Using the Critical Response Process for Kinder, More Constructive Peer Review in Science Seminar Courses

By Lekelia D. Jenkins

Existing processes for academic peer review can yield unnecessarily harsh critiques that focus on any vulnerability rather than constructive feedback to improve the work. Efforts to improve the peer-review process recommend training at the graduate level. This article describes the Modified Critical Response Process (MCRP) as a means to achieve such training and improve in-class peer review. The MCRP is based on Liz Lerman’s Critical Response Process (CRP), an art-critique method that helps form constructive dialogues about artworks in progress. I adapted the MCRP for the nature of science products and the time limitations of graduate-level seminar courses. The four-step MCRP process includes (i) focus areas prescribed by presenter and rubric, (ii) clarifying questions asked by responders, (iii) positive comments offered by responders, and (iv) bounded comments given on areas for improvement. Evidence from instructor observations, student evaluations, and teaching peer reviews suggests that the MCRP can be a kinder, more constructive way for students to give and receive peer-review feedback. The MCRP can help students learn, articulate novel scholarly insights, and develop facilitation and teaching skills. The MCRP could readily be applied to seminar courses, lab group meetings, seminar series, or workshops.

As a young scientist, I prided myself on giving insightful critiques that revealed methodological weaknesses, overgeneralizations, and unsupported conclusions. I learned this approach to scientific peer review in graduate school but discovered it did not transfer well to other sectors. As a government employee, I offered feedback on a talk about aquaculture. Instead of nods of accord, the audience stiffened. My colleagues avoided me until one asked, “So I guess you don’t like aquaculture?” My sharp critique, which was intended to improve future research, instead made people think I despised the field. I realized my critiques—although objectively and dispassionately given—sliced deeply and exposed the presenter in uncomfortable and painful ways (Jenkins, 2022).

Scholars have highlighted similar problems with the peer-review process for journals (Smith, 2006). They have suggested alternatives, such as open review and open exchange between reviewers and reviewees (Suls & Martin, 2009). Still, fears of aggressive attacks and humiliation hinder open review (Tattersall, 2015). Scholars have recommended training at the graduate school—level to improve peer review (Cooper, 2009) but fail to describe an approach to this training.

As a professor, I wanted my students to learn a better way that was helpful without being harmful. I borrowed and modified an art-critique technique, Liz Lerman’s Critical Response Process (CRP; Figure 1), which helps the individual form constructive dialogues about works in progress. Using a four-step, facilitated

FIGURE 1
discussion, it offers the artist and the audience a chance to ask questions, share reactions, and voice opinions to help create a stronger work of art. Lerman created the CRP after experiencing similar frustrations to mine but with the art-critique process. She writes, “So-called ‘feedback sessions’ often seemed brutal and frequently not very helpful” (Lerman & Borstel, 2003). Lerman espouses the value of the CRP for any creative process, from arts to education to business (Lerman & Borstel, 2003, 2008; Stark Smith, 2008). Its use has spread worldwide, and participants are often inspired and energized to return to creating and revising their work (Lerman & Borstel, 2008; Stark Smith, 2008).

I applied the CRP to three interdisciplinary graduate-level courses: Case Study Research: Design and Methods, Project Design for Conservation and Community Development, and Human Dimensions of Tidal Energy. I require students to give a final presentation or paper as a summative assessment. In preparation for this task, the students give a presentation on the work in progress and receive feedback from the other students and myself on both the content and the presentation style. This serves as a formative assessment. I thought the CRP could be a helpful format for the formative assessment and would introduce students to a new way of giving peer reviews.

**Critical Response Process**

In its simplest form, the CRP consists of three roles (artist, responder, and facilitator) and four core steps (Figure 1). Lerman and Borstel (2008, p. 16) explain, “The artist offers a work in progress for review and is prepared to question that work in a dialogue with other people.” Responders commit to the artist’s intent to make excellent work and offer reactions to the work in a dialogue with the artist. The facilitator initiates each step of the CRP, keeps the process on track, and helps the artist and responders use the process to frame useful questions and responses (Lerman & Borstel, 2003, 2008).

After the artist shows a work in progress, the facilitator initiates the CRP according to the following steps (Lerman & Borstel, 2003, 2008):

1. **Statements of meaning:** The facilitator asks the responders, “What has meaning for you about what you have just seen?” The responders then state what was meaningful, evocative, interesting, exciting, or striking in the work they experienced.

2. **Artist as questioner:** The artist asks questions about the work. The responders’ answers may express opinions if they directly respond to the question and do not have suggestions for changes.

3. **Neutral questions from responders:** The responders can ask the artist informational or factual questions without opinions. For instance, the question “Why are the costumes so baggy?” is not neutral. A neutral version would be “What ideas guided your choices about costumes?”

4. **Permissioned opinions:** The facilitator invites opinions. This follows a specific protocol; the responders first name the topic of the opinion and ask the artist for permission to state the opinion (e.g., “I have an opinion about X; would you like to hear it?”). The artist may accept or deny the request.

**Modified Critical Response Process**

The CRP is not ideal for a science classroom and needs time that is not available in most university classes. In my courses, students or teams only have 15 minutes to present and receive feedback. Also, my students give conference-style science presentations with objectives, conclusions, limitations, and generalizations. Thus, presenters explicitly prescribe the meaning and purpose of the presentations, and, unlike in art, there is little opportunity for the audience to ascribe meaning to the “work.” This makes Step 1 of the CRP less expansive when applied to science. I use a Modified CRP (MCRP) to better align with science seminar courses. I typically use this MCRP (Figure 2) for in-class presentations.

**Step 1: Focus areas prescribed by presenter and rubric**

This step combines elements of CRP Steps 1 and 2 to reduce time. Implicit in prescribing focus areas is also defining meaning. Explicit discussions...
Step 3: Positive comments offered by responders

Next, the responders offer comments on things that worked well in the presentation. This step holds some of the value of CRP Step 1 but is more explicitly positive. Positive feedback in STEM peer review is a rarity and not often taught, so I made this a learning objective. I also strictly enforce this step on positive comments before students can give any other opinions. Students struggle most with this step, so if it is needed, I model this step by sharing things I liked about the presentation or that helped me understand the content better. I also use this step to highlight ways to earn full points on a rubric criterion with which students often have trouble. For instance, students frequently rely on statistics to show relevance and lose points for their introduction because it is informative but not compelling. Once, a student presented on the vulnerability of dams to cyberattacks and began by stating how quickly the campus would be submerged if the nearest dam were breached. I commented positively on this presentation, emphasized how making an issue personal makes it more compelling, and urged the class to take note so they also could earn full points for a compelling introduction.

Suppose the class is still not forthcoming with positive reflections after modeling positive feedback. In that case, I draw their attention to the grading rubric and ask them to consider what worked in the presentation for each point of evaluation. Eventually, students are forthcoming; however, this is also the step in which I must be most diligent as a facilitator. Sometimes students will want to hold the floor and keep talking, trying to move from their points of what worked to what needs improvement. I have to gently interrupt them, remind them we are still on Step 3, and ask them to hold these thoughts for the final step (Jenkins, 2022).

FIGURE 3

Class presentation peer review guide.

Instructions
For each section below (clarity, organization, and style), list 1-3 things that worked and list 1-3 things that need improvement. Give suggestions of how to improve these elements. In conducting this assessment, think about the following questions:

Conceptual Clarity
- Were you able to understand the project well enough to summarize it to another person?
- Did the presenter use metaphors, illustrations, or other tools to help you understand?
- Did the presenter divide the project into easily understood units of information?

Organization
- Did the presentation have an introduction that gave a clear purpose?
- Did it present information in a logical sequence that you could follow?
- Did it have a strong conclusion that tied together all the information presented?

Style
- Did the presenter speak with confidence at an understandable rate and volume?
- Did the presenter appear comfortable?
- Did the presenter show enthusiasm about their topic?
- Did you stay engaged while watching the entire presentation?

Suppose the class is still not forthcoming with positive reflections after modeling positive feedback. In that case, I draw their attention to the grading rubric and ask them to consider what worked in the presentation for each point of evaluation. Eventually, students are forthcoming; however, this is also the step in which I must be most diligent as a facilitator. Sometimes students will want to hold the floor and keep talking, trying to move from their points of what worked to what needs improvement. I have to gently interrupt them, remind them we are still on Step 3, and ask them to hold these thoughts for the final step (Jenkins, 2022).
Step 4: Bounded comments given on areas for improvement

The final step in the MCRP is that the audience can offer suggestions for things that needed to be improved, focusing on the specific areas for which the presenter asked for feedback and bounded by the criteria in the rubric. This step is most analogous to CRP Step 4. If the student interrupted in the previous step does not readily volunteer their thoughts, this can indicate that the student feels censured and hesitant to share now. I invite that student to share their thoughts on improvements. For this final step, I hold my comments until the end to keep the space student focused rather than teacher focused. However, some presenters are not confident in the advice of their peers, so when I give comments, I reinforce the value of the peer comments by highlighting the points of agreement I have with students, naming the individuals, and crediting them for the ideas (Jenkins, 2022).

I use a further simplified MCRP for written work because the students provide feedback outside class and without a facilitator. For written work, the process is to (i) review the grading rubric, (ii) read the paper, (iii) offer positive comments, and (iv) identify things to improve. I grade and respond to reviews to incentivize following the simplified MCRP for written work. Using a rubric (Figure 4), I grade the reviewers on how well their feedback aligns with the simplified MCRP and gives substantive, constructive feedback to the author. In their final summative written paper, the authors are required to include the reviewers’ comments and a letter detailing what changes they made in response to the comments or defending their decision not to make changes. I grade this response letter as part of the rubric (Figure 5) for the summative assessment (Jenkins, 2022).

Evaluation

To gather insights into the utility of this approach, I conducted an informal evaluation that allowed me to gather feedback for each course in which I used the MCRP. In addition to my observations, I reviewed the responses to the open-ended questions in student evaluations, examined the letters written by my colleagues after conducting teaching peer reviews, and emailed all the students from my previous courses and asked for feedback.

For the first two approaches, I gathered any references to the MCRP. For the latter approach, I briefly re-
freshe the students’ memories about the MCRP, explained the purpose of the email, and asked the following questions:

I would like to know in 1–3 sentences your thoughts on this approach. How was it different from how you have received feedback from peers in other classes or after conference/meeting presentations? Was it a more favorable experience, less favorable, or the same? Do you see value in using an approach like this in more classes? Any other thoughts about this approach?

Collectively, the responses and comments across the three evaluative approaches gave at least one piece of evidence for each course offering. In total, I emailed 21 students across four classes (convened 2013–17), with a response rate of 14%. The review of student evaluations yielded two comments about the MCRP. The teaching peer reviews produced one comment. This comment was from the only professor who attended a class session in which I used the MCRP. Although the number of comments was small, these comments are still meaningful because they arose unprompted, as neither the evaluation forms nor the teaching peer reviews included any specific questions about the MCRP. Across the three evaluative approaches, all comments about the MCRP were positive. The next section addresses these comments in more detail.

Discussion

I have received positive feedback from students that this MCRP for oral presentations is indeed helpful without being harmful. One student said:

Having my peers provide live feedback in a structured manner helped me feel at ease with my presentation for various reasons; it provided transparency and met expectations as well as lessened a potential personal bias when receiving and providing feedback. Although other classes had opportunities for peer critique, they were often informal, unstructured, and randomly selected. This style seemed to add pressure and anxiety to not only the presenter but [also] the audience. Therefore, Dr. Jenkins’s adapted approach to CRP [boded] well for the progress of her students.

This student’s sentiments mirrored the perceptions of my colleague who reviewed a different course and wrote:

After each student presented, the others were encouraged to ask questions and give feedback. Professor Jenkins was a skilled facilitator, allowing the students plenty of time to discuss, and then steering the conversation at appropriate intervals, as well as giving constructive criticism in a very positive way to the students. The atmosphere in her classroom was very welcoming, relaxed but focused, and each student appeared comfortable [sic] in speaking and commenting.

Students felt that the MCRP helped them learn and incorporate their ideas into their work. This latter point is vital for students to learn how to make original scholarly additions to the literature. Here are comments from two students:

I think that the review paper was the most helpful and I appreciate how you let us edit our review papers, because I feel like I learned the most from my mistakes.

This class was incredibly stimulating, the review paper requirement was especially helpful, because I felt like [I] learned [a lot] from going through the editing process and trying to integrate my own new ideas.

I observed that many students implemented the feedback they received. They noticeably improved from their formative assessment presentations to their final summative assessments. They noticeably improved the visual components and informational content because students can change these two aspects more quickly than their oral presentation skills, which requires long-term practice.

Further evidence of the utility of the MCRP is that the model is spreading. One of my former students, who was completing a PhD in education, began using the MCRP in the classes he taught. He wrote:

I think asking for feedback on element/aspects of the presentation that I want is personally way more helpful, enriching, and constructive than listening to random ideas that perhaps are not needed, that I already know I need to work on, or that would not help improve my presentation. I have used this approach in a small seminar with other graduate students, resulting in less waste of time, as we have a clear goal or objective when reviewing documents or presentations. It has helped us create a mindset of acceptance for feedback, and be open to receive comments as a learning/reflective opportunity for our work.

Another student who was also a science teacher affirmed the value of the MCRP:
As a former associate superintendent and science teacher for public K–12 schools for 8 years, I quickly realized the power of formative assessment techniques in helping students advance their thinking. The Critical Response Process (CRP) is one such method of providing immediate, constructive, and targeted feedback to students. Rather than waiting for delayed written teacher-only feedback, this method provides a safe space to share immediate peer-to-peer and teacher-student feedback. I personally found it valuable for pushing my thinking and improving my presentation skills.

Conclusion

This article has presented the MCRP and evidence of its utility for science seminar courses. I have shown that this approach can be a kinder, more constructive way for students to give and receive peer-review feedback. The MCRP can help students learn, articulate novel scholarly insights, and develop facilitation and teaching skills. The MCRP could be readily applied to lab group meetings, seminar series, or workshops. Helpful next steps for the further adaptation of the MCRP would be to use it in larger STEM courses with more students and less time. One potential approach is to post recorded presentations that include MCRP Step 1 in the learning management system. Students’ classmates would view these before class and then have MCRP Steps 2 through 4 take place during class, or they could follow the MCRP steps online through moderated discussion groups.

References


Lekelia D. Jenkins (kiki.jenkins@asu.edu) is an associate professor in the School for the Future of Innovation in Society at Arizona State University in Tempe, Arizona.