

Writing Problems

The challenge in writing a problem lies in the fact that a problem that does not challenge your students is simply an exercise; a problem that stumps them is just frustrating. So we are going to help you understand what makes a good problem and what you need to do to compose a problem that will meet the instructional objectives for your course. P.K. Rangachari discusses his method for beginning the problem writing process in *Writing Problems, A Personal Casebook*. He suggests that you build your problem around the goals and objectives of the course as well as considering what you would like your students to take away from the experience. In other words, make your problem applicable to your students' needs and your stated goals and objectives (Rangachari, P.K., 1998).

The Writing Process

Writing is a complex process that requires a lot of practice and no formula can guarantee a good problem. What we suggest in the following section is a workable linear model for preparing and writing a problem. The important thing is to keep the model in mind. As you become more proficient, you will become more confident in developing your own problem writing techniques.

Determine Content Objectives:

The first step is to determine which course objectives you would like to include in the problem. Are you planning to use a problem that will encompass all of your content objectives? Or are you planning to use a problem that will only concentrate on one or two of the objectives? These content objectives will drive the problem writing process.

Choose a Topic for the Problem:

You may already have a vague idea about what you would like to write the problem about. In this step you should fine-tune the ideas and be sure that the topic is appropriate for the number of content objectives you plan to cover. Try to make the topic as specific as possible as this will help in the writing process.

Brainstorm:

In this step, don't worry about the objectives, the student's knowledge, or the length of the problem. Come up with as many ideas as you can that are related to the chosen topic. The greater the list, the greater the likelihood you will be successful when you begin to compose your problem. Keep the list handy, you may decide to use it to help you develop additional problems in the future.

Frame the Problem:

In this step, you need to combine all of the information you have created thus far. Compare your brainstormed ideas to the topic and the objectives and eliminate the ideas that are not going to

meet the objectives for this problem. Start building the framework for your problem in preparation for the first draft. The framework may look something like this:

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Content Objectives	Topic or Area of Study	Methods that could be used to achieve the objectives
Students will design an investigation of organisms living in an ecosystem.	Ecology	River study
Students will identify at least 3 organisms used to measure the health of an ecosystem.		Rainforest study
		Arctic study
		Urban study

The First Draft:

This is your first attempt at actually writing the problem. In the frame you identified a few ways to present the problem, pick one and build your problem around it focusing on the objectives. Make your problem as simple as one sentence or as complex as a short story. Keep in mind that not all of the information in the problem has to be relevant; in fact, in some cases, distracters may be a good idea. The problem should be open-ended with no clear path to follow to find a solution. The key is to try not to give your students the answer to the problem within the problem itself.

Review and Revise your First Draft:

In this step you will want to check to make sure that the problem you have written meets its intended objectives. If not, you will want to make revisions. The revision process may address the missing characteristics or enhance the ones you have already met. In some cases you may make the problem more creative or add distracters that contribute to the messiness of the problem. It might also be helpful at this point to have a colleague review your problem to see if they see any "holes".