TLSC 231-001: Teaching Science in Elementary Grade Classrooms

Sequence 4: Specializing in an Area of Teaching and Learning: Discipline Specific Instruction in Elementary Classrooms

Teaching, Learning, and Leading with Schools and Communities
School of Education, Loyola University Chicago
Spring Semester 2014

Instructor: Elizabeth Coleman
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Office hours: After class or by appointment

Module Information
Dates: February 11 – March 13
Days: Tuesdays & Thursdays
Times: 8:15 – 12:45
On-Campus Location: Mundelein 620
School-Site Location: Bateman Elementary School
Address: 4220 N. Richmond St., Chicago, IL 60618
Phone: (773) 534-5055
Website: http://batemanschool.org/

Module Description

This module introduces teacher candidates to the discipline of science, provides them experiences engaging in the teaching and learning of science in multiple settings, and specifically works to help candidates integrate literacy and civic connections into their science instruction. The goal of this module is to introduce candidates to the nature and culture of science, and to help them see connections between scientific practices and other ways of thinking and doing (related to other disciplines and their own lives). This will entail candidates engaging in diverse experiences as they explore what it means to learn and do science in different contexts. These explorations will occur on the candidates’ own campus, in informal learning institutions around the city, and in elementary school classrooms, with the intention that they will broaden their conceptions of science and what it means to engage in scientific inquiry. This module intends to develop candidates’ knowledge, skills, and dispositions related to science teaching, in order to provide a foundation to later build instructional sequences that will facilitate their students’ science learning.

Module Goals

Essential Questions:
- What is science? What are the essential elements of scientific inquiry?
- What does inquiry look like in the elementary classroom?
• What role does argumentation play in practices of science?
• What are the core ideas, cross-cutting concepts, and essential practices K-12 students should be engaged in?
• How can we use the principles of backward design to organize science instruction that supports deep understanding?
• What roles do students’ cultural practices and funds of knowledge assume in their science learning?
• How might we help students connect science learning in and outside of the classroom?
• How can interdisciplinary connections enhance the authenticity of scientific investigations?

As a part of this module, candidates will understand that effective educators:
• Use research and evidence-based practices to design instruction that includes the alignment of goals, objectives, assessments and instructional strategies to meet the individual needs of students. (EU 3)
• Apply deep understanding of both content and pedagogy to provide developmentally appropriate instruction to all students. (EU 6)
• Explicitly integrate the teaching of reading, writing, communication and technology across content areas. (EU 8)
• Maintain and utilize global perspectives and international-mindedness when engaging in teaching, learning and leading, including the awareness and application of the social, cultural, inter-cultural and linguistic facets of student achievement. (EU 11)

As a part of this module, candidates will:
• Describe the important facts and central concepts, principles, and theories associated with their certified content areas. (b1B, b1G)
• Identify the content standards and the scope and sequence of the subject area of their certified content areas. (b1B)
• Describe how their subject is related to other disciplines. (b1D) (IB)
• Describe content-specific instructional strategies.
• Describe how global issues can be infused into instructional practice to inspire inter-cultural awareness and international mindedness. (i1G) (IB)
• Describe how instruction utilizes transdisciplinary/interdisciplinary units to incorporate inquiry into multiple perspectives, diverse cultures, and global issues. (b1D) (IB)
• Integrate connections between their content area and the other content areas. (b2F, c2E) (IB)
• Use students’ prior knowledge and experience to introduce new subject-area related content. (a2B, b1G, c2D) (IB)
• Connect content to relevant life experiences and career opportunities. (a2E, b2F, c2D, e1D) (IB)
• Create and select activities that are designed to help students develop as independent learners and complex problem-solvers. (a1B, e2A, e2D ) (IB)
• Demonstrate the ability to recognize and value student diversity and the differences in how students learn and provide instruction to accommodate such diversity. (a1A, a2A, b2E, a1B, b1E, c2J, e2E) (IB)
• Use resources and multiple representations of content effectively, including technology, to enhance student learning. (b2A, b2B, b2D, b2E, b2G) (IB)
• Plan instruction to support students’ structured inquiry into global issues to inspire inter-cultural awareness and international mindedness. (b2C) (IB)
• Engage in different ways of knowing within or across various disciplines. (b2B) (IB)
IDEA Objectives

Essential module objectives:
- Gaining a broader understanding and appreciation of science as an intellectual and cultural activity
- Learning how to find and use resources for answering questions or solving problems
- Acquiring an interest in learning more by asking questions and seeking answers

Important module objectives:
- Developing specific skills, competencies, and points of view needed by professionals in the field
- Learning to analyze and critically evaluate ideas, arguments, and points of view

Dispositions Assessment

Each course/module in the School of Education focuses on one or more professional dispositions. Teacher candidates are offered opportunities to receive feedback on their dispositional growth in the areas of professionalism, fairness and/or the belief that all students can learn. The specific dispositions for this module are listed below and the descriptions for the expected behaviors for the dispositions can be found on the rubric for this module posted in LiveText.

The teacher candidate demonstrates appropriate professional and interpersonal behaviors by committing to:
- Demonstrate professionalism and reflective practice in collaborating with teachers, students, administrators, families, and communities to improve achievement for all students. (i2F)
- Participate in ongoing professional development, reading, and research in order to deepen their knowledge and expand their repertoire of skills. (i2G) (IB)
- Value the unique identities and backgrounds of all students, families and communities as essential assets in learning environments. (i2D, i2F)
- Recognize authentic literacy instruction is the responsibility of all teachers, across all disciplines and grade levels. (b1H, f1A) (IB)
- Value and promote curiosity, creativity, and life-long learning in students. (IB)

School of Education Policies and Information

Conceptual Framework

The School of Education at Loyola University Chicago, a Jesuit and Catholic urban university, supports the Jesuit ideal of knowledge in the service of humanity. We endeavor to advance professional education in the service of social justice, engaged with Chicago, the nation, and the world. To achieve this vision the School of Education participates in the discovery, development, demonstration, and dissemination of professional knowledge and practice within a context of ethics, service to others, and social justice. We fulfill this mission by preparing professionals to serve as teachers, administrators, psychologists, and researchers; by conducting research on issues of professional practice and social justice; and by partnering with schools and community agencies to enhance life-long learning in the Chicago area.
This module embodies the conceptual framework – Professionalism in Service of Social Justice – of the School of Education (SOE) at Loyola University Chicago. As educators, we serve the youth in our classrooms, their families, and our communities. In this module, we will explore what it means to be an ethical teacher in the context of science learning and teaching. With respect to skills and knowledge, we will also explore current best practices in science education and strive to make connections between our pedagogy and authentic scientific practice, social justice, and youth’s lives.

**Technology**

In this module candidates will think about how to integrate technology into science learning and teaching. Various forms of technology are crucial to many aspects of scientific work, and therefore, youth should have the opportunity to engage with appropriate technology, used for specific purposes, when learning science. Teacher candidates will have opportunities to use technology themselves, as well as discuss and practice how to effectively utilize technology in science learning and teaching.

**Diversity**

This module will focus on teaching science in ways that acknowledge and respect all aspects of diversity. Not only must we have respect for each other relative to diversity, but we must also examine how issues of diversity interact with science learning and teaching in elementary classrooms. We will continuously discuss what it means to teach science in culturally responsive ways.

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**University Policies and Information**

**Academic Honesty**

Academic honesty is an expression of interpersonal justice, responsibility and care, applicable to Loyola University faculty, students, and staff, which demands that the pursuit of knowledge in the university community be carried out with sincerity and integrity. The School of Education’s Policy on Academic Integrity can be found at: [http://www.luc.edu/education/academics_policies_integrity.shtml](http://www.luc.edu/education/academics_policies_integrity.shtml). For additional academic policies and procedures refer to: [http://www.luc.edu/education/academics_policies_main.shtml](http://www.luc.edu/education/academics_policies_main.shtml)

**Accessibility**

Students who have disabilities which they believe entitle them to accommodations under the Americans with Disabilities Act should register with the Services for Students with Disabilities (SSWD) office. To request accommodations, students must schedule an appointment with an SSWD coordinator. Students should contact SSWD at least four weeks before their first semester or term at Loyola. Returning students should schedule an appointment within the first two weeks of the semester or term. The University policy on accommodations and participation in courses is available at: [http://www.luc.edu/sswd/](http://www.luc.edu/sswd/)

**Harassment (Bias Reporting)**

It is unacceptable and a violation of university policy to harass, discriminate against or abuse any person because of his or her race, color, national origin, gender, sexual orientation, disability,
religion, age or any other characteristic protected by applicable law. Such behavior threatens to
destroy the environment of tolerance and mutual respect that must prevail for this university to
fulfill its educational and health care mission. For this reason, every incident of harassment,
discrimination or abuse undermines the aspirations and attacks the ideals of our community. The
university qualifies these incidents as incidents of bias.
In order to uphold our mission of being Chicago's Jesuit Catholic University-- a diverse
community seeking God in all things and working to expand knowledge in the service of
humanity through learning, justice and faith, any incident(s) of bias must be reported and
appropriately addressed. Therefore, the Bias Response (BR) Team was created to assist members
of the Loyola University Chicago community in bringing incidents of bias to the attention of the
university. If you believe you are subject to such bias, you should notify the Bias Response Team
at this link: http://webapps.luc.edu/biasreporting

Module Policies and Information

Attendance

- Arrive promptly and maintain excellent attendance records. Candidates are expected to
  attend every module session for the scheduled duration as to maintain consistency for
  students and education professionals. Because you will not be able to participate in the
  school community, our class community, and related experiences if you are not present
  on time, and because all of the module assignments require your active involvement in
  the classroom and other informal sites, tardiness and absences will result in you receiving
  a lower grade in the module, except in the case of extreme circumstances (e.g., family
  emergency, illness) where proper documentation is supplied.
- Ask your cooperating teacher educator how he/she wishes to be contacted regarding any
  special circumstances. You may contact me in advance to discuss any conflicts via
  email. For last minute emergencies, please call my cell phone to speak with me or leave
  a message. Make arrangements and notify everyone involved prior to your absence.
  After missing a day of the module, it is necessary for you to initiate contact with me, and
  your cooperating teacher educator if applicable, to arrange ways to make up for your
  absence. I expect excellent communication (e.g., notifying me prior to any absence,
  notifying me about any issues regarding assignments) because excellent communication
  is part of what it means to be a professional.
- In addition to consistent attendance, while at our school site and informal learning sites, I
  expect that you will conduct yourself in a professional manner at all times, which
  includes appropriate dress, communication, and interactions with adults and students.
  Participation points will be negatively impacted if you choose to engage in
  unprofessional conduct. In addition, I will complete a disposition form so that your
  behavior is officially documented.

Community of Learners

Our work together relies on honest, open, and respectful dialogue so that all candidates feel free
to express their views. Disruptive behavior (e.g., inappropriate language, talking over others)
will not be tolerated and will result in the loss of participation points. Here are a few guidelines
to help facilitate our discussions and experiences each week:

- All questions are valued and important! Please ask any and all questions you have and
  remember that by asking your questions, you are allowing us to learn as a community
  because you are helping to make ideas visible.
- Be respectful of others’ ideas and experiences even if they are different from your own.
We do not have to agree, but we do owe it to each other to listen to and consider each other’s points of view. On a related note, please respect confidentiality both in the class and outside of it.

- **Practice active listening.** Listen to others by not interrupting and by not passing judgment until you have heard and considered what others have said. Do not assume that silences are unproductive. Give others time to think, consider, and formulate ideas.
- **Monitor your participation.** If you are outgoing and tend to dominate conversation, use this module to practice allowing others a space to participate. If you are less outgoing and tend to let others do the talking, use this module as an opportunity to practice speaking up. It is always helpful to ask others what they think in any given situation.
- **Use electronics professionally and responsibly.** Please either turn cell phones off or to vibrate before each class session out of respect for our community. Refrain from using your cell phone at the school site or during our class sessions at informal institutions. On a related note, use laptops and tablets appropriately (e.g., note taking, presentations).

**Late Work and Extension Requests**

All assignments are due on the dates listed in this syllabus. I will only accept late work in the event of special circumstances (e.g., family emergency, illness). Please talk with me in person or contact me via email to discuss assignment extensions. **Make sure you contact me prior to any given due date.** Failure to do so will result in significant point deductions.

**Format for Assignments**

Unless otherwise noted, all assignments must be typed. **Please double-space your work and use 12 point Times New Roman font.** As with all assignments, I expect you to attend closely and carefully to spelling and grammar. If referencing course or other textual materials, please follow American Psychological Association style guidelines (APA – 6th edition). You can access the APA style manual through Loyola University Chicago’s libraries or online at [http://www.apastyle.org](http://www.apastyle.org). Also note that I expect you to attend to the feedback I give you on assignments. If I give you a particular piece of feedback and you choose not to attend to it on subsequent assignments, your point total will be impacted.

**Grading Scale**

The course grading scale is as follows:

<table>
<thead>
<tr>
<th>Percent Range</th>
<th>Corresponding Grade</th>
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<tbody>
<tr>
<td>93% - 100%</td>
<td>A</td>
</tr>
<tr>
<td>90% - 92%</td>
<td>A-</td>
</tr>
<tr>
<td>87% - 89%</td>
<td>B+</td>
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<tr>
<td>83% - 86%</td>
<td>B</td>
</tr>
<tr>
<td>80% - 82%</td>
<td>B-</td>
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<tr>
<td>77% - 79%</td>
<td>C+</td>
</tr>
<tr>
<td>73% - 76%</td>
<td>C</td>
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<tr>
<td>70% - 72%</td>
<td>C-</td>
</tr>
<tr>
<td>67% - 69%</td>
<td>D+</td>
</tr>
<tr>
<td>63% - 66%</td>
<td>D</td>
</tr>
<tr>
<td>60% - 62%</td>
<td>D-</td>
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<tr>
<td>Below 60%</td>
<td>F</td>
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</tbody>
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Module Assignments

NOTE: All assignments for this module will be submitted via LiveText. Please make certain you have activated your LiveText account if you have not already done so.

• **Module Participation: 10% of final grade**
  You are expected to consistently and actively participate in all module experiences. Since much of this module takes place in a school and other informal learning institutions, you are expected to dress and act professionally. You must arrive on time and stay for the duration of the class session. Class sessions will build directly on assigned readings; therefore, you must come to class having read all assigned texts. For each class session, you can earn up to two participation points. The following guidelines will determine the points you earn:
  • 2 points = On-time to class, professional dress and actions, prepared with clear understanding of the readings, active participation in our discussions and in the classroom/informal learning environment
  • 1 point = Late to class, somewhat unprofessional dress or actions, unprepared with limited understanding of the readings, and/or passive in our discussions and in the classroom/informal learning environment
  • 0 points = Did not attend class, had to be removed due to unprofessional dress or actions, unprepared with no understanding of the readings, and/or did not participate at all in our discussions or the classroom/informal learning environment

• **Weekly Course Reflections: 20% of final grade**
  You will write four informal course reflections that will ask you to reflect on and make sense of your experiences during this module. Each week, you will be asked to respond to broad questions or ideas and how they pertain to doing, learning, and teaching science.

• **Sequence 4 Summative Assessment: 20% of final grade**
  You will begin a significant portion of your Sequence 4 Summative Assessment in this module. First, you will choose an interdisciplinary topic of interest to investigate, with specific connections to science and civic issues. You will pose questions and use inquiry-based approaches to investigate this interdisciplinary issue. As you inquire into your issue, you will draw on a range of informational texts and argumentation skills, emphasized in all the modules in this sequence. This will give you the opportunity to engage in both scientific and historical inquiry, while utilizing relevant literacy practices. The goal of this assessment is for you to demonstrate a strong command of the content areas of science and social studies, as well as the skills of academic writing. This inquiry experience will highlight common themes between and across the disciplines of science and social studies that have local, national, and global connections.

• **Inquiry Plan Defense: 25% of final grade**
  The first step of the Sequence 4 Summative Assessment is to develop and present a plan for your interdisciplinary inquiry to your peers, with the goal of getting productive feedback to move your inquiry forward. The plan must include a researchable question, a rationale for how it addresses an issue of both scientific and civic importance, as well as some initial plans for data collection (including sources and modes of collection). You will present your inquiry plan to our class to receive constructive feedback regarding the
feasibility of your investigation, and we will discuss other possible data or resources that might assist you in your investigation.

- **Science Talk: 25% of final grade**
  You will *formatively* assess the students in your cooperating classroom on their understanding of a specific science topic (ideally connected to your inquiry project), the types of experiences or knowledge bases they draw upon to make sense of the world, and what they wonder about or have questions about in connection to science. This will provide a valuable opportunity to learn about and from your students, and it will help you think about how their prior knowledge, experiences, and curiosity can inform your science instruction.

**Module Resources**


