



Minute Papers: Taking Stock of the Day

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Context: In class; Calculus III and Abstract Algebra

Keywords: class reflection, muddiest point

Student Activity Time: 3-10 minutes

At the end of a class session, students reflected on a question related to the class.

Introducing the Reflection Activity

In an advanced mathematics course, students reflected on their learning in the class by responding to a question related to the class in what the educator called minute papers. The purpose of the minute papers was for students to think about and evaluate their learning with respect to a specific question.

The first time the educator used minute papers she introduced the concept to students, explaining the rationale behind them. In the minute papers, at the end of a class session the educator gave each student a notecard to respond to a question she wrote on the board. The questions ranged from what was the muddiest to what questions do you still have. Sometimes the educator implemented these minute papers as group work in which students responded to the questions in groups. Other times the educator asked students to work in groups to form a question about that day's material that they want to see answered (i.e. I want a math question). She often encouraged them to write down their most burning question(s).

After the class session, the educator read the responses, categorized the responses, and prepared to address the feedback in the next class session. The educator used these responses to start the next class session (e.g., re-teaching topics, addressing concerns, offering rationale for pedagogical choices).

In terms of outcomes, when students participate in minute papers, there is the potential for them to better understand their learning, specifically what they know and don't know. When students reflect on their learning, they may be able to work out questions on their own.

Recreating the Reflection Activity

	Description
1	Talk to students about the purpose of minute papers.
2	Offer a question for students/groups of students to respond to OR ask students/groups of students to suggest questions for the minute papers.
3	Read all the minute papers; group the main ideas from the minute papers; and choose what to address in the next class session.
4	Debrief students based on what you read in the minute papers.

In the words of the Educator: Tips and Inspiration

Be strategic about the question asked. There are lots of different types of questions you can ask. I think it is important to consider what type of information you want to learn and what you want students to think about. While you can ask lots of questions, only ask one question—too many questions can water down the reflection.

Get creative in large classes. In large classes, reflection activities, like the minute paper, can seem like a lot of work on the educator's side because the educator has to read all the responses. Instead of having students write individual responses, ask them to respond in groups. Not only do you receive feedback, but also students collectively grapple with the question.

Be strategic about how you respond to the minute papers. First, I believe you must start the next class session with addressing the feedback from the minute papers—a good closing the loop activity. In addressing the feedback, it can be challenging to choose what to focus on, especially when the responses are varied. I end up choosing what to address based on what I think is the most important. However, I also have a fear that I am sending the message that because I didn't focus on your question, it means that it isn't important to the class.

Be prepared to deal with criticism. The first time you implement an activity like this, in which students giving you feedback, it can be intimidating—what if you don't like the feedback? Over time the way I've dealt with this issue is not to take things personal and to have a rationale for my teaching practice and to share that rationale with students.

What was the inspiration for the reflection activity? In the last few years, I have been participating in workshops and activities hosted by the Center for Enhancement in Teaching and Learning (CETL) at Georgia Tech. Specifically, I learned about minute papers through the class of 1969 teaching scholars program.