TE 802 – Section 15
Reflection and Inquiry in Secondary Mathematics Teaching I
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course.
Themes and Goals of the Course

These are great and wonderful times to be a mathematics teacher. Your career begins at the dawn of the 21st century. Who knows what will happen in mathematics education over the next 35 years! Will new technologies have taken over? Will schools have changed drastically? Or will schools be much like they are today? And what of mathematics teaching? If schools remain like they are, will mathematics teaching resemble the teaching you experienced in high school? Will it reflect the Standards-based reform movement that has been gaining momentum over the last decade and a half? Or will it evolve in ways that are even hard to imagine now? And what of the curriculum? Will high schools teach the familiar General Math, Algebra One, Geometry, Algebra Two, Precalculus...sorts of courses? Or will we teach different sorts of mathematics to students?

Behind all these questions are two dynamics central to this course:

- You need to prepare to be both a teacher who can be successful NOW in the schools of today and a teacher who has a vision for the FUTURE of mathematics teaching and the skills to meet future challenges.
- There is no taken-for-granted consensus at the moment about how mathematics should be taught. Here and there you can find pockets of people with similar ideas. You can also find commonalities among people who initially seem quite different. But, as a teacher, you will need to be ready to justify what you do, because other people will not automatically hold similar opinions.

One theme of the course: NOW and FOREVER

With both the NOW and the FOREVER in mind, here are two desires that we have for the course. As your instructor, we would like TE 802 to

- Be useful to you in an immediate sense, providing the support that you need during your internship this year (in the many senses of “support” – collegiality, feedback, help with problem solving, resource for ideas, and so on), and
- Prepare you for continued professional growth once the year is over, so that you can become a truly outstanding mathematics teacher.

This balancing of the NOW and the FOREVER aspects of the internship year will be a theme of the course. If we get too focused on the particulars, we’ll encourage you to think about how they might relate to your future teaching in other settings. If we get too theoretical, idealistic, or abstract, we’ll encourage you to think about how to apply the ideas to what you’re doing right now.

As examples of the way that the NOW and FOREVER complement each other, consider that we’ve designed the course to help you:

- begin to develop a deeper understanding of the school mathematics curriculum and become a life-long explorer of the mathematics you are teaching
• begin to develop a comfortable and workable teaching persona and become a professional who has strategies to keep evolving as a teacher
• begin to be a thoughtful questioner and active listener, comfortable enough to focus on your students as well as on your own performance, and become a reflective critic of your own actions, sensitive to important problems of teaching

With an agenda as big as ours, the internship year can sometimes seem overwhelming. With this in mind, we’ve done our best to design course assignments that relate directly to your work in school, fit with the rhythm of the internship, and mesh with other program requirements. Thus, for example, many of the course assignments will help you with your Focus Class Binder and your portfolio. Nonetheless, there may be times when immediate survival will seem to conflict with the notion of doing assignments that ask you to step back from the hustle and bustle and reflect on what’s happening. This is natural and to be expected. Paraphrasing (Mr) Bill Rosenthal, who taught this course in the past, here is what we propose that we all do.

**Our** duty as the instructor is to always keep in heart and mind that it is understandable and wise of you to be primarily concerned with this year and to act accordingly.

**Your** duty is to trust that our keeping an eye on the future will serve you well, not only in the future but also in this year, counterintuitive as the proposition may seem.

**Another Theme: Talking about Teaching and Learning From Each Others’ Experiences**

This year, you will be working closely with several instructors of different kinds: your mentor, your field instructor, your 801-803 instructor, and us. We all intend to help you become the best teacher you can be. But, we may not all agree about what that means; we may have different views of teaching. We all have different assumptions, different experiences, and different expectations, yet we all play a role in evaluating you.

With this in mind, a couple of suggestions and a promise:

First, we suggest that it is important to discuss such differences in point of view. It is often difficult to talk about teaching, but in times like these when there is no taken-for-granted consensus about teaching, you have to be ready to defend your views on teaching. Hearing others do the same and participating in reasoned conversation about teaching is one way to do this. These moments of conflict are important opportunities for you to learn, as you develop your own views about the kind of teacher you would like to be.

Second, we think that it is important to keep the program standards in mind. These standards indicate the commitments of the MSU Teacher Education program and the sorts of teachers it aims to develop. While we may differ in our opinions about many matters, we have all signed on to participate in a program with these goals.

Finally, our promise to you is that we will endeavor to do exactly what we have suggested to you: to articulate our views of teaching, to open them up to
One of the most important reasons for us to meet together each week is that while each of you is getting a deep and thorough experience of the teaching of one teacher (your mentor) in one school, an appreciation of the broad range of teachers and schools is difficult to see in your placements. Teaching is such a complex task that it takes a long time to understand all the subtleties of your individual placements, and this can only develop over a long period of time in your school. The danger, though, is that you make assumptions about what parts of your experience in your placements can be generalized to others and what cannot, based on this sample size of one. For example, just because in your urban middle school placement some activity, strategy, or policy didn’t work, this doesn’t necessarily mean that it won’t work in any other urban school, or middle school, or whatever.

So, in our class we will:

- spend time sharing and examining the things you’re learning in your individual placements, and
- place emphasis on using these to understand the degree to which this learning will be transferable to the next place you teach, and beyond

**Key goals of the course**

Strong teaching combines knowledge and skill with habits of mind, practice, and heart. It requires that you attend to things at many different levels, from minute-to-minute decisions made on the run about teaching, to day-to-day planning, to the big picture of a course and the main themes within it. It calls for action and reflection, for attending to students as social as well as intellectual beings, for being able to shift your attention back and forth – bringing particular things to the foreground at different times while not completely losing sight of the rest. Becoming a strong teacher is a “forever” kind of task; we can only start the process this year.

We think that several capacities are key in becoming a great mathematics teacher, so the course is intended to help you:

- create and locate tasks that are genuinely engaging for your students and that help them develop both a relational understanding of important mathematical ideas and facility with skills and algorithms;
- develop your ability to find out how your students are making sense of mathematics and to use this to inform where you go next with your teaching;
- explore the kinds of classroom talk that support learning and ways of involving all students in what happens in class;
- deepen your own mathematical knowledge, especially of secondary school mathematics;
- strengthen your capacity to ask hard questions about your teaching and to find ways to pursue those questions;
- be able to justify what mathematical ideas are worth learning and describe how such ideas can be developed over the course of a year or even a sequence of courses;
• find ways to discover and build on things that are meaningful to students and to make connections between students’ thinking and that of the larger mathematical community;
• think about issues of mathematical authority;
• contribute to an educational system where all students can become mathematically powerful.

A final desire for the course

Finally, we hope that the shared experience of the internship year develops in you a sense of community as a cohort. You are the teachers of the future. In ten to fifteen years, you will be the experienced teachers who will be mentors, department chairs, leaders of the profession, and more. In our class, we think it is important that you are supportive of one another, share discoveries and concerns, take risks and feel safe doing so, are helpfully critical of each others’ ideas, and so on. We also think that it is important for you all to stay connected in your first years of teaching. The relationships that you develop with members of your cohort could stand you in good stead over the years.
Assignments

One of the most difficult things about this year will be the tension between your roles as both a teacher and a student. It’s critically important that you start thinking of all of your work as a teacher, even when you’re doing things like sitting in this class or working on an assignment. However, you will still be a student this year and on many occasions to come, so now is a good time to figure out how to synthesize the old student you and the new teacher you.

Since you are still students, there are going to still be assignments, complete with learning objectives, guidelines for completion, and due dates. But since you are now teachers, and this course is about improving your teaching, your goal should not be to complete the assignments to the letter in an attempt to please us and thus be rewarded with a good grade. Your goal should now be to find and exercise the considerable latitude there will be for your own interpretations and emphases of each assignment, in an attempt to become a better teacher for your students.

There will be four major assignments that you will complete individually as part of this course. Before beginning each, you will receive more detailed information to help you understand the goals and requirements. What follows here is a brief description of the assignments to give you an idea of what to expect, and when.

1. Unit Planning Reflection  
   Due: December 6

   It is a requirement of TE 501 (the internship itself) that you create unit plans for each unit that you will be teaching in your internship. Not only is the planning important for you as the teacher, it is also important for communicating with your mentor about what and how you intend to teach, so that your mentor can feel comfortable turning his or her class over to you. And, your field instructor can be most helpful during visits if you use the unit plans to help him or her understand the bigger context into which your lesson falls. Plus, they are a nice way to keep a record of what you taught this year, to use as a reference next year and beyond.

   In TE 802, we will be focusing on unit planning during the middle part of the semester. Prior to GLT 1, we will review some things about unit planning from TE 401-2 and work on creating your unit plan for the non-focus class you will be teaching. You will give these plans to your mentor teacher and field instructor for feedback and suggestions before beginning GLT 1. After you return from GLT 1, we will spend some time reflecting on the teaching from GLT 1 and aspects of these unit plans in order to prepare you to create the unit plans you will be teaching in GLT 2. Again these plans will be submitted to your mentor and field instructor for feedback prior to beginning GLT 2. After GLT 2, you will be writing about the unit planning you did during first semester, including what you’ve learned about planning and how your planning has evolved. This final reflection is what you will turn in as part of TE 802.

2. The Year-Long Curriculum (YLC)  
   Due: September 20

   Just as lesson plans are detailed plans that flesh out the overall goals set in the unit plan, unit plans themselves are a fleshier, more detailed plan of action for meeting the goals of the course as a whole. And just as unit plans establish the focus and depth of your teaching in each lesson,
and help ensure that your lessons follow in a logical order, the YLC will do the same for the **scope** and **sequence** of your units.

One of the things that is often difficult for interns to think about, but is on the mind of your mentors a lot, is the need to teach a certain amount of stuff before the end of the year. Since you are done in April, you’ll miss seeing the last few weeks of school when the decisions about what to do to make the course fit the school calendar are often made. In order to decide whether, for example, you can take one more day to review before the test in October, or can spend three days on a project before Thanksgiving break, you need to think about where that time is coming from: what other things are you not going to get to by deciding to use the time in that way? Good teachers make these decisions not by always taking the extra day, not by refusing to deviate from their plan, but by weighing the pros and cons of the decision. In order to do this, you’re going to need some idea of where you’re planning to go by the end of the year.

The nature of this task of planning for the year will vary depending on the course and the school in which you are teaching. For some of you, a detailed guide of what objectives you need to teach and when you need to teach them is in place. For others, the text serves as the major organizing tool, but the pace and order of lessons or chapters is more flexible. For still others, there may be only a list of topics that need to be covered by the end of the year, using whatever organization and materials you like. In any case, the main focus of the YLC is to take these guidelines and create something that makes sense as a course.

Early in the semester we will be working in class on activities to help you construct your YLC for your focus class, particularly with regard to thinking about how your topics connect to one another and what you can do to envision the course as ALL ABOUT SOMETHING, rather than just a laundry list of topics. Doing this effectively will not only help you make decisions in your planning at the unit and lesson level, but also help your students understand how each day what they are doing is helping them learn more about something important.

#### 3. Cool Stuff  
(a.k.a. Rich and Engaging Tasks for students)  
**Plans due: October 4, October 28**  
**Reflections Due: October 18, November 8**

In the past, many interns have mentioned that one of the great things about Friday classes is the opportunity to get together to share ideas and strategies with each other. One of the planned activities for sharing experiences is the sharing of Cool Stuff. Cool Stuff is just that: stuff for students to work on, think about, or play with that’s **cool**.

Now, obviously we all will have different ideas about what exactly makes stuff cool. And our students may spend a lot of time trying to convince us that nothing in math class could ever possibly be cool. But we know better, don’t we? Seriously, one of the major things we’ll have to work on in this assignment is discussing and maybe even deciding on criteria for what makes stuff cool.

Finding cool stuff for students to do is part of planning units, and so we’ll be talking about this assignment primarily during the middle part of the semester. First, you’ll select some stuff (task, activity, question, problem, worksheet, project, whatever) from your text or some other resource
for students to work on during GLT 1. You’ll design a lesson around this stuff, then teach and
document your work, and finally reflect on what you learned about selecting good tasks. In
class, we’ll use them as examples to talk about what makes a task cool. During GLT 2, you’ll
design (this means a good part of it is your own original contribution) some stuff for students to
work on. Prior to using the tasks, you’ll share them and their accompanying lesson plans.
You’ll get feedback from your peers about whether they seem to be cool, and suggestions about
how to improve them. After getting feedback on the coolness of your task from your colleagues
in class, you’ll want to give it some final tweaking and then try it out. Eventually we’ll hope to
produce: 1) a detailed if not comprehensive description of what features make stuff really cool,
and 2) for each of you, a well documented, very cool task for you to include in your portfolio,
should you choose to do so.

4. Dossiers

The way that your students experience your class has a lot to do with how you conceive of the
class, the tasks you choose or create, and the experiences you design for students. But even
though each student sits in the same classroom, each experiences it in a different way. (If you
doubt this for even a second, just look at the grades on the first test you give.) This can be really
frustrating! You’ll want to be able to predict how students will react to your plans for them, but
you’ll find that no matter how much you plan, something unexpected will happen. To keep these
surprises small and manageable, you’ll find it helpful to really get to know your students.

Now, when we say, “Get to know your students,” we don’t mean just their names and student
numbers. You’re going to need more information that what appears on your attendance list that
first day of school. But we don’t mean that you should go out and interview each one of them
either. No, this is more like detective work. There’s lot’s of useful information out there, if you
know where to look.

In this assignment, you’ll choose two students in the class you plan to pick up for GLT 1. This is
to allow you to spend some time gathering information about these students before you have to
worry about teaching them. Early in the semester, you’ll start completing a dossier (collection of
documents relating to a person) on these students, to get you ready to teach them.

The dossier will include 4 parts:

− The Student as a Student: What type of student is this? What are his/her hobbies,
interests, and goals? What aspects of this student’s personal or school history and
culture might impact their work in my class?
− Relevant Prior Knowledge: What mathematical ideas, skills, conceptions,
misconceptions, beliefs, behaviors, dispositions and conjectures does this student have
that might be useful to know about as I teach him/her?
− Student Ideas: What original ideas does this student have? What questions is he
asking? What questions is he not asking? What sense is he making of the material
we’re presenting?

Due: Weekly from Sept 6 through 27

(the Focus Student assignment)
Assessment: What has the student taken away from our teaching? Did he reach the goals we established, and what do I take as evidence? What will I need to keep in mind about this student as I continue through the course?

We’ll build up these dossiers over the first part of the semester. We’ll talk about strategies for getting this information. We’ll also talk about how to make use of this information in your teaching and in your classroom management.

5. Researchable Question

Data Collection Due: November 8

We know we said that you’ll only have five individual assignments, and that’s true. The Researchable Question assignment is one that we’ll work on as a whole group this semester, but will reappear next semester as an individual assignment, so we thought we’d mention it here.

We will identify an important question about teaching and learning that we will investigate as you teach. The question can be anything that we decide we’re interested in investigating within the following constraints: (1) it must connect to your students’ experiences learning mathematics; (2) it must be researchable (more on this point to come). We’ll talk about what makes a question researchable and about how one goes about researching one’s own teaching. We’ll collect information (data), analyze it, and come up with some conclusions about what we’ve learned.

An important note:
All of the assignments described here are negotiable. We want the assignments to serve you well, so if changes to the assignments will help you learn more and get more from your placements, then we would be happy to modify our plans. However, if you want to negotiate an assignment, this must happen before the assignment is due! In addition, our being open to negotiation doesn’t mean that you can simply do as you please; you will need to help us understand why the substitution that you propose serves you as well as the assignment we’ve given (both NOW and in the FUTURE). Rest assured, though, that we are indeed open to being convinced.

Readings

In TE 802, what you are doing in your placement forms the focus of much of what we will do. We will be asking you to bring in your experiences and we will analyze them together. As a result, there are no assigned texts and no prepared packet of readings. As the semester progresses, we will provide you with copies of required readings, as well as optional articles. However, when you get to the bookstore, you will find a long list of books for purchase under this course title. These books are not required. We have ordered these books because they are of interest to future mathematics educators and many of them are not widely available. We have asked to have them available at the bookstore all year. Please make use of this; look through them and decide which ones are a must for your professional library. All of these books focus on mathematics and have implications for the teaching of mathematics. Many could be useful references for the completion of some of the assignments for this course, and are referred to in
the more detailed descriptions of the assignments yet to come. A complete list of these books is available.

**Grading**

Our primary concern in this course is to support your learning to teach. One way for us to do that is to give feedback on your work – to let you know what we see as strengths, what we believe is in need of more thought, how clearly you have conveyed your ideas in your writing, the extent to which your work responds to the intent of an assignment, etc. Grades are not a particularly effective way of communicating these things. So, we’re not planning to grade the individual assignments you turn in. Sometimes we will ask you to respond to our comments and questions, and you are welcome to revise and resubmit work after reading our feedback at any time it seems useful to do so (or you may just want to keep feedback in mind as you undertake subsequent work).

But we, like your mentor and field instructor, are also being asked to verify that you are meeting requirements for certification, one of which is satisfactory performance in this course. In light of that, we will assign grades at the end of the semester. We will also let you know where you stand grade-wise at mid-semester (at which time we will also ask you to reflect on your progress and communicate your thoughts to us). You are welcome to ask where you stand at any other time. In determining your grade, we will look across all of your work on the various assignments and consider the following:

1. What you know at the end of the semester vis-à-vis the learning goals for the course (in this syllabus) and the program standards (in your handbook).
2. Your growth during the semester and disposition for continued growth.
3. How well you meet the “objective” course requirements (e.g. attendance, turning in assignments when they’re due, responding to comments and questions if we write “Please respond!” on your work).
4. Your involvement and effort. Note that “involvement” does not equal “talking in class”; there are many ways to show us that you are engaged during class (e.g., body language, incorporation of ideas from discussion into your work, thoughtful participation during discussions).

Yes, using these criteria to determine grades is subjective, but that is true of all grading (consider, for example, the subjectivity of decisions that are made about what weight to give homework, what to include on a test, whether to give partial credit, etc.). If you would like to propose modifications regarding grading in this class, we encourage you to do so. If you provide convincing documentation of having done all the assignments (and thus of having practiced a critical mass of what you’ve studied in the TE program), then you’ll earn at least the minimum required for certification.
Miscellaneous

As we noted above, what you are doing in your placement forms the focus of much of what we will do in TE 802 this semester. We plan to build in time for you to discuss issues of particular concern to you. See the course calendar for our current plans for the course; keep in mind that all these dates are subject to change as the semester unfolds.

A word from Team 4 (Handbook, p. 28):

Interns are expected to be present and on time for professional commitments.

Interns who must be absent from their placement or a seminar due to illness or emergency must inform all who are affected by such absence (e.g. mentor teacher, field instructor, course instructor). If the absence is planned or anticipated, those affected should be informed in advance. Interns should comply with school policies regarding absences and make sure that plans are available for substitutes.

More than two absences from the placement or a seminar course during a semester may jeopardize an intern’s recommendation for continuation in the program. Interns who are repeatedly absent or late may be required to make up time at the end of the school year. If there are extenuating circumstances, it is the intern’s responsibility to inform the mentor teacher, field instructor, course instructor, and school coordinator so that appropriate arrangements can be made. Any unusual or lengthy absences should be referred to the field instructor coordinator (faculty leader) and the school coordinator.

The content of the intern-year seminars is part of the Michigan teacher certification requirements and 100% attendance is expected under normal circumstances. Excused absences from seminars will only be granted in case of illness or personal emergency (such as a death in the family) or when an important school-related activity essential to the intern’s professional education (e.g. parent-teacher conferences) conflicts. Workshops or in-service training are generally not an adequate reason to miss class. For any type of absence, interns will be expected to arrange for making up missed educational activities.

Given our limited number of class meetings and the importance of in-class discussions to your professional growth, you can further expect that more than one absence in a semester will negatively impact your grade in our course.