the graduate students digest the content and the core of the reviewed work. In addition, participants reported that TPRP provides an in-depth and helpful information to readers and researchers. In the study by Mehmani,²⁴ 33% of the journal editors surveyed reported transparent peer review has enhanced the overall quality of reviews. Of these editors, 70% indicated that the open review reports were more comprehensive and offered more constructive feedback.²⁴ The peer review process shows the rigorous nature of arguments in healthy scientific discussions and reports and provides highly objective and constructive arguments. Previous research found that the policy of transparency in the peer review process in academic

journals shows promising reliability and validity, prevents reviewers' biases, prompts honesty and openness, and does not significantly compromise referees' willingness to review.^{16,25,26}

Our approach to TPRP is more likely to help future researchers understand and utilize the review process and provide rigorous approaches and methods to enhance their work quality. Interestingly, the majority of the participants revealed a favorable disposition toward publishing their forthcoming research in journals that adopt the TPRP. According to Garakyaraghi and colleagues,²⁷ transparent peer review offers various benefits, especially for novice and emerging researchers, such as the present study participants. It allows readers to glimpse the peer review process, providing educational opportunities by presenting tangible instances of reviewer reports and the corresponding author responses. Accordingly, TPRP is more likely to guarantee a high quality of work by improving academic quality control.²⁵ Future researchers are more likely to be enthusiastic about training and learning new academic experiences such as the TPRP. Bravo et al. found that younger scholars were more willing to accept invitations to review and provided more positive and objective recommendations.²⁸ Researchers do their best to boost the chances of publishing manuscripts in a reputable journal. Based on analyzing 231 papers published in transparent peer-reviewed journals, Wicherts²⁵ found a positive association between the TPRP and the quality of the peer review process, enhancing the quality of the work.

Participants reported more pros than cons in utilizing the TPRP approach. Several studies²⁹⁻³¹ contend that the advantages of implementing an open and transparent peer review system, which include enhancing trust, responsibility, and accountability within the peer review process and acknowledging the contributions of editors and reviewers, surpass any potential logistical issues. As reported by previous research,^{26,30} the participants of our study confirmed that the TPRP process is time-consuming and expensive for the journals. Moylan and colleagues³⁰ emphasized this point in their study by reporting that editors had to invite more peer reviewers to secure a sufficient number of reviewers to agree to review an article, increasing editorial time and effort.

One main objective of our self-directed learning activity of the transparent published peer review is to demonstrate a real example of a peer review process through which the graduate students understand the process and the nature of the scientific peer reviewing. The innovation aims to train graduate students to be successful and professional future researchers. Therefore, faculty members are highly encouraged to train, mentor, and coach their graduate students about the systematic publishing process, mainly in courses related to research methods. According to their feedback

on this activity, participants indicate that the TPRP process significantly enriched their comprehension, provided valuable insights, and elevated their scholarship in peer review processes.

This study contributes to the existing body of literature by examining the educational application of the TPRP and publicly available peer review reports for training postgraduate students in the fundamentals and processes of peer review. Unlike previous research studies, which may have focused on theoretical aspects or broader educational strategies, the present study specifically evaluates the potentials of using these tools in enhancing the students' critical scientific writing and peer review skills. By analyzing the students' reflections and experiences, this research offers practical insights and demonstrates how these approaches can be utilized to improve educational practices in peer review training. The findings from this study provide valuable evidence for educators seeking to develop more effective methods for teaching peer review and critical analysis.

The present study is exploratory, which aims to investigate a new research topic in which previous research is extremely limited. The study analyzed the self-learning feedback using the qualitative technique by examining the content of the participants' reflection assignment. Qualitative research is crucial in generating in-depth understanding of feelings, insights, and attitudes about the explored topic using the voice of the participants and the findings may not apply to larger populations. The qualitative data analysis is inherently subjective, and the researcher's biases, perspectives, and preconceptions can influence all stages of the research process, including data collection, analysis, and interpretation. This may compromise the rigor and trustworthiness of the study if not adequately addressed.

In our study, we asked the participants to provide their feedback about the self-learning activity of the transparent peer review publishing policy by answering the assigned 6 questions as developed by the authors. However, we might have inadvertently sought for information that confirms our preconceived ideas about public-facing review, which might have led to confirmation bias. Moreover, there were possibilities of social desirability bias because the investigators were the students' instructors who designed the activity and selected the examples used in the session. Therefore, the students might have reported this educational activity as a valuable one when writing their reflection. However, the questions asked allowed the room for the students to express opposing views (eg, lack of benefit of the approach in the learning process). To increase credibility and trustworthiness, the educational activity was developed and delivered by 2 investigators (AMAK and AA), the analysis was done by the other 2 investigators (RA and OR) who did not develop or deliver the content. Surveys conducted among various researcher communities indicate a rising endorsement of increased transparency and acknowledgment within peer review initiatives.³² Therefore, future research may give more opportunities to participants to add any other issues or points they would like to add based on their learning experiences. This opportunity would encourage participants to provide further insights and perspectives that authors might have neglected.

6. Conclusion

We described a new instructional strategy for teaching peer review and scientific critique among graduate students. Available peer review reports from journals that support the TPRP were used through an educational activity to train the graduate students on the fundamentals of the peer review process and scientific critique. The students expressed their experiences and thoughts regarding this learning activity as positive in enriching their understanding of the science and the peer review process and inspiring them to conceive new research ideas. We believe that the proposed educational activity can be seamlessly integrated into diverse courses, disciplines, and universities. It could be embraced as a powerful and effective educational tool to train students and young researchers in scientific critique and peer review methodologies.

Author Contributions

Conceptualization: A.M.A., A.A. **Project administration:** A.M.A., A.A. **Investigation:** All authors. **Data curation:** All authors. **Writing – original draft:** A.M.A., R.A. **Writing – review and editing:** All authors. **Methodology:** A.A., R.A.

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Declaration of Competing Interest

None declared.

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