

TE 804 (Elementary Science)
REFLECTION & INQUIRY IN TEACHING PRACTICE II

Thursdays, 12:40 AM – 3:30 PM, Room 133D Erickson Hall
Spring 2009, Section 2

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COURSE OVERVIEW

Welcome to TE 804! TE804 includes the science portion of your internship year coursework. It is designed to help you teach science in elementary classrooms. This course will help you reflect and build on ideas and concepts taught in prior teacher education courses. The focus of this class will be on supporting you in developing standards-based practices in planning, teaching, and assessment. We will concentrate on several main areas of work (see below).

The course is divided into two blocks. The first five-week block will focus primarily on the following:

Planning a science unit

- Determining the content and learning goals for your science unit
- Assessing your students' ideas, resources for learning, and special needs
- Analyzing your curriculum resources
- Developing an instructional sequence to meet the learning goals
- Planning your science lessons that match your students' resources and needs
- Creating your unit assessment

Preparing your classroom learning community inquiry project

- Identify a goal for your classroom learning community that supports science learning
- Develop a plan for meeting your goal
- Develop a plan for assessing whether you've met your goal

The second six-week block is your guided lead teaching time. During guided lead teaching, TE804 will not be meeting. You will be:

Revising and enacting your science lessons

Refining your classroom learning community

Reflecting on your teaching, students, and classroom learning community

Collecting data on student learning, your teaching video, and the classroom learning community

The last five-week block will occur after the guided lead teaching period. During this time period we will be:

- Reflecting on and evaluating your unit plan enactment with respect to aspects such as student learning**
- Analyzing a video of your teaching**
- Analyzing your learning community inquiry project results**
- Examining ways to integrate literacy and technology in your science teaching**
- Reflecting on your growth as a teacher and refining your teaching philosophy**

Readings, class activities and discussions will relate to and support these topics.

COURSE GOALS

This course is designed to build on your experiences in TE 401 Science, SME 301, and your other teacher education courses. The goals of the course are to develop your competency with the following practices:

Planning and teaching effective science units

- Specify an appropriate set of learning goals for a lesson sequence or unit
- Pre-assess learners' knowledge and experiences in relation to a set of learning goals
- Analyze curriculum materials to identify their affordances and limitations
- Modify curriculum materials to reflect "best practice" and meet the needs of your students.
- Strategically enact a planned activity sequence or unit to address a set of learning goals
- Assess student progress toward achievement of a set of learning goals
- Evaluate and revise a unit plan and teaching in light of the student learning outcomes

Establishing an inclusive science learning community in the classroom

- Identify qualities of an inclusive science learning community to be established in a classroom
- Plan and enact strategies to foster and maintain desired qualities of a science learning community in the classroom
- Identify individual and cultural resources that can enable student engagement in the science learning community

Inquiring into one's own science teaching

- Identify a question, problem or innovation to investigate
- Identify evidence to be used and how it will be collected and analyzed
- Collect and analyze evidence
- Interpret the results and their implications for teaching

Fostering one's own ongoing professional growth

- Adopt a life-long learning approach toward teaching
- Develop planning and assessment practices that promote professional knowledge growth
- Participate in professional communities that promote professional growth

COURSE READING AND MATERIALS

Required Materials

Weinstein, C. S., & Mignano, A. J. (2007). *Elementary Classroom Management: Lesson from Research and Practice* (4th ed.). New York: McGraw Hill.

This book is available through the MSU & other bookstores.

Selected chapters from the book: Michaels, S., Shouse, A., & Schweingruber, H. (Eds.). (2007). *Ready, Set, Science! Putting Research to Work in K-8 Science Classrooms*. Washington, D. C., National Academies Press. These can be accessed electronically from the web at http://www.nap.edu/catalog.php?record_id=11882. Alternatively, you can buy PDF chapters from the book at that website for \$1.60 per chapter.

Additional readings listed in the syllabus and provided on the course Angel website. Please bring an electronic or hard copy of the readings to class on the day the readings will be discussed. This will enable much richer discussions.

1 mini DV videotape (approximately \$4.00 at the College of Education copy center on the 5th floor or Erickson Hall; may be cheaper elsewhere)

1 CD or DVD (transfer from DV videotape to DVD is approximately \$5.00 at the College of Education copy center; you may find alternatives at your school)

Access to MSU email and the course Angel site

Recommended Books

Michaels, S., Shouse, A., & Schweingruber, H. (Eds.). (2007). *Ready, Set, Science! Putting Research to Work in K-8 Science Classrooms*. Washington, D. C., National Academies Press.

Rosebery, A., & Warren, B. (Eds.). (2008). *Teaching Science to English Language Learners; Building on Students' Strengths*. National Science Teachers Association Press.

Electronic Resources

Michigan Department of Education GLCEs

The Science Grade Level Content Expectations (GLCE) were adopted in December, 2007. An electronic copy of the GLCEs is available on the Angel course website and at: http://www.michigan.gov/documents/mde/Complete_Science_GLCE_12-12-07_218314_7.pdf

Macomb Intermediate School District's MIBIG.

MIBIG is an older resource that can provide some background information to help you unpack your learning goals. It is oriented around the former Michigan Benchmarks, but still serves as useful information. The page can be found at: <http://www.misd.net/MIBIG/>.

National Research Council (2000). *Inquiry and the National Science Education Standards*. Washington, DC: National Academy Press.

You may purchase a hard copy or download the text by going to the following link: http://www.nap.edu/catalog.php?record_id=9596

National Research Council (1996). *National Science Education Standards*. Washington, DC: National Academy Press.

You may purchase a hard copy or download the text by going to the following link:
<http://www.nap.edu/openbook/0309062357/html/index.html>.

American Association for the Advancement of Science (AAAS). (1993). *Benchmarks for Science Literacy*. New York: Oxford University Press.

You may purchase a hard copy or download the text by going to AAAS at:
<http://project2061.aaas.org/publications/bsl/online/bolintro.htm>.

COURSE ASSIGNMENTS AND GRADING

Assignments

Below is a list of major assignments for the course and the point value they hold towards your final grade:

Unit Plan (parts due throughout the semester)	
▪ Learning Goals and EPE table	5
▪ Assessment of student toolkits for science	5
▪ Curriculum Materials Analysis	5
▪ Instructional Sequence	15
▪ Lesson Plans	10
▪ Post Assessment and Analysis	10
Video and Analysis of Your Teaching.....	10
Science Learning Community Inquiry Project.....	25
Science Teaching Presentation.....	5
Attendance and Participation (including responses to the readings)...	10
TOTAL.....	100

Brief Assignment Descriptions

1. Science Unit Plan – You will prepare a complete plan for 2-4 weeks of science instruction (approximately 9-12 days of instruction). Plans include
 - A. Learning Goals and EPE (Experiences, Patterns, Explanations) table
 - B. Student Pre-assessment (includes student ideas and student cultural resources for learning science)
 - C. Analysis of curriculum materials, teacher guides, activity guides
 - D. Instructional Sequence – order of activities
 - E. Lesson Plans (at least 3) & Angel Blog reflections/updates.
 - F. Post-Assessment and analysis
2. Video Teaching Analysis – We can learn much from watching ourselves teach. You (or someone else) will videotape one lesson of you teaching science in the classroom. You will select a clip (10 mins) of the video to show to a small group of peers to get feedback, then write up a short analysis of your own teaching. This clip could also provide information about your science learning community inquiry project. Be sure to try your videotape setup to make sure you can hear students’ voices.

- A. You can check out video cameras and tripods from the Technology Interns (TIES) in Erickson room 133. They suggest that you reserve the equipment 2 weeks in advance 355-8437, ties@msu.edu
 - B. You will need to provide your own mini DV tape and have the tape burned to a CD or DVD for use in class. You can share your video with one another on laptops; it is a good idea to test this out ahead of time to make sure it works.)
3. Science Learning Community Inquiry Project – Teaching science is about more than presenting content or activities. The climate of your classroom, the expectations that you have for students, and the overall management of the students and events greatly effects your teaching and your students’ learning. This project is designed to support you in teaching science. You will design and implement a plan that supports development of one aspect of a science learning community that they would like to foster in the classroom. This project includes
 - A. Science Learning Community Plan
 - B. Implementation of your plan and collection of evidence about how well it worked
 - C. Learning Community Analysis & Reflection
 4. Science Teaching Presentation – You will share what you learned from your Science Learning Community (inquiry) project with your peers and present your science teaching philosophy (grounded in your specific experiences and the readings) in preparation for how you might present this to potential employers and parents. This presentation will take place the last day of class.
 5. Participation & Professional Conduct – This includes doing the course readings, responding to the readings on Angel and participating in class discussions, arriving at class on time, communicating with the course instructor, turning in all assignments on time, and conducting yourself professionally in class and in your field placement classroom.

Grading

Attendance, Preparation, and Class Participation: The success of any professional seminar hinges on active participation by each member. Each member is expected to come to class ready to contribute thoughts and prepare for class each week through readings, writings, observations, information or resource gathering. In this way, each person will not only benefit from his/her own efforts and experiences, but also from those of the whole group.

Because it is not possible to participate if you do not attend, your final grade will be affected by anything beyond one excused absence. This involves having up to 5 points deducted from your final grade. Excused absences include: (a) illness or significant personal emergency (e.g., death in the family) and (b) an important school-related activity (e.g., parent conferences). As in any professional setting, it is your responsibility to notify the course instructor ahead of time if you are unable to attend or will be late. This can be done by e-mail or voice-mail. You are expected to be on time for class and have assignments prepared on time. You are also responsible for any materials and assignments missed due to absence.

Turning in Assigned Work: Assignments are due by midnight (11:59:59 p.m.) on the date indicated on the course schedule; you are responsible for knowing the due dates. Unless you make arrangements in advance of the due date, late papers will be graded as such. Please be in communication with me at all times about your assignment progress. All assignments should be turned in to the Angel Drop Box. Please name your files using the following format: **LastnameAssignmentVersion.doc**. For example: SchwarzLearningGoalsv2.doc. If you turn in

revisions after the original due date, please send me an email so that I know to look in the dropbox. This will help me get feedback to you in a timely manner.

We hold high expectations for interns as you move towards your professional teaching careers. Formal assignments, such as unit plans, reflections, and analyses must be word processed and free of grammatical, spelling and punctuation errors. These assignments will be returned to you for revision if they are missing requirements or contain grammatical, spelling and punctuation errors. Revisions will need to be made in a timely fashion and not left until the last day of class.

Grading Scale: The following grading scale will be used

Points	Four point scale	Description
95-100	4.0	Outstanding, exemplary work. Uses and integrates readings, classroom discussions, and teaching experiences (where appropriate) to inform the writing. Meets all the requirements of the assignment, is deeply thoughtful, and provides many details and examples to support writing. No errors in grammar, punctuation, spelling.
90-94	3.5	High quality work. Uses many readings, classroom discussions, and teaching experiences (where appropriate) to inform the writing. Meets all the requirements of the assignment, is thoughtful and provides some details and examples to support writing. Very few errors in grammar, punctuation, spelling.
85-89	3.0	Good quality work, performing at expected level for internship year. Uses some readings, classroom discussions, and field experiences to inform writing. Meets all requirements of assignment, shows attempt to engage with purposes of assignment, provides details and examples to support writing. Few errors in grammar, spelling, punctuation.
80-84	2.5	Work below expected level of quality for the TE program. Does not include appropriate references to relevant readings, class discussions, and teaching experiences to inform writing. Does not meet all requirements of assignment. Limited attempt to engage with purposes of assignment, few details and examples to support writing. Many errors in grammar, spelling and punctuation.
75-79	2.0	Significantly below expected level of quality. Many errors in grammar, spelling and punctuation. Shows little evidence of having read course readings, of uses of classroom discussions or of field experiences. Meets few of the assignment’s requirements. Shallow attempt to engage with purposes of assignment, no details or examples to support writing.

Incomplete Grades: MSU policy is that the ‘I’ (incomplete) grade may be given only when the student (a) has completed at least 12 weeks of the semester, but is unable to complete the class work and/or take the final examination because of illness or other compelling reasons; and (b) has done satisfactory work in the course; and (c) in the instructor’s judgment can complete the required work without repeating the course.” For the entire grading policy at MSU, please visit: <http://www.reg.msu.edu/read/UCC/Updated/geninfogenpro.pdf> .

COURSE POLICIES

Professional Conduct Policy: (<http://ed-web3.educ.msu.edu/te/teacherprep/ProfCondPol.htm>)

The teacher preparation program has a professional conduct policy for teacher candidates. It addresses such matters as attendance and punctuality, confidentiality in discussions of or writing about school personnel, professional dress in schools, alcohol and illegal drugs, and professional communications.

Academic Honesty and Integrity. We assume that the student is honest and that all course work and examinations represent the student's own work. Violations of the academic integrity policy such as cheating, plagiarism, selling course assignments or academic fraud are grounds for academic action and/or disciplinary sanction as described in the university's student conduct code. **Incidents of plagiarism are taken very seriously and will be pursued.** Students are strongly cautioned not to copy any text verbatim on class quizzes, tests, reports, projects, or other class assignments without using appropriate quotations and source citations – this includes any material obtained online. For University regulations on academic dishonesty and plagiarism, refer to: <http://www.msu.edu/unit/ombud/plagiarism.html>. As teachers, academic honesty and integrity take on additional meanings beyond the implications for you as a student. The professional relationships you build with your colleagues, including classmates, instructors, your CT and other teachers are a vital part of your professional identity. Developing and maintaining of these relationships are as important as any consequences that might arise from incidents of academic dishonesty.

Electronic Mail and Angel: MSU Email and the Angel course management system will be used during this course. If you have an alternate email address, please have your mail forwarded from your MSU account. **Please read your email between class sessions, as I may contact you with information that pertains to the next session.** If you receive a message that information has been posted on Angel you are responsible for accessing it. **Also, please set your Angel mail to forward to your MSU account.**

Laptops, cell phones, other electronic devices: Technology in the classroom provides us with wonderful tools that can help us accomplish many things we wouldn't be able to do without them. But technology must also be used wisely and appropriately. You are welcome to bring and use a laptop in class as long as you are using it for class purposes. Please refrain from surfing the web, checking email, chatting (or IMing), playing games (i.e. Sudoku) or conducting other activities that do not pertain directly to the class activities happening at the time. Also, please turn off cell phones, pagers, ipods, etc. during class. Your classmates and I thank you for this respect.

Professional Development Time: Per the policy requirements described in the LAET Internship Handbook, interns have up to three hours per week for professional development time (only during weeks when we have class sessions). Many activities may take place in the internship classroom, while others may take place somewhere in the school, at another school, or in the community. Interns must discuss in advance with their CTs their plans for using their professional development time so that there is ample notice if they are not going to be in the classroom. The following are general suggestions for use of this opportunity, and other suggestions will be given throughout the semester.

Prior to Lead Teaching

Study curriculum materials and documents

Investigate science resources for lead teaching

Identify needs of special education students and/or ELL students and explore resource support

Meet and discuss ongoing inquiry work with colleagues in your building

After Lead Teaching

Visit another classroom or school to explore alternative approaches to science instruction

Analyze artifacts collected during lead teaching for your professional portfolio

Meet and discuss ongoing work with colleagues in your building

Confidentiality: Your school setting and experiences are an important part of your learning and you will be discussing them in this course. Just as teachers are expected to respect the privacy and dignity of the children and families with whom they work, so you are expected to use discretion. In casual conversations or social situations, do not relate stories from classrooms or schools that may be embarrassing to teachers or students or that include sensitive information about a child or family. When discussing classroom situations in class, do so carefully. Mask the name of a student on any written or visual work shared in class or used in an assignment. When discussing teaching practice you have observed in the field, be mindful of maintaining a tone of professional courtesy.

Problem solving: If problems arise regarding how this course is conducted, assignment requirements, or any issue that you feel needs to be addressed, your first step should be to contact me as your course instructor. If the problem is not resolved, you may contact one of the LAET Coordinators (Judy O'Brien, 303 Erickson hall, jlobrien@msu.edu, or Sally Labadie, 116T Erickson, labadies@msu.edu), then the LAET Team Leader (Cheryl Rosaen, 116D Erickson Hall, 353-0632, crosaen@msu.edu).

Accommodations for Disabilities. It is Michigan State's policy not to discriminate against qualified students with documented disabilities in its educational programs. If you have a disability-related need for modifications in this course, contact your instructor and the Resource Center for Persons with Disabilities. Instructors should be notified as early in the semester as possible. For an appointment with a counselor, call 353-9642 (voice) or 355-1293 (TTY). Instructors in the course may request a VISA Form (Verified Individual Student Accommodations Form) from a student requesting services. The OPHS website is at <http://www.rcpd.msu.edu/Home/>.

Counseling Center. Even normal, capable, intelligent, and reasonable persons like the members of this class sometimes face situations and problems that they find difficult to deal with by themselves. LAET instructors or cluster leaders might be able to help. Also, MSU has an Office of Student Affairs and Services, with a Counseling Center, for which the phone number is 355-8270. The Center is at 207 Student Services Building.

Writing Center. Teachers are models and coaches of writing for their students, and must communicate effectively in writing with colleagues, parents, and others. For those reasons, teacher candidates are expected to write effectively and conventionally. If you need more help in meeting those expectations than you can get from your instructors and other teacher candidates, try the Writing Center at 300 Bessey Hall, 432-3610. Grammar Hotline: 432-1370.

Rights and Responsibilities of Students: <http://www.vps.msu.edu/SpLife/afr1.htm> MSU students' rights and responsibilities are an important counterpart to MSU's Code of Teaching Responsibility (see Elementary Program website).

TENTATIVE COURSE SCHEDULE

The following course schedule is tentative. The content and order of this schedule may need to be changed or adjusted to better meet your needs. It is here to provide you with information about the planned activities, assignments, and pace of the class.

January 15 Class Meeting in Erickson 133D: *Introductions, Course Syllabus, Getting Started*

Readings for today: none

Assignment due today: none

January 16 Class Meeting in *306 Bessey***: *Science Learning Goals and Inquiry***

Readings for today:

Gunckel, K. L. (2007). Using experiences, patterns, and explanations to make school science more like scientists' science. Unpublished manuscript. Michigan State University (6 pages).

Michaels, S., Shouse, A., & Schweingruber, H. (Eds.). (2007). *Ready, Set, Science! Putting Research to Work in K-8 Science Classrooms*. Chapter 2: Four Strands of Science Learning, pp. 17-36.

Assignments due today:

- Post a comment to the Angel discussion site about each reading – how the ideas relate (or do not) to the science teaching you have seen and thought about; Pose a question about the ideas or answer someone else's question.
- Post the topic of your science teaching to the Angel discussion site.

January 22 Class Meeting in Erickson 133D: *Science Learners and Their Toolkits*

Readings for today:

Michaels, S., Shouse, A., & Schweingruber, H. (Eds.). (2007). *Ready, Set, Science! Putting Research to Work in K-8 Science Classrooms*. Chapter 3: Foundational Knowledge and conceptual change, ONLY pp. 37-44.

Rosebery, A., & Warren, B. (Eds.). (2008). *Teaching Science to English Language Learners; Building on Students' Strengths*. National Science Teachers Association Press. Chapters 5 and 6: Using everyday experiences to teach science, pp. 39-56.

Calabrese Barton, A. (2006). Anti-deficit perspective: A strengths-based approach to science teaching and learning (6 page handout).

Optional reading for today: (useful to skim for learning community inquiry project assessment – particularly if focusing on aspects of culture)

Rosebery, A., & Warren, B. (Eds.). (2008). *Teaching Science to English Language Learners; Building on Students' Strengths*. National Science Teachers Association Press. Chapters 18, and 19 on creating culturally responsive learning communities, pp.151-165.

Assignments due today:

- Draft of learning goals and practices/EPE chart assignment.
- Post a comment to the Angel discussion site about the readings (support your idea or claim with evidence or examples from the readings) and a question or response.

January 29 Class Meeting in Erickson 133D: *Inquiry-Application Instructional Model and Analysis of Curriculum Materials*

Readings for today:

Michaels, S., Shouse, A., & Schweingruber, H. (Eds.). (2007). *Ready, Set, Science! Putting Research to Work in K-8 Science Classrooms*. Chapter 4: Organizing science education around core concepts, READ pp. 59-65 SKIM pp 66-75.

Michaels, S., Shouse, A., & Schweingruber, H. (Eds.). (2007). *Ready, Set, Science! Putting Research to Work in K-8 Science Classrooms*. Chapter 7: Learning from science investigations, pp. 127-148.

Inquiry and Application Instructional model (1 page handout)

Assignments due today:

- Draft task and/or questions for assessing students' science toolkits in your subject area.
- Post a comment to the Angel discussion site about the readings (support your idea or claim with evidence or examples from the readings) and a question or response.

February 5 Class Meeting in Erickson 133D: *Instructional Sequencing (continued) and Learning Communities*

Readings for today:

Reddy, M., Jacobs, P., McCrohon, C. & Herrenkohl, L. (1998). Acquiring scientific habits of mind in a learning community. In *Creating Scientific Communities in the Elementary Classroom*, pp. 13-32.

Michaels, S., Shouse, A., & Schweingruber, H. (Eds.). (2007). *Ready, Set, Science! Putting Research to Work in K-8 Science Classrooms*. Chapter 5: Making thinking visible: Talk and argument, pp. 87-107.

Weinstein, C. S., & Mignano, A. J. (2007). *Elementary Classroom Management: Lesson from Research and Practice* (4th ed.). New York: McGraw Hill. Chapter 10: Managing recitations and discussions, pp. 299-331.

(Optional reading):

Simpson, D. (2000). Collaborative conversations: Strategies for engaging students in productive dialogue.

Assignments due today:

- Final Curriculum Materials Analysis
- Draft Instructional Sequence
- Post a comment to the Angel discussion site about the readings (support your idea or claim with evidence or examples from the readings) and a question or response.

February 12 Class Meeting in Erickson 133D: *Assessments and Learning Community Project*

Readings for today:

Koch, J. (2005). What's the big idea? Assessing what students know and are able to do. Chapter 14 in *Science Stories: Science methods for elementary and middle school teachers* (3rd ed.). New York: Houghton Mifflin.

Weinstein, C. S., & Mignano, A. J. (2007). *Elementary Classroom Management: Lesson from Research and Practice* (4th ed.). New York: McGraw Hill. Chapter 9: Managing groupwork, pp. 264-296.

Assignments due today:

- Learning Community Inquiry Project Plan
- Post a comment to the Angel discussion site about the readings (support your idea or claim with evidence or examples from the readings) and a question or response.

February 19 - March 26: No Class Meetings – Guided Lead Teaching

(Optional reading):

Science and Safety: It's Elementary. A science education safety guide for elementary:
<http://www.csss-science.org/safety.shtml>

Assignments due:

Draft Post Assessment Plan - February 19

Final Learning Goals & EPE chart – must be turned in before you begin teaching.

Final Instructional Sequence – Your instructional **must** be approved by myself and your CT before you begin teaching.

Draft and Final Lesson Plans – Prepare lesson plans for your individual lessons. You will need to turn in 3 before teaching. Your CT and field instructors may request additional lesson plans.

Teaching Blog – Post at least 3 messages on the course Angel Blog to share three teaching experiences (what went well, what challenges you experiences, questions you have, what you learned, etc.). Blogs should be posted at no more than 3 days following teaching of the lesson.

Video – Be sure to videotape one complete science lesson. Transfer the tape to DVD.

Select 10-15 minutes you would like to show to your peers. Choose a segment for which peer feedback would be helpful. Make sure you set the video recorder close to students so you can hear their voices and that you are able to play your video on yours or someone else's laptop during our first class meeting.

April 2 Class Meeting in Erickson 133D: *Reflecting on your experiences teaching: Analyzing student work and teaching videos*

Reading for today: none

Assignment due today:

Selected DVD video segment to share with peers

April 16 Class Meeting in Erickson 133D: *Science Teaching and Technology*

Reading for today:

TBA

Assignments due today:

- Analysis of teaching video
- Post a comment to the Angel discussion site about the readings (support your idea or claim with evidence or examples from the readings) and a question or response.

April 23 Class Meeting in Erickson 133D: *Science Teaching and Literacy*

Reading for today:

Incorporating Literacy to Increase Conceptual Understanding: *BSCS Science Tracks Handbook: A Resource for Educators*, pp. 47-74.

TBA

Assignments due today:

- Final Post Assessment Reflections
- Final Learning Community Inquiry Project Report

April 30 Class Meeting in Erickson 133D – Last Day of Class: *Reflecting on your Professional Development; Class Presentations*

Reading for today: none

Assignment due today:

- Class presentations of Learning Community Inquiry Projects and Teaching Philosophies