EDUC 5351
Interdisciplinary Methods

Instructor Information
John Lamb, Ph.D.
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Office Hours:
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Course Catalog Description:
Science, Technology, Engineering, and Mathematics (STEM) Education is by definition interdisciplinary. This course will explore how K-12 teachers can best integrate multiple disciplinary concepts within their STEM and Non-STEM classrooms. Interdisciplinary methods related to STEM; STEM with Fine Arts; STEM with Language Arts; and STEM with Social Studies will be addressed in this course.

Student Learning Outcomes & Assessments:
1. The student will be able to discuss, critique, and reflect on the writings and experiences related to interdisciplinary methods in STEM education.
2. The student will be able to prepare, implement, and reflect on instructional lesson planning regarding interdisciplinary methods in STEM education.
3. The student will be able to synthesize personal perspectives and research literature as it relates to interdisciplinary methods in STEM education.

Evaluation and Grading
Talking Head Lectures 25%
-- Lectures focused on specific readings will be viewable and launched throughout the semester. The instructor will present content during these Tuesday Talking Head Lectures and a quiz will be associated with each lecture. Each quiz will have multiple choice and True/False questions related to the selected readings and content discussed in the lectures.

Professional Article Summaries 25%
-- Various articles related to interdisciplinary instruction will be researched, selected, read, and summarized by students throughout the semester. An example of the guidelines and work sample are provided with the syllabus.

Interdisciplinary Methods Project 25%
-- Students will be expected to generate an interdisciplinary STEM unit that utilizes methods associated with the integration of STEM with Fine Arts, Language Arts, and Social Studies.

Interdisciplinary Methods Oral History Paper 25%
-- Students will be grouped and work collaboratively on this paper. Each student in each group will conduct two interviews with individuals whose story would help the students answer a research question related to interdisciplinary methods in STEM education. Each group is expected to research literature and use their interview data to construct a paper synthesizing both the review of literature and oral history data.

TOTAL 100%
A = 90-100%  B = 80-89%  C = 70-79%  D = 60-69%  F = 0-59%

Required Text, Materials/Supplies, and Related Readings:
There is no required textbook for this course. This course will utilize published articles for its literature.

Required Course Materials
All required readings are found on Blackboard.
The Professional Article Reading guidelines and example work product are provided at the end of the syllabus.
Interdisciplinary Methods

Course Policies (attendance, make-up assignments, etc.)
All assignments are due on or before the dates provided in the Topical Outline. Each assignment must be typewritten and submitted in Blackboard. No email attachments will be accepted. Ten percentage points will be subtracted from your assignment score for each calendar day the assignment is late. Assignment dates may be moved to later (but not earlier) scheduled dates during the course of the semester. All exam dates are final. If an exam is not taken due to a documented illness, funeral, or other university related activity, then a make-up date must be scheduled with the professor.

Note that the Blackboard program SafeAssign will be used during the semester to make sure no assignment has been plagiarized. This program will check your assignment against their database of resources then produce a percentage match. This percentage will tell me how much of your assignment matches the resources available. Each student may submit his or her assignments as drafts prior to final submission to check this percentage.

Topical Outline: See Blackboard

UNIVERSITY POLICIES
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://www2.utyler.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 September 4, 2012. Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.utyler.edu/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 is the deadline for many forms and enrollment actions that students need to be aware of. 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.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a “W” grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

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.

Texas Administrative Code
Title 19: Education
Part 7: State Board for Educator Certification
Chapter 247: Educator’s Code of Ethics

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
Summary Checklist (Cover Page for Packet)

Name: _______________________________________________________________

_____1. Bibliography, APA style, on both outline and summary pages. (Maximum 10 points)

_____2. Outline, typed, similar structure to outline page model handout. Outline includes the phrases—First of all, Secondly, finally, and In conclusion at the beginning of each unit beginning with Roman Numeral II. Underline these terms in your summary paragraphs. Four or more subdivisions (The hyphens in the example (-)) in the outline of the body of the summary. (Maximum 15 points)

_____3. Thesis statement included on both outline and critique pages. Thesis statement includes the tag “for several reasons” or some indication of at least three ideas included in the outline. These three or more main ideas must reflect the topics of the body paragraphs. The Theses Statement exceptionally addresses the main ideas of the summarized article. (Maximum 25 points)

_____4. The introductory paragraph of the summary includes the introductory material submitted as a model of the instructor—author, title, background, TS (Thesis Statement), ABC (from outline), and maybe transition sentence. The body paragraphs are connected to the introduction and especially the TS. The conclusion summarizes the main ideas of the article. The overall essay provides an exceptional summary of the articles primary objectives. (Maximum 25 points)

_____5. Edited for sentence construction, spelling, punctuation, and form. All paragraphs single-spaced, Evidence of transition words to tie sentences together for coherence, Underline those identifying phrases in which you refer to the author. For example, phrases such as these—according to the author, the author said that, Jones pointed out, etc. If you read the article carefully, look to see how the professional writer referred to other sources. Font size 12, Times New Roman style. Article included with critique. Staple it to the written portion of the summary. (Maximum 15 points)

_____6. Summary submitted to SafeAssign in Blackboard. Plagiarism is not evidenced by the SafeAssign Report. (Maximum 10 points) Note: excessive plagiarism will result in a zero on this assignment and any subsequent acts of academic dishonesty will earn a zero in the course and possible removal from the Teacher Preparation Program.
America’s children: providing early exposure to STEM (science, technology, engineering and math) initiatives


Thesis Statement: The author posits the idea that a proactive approach can ensure that students are on coursework for adequate preparation to enter STEM degree programs at institutions of higher learning through early exposure of STEM curriculum, impacting elementary teacher education in STEM disciplines, and goals for future elementary STEM education.

I. Thesis Statement: The author posits the idea that a proactive approach can ensure that students are on coursework for adequate preparation to enter STEM degree programs at institutions of higher learning through early exposure of STEM curriculum, impacting elementary teacher education in STEM disciplines, and goals for future elementary STEM education.
   A. Early exposure to STEM curriculum for students in K-12 education is an increasing concept for all educators.
   B. Preservice and veteran teachers alike lack the knowledge in scientific inquiry and technological design.
   C. President Obama’s “Educate to Innovate” campaign is pushing the STEM initiatives into the American education system at rapid paces, but obstacles are still in the way.

II. First of all, the author believes that exposing students early in their K-12 education to STEM initiatives will increase their STEM career field choices in their future education.
   A. There needs to be emphasize in the science and mathematics instruction in the early grades.
      -- Elementary teachers need support in teaching math and science curricula in abstract ways.
      -- Suggestion that outreach programs are need with community and educators.
   B. In order to prepare students for science, schools should focus more on STEM processes rather than content.
      -- Suggestion that science classes promote more problem solving, critical thinking, and open-ended inquiry.
      -- Suggestion that scientific problem-based activities promote critical scientific thinking as well as engaging the students in science.

III. Secondly, the author argues about the impact on new and old classroom teachers’ lack of pedagogical expertise in the STEM disciplines.
   A. The lack of pedagogical expertise given by teacher education programs hinders the STEM initiatives.
      -- Preservice teachers don’t receive enough training in teaching science inquiry.
Veteran teachers lack self-efficacy.

B. There is an increasing pressure on teachers in America.
   -- Standardized testing.
   -- Reduce the delivery of structured science programs.

IV. Finally, the author demonstrates how important it is to implement STEM initiatives into the American education system.
   A. Postsecondary institutions need to join forces with K-12 schools to help incorporate STEM initiatives.
      -- Continue with Partnership for 21st Century Skills and President Obama’s Educate to Innovate campaign.
      -- Prepare teachers with the education they need to be effective.
   B. Help motivate students at an early age to pursue STEM careers.
      -- Educate the educators.
      -- Excite the learners.

V. In conclusion, the author posits the idea that a proactive approach can ensure that students are on coursework for adequate preparation to enter STEM degree programs at institutions of higher learning through early exposure of STEM curriculum, impacting elementary teacher education in STEM disciplines, and goals for future elementary STEM education.
   A. Early exposure to STEM curriculum for students in K-12 education is an increasing concept for all educators.
   B. Preservice and veteran teachers alike lack the knowledge in scientific inquiry and technological design.
   C. President Obama’s “Educate to Innovate” campaign is pushing the STEM initiatives into the American education system at rapid paces, but obstacles are still in the way.
America’s children: providing early exposure to STEM (science, technology, engineering and math) initiatives


Thesis Statement: The author posits the idea that a proactive approach can ensure that students are on coursework for adequate preparation to enter STEM degree programs at institutions of higher learning through early exposure of STEM curriculum, impacting elementary teacher education in STEM disciplines, and goals for future elementary STEM education.

Nancy K. DeJarnette, of Rowan University, is the author of “America’s children: providing early exposure to STEM (science, technology, engineering and math) initiatives.” In her article, DeJarnette gives her explanation of why the United States needs to provide students and educators adequate preparation of STEM related initiatives. The author proposes that early exposure to STEM curriculum for student during their primary school years is becoming increasingly important to motivate students to pursue STEM related jobs. DeJarnette also provides an insight of how the teacher education program is lacking pedagogical expertise in STEM disciplines. The author describes some STEM initiatives that are presently occurring, but many obstacles still lie in the way of a true STEM curriculum focus.

First of all, DeJarnette suggest that exposing students early in their K-12 education to STEM curriculum, “based on interactive problem-solving activities,” will increase their STEM career field choices in their future education. In order to accomplish this, the author quotes Swift and Watkins, stating that “effective science and mathematics instruction must begin in the early grades.” DeJarnette believes that, “Elementary teachers need support to find ways to incorporate more hands-on, inquiry-based activities into the math and science curricula to assist in teaching the more abstract concepts.” Swift and Watkins stress outreach programs that can have community members with STEM backgrounds support educators by providing different activities. The author talks about a study by Roth & Eijck that stated, “the focus in schools should be more on STEM processes rather than specific content...” In keeping with this idea, the author believes science classes should focus on more problem solving, critical thinking, and open-ended inquires to help develop students’ process skills and engage the students in science, rather than just learning the content knowledge from the book.

Secondly, the author suggests that preservice and veteran teachers lack the pedagogical expertise in STEM disciplines to effectively teach science inquiry. Teachers with less formal science education, typically elementary teachers, have a low self-efficacy and tend to not incorporate scientific inquiry into their lessons which leads to lower student achievement. The author as stated that, “The emphasis on standardized testing in America has hampered the growth of scientific pedagogy in the elementary schools to include inquiry-based projects.” Students don’t get to experience scientific investigations at a personal level. In fact they typically learn through the theory and knowledge of others, i.e.
their teachers and books. Schools need to motivate students by allowing them “to construct their own knowledge and expertise through procedural and pedagogical methods that encourage and support inquiry.”

Finally, the author describes what has been done and what needs to be done in order to implement STEM initiatives into the education system. The author states that “Institutions of higher learning need to take the front lines to join forces with the current initiatives of the Partnership for 21st Century Skills and President Obama’s Educate to Innovate campaign.” It is up to the teacher education programs to provide preservice teachers the skills and knowledge they need in STEM concepts to allow them to effectively integrate the STEM concepts. As for veteran teachers, DeJarnette says it should be the focus of university teacher educators “to reach out to their community schools’ and provide development.” Although these concepts are good, students need to be motivated early in their school careers if we want to increase the students’ choices in future STEM disciplines. The author suggests we do this by, “Interactive problem-based learning activities in STEM disciplines” which “are innovative and exciting for young learners.”

In conclusion, the author posits the idea that early exposure of STEM initiatives for students is important to foster students that might continue in a STEM related field once at an institution of higher learning. In order for this to happen, teachers must be trained in STEM initiatives throughout their teaching education program and veteran teachers must be given professional development in STEM related concepts. There are many STEM initiatives available today, with many more on their way thanks to President Obama’s “Educate to Innovate” campaign and requirements of highly qualified teachers in core areas.