A Cooperating Teacher's Guide to STERS

(Student Teacher Effectiveness Reporting System)

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Introduction:

The Illinois State University Physics Teacher Education Program has implemented a *Student Teacher Effectiveness Reporting System* (STERS) in accordance with the National Science Teachers Associations guidelines for program accreditation and in effort to monitor student teacher effectiveness as they prepare to transition to their own classrooms. STERS provides student teachers with an opportunity to integrate their knowledge of science, science education research, educational psychology, and pedagogy. During this process student teachers will create and plan a wide variety of educational activities and assessments that will be implemented during their semester of student teaching. The purpose of STERS is to allow student teachers to document the fact that they can teach science using multiple approaches, and have a demonstrable impact on student learning.

Teacher candidates begin working on STERS two semesters before student teaching. This allows these students to take advantage of planning and preparing for multiple assessments during student teaching while they have ample time. More importantly, this planning period allows student teachers to plan and coordinate STERS activities and assessments with their future cooperating teachers. A detailed description about STERS and its five required student teaching assessments can be found by visiting the following URL: http://phy.ilstu.edu/programs/ptefiles/sters/sters.html.

STERS requires student teachers to use a wide range of teaching and assessment practices, in which cooperating teachers play an important role. Pre-service teachers are required to work hand-in-hand with their cooperating teacher under whom they will be student teaching. This guide was created for the cooperating teacher, and outlines the cooperating teacher's role in a step-by-step fashion.

Overview:

Pre-service teachers complete this project in four steps. In STEP 1, the students are introduced to the basic elements and standards for teaching that are included in STERS. This is two semesters before student teaching begins. The cooperating teacher has **no responsibilities.**

In STEP 2, teacher candidates develop the basic outline for their five student teaching assessment projects. The students are required to consult their cooperating teachers to plan and begin development of the assessments. This is completed during the fall semester before they begin student teaching. The role of the cooperating teacher at this point is to consult with the teacher candidate to help him or her define assessments that will fit into the content that will be taught during student teaching. The student teacher will visit the school site to complete a

number of clinical experiences as part of PHYSICS 311, and to participate in face-to-face discussions with the cooperating teacher. The cooperating teaching **must approve** of all learning activities and draft assessment activities that the pre-service teacher intends to create.

STEP 3 takes place during the five weeks immediately before student teaching that runs from early January through mid February. The student's goal at this time is to further develop the teacher-approved activities and assessments in greater detail. This will include the formulation of student performance objectives objectives, detailed activity plans, and preparation of assessment instruments. The cooperating teaching **must approve** of all assessment activities that the pre-service teacher creates. The pre-service teachers implement these during student teaching. Still, with the approval of the cooperating teacher, some pre-assessments may be conducted during this time (e.g., pre-testing) in cooperation with the in-service teacher.

STEP 4 is implemented during student teaching. Throughout this time period the student teacher will collect, analyze, and report data and conclusions to the cooperating teacher and university supervisor to show their effectiveness as a teacher candidate.

Teacher Responsibilities for STEP 2: (autumn semester before student teaching)

- Look over the student's responsibilities in STERS STEP 2. As you read through the five assessment activities that the student must complete, make note of specific activities that you normally implement that will help meet these requirements.
- Give the pre-service teacher an outline of the content they will be covering during their ten weeks of student teaching.
- The pre-service teacher will be creating five assessment activities throughout the autumn semester. Provide constructive feedback and criticism. Address these questions with your critique of each assessment:
    - Is this a worthwhile assessment?
    - Is this assessment an effective use of classroom time?
    - What could the pre-service teacher do to improve this activity?
- Offer insight and help to questions that the pre-service teacher may have using your activities as examples.

Teacher Responsibilities for STEP 3: (5 weeks before spring semester's student teaching)

- Look over the student's responsibilities in STERS STEP 3.
- The pre-service teacher will be submitting each assessment activity again. This time they will be written in greater detail. Each of these activities will be implemented during student teaching and you must be approved before they can be used in your classroom. Here is a list of the seven assessments; check them off as you approve of them.
    - Objectives, activities, and assessment 1: The major concepts, principles, theories, and laws of science.
    - Objectives, activities, and assessment 2: Technological applications in science
    - Objectives, activities, and assessment 3: The philosophical and historical nature of science
    - Objectives, activities, and assessment 4: The practice of scientific inquiry

- Objectives, activities, and assessment 5: Issues related to science and technology

Teacher Responsibilities for STEP 4: (during spring semester's student teaching)

- Help university supervisor to ensure complaints with STERS requirements.
- Assist student teacher with implementation of STERS projects.
- Help student teacher reflect on significance of assessment findings.
- Evaluate the effectiveness of each of the assessment activities using scoring rubric.
- Follow up with student teacher to ensure submission of required reports to university supervisor.

Examples for the Student Teacher Effectiveness Reporting System

The following is a collection of examples from former pre-service teachers in the Illinois State Physics Education Program. Each of these examples has met the assessment requirements of STERS to varying degrees. More examples can be found at the website listed above.

Examples from STERS Assessment #1 *(The Major Concepts, Principles, Theories and Laws of Science)*

To meet this standard the teacher candidate must provide data from a unit or other block of instruction.

1. The student teacher created a momentum pre-test, post-test for the physics class. This pre-test consists of 11 multiple-choice, true-false concept questions in which key momentum concepts are tested. The same concepts are tested for the chapter test in which the first 11 questions test the same concepts and these two results can then be compared. Attached are the pre-test and the similar section of the post-test.
2. Students were given a conceptual pre-quiz on color theory and properties of light. At the end of the week, a full size quiz was given, with the 2nd half post-quizzing the color theory and properties of light.

Examples from STERS Assessment #2 *(Technological Applications in Science)*

To meet this standard, the teacher candidate must successfully complete at least one activity that is directed toward student understanding of a technological application of science.

1. In this assignment, students "dissected" single-use cameras in order to investigate the optical instruments within. Each lab group is given a camera. They open it up and then proceed to play around with the different lenses. There are lasers, smoke in a can, and other options for determining focal length.
2. This assignment was designed for students to relate the law of conservation of momentum and impulse to the real world and real world situations. In order to do this, students were asked to write a short essay/paragraph regarding what the advantages are of having an airbag deploy during an impact. They were also asked to be sure to integrate impulse and conservation of momentum into their responses.

Examples from STERS Assessment #3 ***(The Philosophical and Historical Nature of Science)***

To meet this standard, the teacher candidate must successfully engage students in at least one activity designed to further their understanding of the history, nature, and tenets of science as a philosophy, activity, and profession. *Do not confuse this assignment with Inquiry. See next assessment.*

1. The students took a pretest and a posttest that was developed by Carl Wenning, called the Nature of Science Literacy Test (NOSLiT). Students were introduced to the nature of science throughout the entire semester and were tested at the end of the class.
2. For this assessment the teacher administered the NOSLiT in pre/post-test format. The teacher administered the pre-test before the first full unit and at the end of the 10 weeks. The teacher went through the test with the students after the pretest and discussed common misconceptions.

Examples from STERS Assessment #4 ***(The Practice of Scientific Inquiry)***

To meet this standard, the teacher candidate must successfully engage students in multiple lessons and lab activities incorporating the learning cycle, in which students observe a phenomenon without knowing its significance or meaning beforehand, ask questions, design a controlled experiment, collect data, and construct meaning using the data collected.

1. The groups were given a converging lens on a track and a screen on which to form an image. The goal was to arrive at the thin lens equation. Students were briefed in a pre-lab discussion. An overview of the procedure was given, but not specific steps. Groups turned in a formal lab report with questions added to the rubric.
2. The student teacher administered the Scientific Inquiry Literacy Test (ScInqLiT) pre-test upon the onset of student teaching. The student teacher then went through the test with the students to discuss common misconceptions.

Examples from STERS Assessment #5 ***(Issues Related to Science and Technology)***

To meet this standard, you must successfully engage students in at least one activity requiring them to consider the their own values and needs, social values and needs, and how they relate to an issue in science or technology.

1. This activity is the culminating point of the project for the problem-based-learning unit on ionizing radiation and waste management. Students will, in their groups, make a 10-15 minute presentation regarding their side of the issue of Yucca Mountain and the Treaty of Ruby Valley.
2. This assignment followed a lesson on telescopes. Students were introduced to the topic of radio telescopes and then the SETI project. Students were given a hypothetical situation where legislation was going to be voted on to give NASA money to potentially fund SETI. Students were then to write a position paper on whether or not the bill should pass. Students were given the option of writing on a more local issue: whether or not an allegedly polluted site should be used to build a new school in the district.

3. The student teacher had the students develop an essay from outside research they had done and a classroom discussion regarding what the possible consequences might be for the loss of the Earth's magnetic field. Once they had identified possible consequences, students were charged with the task of discussing how the consequences may disrupt life on Earth.