

Theoretical thoughts.

Even if we agree that teaching is an interactive process, still the question is how we can invite our students to actively participate. While learning new material how we can develop their ability to *listen* and *respond*; how can we teach them to *think*? How can we evaluate their development in this direction? In this paper I wish to share one possible approach to the problem and my experience related to it.

In North America undergraduate math students are assessed primarily through written exams given during and at the end of each term. This works well except a few cases. For instance, student makes an arithmetic mistake right in the beginning of a problem, or even rewrites the problem incorrectly, but this changes the problem dramatically in terms of the material tested on the exam. Should the student get a partial credit or nothing or receive full mark if everything related to the tested material is done correctly? A student misunderstands a

question or notations. Should the student lose the points?

My own education was assessed mostly by oral exams. Oral exam in an interview on a given topic or a set of problems for which the student gets a mark or points later converted into a grade. *The teacher conducting the interview has the opportunity to reformulate the question if necessary and observe the way how the student approaches the problem.* In most of the cases the level of student's understanding, as well as his/her weak and strong areas became pretty clear after a very short conversation.

I think that these features of oral exam make it an important tool for teaching and assessment. I would like to emphasize some benefits of oral examination as a part of a course grading scheme. Just to make it clear: *the idea is not to substitute but rather supplement written exams by the oral ones.*

2. Practice.

During years of teaching undergraduate math I have conducted a number of experiments on using oral exams as a part of evaluation scheme.

After a first term test (approximately a month after beginning of a 3-month semester) a written 1-hour exam was given. When the test was graded and returned to the students, an oral exam (usually called a conversational component of the exam) was introduced. The students willing to improve their current grade were invited to talk about problems related to the test, to explain their mistakes and solve similar problems. If a student can demonstrate the ability to solve, prove, explain etc., the student was given up to 10% increase of the grade obtained at the written exam.

Students arrived in my office in small groups. Often they were explaining problems to the whole group and received a feedback from myself as well as from other students.

It was observed that oral exam can be successfully adopted not only in small size classes (where it definitely works well). First, not every student would come, only those who care. Second, I can schedule the appointments of groups which saves me time too. The biggest class I had was 150 students.

I was collecting the students opinion about oral exam. After the interview the students were given a week to to respond the question: *What do you think about the oral component of exam? Was it helpful to improve the understanding?*

Here are some of the responses:

- More of such discussions should take place.
- Because of the meeting I got a full understanding of the material covered on the test. I don't think tests fully test what you know because of nerves and time constraints.
- It was helpful to have other students [at the conference] at the same time.
- Very helpful. Before the test it is hard to know exactly what I do or don't understand. Talking about it after the test helped me to understand the things that I personally didn't before.

- It is good to talk over the material, and if anyone had a question, it could be answered on one-to-one basis.

- Talking directly about what I did wrong helped me to understand my mistakes.

- I already understood the material. I didn't feel that the meeting should be required. If students are unsure of a question they should come on their own. (*Such comments were received when all students were invited for the conversation. After that I changed my policy and invite only those who wish.-M.K.*)

- I like the fact that I can prove to you that I do understand the material.

- I would come to talk even if we were not invited to have the grade improved.

3. Conclusions.

Communicative activities in general enhance understanding in students via articulation of their ideas. On the other hand any discussion will not automatically lead to better understanding: students must receive a professional feedback to direct if needed their ways of problem solving, logic, reasoning, and the concepts' formation.

My own experience in teaching undergraduate math shows that oral exams given during the semester provide such an opportunity. It gives the following benefits.

1. Discover student's background. What is hard and unclear. It helps to plan further lectures and learning activities.

2. Help a student to locate his/her own problems of understanding and find ways to overcome them.

3. Focus on positive student's experience, on the moments of deriving a right idea. It gives the student self-confidence, establishes habit of critical thinking, develops potential for future growth.

4. Provide better assessment. Oral exams better reflect students' level of understanding.

5. Establish some interpersonal relations with the students. If we want the students to understand the subject we teach we should make some efforts to understand them.

I believe that this approach also accommodates the idea that effective pedagogy must be based on what student currently knows, must affirm active cognitive construction and make the student consciously self-aware of its implicit epistemology.