

Filling in the Gap

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Context: Out of class; Semiconductor Devices and Circuits

Keywords: circuits, exam wrapper

Student Activity Time: 1-2 hours

In order to re-take an exam, students submitted a post-exam reflection and completed practice problems.

Introducing the Reflection Activity

Sometimes, having a second chance at an exam that went poorly can make a huge difference for student learning. An educator offered their class an opportunity to retake an exam by first completing a written reflection about the mistakes they made on the exam, what they would do to correct those mistakes, and complete and submit some practice problems. The purpose of this activity was to prompt students to consider their exam performance, identify errors, explain the steps that could be taken to avoid those errors in the exam retake, and get more practice by completing and submitting about a dozen circuit analysis problems.

An educator administered a regularly scheduled course exam, yet the majority of students did not do well on the exam. After returning the graded exam to students, the educator offered students the opportunity to retake the exam, but only after completing a post-exam reflection. The educator required students to write a brief reflection on the exam and detail the errors that were made. The activity also included practice problems to prepare students for the exam re-take. In addition, students identified strategies to avoid the errors that they made on the original exam. The post-exam reflection was a gatekeeping requirement for students who wished to re-take the exam. The students submitted their post-exam reflections and were permitted to re-take the exam.

The educator found that many students identified misconceptions or errors that related to the pre-requisite circuits course. As a result of the post-exam reflection, students made significantly fewer mistakes related to core concepts (basic circuit analysis, such as KVL, KCL) on the remaining exams, compared to other cohorts that took the course.

Recreating the Reflection Activity

	Description
1	Grade and return students' exam, then offer the opportunity to re-take the exam by completing the reflection activity.
2	Provide students the guidelines for the reflection activity and the due date.
3	Collect the reflection activity and administer the exam re-take.

In the words of the Educator: Tips and Inspiration

Focus on specific questions. Instead of leaving it open-ended, I would suggest focusing students' attention on specific questions and selecting a short number of problems to re-take. If they are focused on a shorter number of problems, students can usually identify and address the fundamental problem without overwhelming themselves with the whole exam. Just asking for one or two sentences per problem on the reflection and an overall summary of the exam will get to the point faster and students are less likely to shy away from doing it.

Use it as a gatekeeper. I decided that if they wanted an opportunity to retake the exam, they had to complete this activity in order to do so. They needed to show me that they knew what their mistakes were before they could make the same mistake again. The practice problems were included because I didn't want them just to reflect and take the exam again; they needed to practice it first. The combination of the reflection and the practice problems really made it work. This time I did not grade it, but it could be graded for partial credit.

What was the inspiration for the reflection activity? I found an activity like this in the CPREE field guide. My students had done very poorly on an exam and this seemed to be a good way to help them see why they made the mistakes that they made. I want students to see where they are missing things. I really want them to apply this kind of approach to learning in general and ask themselves "why am I making the same mistake?"