Technology in the 21st Century Math Classroom (6-12):
Supporting Common Core Standards and Increasing Student Achievement
Online Participant Syllabus

Course Description

This course is designed for grade 6-12 mathematics educators and district mathematics curriculum directors interested in integrating technology into mathematics instruction in order to maximize student achievement. Participants will examine and evaluate software packages and tools, Web resources, and other instructional materials used to integrate technology into mathematics instruction. Additionally, the management and assessment of online learning environments and the Flipped Class model will be discussed.

Course Prerequisites

Educators enrolled in the course are required to hold a baccalaureate degree.
No prerequisites for this course are required.

System Requirements

- Computer with word processing software
- Internet access connection
- Online video viewing capabilities/Adobe flash player
- Software capable of reading PDF files

NOTE: Additional software will be used, but will either be free and open-source, trial versions, or readily available software on most systems. TI calculators may be very useful for secondary or post-secondary teachers to have for the course. Technologies chosen by each teacher for assignments will be based on the individual needs of the teacher's classroom. The instructor will work closely with each teacher to assist in determining the appropriate technologies that can be useful in various settings.

Text Books/Supplemental Reading

No textbook is required for this course. Critical reading of assigned articles and text is embedded throughout the course.

Global Goals of the Course

To deepen and/or apply the content and skills of the teacher's existing professional knowledge base by meeting the following global goals of this course:

1. To understand and employ the Common Core State Standards in the mathematics classroom to increase student achievement (NBPTS 1, 2, 3; ISTE 1, 2, 3, 4; InTASC 1-8)
2. To understand and employ the Common Core Mathematical Practices within lesson plans to foster student mathematical development (NBPTS 1, 2, 3, 4; ISTE 1; InTASC 1-8)
3. To demonstrate the overall effective use of technology in the mathematics classroom to improve teaching and learning (NBPTS 1, 2, 3, 5; ISTE 1, 2, 3, 4, 5; InTASC 1-8)
4. To employ technology appropriate to the specific content areas within the Common Core Standards (NBPTS 1, 2, 3; ISTE 1, 2; InTASC 1-8)
5. To understand and employ the use of technology in mathematical representations and communication towards the development of students' 21st century skills (NBPTS 1, 2, 3; ISTE 1, 2, 3, 4; InTASC 1-8)
6. To employ other educational professionals in seeking out useful and appropriate technologies to increase student achievement (NBPTS 5; ISTE 5; InTASC 9, 10)

Instructional Objectives

By the conclusion of the course, each participant should be able to do the following:

1. Examine approaches used in the standards-based mathematics classroom.
    - 1.1 Examine the Common Core Standards in mathematics and support of other mathematical, standards-based organizations.
    - 1.2 Demonstrate intentional, as opposed to incidental, implementation of the standards.
2. Evaluate the Common Core Mathematical Practices and explore infusion within daily lessons.
    - 2.1 Examine the Common Core mathematical practices.
    - 2.2 Evaluate how these practices impact and support the use of technology in the mathematics classroom.
3. Appraise technologies appropriate to the specific content areas within the Common Core Standards.
    - 3.1 Evaluate and employ appropriate and grade-specific technologies in the area of Number and Operations.
    - 3.2 Evaluate and employ appropriate and grade-specific technologies in the area Algebra.
    - 3.3 Evaluate and employ appropriate and grade-specific technologies in the area Geometry.
    - 3.4 Evaluate and employ appropriate and grade-specific technologies in the areas Measurement and Data, Mathematical Modeling, and Statistics and Probability.
4. Employ the use of technology in mathematical representations and communication towards the development of 21st century skills in students.

4.1 Demonstrate knowledge of the differences between conveyance technologies and mathematical action technologies.
4.2 Employ appropriate technologies for student use that can be used for presentation, communication, and sharing/collaboration.

5. Employ other educational professionals in seeking out useful and appropriate technologies to increase student achievement.
   5.1 Describe and employ effective classroom technology practices.
   5.2 Demonstrate qualities of an effective math teacher through implementation of standards, commitment to students, and other professional requirements.
   5.3 Employ feedback that moves learners forward and elicits evidence of reflection that directly impacts instruction.

Teaching Methodology and Delivery Model

Teaching methodologies used in this course are specifically designed to maximize learning in a graduate-level, online distance-learning model. Each course facilitator is trained and/or experienced in facilitating graduate-level online courses as well as the specific content and skills of this course.

1. Online methodologies include instructor/expert presentations, directed skill practice, Forum and Assessment completion, as well as the synthesis of new knowledge and skills in designing educational applications.
2. The course is taught in a supportive learning environment with teacher-participant interaction and feedback.
3. Content focuses on the presentation of advanced concepts linked to instructional strategies which accommodate learning needs of a diverse student population.
4. Course content, activities, and assignments are organized into Milestones that participants complete during the 12-week span of the course. Course content is intended to cover material equal to 45 seat hours of instructional time.
5. Class participants actively construct their own learning and make it personally relevant by acquiring and applying course knowledge/skills to their own teaching situation.

Learning Assessment

Formative assessment of learning objectives for this course is conducted informally throughout the course via discussion, critiques, self-evaluations, instructor feedback, and activities requiring participants to make sense of new knowledge and/or skills within their realm of teaching. Additionally, three formative assessments are embedded within the course. Summative assessment for the course occurs in the form of a final project which requires each participant to synthesize class content and apply it within the teacher's specific teaching environment.

Compliance with National Board of Professional Teaching Standards

The National Board of Professional Teaching Standards represents the highest level of professional achievement in the continuum of teacher professional development. There

are five core principles (standards) which cover five aspects of professional educational practice: (1) commitment to students and their learning, (2) knowledge of subject matter and instructional strategies, (3) management and monitoring of student learning, (4) systematic reflection about the teaching profession to learn and grow from experience, and (5) collaborative participation in the educational learning community.

Compliance with Interstate Teacher Assessment and Support Consortium (InTASC) Standards

The Interstate Teacher Assessment and Support Consortium's work is guided by one basic premise: An effective teacher must be able to integrate content knowledge with the specific strengths and needs of students to assure that all students learn and perform at high levels. All teachers should meet the following standards: (1) learner development, (2) learning differences, (3) learning environments, (4) content knowledge, (5) application of content, (6) assessment, (7) planning for instruction, (8) instructional strategies, (9) professional learning and ethical practices, and (10) leadership and collaboration.

Compliance with ISTE Standards for Technology in Education

Effective teachers model and apply the National Educational Technology Standards for Students as they design, implement, and assess learning experiences to engage students and improve learning; enrich professional practice; and provide positive models for students, colleagues, and the community. All teachers should meet the following standards: (1) facilitate and inspire student learning and creativity (2) design and develop digital-age learning experiences and assessments (3) model digital-age work and learning (4) promote and model digital citizenship and responsibility (5) engage in professional growth and leadership.

Final Projects

Participants taking courses for professional development unit (not-for-credit) must follow the same Participation Expectations as posted in the course syllabus. Participants complete readings and tasks as outlined in the Task List. Forum Post Reflections are also required. However, participants will be exempt from completing the Formative and Summative Assessments unless otherwise noted. Proof of seat hours will be presented to the participants after completing the state required course evaluation located on the student portal.

In keeping with best instructional and assessment practices, this course requires participants to demonstrate synthesis and application of course knowledge in an applied final project linked to the instructional objectives of this course. Assessment of the project should not be limited to the quantity of work submitted but should carefully consider the quality and intellectual value of the work.

Final projects are due and will be submitted to the instructor within 12 weeks of the allotted class time. Unless the instructor states otherwise, all papers are expected to be properly formatted electronically.

Assessments and Grading

Throughout the course, participants will engage in both formal and informal formative and summative assessments. Points are assigned based on a four-point criterion rubric specifically delineated for each assessment that can be further defined as follows:

Distinguished: The assessment is highly imaginative; demonstrates critical thought; is unique; shows substantial application to one's own teaching or professional position; *goes above and beyond requirements;* is creative; demonstrates both breadth and depth of knowledge of transition-related subject matter; shows individual's personality; is professional in presentation and appearance; and demonstrates considerable effort. The assessment is exceptionally completed and demonstrates clear understanding of the tasks, gives explanations, and shows how the assessment applies to a teaching/learning situation. The assessment meets the specific criteria delineated in "Distinguished" on the course rubric.

Proficient: The assessment is well-organized and complete; is effectively and clearly presented; demonstrates clear understandings; applies what has been learned to the author's own classroom situation; clearly shows connections; is detailed; and is thoughtful and supported with ideas. A thoroughly completed assessment demonstrates that the participant shows awareness of the tasks, gives explanations, and shows how the assessment applies to a teaching/learning situation. The assessment meets the specific criteria delineated in "Proficient" on the course rubric.

Basic: This is the lowest passing grade. The assessment meets minimum requirements; includes general information but lacks descriptive detail; shows limited application to teaching/learning; and lacks originality. This denotes work that does not meet **all** aspects of standards for academic performance in a graduate-level course. The assessment meets the specific criteria delineated in "Basic" on the course rubric.

Unsatisfactory: The assessment is missing evidence or information; is sloppy and poorly organized; demonstrates only surface understandings; shows no evidence of application to the author's own teaching situation; is poorly written; and does not meet minimum standards for academic performance in a graduate-level course. The assessment meets the specific criteria delineated in "Unsatisfactory" on the course rubric.

The assessments for this course are weighted as follows:

Participation and Reflection	30%
Formative Assessments	30%

Summative Assessments 40%

Academic Honesty and Integrity

All participants are expected to maintain academic honesty and integrity by doing their own work to the best of their ability. Academic dishonesty (cheating, fabrication, plagiarism, etc.) will result in the participant receiving a zero for that assignment or paper.

Americans with Disabilities Act Compliance

In compliance with Section 504 of the Rehabilitation Act and The Americans with Disabilities Act, participants who have any condition, either permanent or temporary, which might affect their ability to perform in this class, are encouraged to inform the Director of Academic Affairs prior to the first class session. Reasonable academic accommodations, aids, and adjustments may be made as needed to provide for equitable participation.

Attendance

Participants will have 12 weeks from the time of their first date of login to complete the course. They will need to contact their instructor and The Connecting Link at (888) 550-5465 should they not be able to complete the online class in the time given. Failure to complete all work in the 12 week time frame may result in an **incomplete** or a grade of **F** for the work, depending on the reason for the delay.

University Compliance

Course content and instruction are bound by policies associated with the university granting academic credit for the course. Such polices include, but are not limited to: academic integrity and honor codes, institutional objectives and grade grievance procedures. These policies are located within the official academic catalogs which can be accessed through the university's official website.