EDUT 3370
KNOWING AND LEARNING IN MATHEMATICS AND SCIENCE
Spring 2016

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EMAIL: mlewis@uttyler.edu (best way to contact me)
OFFICE HOURS: 12:15-1:45 T & TH or by appointment
Class Meetings: T & Th 11:00-12:15; BEP 215

COURSE DESCRIPTION:
This course focuses on issues of what it means to learn and know science and mathematics. What are the standards for knowing we will use? How is knowing and learning structured and how does what we know change and develop? For the science and mathematics educator, what are the tensions between general, cross-disciplinary characterizations of knowing (e.g. intelligence) and the specifics of coming to understand powerful ideas in mathematics and science? What are the links between knowing and developing in learning and developmental theory, and the content and evolution of scientific ideas? Also, current issues and tensions in education will be discussed, especially as they relate to mathematics and science instruction.

STUDENT LEARNING OUTCOMES:
After completion of this course:

<table>
<thead>
<tr>
<th>Students will be able to:</th>
<th>Evidence of Student Learning:</th>
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</thead>
<tbody>
<tr>
<td>Construct models of knowing and learning to guide classroom practice.</td>
<td>• Meaningful contributions to class discussions</td>
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<td></td>
<td>• Comments posted about analysis of readings</td>
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<td></td>
<td>• Analysis of clinical interviews</td>
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<td>• Written examinations</td>
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<td>• Group problem solving activities</td>
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<tr>
<td>Express informed opinions on current issues and tensions in education, especially as they relate to mathematics and science instruction.</td>
<td>• Meaningful contributions to class discussions • Comments posted about analysis of readings • Written examinations • Group problem solving activities</td>
</tr>
</tbody>
</table>

**EXPECTATIONS, EXAMINATIONS, AND ASSESSMENTS:**

1. **Attendance:** Class attendance is vital to the success of any course. Regular attendance is expected with no more than 2 unexcused absences from class for the semester. Violation of the attendance policy can result in a grade reduction.

2. **Preparation:** Students are expected to prepare for and participate in class discussions and activities.

3. **Participation:** Students are expected to regularly participate in discussions and analyses of selected readings.

4. **Clinical Interviews:** Students are expected to satisfactorily complete two mini Clinical Interviews with an expert/novice paring on a topic. The clinical interview is an extensive process of formally interviewing a subject engaged in a problem solving activity. You will record the interview, transcribe and analyze the problem solving activity. A report will then be submitted and graded with feedback.

5. **Exams:** Students are expected to demonstrate their understanding of course content through two written exams.

6. **Academic Integrity and Scholastic Dishonesty:** students who violate university rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced.
EVALUATION:

Class participation & attendance 30
Exam 1 40
Clinical Interview I 40
Exam 2 40
Clinical Interview II 40
Exam 3 40

Total: 230

Course grades will be assigned based upon the student's accumulated points:

Grading Scale (%)
207 -- 230 = A
184 -- 206 = B
161 -- 183 = C
138 -- 160 = D
Below 138 = F

Note: The course participation and attendance grade will be based on a composite of class attendance and full participation in all course activities. Regular attendance is expected with no more than 2 unexcused absences from class for the semester. Violation of the attendance policy can result in a grade reduction.

ASSIGNED TEXTS:

Educational Psychology: Developing Learners (8E)
Jeanne E, Ormrod,
ISBN: 0-13-297442-8
Softcover
Pub. Date: 2014
Pearson
Available from the UTT bookstore or online.

How People Learn: Brain, Mind, Experience, and School : Expanded Edition
John D. Bransford (Editor), Ann L. Brown (Editor), Rodney R. Cocking (Editor),
Hardcover - 386 pages
ISBN: 0-309-50145-8
National Academy Press
Pub Date: 2000
This text is a free download. It is available in the Course Documents section of our Blackboard page.

Additional Readings
I may assign additional readings at several points during the semester. These will be available through Blackboard, and will be discussed in class.

Please Note: A student of this institution is not under any obligation to purchase a textbook from a university-affiliated bookstore. The same textbook may also be available from an independent retailer, including an online retailer.

ATTENDANCE:
I view attendance and participation as being critical to the success of any course. Regular attendance is expected with no more than 2 unexcused absences from class for the semester. Violation of the attendance policy can result in a grade reduction.

CELL PHONES/LAPTOPS/Tablets:
I am certain that you realize that use of cell phones (including texting) in class is disruptive. Please turn cell phones off during class. If you must leave your cell phone on, please switch it to silent mode. You are welcome to use your laptop computer for note-taking in class. Do not use it for anything else (i.e., facebook, twitter, etc.).

OUT OF CLASS WRITTEN ASSIGNMENTS:
Requirements and guidelines for specific written assignments will be distributed separately. In all cases, out of class written assignments are expected to represent university quality work and to meet the following minimal criteria:

1. On Time
2. Word-processed, double-spaced
3. On 8 1/2 X 11 in. paper
4. Free of typographical errors
5. Original copy only; No photocopies will be accepted
CODE OF CONDUCT:

I expect students in this course to conduct themselves as university students of graduate standing. I expect students to attend class regularly and to participate in class activities. I expect students to arrive at the beginning of class and to remain until the class is dismissed. I expect students to meet assigned deadlines. I expect students to behave in an academically honest manner. I reserve the right to penalize students who violate class policies.

TENTATIVE SCHEDULE OF EVENTS:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
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<tbody>
<tr>
<td>1/19-2/9</td>
<td>Course Overview, Definitions of Learning</td>
<td>O – 1, 9</td>
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<tr>
<td></td>
<td>Nature vs. Nurture</td>
<td></td>
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<td></td>
<td>Environmental Theories of Learning</td>
<td>O – 6, 7</td>
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<tr>
<td>2/11</td>
<td>Exam 1</td>
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<tr>
<td>2/16-3/3</td>
<td>Cognitive Theories of Learning</td>
<td>O - 6</td>
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<tr>
<td>3/7-3/11</td>
<td>Spring Break</td>
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<tr>
<td>3/15</td>
<td>Problem Solving and Complex Cognition</td>
<td>O – 8</td>
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<td>3/15</td>
<td>Lab: Clinical Interview I</td>
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<tr>
<td>3/17-3/22</td>
<td>The Development of Cognition; The Socio-cultural Context of Teaching and Learning - Piaget and Vygotsky</td>
<td>O – 2, 10</td>
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<tr>
<td>3/24</td>
<td>Exam 2</td>
<td></td>
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<tr>
<td>3/29</td>
<td>CI 1 due</td>
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<tr>
<td>3/29-4/7</td>
<td>A New Theory of Learning</td>
<td>B – 1</td>
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<td>How Experts Differ From Novices</td>
<td>B – 2</td>
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<td></td>
<td>Learning and Transfer</td>
<td>B - 3</td>
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<td></td>
<td>Inquiry Learning</td>
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<tr>
<td></td>
<td>Introduction to Clinical Interview II</td>
<td></td>
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</tbody>
</table>
4/12-14 Intelligence and Learning Styles O – 5
4/19-26 Foundations of Assessment Formative and Summative Assessment O – 14, 15
4/26 Lab: Clinical Interview II – Peer Review

Date Topic Reading
4/28 Clinical Interview II Due
5/2 Study Day

Finals Week Exam 3

Key to Readings:
O = Ormrod; B = Bransford

UNIVERSITY POLICIES

UT Tyler Honor Code
Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Students Rights and Responsibilities
To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/rightsresponsibilities.php

Grade Replacement/Forgiveness and Census Date Policies
Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. (For Spring 2015, the Census Date is January 26th.) Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.uttyler.edu/registrar. Each semester’s Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date (January 26th) is the deadline for many forms and enrollment actions of which students need to be aware. These include:
□ Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
State-Mandated Course Drop Policy
Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).
Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability Services
In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University offers accommodations to students with learning, physical and/or psychiatric disabilities. If you have a disability, including non-visible disabilities such as chronic diseases, learning disabilities, head injury, PTSD or ADHD, or you have a history of modifications or accommodations in a previous educational environment you are encouraged to contact the Student Accessibility and Resources office and schedule an interview with the Accessibility Case Manager/ADA Coordinator, Cynthia Lowery Staples. If you are unsure if the above criteria applies to you, but have questions or concerns please contact the SAR office. For more information or to set up an appointment please visit the SAR office located in the University Center, Room 3150 or call 903.566.7079. You may also send an email to cstaples@uttyler.edu

Student Absence due to Religious Observance
Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities
If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement:
It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks
violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

**Emergency Exits and Evacuation:**
Everyone is required to exit the building when a fire alarm goes off. Follow your instructor’s directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

**Student Standards of Academic Conduct:** Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

(i) “Cheating” includes, but is not limited to:

- copying from another student’s test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed “crib notes”. The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, homework solution, or computer program;
- falsifying research data, laboratory reports, and/or other academic work offered for credit;
- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.
(ii) “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.

(iii) “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

(iv) All written work that is submitted will be subject to review by SafeAssign™, available on Blackboard.

**COLLEGE OF EDUCATION AND PSYCHOLOGY (CEP) VISION AND MISSION**

**Vision:** The College of Education and Psychology is nationally recognized and respected for its academic programs and opportunities. It is a center of academic excellence, scholarly inquiry, and public service. The College prepares leaders to meet the critical challenges of the 21st Century through productive contributions to local and global communities and toward individual and cultural equity.

**Mission:** The mission of the College of Education and Psychology is to provide a positive environment that fosters the acquisition of knowledge and skills. The mission is individually and collectively realized through a community of scholars that contributes to knowledge through scholarly inquiry; organizes knowledge for application, understanding and communication; and provides leadership and service. We affirm and promote global perspectives that value individual and cultural diversity to enhance learning, service, and scholarship.

**Code of Ethics and Standard Practices for Texas Educators**

**Texas Administrative Code**

<table>
<thead>
<tr>
<th>TITLE 19</th>
<th>EDUCATION</th>
</tr>
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<tbody>
<tr>
<td>PART 7</td>
<td>STATE BOARD FOR EDUCATOR CERTIFICATION</td>
</tr>
<tr>
<td>CHAPTER 247</td>
<td>EDUCATORS’ CODE OF ETHICS</td>
</tr>
<tr>
<td>RULE §247.2</td>
<td>Purpose and Scope; Definitions</td>
</tr>
</tbody>
</table>

(b) Enforceable Standards.

**(1) Professional Ethical Conduct, Practices and Performance.**

(A) **Standard 1.1.** The educator shall not intentionally, knowingly, or recklessly engage in deceptive practices regarding official policies of the school district, educational institution, educator preparation program, the Texas Education Agency, or the State Board for Educator Certification (SBEC) and its certification process.

(B) **Standard 1.2.** The educator shall not knowingly misappropriate, divert, or use monies, personnel, property, or equipment committed to his or her charge for personal gain or advantage.

(C) **Standard 1.3.** The educator shall not submit fraudulent requests for reimbursement, expenses, or pay.

(D) **Standard 1.4.** The educator shall not use institutional or professional privileges for personal or partisan advantage.
(E) **Standard 1.5.** The educator shall neither accept nor offer gratuities, gifts, or favors that impair professional judgment or to obtain special advantage. This standard shall not restrict the acceptance of gifts or tokens offered and accepted openly from students, parents of students, or other persons or organizations in recognition or appreciation of service.

(F) **Standard 1.6.** The educator shall not falsify records, or direct or coerce others to do so.

(G) **Standard 1.7.** The educator shall comply with state regulations, written local school board policies, and other state and federal laws.

(H) **Standard 1.8.** The educator shall apply for, accept, offer, or assign a position or a responsibility on the basis of professional qualifications.

(I) **Standard 1.9.** The educator shall not make threats of violence against school district employees, school board members, students, or parents of students.

(J) **Standard 1.10.** The educator shall be of good moral character and be worthy to instruct or supervise the youth of this state.

(K) **Standard 1.11.** The educator shall not intentionally or knowingly misrepresent his or her employment history, criminal history, and/or disciplinary record when applying for subsequent employment.

(L) **Standard 1.12.** The educator shall refrain from the illegal use or distribution of controlled substances and/or abuse of prescription drugs and toxic inhalants.

(M) **Standard 1.13.** The educator shall not consume alcoholic beverages on school property or during school activities when students are present.

(2) **Ethical Conduct Toward Professional Colleagues.**

(A) **Standard 2.1.** The educator shall not reveal confidential health or personnel information concerning colleagues unless disclosure serves lawful professional purposes or is required by law.

(B) **Standard 2.2.** The educator shall not harm others by knowingly making false statements about a colleague or the school system.

(C) **Standard 2.3.** The educator shall adhere to written local school board policies and state and federal laws regarding the hiring, evaluation, and dismissal of personnel.

(D) **Standard 2.4.** The educator shall not interfere with a colleague's exercise of political, professional, or citizenship rights and responsibilities.

(E) **Standard 2.5.** The educator shall not discriminate against or coerce a colleague on the basis of race, color, religion, national origin, age, gender, disability, family status, or sexual orientation.

(F) **Standard 2.6.** The educator shall not use coercive means or promise of special treatment in order to influence professional decisions or colleagues.

(G) **Standard 2.7.** The educator shall not retaliate against any individual who has filed a complaint with the SBEC or who provides information for a disciplinary investigation or proceeding under this chapter.

(3) **Ethical Conduct Toward Students.**

(A) **Standard 3.1.** The educator shall not reveal confidential information concerning students unless disclosure serves lawful professional purposes or is required by law.
(B) **Standard 3.2.** The educator shall not intentionally, knowingly, or recklessly treat a student or minor in a manner that adversely affects or endangers the learning, physical health, mental health, or safety of the student or minor.

(C) **Standard 3.3.** The educator shall not intentionally, knowingly, or recklessly misrepresent facts regarding a student.

(D) **Standard 3.4.** The educator shall not exclude a student from participation in a program, deny benefits to a student, or grant an advantage to a student on the basis of race, color, gender, disability, national origin, religion, family status, or sexual orientation.

(E) **Standard 3.5.** The educator shall not intentionally, knowingly, or recklessly engage in physical mistreatment, neglect, or abuse of a student or minor.

(F) **Standard 3.6.** The educator shall not solicit or engage in sexual conduct or a romantic relationship with a student or minor.

(G) **Standard 3.7.** The educator shall not furnish alcohol or illegal/unauthorized drugs to any person under 21 years of age unless the educator is a parent or guardian of that child or knowingly allow any person under 21 years of age unless the educator is a parent or guardian of that child to consume alcohol or illegal/unauthorized drugs in the presence of the educator.

(H) **Standard 3.8.** The educator shall maintain appropriate professional educator-student relationships and boundaries based on a reasonably prudent educator standard.

(I) **Standard 3.9.** The educator shall refrain from inappropriate communication with a student or minor, including, but not limited to, electronic communication such as cell phone, text messaging, email, instant messaging, blogging, or other social network communication. Factors that may be considered in assessing whether the communication is inappropriate include, but are not limited to:

(i) the nature, purpose, timing, and amount of the communication;

(ii) the subject matter of the communication;

(iii) whether the communication was made openly or the educator attempted to conceal the communication;

(iv) whether the communication could be reasonably interpreted as soliciting sexual contact or a romantic relationship;

(v) whether the communication was sexually explicit; and

(vi) whether the communication involved discussion(s) of the physical or sexual attractiveness or the sexual history, activities, preferences, or fantasies of either the educator or the student

**Source Note:** The provisions of this §247.2 adopted to be effective March 1, 1998, 23 TexReg 1022; amended to be effective August 22, 2002, 27 TexReg 7530; amended to be effective December 26, 2010, 35 TexReg 11242

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**SCHOOL OF EDUCATION PROGRAM STANDARDS**
The School of Education has adopted program standards that guide the development of teacher candidates in their understanding of the complexity of teaching. These standards are based on those developed by the Interstate New Teacher Assessment and Support Consortium (InTASC) and shared by other accredited universities in Texas and across the United States. The Standards are broad understandings and practices gained throughout the program using a constructivist model in which new learnings are assimilated and attached to prior understandings, thus, over time, building a mental structure (schema) of educational concepts.

**Standard #1: Learner Development (students in general)**
The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

*Texas Teacher Practice Standards: 1.2, 2.1, 2.2, 2.3, 4.1*

**Standard #2: Learning Differences (individual students)**
The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

*Texas Teacher Practice Standards: 1.3, 2.1, 2.2, 2.3, 4.1*

**Standard #3: Learning Environments**
The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self motivation.

*Texas Teacher Practice Standards: 1.3, 1.4, 1.6, 2.3, 4.1, 4.2, 4.3, 4.4*

**Standard #4: Content Knowledge**
The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

*Texas Teacher Practice Standards: 1.2, 1.5, 1.6, 3.1, 3.2, 3.3, 5.2*

**Standard #5: Application of Content**
The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

*Texas Teacher Practice Standards: 1.5, 3.2, 3.3*

**Standard #6: Assessment**
The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher’s and learner’s decision making.

*Texas Teacher Practice Standards: 1.6, 5.1, 5.2, 5.3, 5.4, 6.2*

**Standard #7: Planning for Instruction**
The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

*Texas Teacher Practice Standards: 1.1, 1.2, 1.3, 5.1, 5.3, 5.4*

**Standard #8: Instructional Strategies**
The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.
Texas Teacher Practice Standards: 1.4, 1.5, 1.6, 5.4

Standard #9: Professional Learning and Ethical Practice
The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Texas Teacher Practice Standards: 3.2, 3.3, 6.1, 6.2, 6.4

Standard #10: Leadership and Collaboration
The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

Texas Teacher Practice Standards: 6.3, 6.4

Standard #11: Technology
The teacher is able to create, implement, and evaluate technology to enhance teaching, student learning, and other obligations (e.g. reports, grades, tests, etc.) required of teachers.

Texas Teacher Practice Standards: 1.5