Undergraduate Research Course Redesign AY: 2022-2023

Fall 2022 Narratives

Name: Ashlee J. Burt, M.S., RN
Department: Health & Kinesiology

Project Title:

Implementing Experiential Learning into Practice in Emergency Situations through Roleplaying Simulations

Project Summary:

All students participated in a simulation at the end of the semester that tested all knowledge and skills learned throughout the semester that met each student learner objective.

Methodology:

Twenty students complete the EDHL 2124 course. This course covers a variety of First Aid/CPR and AED concepts. Students complete the Red Cross lessons and skills to obtain First Aid/CPR/AED certification.

All students received Adult and Pediatric First Aid/CPR/AED certification through the Red cross. The rest of the semester was dedicated to further research on the pathophysiology of diseases and injuries and how they play a role in sports/athletes as well as debate among sport lawsuits that affected athlete's health.

Each student was assigned two individual case studies with a scenario in which they were require to identify signs, symptoms, and possible conditions, then based on articles/scholarly sources identify what they believe to be the final condition. Students received evidence-based information on sport injuries and first aid and practiced throughout the semester to identify and appropriately treat the patient.

The lectures, small group discussions, hands on skill practices, and case study all scaffolded information to lead up to completing their simulation.

Student-Learning Outcomes:

a. Students will define key concepts and terminology related to First Aid/CPR/AED and Sport First Aid
b. Students will identify and assess emergency situations.
c. Students will demonstrate proper execution of skills relating to First Aid/CPR/AED and Sport First Aid.
d. Students will research best practices based on evidence to apply intervention techniques.
e. Students will develop critical thinking skills through collaboration with peer team members during skill practices and a final skill simulation.
f. Students will role-play as patients and first aid responders in simulation scenarios.
g. Demonstrate leadership in independent simulation scenarios.
h. Students will critique peer's application of skills based on evidence-based practices.
i. Critique recommended gold standards based on evidence-based scholarly research.
j. Students will reflect on positive and negative outcomes from the simulation.
k. Students will reflect and develop a plan of action to improve skills.

Detailed Project Description:

All students participated in a simulation that tested all knowledge and skills learned throughout the semester. Each student was part of a group and each group was removed from the simulation area to allow for environmental and victim setup. The group is then provided a very vague/broad explanation of the scenario they will be walking into and are on their own to address and treat those involved where communication among team members is key. Scenarios were video recorded and reviewed during class where positive feedback and constructive critiquing took place. The purpose of the emergency simulation scenario is to allow students to independently work as a team and through communication and collaboration apply the appropriate skills that were learned throughout the semester. Students will be stressed as peers will role-play as patients to provide a more realistic environment and to provide difficult situations that could occur in the real world. Students will be provided a very vague and brief situation and instructed to begin and not receive any help from the Instructor

Assessment and Results

Simulation Scenario Class Average: 96%
Simulation Critique Class Average: 85%
Case Study Class Average: 77%
Red Cross Exam Class Average: 86%
Participation Class Average: 88%

Continuation of Project:

This project will continue to take place every semester with minor adjustment, such as ensuring all student attend BOTH simulation days for credit.

Name: Amber Shipherd, Ph.D., CMPC
Department: Health and Kinesiology

Project Title

EDKN 3352 Sport Psychology Course Redesign – Applied Case Studies

1. Project Summary

One major objective of this course is to introduce mental tools and skills to the students and aid them in understanding how to apply and use these concepts. The class project was previously a paper, however, I believe having students apply the tools and skills to an aspect of their own performance will better help achieve this goal. Thus, students conducted a case study on themselves by selecting a particular type of performance they wanted to improve and applied several mental tools and skills to their own performance. Students developed a research question, reviewed and critiqued existing literature on the mental tools and skills they planned to utilize, collected and analyzed data, and then presented their projects during an in-class poster presentation. This research project provided students with an opportunity to explore sport psychology tools and skills in greater depth, stimulate student interest in sport psychology and in research by providing them autonomy in selecting topics that were of interest to them, allowed students to develop critical thinking skills, and provided students an opportunity to practice applying the effective communication skills learned in this sport psychology course.

Methodology

The project was broken down into several smaller assignments to scaffold the students and provide them continuous feedback on their progress. These smaller assignments consisted of: 1) goal identification, 2) article analysis, 3) proposal, 4) poster, and 5) poster presentation. The goal identification assignment followed the unit on goal setting in class and students were tasked with identifying the type of performance they wish to be working on during the semester, and setting an effective SMARTS goal for their performance. For the article analysis assignment, students located a scholarly article on a mental tool or skill they intended to use in their projects and learned to read and analyze scholarly work by locating relevant information (article name, authors, purpose, methods, etc.) and summarizing the main ideas using their own words and including appropriate citations. Students then created a proposal that mirrored the methods section of a research project. They identified how they would objectively assess and track their performance and outlined their plan for improving their performance. This plan included the specific mental tools and skills were planning to use, how they planned to introduce or use the tools/skills, and a brief rationale based on the literature for why they included each tool/skill. Finally, at the end of the semester students created and presented a poster to their classmates and faculty describing their project and findings.

Student-Learning Outcomes

The below SLO's were addressed through the research project. After successful completion of this project, students will:

a. Evaluate the impact of mental training and mental training tools (e.g., goal setting, imagery, self-talk, arousal regulation) on individual performance
b. Discuss and analyze the influence of selected psychosocial variables (e.g., stress and anxiety) on performance
c. Make connections between this course content and other classes; namely, apply mental tools and strategies to enhance performance in other domains
d. Read and critique scholarly research articles in the field of sport psychology
e. Formulate an appropriate research question over a sport psychology topic
f. Design an ethical research methodology to obtain an answer to their research question
g. Collect and analyze data
h. Reflect on their progress and learning in the course, identifying lessons learned, strengths, and ways to improve
i. Apply effective verbal communication skills and articulate their research to fellow students and faculty

Detailed Project Description

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Assessment and Results

I used a mixed methods approach to collect data and assess how this new project impacts course learning objectives. Specifically, I assessed the course redesign using the following:

a. Examining the percentage of students mastering SLO's
    i. This will be determined by examining student grades on all assignments and assessments, including those assignments directly connected to the application project
        - Final poster and presentation: 74%
        - Overall project: 79%

b. Both qualitative and quantitative self-report data from students via a course evaluation designed by the instructor to specifically examine the impact of the research project elements on student learning
    i. The following quantitative items were assessed, using a Likert scale from 1 (not at all) to 7 (very much). Means are reported below for each item.
        - The extent the application project improved your understanding of sport psychology concepts ($M = 6.2$)
        - The extent the application project improved your understanding of the impact of mental training and mental training tools (e.g., goal setting, imagery, self-talk, arousal regulation) on individual performance ($M = 6.5$)
        - The extent the application project improved your understanding of the influence of selected psychosocial variables (e.g., stress and anxiety) on performance ($M = 6.3$)
        - The extent the application project improved your understanding of how to apply mental tools and strategies to enhance performance in other domains ($M = 6.1$)
        - The extent the application project improved your ability to read and critique scholarly research articles in the field of sport psychology ($M = 5.4$)
        - The extent the application project improved your ability to formulate an appropriate research question over a sport psychology topic ($M = 5.6$)
        - The extent the application project improved your ability to design an ethical research methodology to obtain an answer to your research question ($M = 5.5$)
        - The extent the application project improved your understanding of data collection and analysis ($M = 5.4$)
        - The extent the application project improved your ability to reflect on your progress and learning in the course, identifying lessons learned, strengths, and ways to improve ($M = 5.9$)

- The extent the application project improved your ability to apply effective verbal communication skills and articulate your research to students and faculty ($M = 6.1$)
- The amount of effort you put into the application project ($M = 6.7$)

ii. There will also be several qualitative open-ended items on the evaluation asking students to discuss their thoughts on the project and/or what they believe they learned from the project.
I am still in the process of analyzing the qualitative data.

c. Examining the number and/or percentage of students who submit their project to the Javelina Undergraduate Research Symposium the following semester, the Javelina Undergraduate Research Journal (both after obtaining IRB), apply for the Department of Health and Kinesiology's Undergraduate Research Award, or choose to engage in some other form of research.
This cannot be determined at this time.

<u>Continuation of Project</u>

Unfortunately, I will not be teaching this course again for at least the next year but likely longer as I am needed to teach several required graduate courses so there is no present plan to continue this project at this time.

Dr. Muhittin Yilmaz
Electrical Engineering and Computer Science Department

Project Title

Circuit Frontiers

Project Summary

The redesigned course with the research enhancement project was implemented in EEEN 3331 – Circuits and Electromagnetic Devices course (3-credit, 3-lecture hours, no laboratory, a junior-level service course for non-Electrical Engineering students) in the Fall-2022 semester. The research infusion allowed students conduct research at the course-level technical contents to complement the traditional course focusing on theoretical foundations of electrical circuits and corresponding solution frameworks.

Methodology

The inquiry-driven, team-based, hands-on research activity provided students necessary research guidance, technical and experimental resources, teamwork, double-blind review, and research synthesis, in addition to the traditional course theoretical coverage.

Student-Learning Outcomes

The research integration has enhanced the student understanding levels in a number of ways:

a) Students were able to identify major contemporary system components and describe their operational principals as well as impacts efficiently, and
b) Students were able to identify, evaluate, design, and formulate advancements on existing electrical subsystems to address contemporary engineering and social trends.

Detailed Project Description

The proposed course redesign established the student-led research teams with 4-5 students in the Fall-2022 semester, included 19 students, and incorporated the active-learning project-based research plan with a number of relevant components, as described below, with relevant document samples included in the appendices:

a) The course instructor (Dr. Yilmaz) explained the undergraduate research component of the proposed redesigned course during the first class at the beginning of the Fall-2022 semester and associated major undergraduate research activities were included in the course syllabus. The anticipated research activities were aligned with the topic coverage during the same semester.
b) The course instructor (Dr. Yilmaz) requested/arranged a TAMUK Jernigan Library representative (Ms. Bailey Reagan Smith) research resource training presentation (September 12, 2022, in-class, 1p-1:50p) about the library research resources, including basic library tools, interlibrary loans, etc.

c) The course instructor (Dr. Yilmaz) described the research process at the course technical levels, identified potential resources for the research activity, and explained the expected research report contents by using an IEEE Transaction manuscript template during the early lectures of the course.
d) The course instructor (Dr. Yilmaz) identified relevant hands-on research kits and requested for their procurements. Once research kits arrived, Dr. Yilmaz described the kits, basic safety guidelines, and explained the experimentation process to test relevant student team hypotheses. At the end of the semester, Dr. Yilmaz requested the research office clearance to grant the research kits to the student teams for anticipated future involvements with the same/similar research concepts.
e) The course instructor (Dr. Yilmaz) requested and received a student research assistant/leader who is dedicated to guide/support/evaluate student research activities in a timely and effective manner.
f) The course instructor (Dr. Yilmaz) and the student research assistant (Ms. Guliz Sensoyu) held dedicated office hours, 1-hour and 2-hours, respectively, solely dedicated for this course research activities for superior and timely guidance as well as assistance of student research teams (in addition to regular office hours for all courses under the semester teaching load).
g) The student teams conducted research on electrical circuit characterization and analysis for i) an autonomous or electric vehicle operation, and ii) a heating, ventilation, and air-conditioning system operation, based on anticipated student disciplines, by using the technical literature and applications to investigate the contemporary trends such as smart/green homes or vehicles, i.e., the research problem was that how each dynamic operation and electrical subsystem could be modeled effectively for dynamical characteristics and how contemporary trends could be effectively integrated into existing systems. The research activity was implemented in an iterative fashion during the regular assignments, i.e., from basic proposal in the first assignment to final research outcomes in the fourth regular assignment. The student research teams proposed, with convincing justifications, one more advancement for respective electrical subsystems to address the ever-growing energy efficient or smart operation requirements, effectively challenging the inquiry and critical thinking skills of the students.
h) The final student reports were anonymized for a double-blind review and the student teams performed the critical evaluations accordingly.
i) The student teams investigated the relevant subsystem components, National Electric Code (NEC), electric and electronic circuit component symbols as well as costs, basics of Programmable Logic Controllers (PLC) and related implementations to develop a technical list of items and associated budget to implement their proposed advancement for the electrical subsystem.
j) The student teams utilized technical writing principles and presented their research findings in the IEEE manuscript formats that were qualitatively evaluated by the instructor, in terms of both content and format aspects, and by the student research assistant, in terms of quantitative evaluation of research activity and presentation components.
k) Although the student team involvements were designed for campus mentorships and related presentations, it was realized that several student teams experienced technical

hardship during the project implementations and basic research activities were emphasized to complete them successfully.

Assessment and Results

The research integration of the course included a number of assessment tools:

a) The research efforts and technical reports were reviewed, mainly by the course instructor (Dr. Yilmaz), for a scientific publication venue, e.g., IEEE or ASEE annual conference, in addition to the High-Impact Practices in Higher Education Conference at TAMUK. However, lack of student interests as well as involvements for scientific venue level research outcomes were observed while a few students showed significant interest for the research components, i.e., there was a very broad spectrum among the students towards research involvements.
b) The proposed electrical subsystem advancement components and subsystem effectiveness were considered in a number of perspectives, including the proposal quality, cost, and performance levels.
c) Institutional pre- and post-surveys were utilized to quantitatively measure the project outcomes.

Continuation of Project

The redesigned course anticipated assessment tools and associated evaluation results will be considered for potential compilations to pursue relevant external grant opportunities to ensure the continuity of the redesigned course with research integration.

Olivia Panganiban Modesto, Ed.D.
Teacher and Bilingual Education Department

Project Title:
Recording High-Quality Teachers' Voices: Using Interview as a Qualitative Research Method

Project Summary

I redesigned a reading education course, Teaching English Language Arts (ELA) in the Elementary, to include research. This course is required for undergraduate students seeking elementary teaching certification. It deals with the interrelationships between oral and written language; psycholinguistics and sociolinguistic theory and its application to English Language Arts learning. Course completion is comprised of face-to-face classes and 80 hours of field assignment. Students are placed in elementary schools to observe classes. Twenty-one students completed the CITI Research Training Student Course. They conducted research on their chosen literacy education topic.

Methodology

To include a strong research component completed the Social and Behavioral Researchers' CITI training modules (Students' Level) to prepare for interviewing a certified teacher. A blanket IRB Protocol application was submitted to obtain approval for the study. However, the IRB Protocol application was returned very late into the semester and was heavily questioned. Therefore, I had to decide to withdraw it and implemented an alternate research: writing an original literature review.

Student-Learning Outcomes

In addition to the existing SLOs for this course, the students will:
1.explain the characteristics and uses of qualitative research in educational settings, (assessed through written assignments and discussions),

2.complete the student level CITI training requirements for investigators primarily with social/behavioral research with human subjects

3. use interviewing as a qualitative data collection method (assessed through the application of a grading rubric), and

4. apply APA conventions such as the use of in-text citations, references and formatting, (assessed through the production of a basic qualitative research paper).

Detailed Project Description

Students wrote a literature review on specific literacy education topics. I taught them how to delineate their research topics and how to use the library's electronic database to search for relevant peer-reviewed studies. I provided and analyzed a sample literature review. In class, they practiced narrowing their topics and searched for articles using the database. They also wrote their notes for the articles they read using an article review matrix that provided a guide on how to understand research articles. Students needed to specifically note a research study's purpose, conceptual framework, methodology, results, conclusions, and implications for practice. Using this matrix, they wrote and submitted their drafts.

After submission, they were provided specific feedback to improve their paper. They were given opportunities to further receive guidance as they continued to write their literature review. Writing was viewed as an iterative process and as an essential component in the research process.

Assessment and Results

The class submitted drafts which was reviewed. After revising and editing their drafts, they submitted their final paper. Their papers centered on literacy topics: fluency, vocabulary, read alouds, foundational reading skills, writing, etc. Based on my evaluation and students' feedback, most students are at the beginning level of understanding how to write a literature review with APA style of citation and references. With regards to students' attitudes towards research and the work it entails, they were receptive even though they faced some challenges. Some students' comments were as follows:

Comment 1:

Going through the various articles was an exciting and beneficial aspect for me. Looking at the data and how people conducted the research helped me learn more about my topic. The electronic database was useful in identifying peer-reviewed journals that can be trusted. When conducting research, having a database to refer to is a valuable resource. Creating the matrix for the articles was new to me, but it was very beneficial in arranging the information. I don't usually write drafts, but it gave me enough time to plan out how I wanted to execute the essay. The literature review, in my opinion, gave me the opportunity to learn more about the topic and form an opinion based on the data from the articles.

Comment 2:

"I felt that using the electronic database to search for our articles was not hard. I believe it was a useful tool to learn in order to write papers with credible sources. It's something that will definitely be helpful to know in a masters or doctoral program as well. Reading the articles was a little time consuming because there were some long journals that I read, but didn't end up using. However, reading each article made it easy to write the literature review because I knew exactly what I was writing about. I learned that using informational texts for read alouds can enhance students' vocabulary because they contain tier 2 and

more tier 3 words. Writing the draft of the literature review was definitely a big help to me. I appreciated that it got me working on my paper. I feel that without the draft I would've procrastinated the final literature review. Also I'm the type of person that needs feedback to make a paper better so I'm glad we get to get feedback from you to make our literature review better."

Comment 3:

"This was hard for me, I feel like writing is not really a strong suite of mine, and just to write the introduction was really difficult. I kept changing what I was trying to say, I kept deleting and retyping until I just finally got it. For the most part, I agree with submitting a draft because you allow us a chance to get a better grade and know what we could improve or change. It especially helps people like me, with writing not being my strong suite."

Comment 4:

"Regarding the searching of articles using the electronic database, I honestly find it a little challenging. Many times, there aren't many sources for the information I'm looking for. I don't find the database hard to navigate but to me it's just the issue of finding information. I found no issues in reading the articles. I must say at first when I saw the article matrix form, I was a little intimidated. However, after seeing the example I was able to understand what was being asked to do. When it came to the writing of the draft, I did find it a little challenging. I do find it to be helpful especially being that you are giving us the feedback we need to correct our writing. Overall, I do think it was good you had as complete the draft by a certain date."

Comment 5:

"Looking for articles in the database has always been so difficult. I find it difficult because you have to look carefully at the article scan it make sure it contains information you are needing. Sometimes the abstract leads a direction to the information you need and then when reading the article, it doesn't provide information that is needed.
The articles are long and time consuming. I work in a different way I have to write down important information that I find in the article. I know that I can simply highlight it but for me I have to write it down. I reread what I read a lot. I write down thoughts and it's a big process when I'm reading and researching. The matrix I tried my best on that part of the research. This was something new for me. I really tried to complete as much as I could. I am doing my best but I will not give up. I am striving for the best I can do."

<u>Continuation of Project</u>

It is a challenge to implement a research integrated course like this within a semester. However, with the university's support and student buy-in, it is rewarding. While some students do not appreciate the work research entails, there are some who discover an interest for it that allows them to become open to the possibility of pursuing graduate studies. They learn that they can further develop their reading, writing, and study skills.

Students' comments also demonstrate their receptivity to learning skills that are genuinely new for them. The research activities done in class challenged them and once they find out they attained a level of success based on my feedback, they feel delighted and motivated to delve more deeply into their field of interest.

In moving forward, I will provide more guided sessions to those who struggle, most especially in their writing--these are for students who feel intimidated, lost, unsure of how to produce a research paper following APA style and conventions. Further, student buy-in is critical. To achieve this, clear rationale must be provided. Without understanding the value of research and the skills that need to be developed to do it, students will not commit to the project. Overall, implementing undergraduate research is beneficial but must be carefully planned and given attention to. I will continue to integrate research in the coming semester.

Velda Basak Soydas
Industrial Management and Technology Department

Project Title:

Design of Different Composite Core Structures and Stress Analysis

Project Summary

The course was redesigned to integrate a research project to which groups of students will be tasked with researching the different types of sandwich core composite structures which can be used in aerospace industry

Research Project Methodology

- Students will be divided into groups of no more than four students.
- The groups will be given a specific geometry for the semester.
- The groups will read two research papers each week about the stress analysis on the assigned geometry.
    - The instructor will provide access or recommendations to the necessary scientific resources to obtain the required information.
- Students will submit a brief research paper concerning the design and stress properties of their assigned geometry and layering applications.
    - The instructor will review each group's research paper to ensure the groups have sufficient information to begin the experimentation process.
- The groups will be using cooperative design software where more than one person can work on the design simultaneously to design their sandwich core composite structure and perform stress analysis on them.
    - The group must focus on the bending stress resistance on the material and build their structure based on this information.
- The students will design an experimental procedure to verify the chosen material property.
    - The instructor will provide periodic guidance by accessing each group's progress report and offering constructive feedback.
- Once the instructor has approved the design parameters and the procedure, the students will execute the project and turn their 3D design into a solid object using 3D printers.

- Once the objects are printed, each group performs a bending test to compare their software outcomes to tangible life outcomes and find the error percentages.
- The groups will document their findings via a formal report.
- The groups will present their findings to their fellow coursemates.
    - The students will be required to utilize an electronic aid such as Microsoft PowerPoint when presenting their results.

Student-Learning Outcomes

Student Learning Outcomes (SLO's)

- ✓ Students will gain hands-on knowledge of cooperative CAD software and teamwork.
- ✓ Students will be able to analyze technical drawings using both CAD and essential manual tools.
- ✓ Students will be able to design and construct mechanical parts for different applications.
- ✓ Students will learn how to develop empirical relationships from experimental find.
- ✓ Students will be able to construct a lab report based on an experiment.
- ✓ Students will learn how to verify the accuracy of their results from theoretical data or accepted values.

Marketable Skills

- Extensive knowledge in industrial design and cooperative team work, simultaneous data building.
- Greater understanding of scientific research and obtaining accurate data.
- Planned execution of technical design based on observed data points and results.
- Critical thinking skills.
- Impeccable understanding of scientific research and obtaining accurate data

Detailed Project Description

The current industry requires especially design engineers to be able to work on the same project simultaneously. In order to address these two objectives, the class must provide students with the knowledge and hands-on experiences necessary to understand and to validate or verify industrial design processes and to determine or assess the physical and mechanical design parameters associated with the vast array designs at their disposal. To achieve and accommodate this goal, this course is redesigned to implement the research and hands-on experience.

Assessment and Results

Students taking this class will be assessed based on the percentage criteria below.

Assessment's Name	Percentage of Total Grade
Midterm	25%
Final	25%
Other Class Activities (Homework and Assignments)	20%
Research Paper Submissions (Total 5)	5%
Progressive Designs (Total 5)	5%
Group Presentation	5%
Group Project Report	5%
Observed Performance and Attendance	10%
Total	**100%**

As shown in the course evaluation table, this course replaces traditional homework and assignment structure with a research-oriented active learning structure. The goal in here is to answer the question in the head of students *'where am I going to use this information?'* which is blocking students' creativity during classes. In this new format, students will be encouraged to utilize their knowledge in actual life experiments and see the results of their contributions.

Students who will be taking this class will be assessed based on the criteria defined below.

Assessment Strategies

- Students ability to conduct scientific research on different types of engineering designs.
- Students ability to work in a group setting where multiple engineers' input is required.
- Student's ability to accurately read test results and cross-check with technical calculations.
- Students' ability to develop a unique design that can respond to the need of the application that is in question.
- Student's ability to conclude the results in technical writing and present it in front of her/his classmates.

Throughout this project, students will be expected to focus on hands-on design software skills and critical teamwork, and the instructor can observe each group closely and monitor their

performance. The research project will also be supported by an assignment given during the semester so students can better understand the technical and research sides together. All necessary technical information will be given during lectures and additional coursework to help students better understand. Students we asked to select a sandwich core composite wind turbine design to work

Continuation of Project

Students were able to execute the planned research and experimentation successfully. As a continuation of this project, students can contribute as a group to a small conference paper where they present their findings and be exposed to the academic environment. This will bring them close to the scholar approach and ignite their passion for higher education in engineering.

Spring 2023 Narratives

Daniel J. Burt, Ph.D.
Department of Health and Kinesiology

Project Title

Physical Activity Measurement and Evaluation Development.

Project Summary

Students were able to work in groups to develop measurement and assessment techniques for the introduction of practical skills and uses to theoretical and psychological constructs in physical activity and health-related movement.

Methodology

The students were assigned a Kinemetric research groups of 4-5 students. Each group conducted a needs assessment by first researching which measurements to use after identifying the specific needs of a provided demographic from the CYC. Additional requirements to develop an impact or post-assessment plan on how to measure a successful implementation if a health-related fitness program for those individuals deficient. Their research will be presented as a measurement assessment and an age-appropriate needs assessment, and will be proposed in a hard binder with other required items including specific goals and objectives, recommended measurement activity, norm v. criteria referencing recommendations, standard score comparisons, and finally outcome/process assessments. Additional group work and interaction with the professor over measurement issues will utilize the University library's Research Commons, which is suited for group work. With the proposed goal to move them from theoretical measurement assessment and interventions to experiencing the issues faced by real-world physical activity measurement and implementation.

Student-Learning Outcomes

1. Differentiate between measurement and evaluation, criterion-referenced and norm-referenced standards, formative and summative evaluation.
2. Apply the following statistical concepts to the evaluation process: classification of scores, frequency distributions, graphs, measures of central tendency, measures of variability, percentile ranks, standard scores, correlation, simple prediction, the normal curve, skewness, and kurtosis.
3. Explain the differences and relationship between reliability and validity.
4. Calculate and determine final grades utilizing a self-developed computer grade book.

5. Demonstrate knowledge of computer software/hardware through the accurate calculation of descriptive statistics.
6. Interpret item analysis results from multiple choice tests.
7. Identify the correct order of importance of validity, reliability, and objectivity of tests.
8. Detail the different education and fitness evaluation models and appropriately apply both norm- and criterion-referenced evaluation standards.
9. Determine the measurement scale (i.e., nominal, ordinal, interval, ratio) of a set of test scores.
10. Describe a set of test scores using central tendency and variation scores (calculated by hand and via Excel/SPSS).
11. Measure relative test performance through the calculation of percentile ranks from a grouped frequency distribution (calculated by hand).
12. Standardize test scores for the purpose of making between- or across-test comparisons for evaluation purposes (calculated by hand and via Excel/SPSS).
13. Explain the concept of cardiorespiratory endurance, the importance of measuring this health-related fitness component in physical education and the exercise sciences, and the advantages and disadvantages associated with commonly used tests for measuring this variable.
14. Test, measure, and evaluate cardiorespiratory endurance using commonly employed field tests for youths and adults, including the use of portable heart rate monitors.
15. Explain the concept of body composition, the importance of measuring this health-related fitness component in physical education and the exercise sciences, and the advantages and disadvantages associated with commonly used tests for measuring this variable.
16. Test, measure, and evaluate body composition using commonly employed field tests for youths and adults.
17. Test, measure, and evaluate sports/game skill using commonly employed tests for youths and adults.
18. Explain the different modes of testing for cognitive knowledge, and the advantages and disadvantage associated with each.

<u>Detailed Project Description</u>

The students were assigned a Kinemetric research groups of 4-5 students. Each group conducted a needs assessment by first researching which measurements to use after identifying the specific needs of a provided demographic from the CYC. Additional requirements to develop an impact or post-assessment plan on how to measure a successful implementation if a health-related fitness program for those individuals deficient. Their research will be presented as a measurement assessment and an age-appropriate needs assessment, and will be proposed in a hard binder with other required items including specific goals and objectives, recommended measurement activity, norm v. criteria referencing recommendations, standard score comparisons, and finally outcome/process assessments. Additional group work and interaction with the professor over measurement issues will utilize the University library's Research Commons, which is

suited for group work. With the proposed goal to move them from theoretical measurement assessment and interventions to experiencing the issues faced by real-world physical activity measurement and implementation.

Assessment and Results

Currently the points dedicated to the current Final Project (approximately 14% of the total grade) were allocated to the production of active research in the new Research Project: Physical Activity Measurement and Evaluation Development. The primary empirical measurement of success were to use the aggregated average scores of the previous class taught with this specific assignment this past year, and compared it to the proposed assignment scores utilizing an independent *t* test. Grade increase was statistically significant compared to past assignments ($p=.0013$). Additionally, it resulted in several students crossing from a mid to high D to a low C, and passing the class, reducing Drop, Fail, and Withdrawal (DFW) rates and its impact on engagement and student retention. It also had a student volunteer to come to independently led research this summer.

Continuation of Project

The project has proven to be manageable in a semester and seemed to be enjoyed by the students in the class as a hands-on way to enjoy an in-depth topic on what has historically been a dry subject for undergraduate students. It is planned to be used in semesters going forward, and is being used this summer, but some editing of the project is occurring during the summer for the shorter semester (5 weeks). The success on increased grades seems to be the piqued interests in the course with increased autonomy over the project, and additionally, the group work assisted in increased mutual understanding of theoretical concepts as they were used in practical experiences.

Integrating Research Posters into Undergraduate Student Scholarship – Project Debriefing

Kenneth R. Price

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College of Arts and Sciences

TEXAS A&M UNIVERSITY KINGSVILLE
DEPARTMENT OF LANGUAGE AND LITERATURE

Name: Kenneth R. Price

Department: Language and Literature

Project Title: Integrating Research Posters into Undergraduate Student Scholarship

Detailed Project Description

Research Posters in the Classroom. Research posters have broad applications in the technical writing classroom. As part of a course curriculum, they give professional writing students the opportunity to discover new areas within the discipline or to further their particular interests in technical communication theory and practice. Perhaps most important, a course with a research component like a research poster provides students the opportunity to apply the principles covered in the classroom to real-world forms of technical/professional writing.

Collective Learning & Public Presentation of Scholarship. A research poster assignment can provide a valuable learning experience that benefits both the students and the university. While the poster assignment generates much discussion and allows the entire class to participate in the learning experience, equally as important, it provides students, regardless of their majors, with a substantive portfolio entry directly related to their major fields of study and framed within technical communication theory and practice. In addition, students are introduced to the methods of qualitative and qualitative research to support their writing in a manner new to them. Students are strongly encouraged to follow through in submitting their research posters to academic and professional conferences, such as the National Conference on Undergraduate Research (NCUR), which further enhances their marketability to graduate programs and potential employers, as well as enhances the reputation of our university.

Fulfill Student Learning Outcomes. This assignment more than satisfies the Texas state-mandated learning outcomes for technical writing courses, the Association of American Colleges and Universities Written Communication Value Rubric, the Accreditation Board for Engineering and Technology (ABET) Mandate for Technical Communication classes, and the Title V goals.

I. State-Mandated Learning Outcomes

Critical Thinking Skills

A. Creative thinking
B. Innovation
C. Inquiry
D. Analysis
E. Evaluation and synthesis of information

Communication Skills

A. Effective development of ideas
B. Interpretation and expression of ideas

Teamwork

A. Ability to consider different points of view
B. Efficiently working with others to support a shared purpose or goal

II. AAC&U Written Communication Value Rubric

The development and expression of ideas in writing. Written communication involves learning to work in many genres and styles; working with different writing technologies; and mixing texts, data, and images.

III. Accreditation Board for Engineering and Technology (ABET) Mandate for Technical Communication Course Work

Technical writing classes should instruct STEM students to effectively integrate digital technology into their writing as well as to apply oral and graphical communication theories and concepts in both technical and non-technical environments.

IV. Title V Goals

- Enhance career outcomes by increasing the number of underrepresented students who plan for experiential learning and scholarly research activities.
- Create a culture of change through undergraduate research and experiential learning.

Methodology

I enhanced my technical writing courses by having an annotated online sources evaluation, a distance oral presentation, and a culminating research poster.

Student Learning Outcomes with Measurable Assessment Strategies. I used multiple methods of assessing the instructional goals and educational outcomes.

Instructional Goals Instructional goals indicate the specific characteristics students should exhibit in order to demonstrate desired attainment of the learning outcomes.	**Learning Outcomes** Learning outcomes describe what students are expected to know and be able to do at the conclusion of the course. These relate to the knowledge, skills, and behaviors the students should acquire as they progress through the class.	**Methods of Evaluation** The following exercises and assignments may be used to evaluate whether students have achieved or accomplished the instructional goals.
Understand and integrate theories and techniques for researching and writing documents using qualitative and quantitative research methods.	Research a variety of sources–articles, books, personal accounts, case studies–and describe the contribution of each source to an overall understanding of the topic.	Annotated online sources exercise (See Appendix A for assignment specifications and student examples.)
Learn the principles and techniques involved in researching and writing research poster for public distribution.	• Select and limit a topic. • Conduct primary and secondary research. • Apply research outside the classroom.	Research poster created from their technical reports (See Appendix B for assignment specifications and student examples.)

Learn the principles and techniques involved in research in preparation for conferences such as the National Conference of Undergraduate Research (NCUR).	Prepare oral presentations, design slides and handouts. Deliver and connect with an audience: effective oral presentation preparation, design, and delivery.	Class presentation of research poster, participation in an academic or professional conference (See Appendix C for assignment specifications and student examples.)

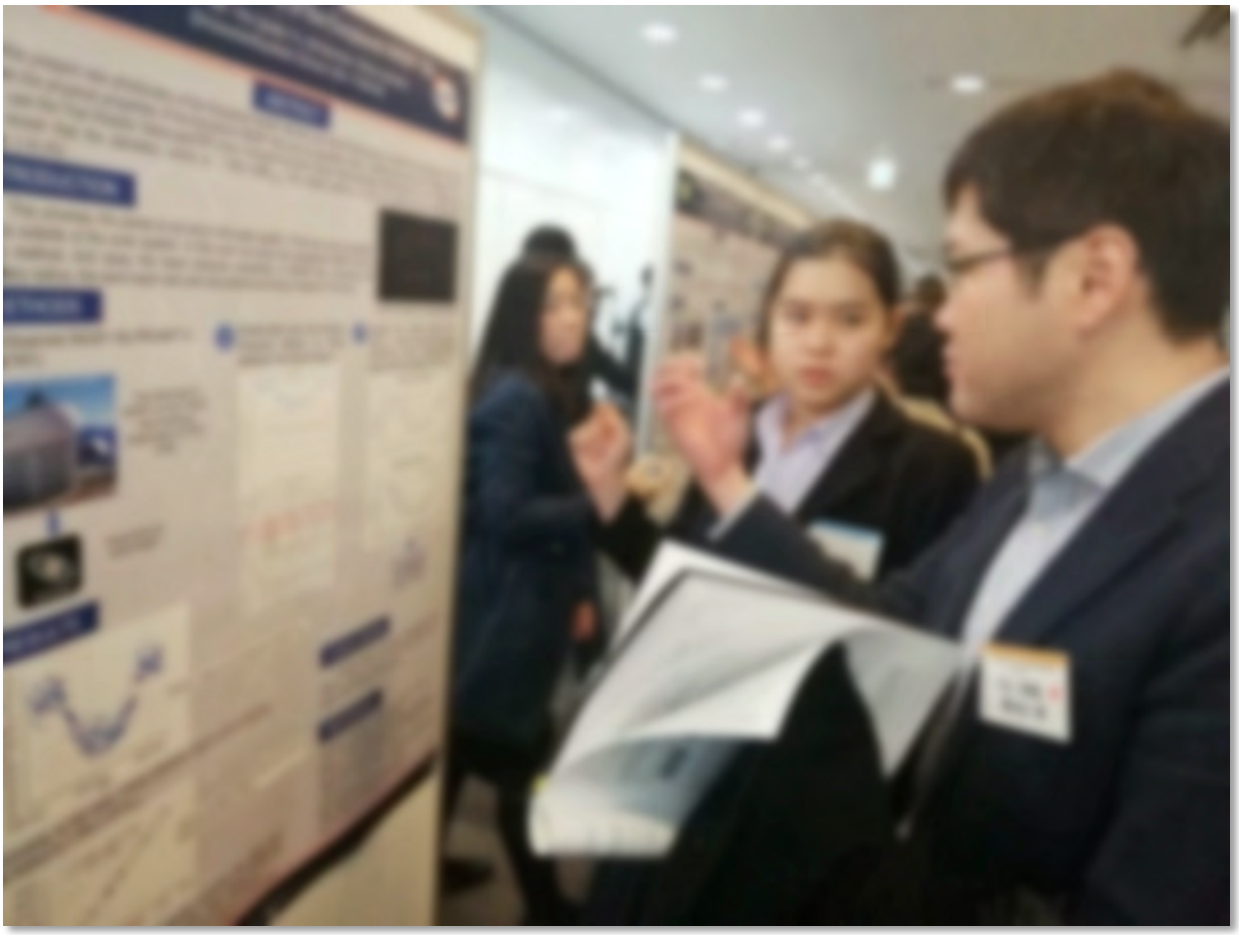
Project Artifacts

I have included artifacts from the Spring 2023 ENGL 2314 course (See Appendix A-C). Several students plan to submit their research posters to discipline-specific professional conferences, student conferences such as NCUR, as well as to the Javelina Undergraduate Research Symposium.

Continuation of Project

I fully intend to incorporate research posters into the curriculum of all of my Texas A&M University-Kingsville English courses, not just the professional/technical writing courses. Additionally, this fall, I plan to submit a follow-up paper to the Association for Business Communication National Conference this fall.

Appendix A: Annotated Online Sources Exercise Student Artifacts



Annotated Online Sources Exercise

Purpose

A list of annotated online sources is a list of born-digital resources—e-only journals, reviews, preprints and white papers, infographic data, blogs, discussion forums, and other resources.

The practice of annotating sources is important for a number of reasons:

- To learn about your topic. Creating an annotated list of resources is excellent preparation for a project. Just collecting resources is useful, but when you have to write annotations for each resource, you're forced to read each more carefully. You begin to read more critically instead of just collecting information.
- To help you discern the importance and usefulness of a resource. An annotated list of resources can help you gain a good perspective on what is being written about a topic. By reading and responding to a variety of resources on a topic, you will start to see the pedagogical methods behind the site.

Assignment

Find 3-4 sources you are considering using in your technical report or white paper and provide a summary and an evaluation of each source, similar to the following examples:

Belk, R. W., Ger, G., & Askegaard, S. (2003). The fire of desire: a multisited inquiry into consumer passion. *Journal of consumer research, 30*(3), 326-351.
The research delves into the concept of human desire and where we see its manifestations in general marketing strategies. The article develops the multiple levels of desire, specifically the phenomenon associated across multiple cultures. This timely, well-researched article ultimately argues that the ability to apply desire to a marketing strategy can prove to be a lucrative skill.

Lipsman, A., Mudd, G., Rich, M., & Bruich, S. (2012). The Power of "Like": How Brands Reach (and Influence) Fans through Social-Media Marketing. *Journal of Advertising research, 52*(1), 40.
This article contends that one of the most effective aspects of social media advertising is the idea of seeing an actual friend unconsciously endorsing a product or service. The word of a friend is greatly influential compared to a celebrity or spokesman. When using a consumer's friend, all the work of gaining trust has been done. This article is timely, descriptive, and well researched.

Brendan Joyce
ENGL 2314_901
Annotated Bibliography

Bales, W. D., Nadel, M., Reed, C., & Blomberg, T. G. (2017). Recidivism and inmate mental illness. *International Journal*, *6*, 41.

In the research article, the study of recidivism and the correlation regarding mental health are statistically examined to provide useful information in the lack in impact of adequate resources for inmates suffering from mental disorders. A study is conducted between inmates who are diagnosed with severe mental health issues and those who are not, to determine the likelihood of recidivism. The overall purpose of the article is to investigate the link between recidivism and mental illness, while further determining the variations within time and the severity of mental diagnosis. This research explains and supports my claim for the need of ample resources and programs for the mentally ill inmates.

Pollock, W., Sibila, D., Frantzen, D., Luo, F., & Carmen, A. D. (2022). A Systematic Examination of the Influence of Indicators of Mental Illness on Deaths in the Texas Criminal Justice System. *Criminal Justice Review*, 07340168221124459.

According to Sage Journals, there is strong evidence that proves law enforcement contributes to the incarceration and deaths of criminals who are mentally disordered. It highlights the stigma representing those with mental health issues to be violent, leading to potential death within law enforcement encounters. It covers areas that address that our justice system is not properly equipped to treat inmates with mental health issues. Furthermore, the article participates in a study that strives to determine the risks faced by inmates who are not properly assessed and diagnosed with a mental health issue prior to incarceration, or while under the responsibility of law enforcement. This study provides useful information on the importance of early intervention and proper training within our correctional facilities to serve proper mental health needs.

Steadman, H. J., & Veysey, B. M. (1997). *Providing services for jail inmates with mental disorders*. US Department of Justice, Office of Justice Programs, National Institute of Justice.

The research article provides various strategies to implement proper mental health care for inmates. The statistical research demonstrates the lack of priority and effectiveness in providing proper care for inmates who struggle with severe mental disorders. Furthermore, the article lists various ways jails and prisons can process, release, and handle mental health care and treatment within the mentally disordered. Crisis intervention and treatment, management services, and discharge planning mechanisms are topics covered within the article.
The information and statistics provided is instrumental in providing detailed strategies that can improve the quality of mental health care services for mentally disordered inmates.

Torrey, E. F. (1995). Jails and prisons--America's new mental hospitals. *American Journal of Public Health*, *85*(12), 1611-1613.

The editorial recognizes the prevalence of mental disorders in jails and prisons. It provides statistics behind the percentage of inmates who suffer from severe mental illness while incarcerated. It highlights the abusive treatment of this particular group and the need for more intervention. It states that numerous inmates struggle to understand the rules and receive harsh punishment not only by staff, but from those around the victim due to their mental disorders. Furthermore, suicide can result from isolation in jail or prison systems. The editorial is useful because it serves to provide evidence that indicates the need for programs that provide treatment and care for those who experience a mental disorder while incarcerated. It also provides insight into the cruel and unjust treatment that is created by lack of sympathy simply because they are labeled as criminals.

Lizette Canales-Gutierrez
ENGL 2314_901
Annotated Online Sources

[1] Understood.org. (n.d.). Speech-Language Pathologists: What You Need to Know. Retrieved from https://www.understood.org/en/articles/speech-language-pathologists-what-you-need-to-know

This website provides an overview of what speech-language pathologists (SLPs) do, their qualifications, and the settings in which they work. The information is written in an accessible and informative style, making it a useful resource for individuals who are not familiar with SLPs and their role in healthcare. The website is maintained by Understood.org, which is a nonprofit organization that provides resources and support for individuals with learning and attention issues.

[2] University of Chicago Medicine. (n.d.). How Can a Speech-Language Pathologist Help? Retrieved from https://www.uchicagomedicine.org/forefront/health-and-wellness-articles/how-can-a-speech-language-pathologist-help

This article provides an in-depth look at the various ways in which speech-language pathologists (SLPs) can help individuals with speech and language disorders. The article explains how SLPs evaluate and diagnose speech and language disorders and describes the different types of therapy and interventions that SLPs use to improve communication skills. The article is written by healthcare professionals from the University of Chicago Medicine and is a reliable source of information for individuals seeking more information about SLPs.

[3] Cleveland Clinic. (n.d.). Speech Therapy. Retrieved from https://my.clevelandclinic.org/health/treatments/22366-speech-therapy

This webpage provides an overview of speech therapy, including what it is, who can benefit from it, and what to expect during a session. The webpage also describes the different types of speech disorders that speech therapy can help treat and provides information about the speech therapy services offered at the Cleveland Clinic. The information is written in an accessible and straightforward style, making it a helpful resource for individuals seeking information about speech therapy. The webpage is maintained by the Cleveland Clinic, which is a reputable healthcare organization.

Anika Martinez
ENGL 2314_901
Annotated Bibliography

[1] Patil, R. P., Kelkar, A. A., & Chaudhari, R. V. (1988). Carbonylation of ethanol using homogeneous Ir complex catalyst: effect of ligands and reaction conditions. *Journal of molecular catalysis*, *47*(1), 87-97.

This research paper discusses the mechanism for the carbonylation of ethanol to propionic acid over a rhodium catalyst. The paper then examines the effect of the organic ligands that are used to create the organometallic framework and their effect on the rate of the reaction. The data is used to determine the best combination of solvents, ligands, and reaction conditions to increase the yield of the propionic acid from the reaction. This paper will increase the understanding of the mechanism and overall chemistry behind the reaction.

[2] Ubale, R. S., Kelkar, A. A., & Chaudhari, R. V. (1997). Carbonylation of ethanol using Ni-isoquinoline complex catalyst: Activity and selectivity studies. *Journal of Molecular Catalysis A: Chemical*, *118*(1), 9-19.

This research paper covers the main reaction and possible side reactions of the carbonylation of ethanol using a nickel organometallic catalyst. It discusses the extent of the reaction of ethanol and carbon monoxide. The paper also discusses several different organic ligands to create the nickel catalyst and their effect on the yield of the reaction and the effects of the byproducts that are created. This paper will provide the information necessary to simulate the reaction of ethanol and carbon monoxide to form propionic acid.

[3] *Global propionic acid market – industry trends and forecast to 2029*. Propionic Acid Market Size, Future Scope, & Industry Analysis. (n.d.). Retrieved April 1, 2023, from https://www.databridgemarketresearch.com/reports/global-propionic-acid-market

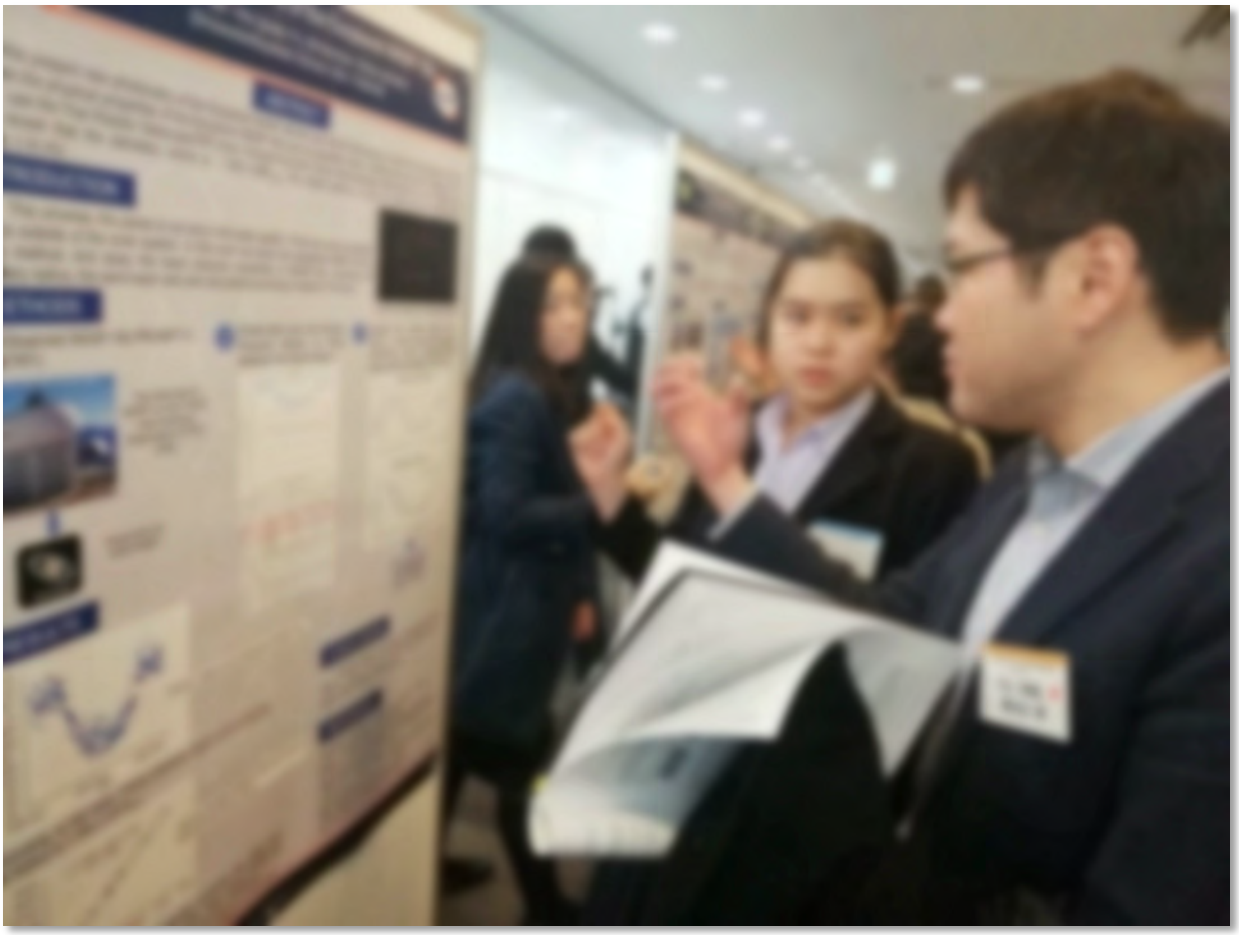
The website is a market research tool which gives an overview of the current 2022 propionic acid market and the possible potential for expansion through 2029. The website also describes the potential products that propionic acid can be used to create and the industry that they serve. The impact of the covid 19 pandemic on the industry and update to new producers of propionic acid. This website will help with the economic analysis of the propionic acid market and the feasibility of creating a new production pathway.

[4] Li, H., Na, J., Cong, H., Wu, L., Zhao, L., Li, X., & Gao, X. (2020). Thermodynamics Foundation and Separation Process Design for Production of Propionic Acid from Ethanol

Carbonylation Catalyzed by Iodide. *Industrial & Engineering Chemistry Research*, *59*(13), 6090-6101.

This paper describes the analysis and implementation of a separation system after propionic acid reaction to purify the crude product that produced. The paper describes the two approaches used to determine the binary vapor data that is used to prove that the separation process works with both an experimental and theoretical aspect. The experimental and theoretical data are then compared to either validate or invalidate a thermodynamic model for the distillation simulation. This paper will provide the information necessary to create the distillation and purification system for the propionic acid production process.

Appendix B: Research Poster Assignment Student Artifacts



Technical Report or White Paper
Research Poster Assignment

For this assignment, you will put your technical report or white paper into the provided PowerPoint template—or one you created or found online—and save it as a PDF. The chapter in the textbook details which sections are mandatory, depending upon the type of technical report or whether you have written a white paper.

Assignment Specifications. Regardless of the type of technical report—lab report, recommendation report, feasibility study, or proposal— at the very minimum, your research poster should have the highlighted sections/panels:

I. **Banner**
II. **Abstract** or **Executive Summary**
III. **Introduction**
IV. **Discussion**
V. Statement of Criteria
VI. **Methodology**
VII. Results
VIII. Evaluation of Options
IX. **Tables** & **Figures**
X. Recommendation
XI. **Conclusions**
XII. Sources
XIII. QR Code hyperlinked to the technical report or white paper that was the source material for the poster
XIV. Acknowledgement(s)
XV. **QR Code** hyperlinked to the voice-over oral presentation that you previously created and uploaded to YouTube

Once you have your report in the template, edit it using the Poster Evaluation Rubric. Then save the poster as a PDF, and upload the PDF to the Blackboard dropbox.

Recommendation Report: Prime Job Location for Mechanical Engineers in the U.S.

Kyleigh Davis, Texas A&M University – Kingsville

Faculty Mentor: Dr. Kenneth Price, Department of Language and Literature, Texas A&M University - Kingsville

Scan to view the YouTube presentation

Executive Summary

With constant advancements of technologies in the fields of robotics, automotive, nanotechnologies, automation and alternative energies, the demand for mechanical engineers is on the rise. With the knowledge that you have chosen a reliable profession, it is important to determine the prime location for your job. A variety of factors need to be accounted for: salary, cost of living, climate and crime rate. These factors can help ensure that you find the best fit city and create the perfect work-life balance for your future. The choice will be up to you in deciding what city fits your personal needs and life goals. I will provide valuable information for sixteen cities within four states located in the United States . From the research gathered, I believe either Ann Arbor, Michigan or Los Alamos, New Mexico would be a great location to work as a mechanical engineer.

Introduction

As the demand for mechanical engineers continues to increase, those searching for jobs are finding themselves having to move to cities and areas across the country with which they are not all too familiar. Relocating can be an overwhelming process, especially when it requires leaving friends and family behind. Also, finding a city that fits your budget, profession and lifestyle needs is no easy task. This research poster will highlight four important aspects of finding the prime location to work as a mechanical engineer: salary, cost of living, climate, and crime rate. Salary and cost of living go hand in hand. A good salary will allow you to live comfortably, save for the future, and provide opportunities for you to enjoy life after work. Housing prices and rental options are also important in selecting a city to continue your career and whether your salary can support it or not. And do you want to find yourself waking up in the middle of the night to blaring sirens because crime is rampant where you live? Feeling safe in the city you live in is vital not only to your personal well-being but your mental health. Climate is a big consideration which will affect your access to outdoor activities, your energy bills, and your overall happiness. The purpose of this paper is to provide the reader with the information needed to allow them to choose the prime location to work as a mechanical engineer.

Methods

To assist in this recommendation, I gathered information based on four key factors mechanical engineers examine when looking for the prime location to live in. I used the following factors as the basis for my recommendation.

- Salary
- Cost of Living
- Climate
- Crime Rate

Results

California

Cities	Salary	Cost of Living	Climate	Crime Rate
San Jose	ME1: $80,899 HME: $316,652	Housing: $1.2 mil Apartment: $2,600	Summer: long, warm, dry and most cloudless skies Winter: short, cold, wet, and partly cloudy Temperature: 45 to 72 degrees	297
San Francisco	ME1: $93,603 HME: $315,390	Housing: $1.5 Apartment: $3,600	Summer: long, clear skies, dry but comfortable Winter: rainy, cold, brief, and sometimes cloudy Temperature: 43 to 80 degrees	387
★Bakersfield	ME1: $80,199 HME: $270,226	Housing: $480,000 Apartment: $1,300	Summer: uncomfortably hot, arid and clear Winter: cold and partly cloudy Temperature: 41 to 99 degrees	380
Santa Cruz-Watsonville	ME1: $83,292-$85,962 HME: $280,647-$290,540	Housing: $800,000-$970,00 Apartment: $2,300	Summer: moderate in length, comfortable and mostly clear skies Winter: short, rainy, cold, and partly cloudy Temperature: 42 to 75 degrees	307

New Mexico

Cities	Salary	Cost of Living	Climate	Crime Rate
Albuquerque	ME1: $70,611 HME: $237,970	Housing: $380,000 Apartment: $1,200	Summer: long, warm, dry, and, mostly clear during the year Winter: short, cold, sometimes rainy with partly cloudy skies. Temperature: 43 to 82 degrees	630
Las Cruces	ME1: $63,834 HME: $215,130	Housing: $364,000 Apartment: $1,000	Summer: hot and partly cloudy Winter: short, cold, and, mostly clear Temperature: 32 to 97 degrees	316
Santa Fe	ME1: $70,969 HME: $239,174	Housing: $632,000 Apartment: $1,140	Summer: warm Winter: freezing and snowy Temperature: 18 to 83 degrees	121
★Los Alamos	ME1: $70,067 HME: $236,137	Housing: $525,000 Apartment: $1,400	Summer: warm and partly cloudy Winter: snowy and mostly clear skies Temperature: 23 to 82 degrees	31

Texas

Cities	Salary	Cost of Living	Climate	Crime Rate
★Austin	ME1: $73,860 HME: $248,918	Housing: $480,000 Apartment: $1,800	Summer: harsh and hot Winter: short, cold, and, windy Temperature: 43 to 97 degrees	317
Houston	ME1: $76,413 HME: $257,524	Housing: $370,000 Apartment: $1,300	Summer: brutal and hot Winter: cool Temperature: 47 to 95 degrees	561
Tyler	ME1: $67,966 HME: $229,056	Housing: $390,000 Apartment: $1,400	Summer: harsh and hot Winter: short, cold, and wet Temperature: 38 to 94 degrees	277
Beaumont-Port Arthur	ME1: $72,838-$71,359 HME: $220,000-$275,000	Housing: $470,000 Apartment: $1,200	Summer: long, hot, and oppressive Winter: short and cold Temperature: 44 to 92 degrees	307

Michigan

Cities	Salary	Cost of Living	Climate	Crime Rate
Detroit	ME1: $75,933 HME: $255,904	Housing: $480,000 Apartment: $1,500	Summer: warm Winter: snowy and freezing Temperature: 20 to 83 degrees	797
Auburn Hills	ME1: $76,000 HME: $255,722	Housing: $450,000 Apartment: $1,450	Summer: warm Winter: windy and snowy Temperature: 18 to 82 degrees	235
★Ann Arbor	ME1: $77,500 HME: $261,000	Housing: $520,000 Apartment: $1,500	Summer: warm Winter: snowy Temperature: 17 to 84 degrees	137
Battle Creek	ME1: $74,400 HME: $250,800	Housing: $400,000 Apartment: $1,500	Summer: warm Winter: snowy Temperature: 18 to 83 degrees	377

ME1= Mechanical Engineer 1

HME= Head of Mechanical Engineering

★:Suggested city within the state based on the factors

Conclusion

Beginning your career as a mechanical engineer is an exciting time in your life. Finding the prime location to lay roots down, on the other hand, can be a daunting task. With thousands of cities in the United States offering various job opportunities, narrowing your selection down to fit your lifestyle, budget and personal preferences is certainly overwhelming. Throughout this process I have examined four cities' attributes in four states to provide a recommendation as to which city would be the prime location to work as a mechanical engineer. I have highlighted a city within each state with a golden star that ranked highly in the factors of salary, cost of living, climate and crime rate. This city would be a prime location within the state for a mechanical engineer.

Recommendation

Uprooting your entire life to find a prime location for work as a mechanical engineer can be a big ordeal. With careful planning and research, you can make this task less stressful. The criteria used are just four of the countless aspects that should be considered when searching for the prime location. Based on the data and information collected, I feel confident in recommending Los Alamos, New Mexico as the prime location to continue in the career of mechanical engineering. Feeling safe in your new community, along with a competitive salary, gives Los Alamos the edge over other cities researched. Crime rates are exceptionally low when compared to state and national averages. The comfortable summer temperatures and the gift of winter snow are appealing if you are one who enjoys the outdoors. Located in an area of the United States known for its beautiful scenery, fascinating history and various cultural activities, Los Alamos is a wonderful place to start your journey as a mechanical engineer.

References

[1] "Crime rate in San Francisco, California (CA): Murders, rapes, robberies, assaults, burglaries, thefts, auto thefts, arson, law enforcement employees, police officers, crime map," *Crime in San Francisco, California (CA): murders, rapes, robberies, assaults, burglaries, thefts, auto thefts, arson, law enforcement employees, police officers, crime map.* [Online]. Available: https://www.city-data.com/crime/crime-San-Francisco-California.html. [Accessed: 05-Apr-2023].

[2] "Most dangerous cities in Texas," *PropertyClub.* [Online]. Available: https://propertyclub.nyc/article/most-dangerous-cities-in-texas. [Accessed: 06-Apr-2023].

[3] R. Eng, "Career in mechanical engineering," *rrce-bangalore*, 20-Jun-2016. [Online]. Available: https://rajarajeswariengco.wixsite.com/rrce-bangalore/single-post/2016/06/20/career-in-mechanical-engineering. [Accessed: 11-Apr-2023].

[4] "Top 16 companies to work for as a mechanical engineer." [Online]. Available: https://www.indeed.com/career-advice/finding-a-job/company-for-mechanical-engineering. [Accessed: 06-Apr-2023].

[5] "Weatherspark.com," *San Jose Climate, Weather By Month, Average Temperature (California, United States) - Weather Spark*. [Online]. Available: https://weatherspark.com/y/1098/Average-Weather-in-San-Jose-California-United-States-Year-Round. [Accessed: 06-Apr-2023].

[6] C. Guagenti, "2023 cost of living calculator: City comparison tool," *Forbes.* [Online]. Available: https://www.forbes.com/advisor/mortgages/real-estate/cost-of-living-calculator/. [Accessed: 06-Apr-2023].

[7] "Mechanical engineering is one of the best STEM jobs Today," *ASME.* [Online]. Available: https://www.asme.org/topics-resources/content/how-engineers-are-thriving-today. [Accessed: 06-Apr-2023].

[8] J. Birdwell-Branson, "The Ultimate Guide to Finding Your Best Place To Live," *Livability*, 01-Mar-2023. [Online]. Available: https://livability.com/topics/where-to-live-now/the-ultimate-guide-to-finding-your-best-place-to-live/. [Accessed: 06-Apr-2023].

[9] 2022 · 5 min read Sergio OcampoLast Updated: Jan 31, "How to choose the right city for you," *moveBuddha*, 31-Jan-2022. [Online]. Available: https://www.movebuddha.com/blog/how-to-choose-a-new-city/. [Accessed: 06-Apr-2023].

[10] "How to decide where to live - US news & world report." [Online]. Available: https://realestate.usnews.com/real-estate/articles/how-to-decide-where-to-live. [Accessed: 07-Apr-2023].

[11] M. White, "How to choose the right city for you," *Moving.com*, 05-Dec-2018. [Online]. Available: https://www.moving.com/tips/how-to-choose-the-right-city-for-you/. [Accessed: 06-Apr-2023].

[12] Areavibes, "Compare cities crime," *Crime Rate Comparison by City.* [Online]. Available: https://www.areavibes.com/crime-comparison/. [Accessed: 06-Apr-2023].

[13] "Best states for mechanical engineers," *Best States for Mechanical Engineers.* [Online]. Available: https://www.aboutmech.com/2021/06/best-states-for-mechanical-engineers.html. [Accessed: 06-Apr-2023].

[14] Ajah_Excel, "21 best cities for mechanical engineering jobs in the world," *Kiiky*, 20-Feb-2023. [Online]. Available: https://kiiky.com/best-cities-for-mechanical-engineering-jobs-in-the-world/. [Accessed: 06-Apr-2023].

[15] *Cost of living in Battle Creek, Michigan.* [Online]. Available: https://www.bestplaces.net/cost_of_living/city/michigan/battle_creek. [Accessed: 12-Apr-2023].

[16] "10 best states for mechanical engineers in 2023," *Zippia*, 06-Apr-2021. [Online]. Available: https://www.zippia.com/mechanical-engineer-jobs/best-states/. [Accessed: 06-Apr-2023].

[17] J. Jones, "Best-paying American cities for Mechanical Engineers in 2022," *Construction Coverage*, 19-Aug-2022. [Online]. Available: https://constructioncoverage.com/research/best-paying-cities-for-mechanical-engineers-2022. [Accessed: 06-Apr-2023].

[18] "Mechanical engineering careers: 2023 guide to career paths, options & salary," *Research.com*, 07-Feb-2023. [Online]. Available: https://research.com/careers/mechanical-engineering-careers#:~:text=The%20top%20industries%20that%20employ,in%20the%20U.S.%20manufacturing%20industry. [Accessed: 06-Apr-2023].

[19] S. built by: Salary.com, "Mechanical engineer I salary," *Salary.com.* [Online]. Available: https://www.salary.com/research/salary/benchmark/mechanical-engineer-i-salary. [Accessed: 06-Apr-2023].

[20] "Ann Arbor, MI," *GLISA.* [Online]. Available: https://glisa.umich.edu/station/ann-arbor-u-of-mich/. [Accessed: 12-Apr-2023].

[21] J. Jones, "Best-paying cities for Mechanical Engineers," *KSJB AM 600*, 25-Jul-2022. [Online]. Available: https://www.ksjbam.com/2022/07/25/best-paying-cities-for-mechanical-engineers/#:~:text=In%20particular%2C%20Michigan%20is%20by,of%20cars%20and%20auto%20parts. [Accessed: 06-Apr-2023].

[22] "Office of Science National Laboratories," *Energy.gov.* [Online]. Available: https://www.energy.gov/science/office-science-national-laboratories. [Accessed: 13-Apr-2023].

Recommendation Report: Wireless Sensor Network

Brendan Joyce

Texas A&M University - Kingsville

Link to Presentation

Executive Summary

This report discusses the design and implementation of a wireless sensor network (WSN) using microcontrollers and RF transceivers for tracking wildlife such as flora and fauna for field biologists. The wireless sensor network will provide valuable data on the behavior and movements of wildlife and help in conservation efforts. This report discusses the design considerations, the hardware and software components, and the various applications of the wireless sensor network.

The design of the WSN must consider several factors, such as power consumption, range, and data transfer rate. The microcontrollers, sensors and RF transceivers used in the wireless sensor network must be low power to ensure long battery life. The range of all transmitters and antennas must be sufficient to cover the area of interest, and the data transfer rate must be high enough to ensure timely transmission of data. This could be using a high-gain antenna for direction or a low-gain antenna for omnidirectional coverage.

The network will be designed using microcontrollers, antennas, and RF transceivers to enable wireless communication between sensor nodes and a base station. The sensor nodes will be deployed in the field to collect data on various environmental parameters such as temperature, humidity, and light intensity. The data collected by the sensor nodes will be transmitted wirelessly to the base station, where it will be stored and analyzed. The sensor nodes will be deployed in the field to collect data on various environmental parameters such as temperature, humidity, and light intensity. The data collected by the sensor nodes will be transmitted wirelessly to the base station, where it will be stored and analyzed.

Introduction

Biologists have a wide range of uses for the Internet of Things (IoT). This could be wildlife technicians checking cameras and GPS data imported into GIS to create a map. It could also be the temperature, humidity, and light sensors with actuators that a plant breeder automated for consistent growth. The selection of components is a critical step in the design process for implementing the network depending on your chosen objective. The components chosen must be reliable, efficient, and well-suited to the application. In the following sections, we will discuss the selection of various components of the wireless sensor network, including microcontrollers, GPS modules, antennas, base station components, frequencies used, wireless protocols, regulations, interfaces, and anything else.

The design of the wireless sensor network must consider several factors, such as power consumption, range, power, data transfer rate, bandwidth, interference. There are environmental hazards unique to the WSN for biologists. The microcontrollers and RF transceivers used in the WSN must be low power to ensure long battery life. The range of the wireless sensor network must be sufficient to cover the area of interest, and the data transfer rate must be high enough to ensure timely transmission of data.

The wireless sensor network has a variety of applications in wildlife biology, such as monitoring the behavior and movements of animals, tracking migratory patterns, and studying the impact of climate change on ecosystems. The wireless sensor network can also be used in conservation efforts, such as identifying and mitigating threats to endangered species.

Figure 1.

Criteria

The basic design principles of a WSN are set by the criteria determined by the problem it is to solve. Component selection is application dependent but there are some basic criteria to consider when designing a wireless sensor network. The process begins with clear objectives and ends with the verification of your syst

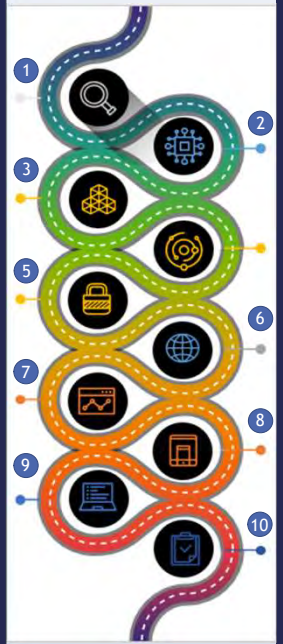


Figure 2.

Methodology

This WSN was based around the needs used in ecology and wildlife biology. Data gathered for this hypothetical WSN would then be sent to be used in GIS. Design methodology was constructed around common parameters for each component as well as typical constraints. These may include volume, mass, or fiscal budgets the client requires. All research was gathered from verifiable methods published in credible journals and authors. The design process was built by examining existing solutions made from wireless sensor networks.

Discussion

1. Spend time developing the technical product breakdown structure, the technical schedule and workflow diagrams, and the technical resource requirements and constraints (funding, budget, facilities, and long-lead items) that will be the technical planning infrastructure in order to fully comprehend and plan the scope of the technical effort. The non-technical parts of the project must also be acquainted to the systems engineer.
2. Identify every interface and assign it both intra- and inter-organizational authority and responsibilities. Understanding possible incompatibilities and outlining the transition are part of this. This entails identifying the transition procedures and comprehending possible mismatches.
3. The configuration must be under your control if you want to know how changes will affect the system. For instance, modifications to the environment or design might invalidate the findings of earlier analyses.
4. Conduct milestone reviews to allow for a thorough and insightful evaluation. The only purpose of these assessments is not to fulfill contractual or time-based incentives. These reviews have certain admission requirements and have to be carried out when they are satisfied.
5. Recognize any biases, presumptions, and limitations that affect the outcomes of the analysis. Put all analyses under configuration control to track the effects of changes and recognize when they require reevaluation.
6. Sensors will make up the bulk of a WSN and should be considered to meet all criteria. Does it fulfill the objective? What types are needed and how many? How do these individual components perform in the field? Also consider heterogeneity and interfaces to be used.
7. Antennas, Transceivers: An adequate frequency must be selected given constraints of range, interference, and available hardware. The most common WSN frequencies are 900 MHz, 2.4 GHz (Bluetooth) and 5.8 GHz. Consider that some frequencies, like Bluetooth, have significantly reduced range surrounded by vegetation. You can then select low power transceivers and antennas based off the frequency. Consider the coverage of a low-gain antenna (shown in figure 3) and a high-gain antenna (figure 4) to determine which is best.
8. Power is an important aspect to determine how each node maintains data transmission. Typically, batteries will need to be selected based off required parameters such as capacity, (dis)charge rate, open circuit voltage, operating temperature, and state-of-health to be effective. Furthermore, projects need command & data handling. A Microcontroller may be used and great consideration will have to determine bandwidth, data rates, and if proprietary solutions are needed.
9. When determining a topology to setup nodes in, several options are available such as star and meshes. Consider then the scalability of the nodes and their mobility. What is the fault tolerance of your network and how will each node handle a failure in communication?
10. Verification & Validation: Did we build the thing? Did we build the thing right? Consider all the parameters and potential conflicts that may arise. Reflect on lead times of component procurement and manufacturing issues that may arise.

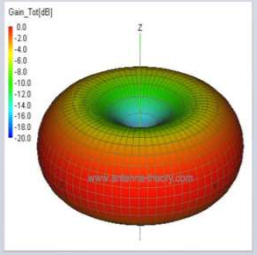


Figure 3. (P. Joseph Bevelacqua)

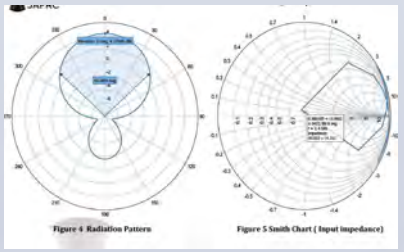


Figure 4. (P. A. Nawal)

Conclusion

The successful operation of a WSN relies on reliable communication between the nodes in the network. Selection of low-power radios, and efficient network protocols is key to long life. The instruments selected should follow the solution to the problem instead of choosing components first.

The construction of a WSN for conservation agencies need to consider what frequency and equipment will work in their quarries' environment. The wireless sensor network can provide valuable data on the behavior and movements of wildlife and help in conservation efforts. The wireless sensor network must be designed to consider factors such as power consumption, range, and data transfer rate. The hardware and software components must be carefully chosen to ensure reliable and efficient operation of the wireless sensor network

I recommend 2.4 GHz for sensors in close proximity while reserving higher frequencies (such as ~430 MHz UHF) for longer ranges. If tracking fauna, GPS will certainly be needed. A Raspberry Pi is an excellent computer for biologists as it is customizable, has interfaces typically required, and plenty of input/output pins. Furthermore, the nonvolatile flash available is expandable in case camera traps are added to the network.

Table of Figures

Sources

[1] P. Joseph Bevelacqua, "The Antenna Theory Website," www.antenna-theory.com. https://www.antenna-theory.com/

[2] J. Porter et al., 'Wireless Sensor Networks for Ecology', BioScience, vol. 55, no. 7, pp. 561–572, 07 2005.

[3] M. Milivojcevic, N. Tolić, and M. Štimac, 'Potential to use microstrip patch instead of dipole antennas in 2.4 GHz wireless sensor networks', Telfor Journal, vol. 14, pp. 44–48, 01 2022.

[4] B. Hull, K. Jamieson, and H. Balakrishnan, "Bandwidth Management in Wireless Sensor Networks," 2003. Accessed: May 03, 2023. [Online]. Available: http://publications.csail.mit.edu/lcs/pubs/pdf/MIT-LCS-TR-909.pdf

[5] P. A. Nawale, 'Rectangular Microstrip Patch Antenna For 2.4 GHz Communication Using Defected Ground Structure', 2015.

Link to Report

Recommendation Poster: Livestock Industries

Lizette Canales, Texas A&M- Kingsville

Faculty Mentor: Dr. Kenneth Price, Department of Language and Literature, Texas A&M- Kingsville

Executive Summary

The livestock industry is a fundamental department that keeps the world in order. While it is not clear when the livestock industry was created, farming/ranching has been around for over 10,000 years and has been evolving to what it is today. It is not common knowledge what it takes for each industry to thrive on the market. Most people are unaware of the cost of livestock, cost of maintenance, the market value, and how much competition they will come across. When agricultural business students, along with ranchers, think of the livestock industry, their minds tend to fall on cattle, but there are more options in the livestock industry that people should be aware of.

In this report, you will learn more about the different industries. It will discuss, in categories, all different livestock animals, and what you should know about them before entering that field. You will read the initial cost of purchasing the animals, how much land does a single animal require, what feed and how much the average animal need, what common vet bills will be needed (supplements, vaccines, etc.), common water bills(maintenance), how each livestock industry does on the market (from current years), where these livestock sell well, and how much competition we will face going into specific industries. The main audience for this report is currently ranchers and/or students majoring in agriculture. Whether it helps you decide which industry to invest into or to gain current knowledge on each livestock industry. Overall, continue to read to learn more about swine, goats, lambs, poultry and cattle, and the livestock industry.

Introduction

The raising of livestock has been around for a long time. Back to when people would raise their own meat and would often trade it for other materials. Since the beginning of the seventeenth century, the livestock industry has traveled around, stated Forrest Larmer. Raising livestock used to be easier before, in the sense that the cost of machinery and cost of the livestock were on the cheaper side, while as of now, it is extremely expensive to maintain. Prices started increasing and boundaries were set by the nineteenth century (Larmer, 2).

As time passes the livestock industry would take more affect on the world. Getting involved with the political department due to the growing financial problems and increasing issues on the business. By the late 1924, the President had taken notice to these issues and the Agricultural Commission was created to represent agriculture (Larmer, 4). While the issue was initially put aside, later the President acted and created laws supporting the livestock industry.

Through these changes made by past and new laws, the livestock industry has been evolving. While it was common to raise multiple types of livestock, it has become more common to focus on one category: swine, goats, lambs, poultry, or cattle. Due to the cost of purchasing and maintaining livestock, most ranchers/farmers decide to invest in one livestock animal, since cost has heavily increased through the years.

There are many students that are interested in the Agricultural field, specifically, the livestock industry. But many do not know the factors leading to successful production: cost of livestock, cost of maintenance, market value, and quantity of competition. These factors should be strongly considered when determining which industry, you want to go into.

The following information I have gathered should assist you in deciding which industry is the best option for you. The recommendation report will discuss the cost of livestock and maintenance, how well/poor the sell are going in the market (recent), and how much competition you have here in the United States.

Scan QR Code to access recommendation repot YouTube Video

Methods

The methods I used for these recommendations consist of me looking at the:

- Cost of maintenance/ requirements
- Market Value
- Competitor Quantity

For the following animals: Cattle, swine, goats, lambs, and poultry.

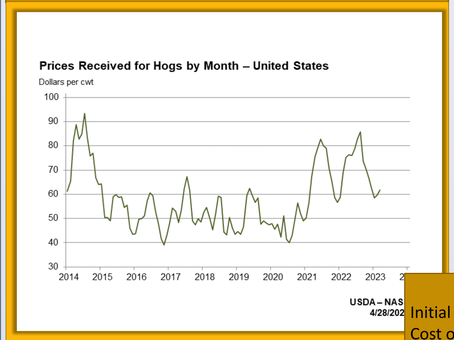




Results

Swine

Initial cost of a pig: $600-$750 (mature pig)
Cost of feed/water: $115
Vet bills (optional): Varies from product used/ if used.
Cost of housing: Building a hog barn can cost around $300/ per pig (not monthly fee).

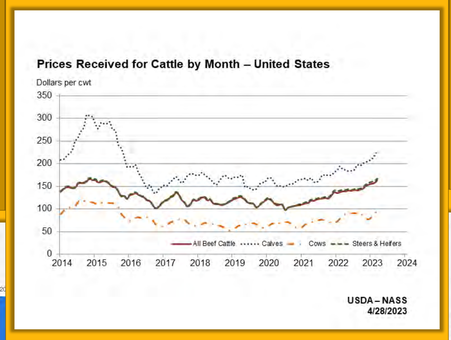


Goats

Initial cost of a goat: $50- $300 (depending on breed)
Cost of feed/water: $10- $50 (constant supply of hay, plus additional feed)
Vet bills (optional): Varies from product used/ if used.
Cost of housing: the initial cost for building a pen and having a roof would be around $400 (not monthly fee and can fit more than one goat).

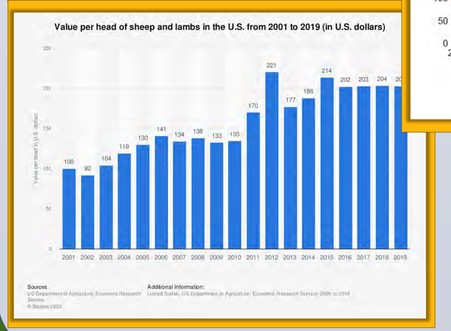
Cattle

Initial cost of a cow: $2,000- $5,000 (mature cow).
Cost of feed/water: Varies if cattle are grazing, if not around $50 for hay.
Vet bills (optional): Might vary from vet. Average cost to palpate $1.50-$3.00 per cow.
Cost of housing: currently the average acre of land is being sold for around $4,000.



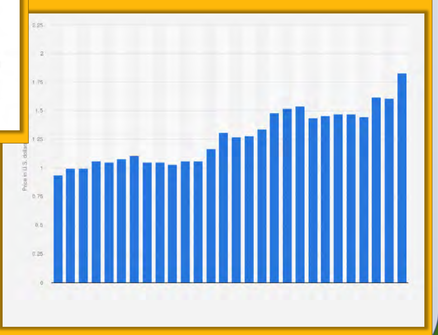
Lambs

Initial cost of a lamb: $200-$250 (for adult female sheep, can go higher).
Cost of feed/water: $ 50 (mainly consume hay and alfalfa).
Vet bills (optional): Varies from product used/ if used.
Cost of housing: the initial cost for building a pen and having a roof would be around $400 (not monthly and not for one lamb).



Poultry

Initial cost of a chicken: $3- $30 (depending on age and breed).
Cost of feed/water: Around $6.
Vet bills (optional): Not likely due to how cheap they are. Cost of housing: Around $2,000- $3,500 per acre (can house a lot of chickens).



Conclusion/ Recommendation

In conclusion, we have reviewed every livestock industry: swine, goats, lambs, cattle, and poultry. We have discussed the mandatory needs for the livestock to thrive, including food, water, temperature, space, and shelter. As well as giving an average estimate of the cost for feed/water, housing, animal cost, and vet bills. We have viewed graphs and tables discussing the market value throughout the years, and if they have increased or decreased. Finally, the competitor quantity was stated. Whether it is high or low, and where the most competition is. This report is a summary of what each industry should require. With this information it should guide students to decide which industry they want to invest their time into, and help ranchers decide whether they want to change industries.

1. If you are trying to join an industry that is not as expensive as the cattle industry and does not have too much competition in the United States. I would recommend joining either the goat industry or lamb industry. Both options do cost money but do not have many competitor companies. They are often combined for a reason.
2. If you are trying to join an industry that makes a big profit, but is not expensive, I would recommend the poultry industry. There is competition in this industry, but based on the table of their market value, they seem to be increasing their revenue every year.
3. Finally, if you are wanting to join a big market industry, swine or cattle would be good for you. These two industries make a decent amount of money due to customer demand. You will gain the most profit out of it if worked correctly. There is a lot of competition in these two industries due to the market value/ customer demand. It is a profitable option, but expensive to maintain too.

References

Allred, Brandi. “Goat Price: How Much Do Goats Cost? Full Cost of Owning Revealed.” AZ Animals, 20 Oct. 2022, https://a-z-animals.com/blog/goat-price-how-much-do-goats-costfull-cost-of-owning-revealed/.

Dominguez, Brandon J. “Management of Pathogens in Swine.” Swine Housing - an Overview | ScienceDirect Topics, 2018, https://www.sciencedirect.com/topics/agricultural-andbiological-sciences/swinehousing#:~:text=Swine%20housing%20is%20designed%20to,sanitation%20are%20control led%2C%20oftentimes%20automatically. Garlock, Fred L., and Forrest M. Larmer. “Financing the Livestock Industry.” Journal of Farm Economics, vol. 9, no. 2, 1927, p. 245., https://doi.org/10.2307/1230053. [5] “Meat Goat Marketing and Price Seasonality - Oklahoma State University.” Meat Goat Marketing and Price Seasonality | Oklahoma State University, 1 Feb. 2017, https://extension.okstate.edu/fact-sheets/meat-goat-marketing-and-priceseasonality.html

Pond, W. G., and J. H. Maner. “Swine Production and Nutrition.” 1984, https://doi.org/10.1007/978-1-4684-6873-1. [8] “Prices Received: Cattle Prices Received by Month, US.” USDA, 31AD, https://www.nass.usda.gov/Charts_and_Maps/Agricultural_Prices/priceca.php.

Shahbandeh, M. “U.S. Retail Price of Fresh Chicken 2022.” Statista, 2 Feb. 2023, https://www.statista.com/statistics/236834/retail-price-of-fresh-chicken-in-the-unitedstates/.

Shahbandeh, M. “U.S. Sheep and Lambs: Head Value 2019.” Statista, 27 Feb. 2023, https://www.statista.com/statistics/194400/head-value-of-sheep-and-lambs-in-the-us-since2001/.

“Small Scale Poultry Housing.” Penn State Extension, 26 Feb. 2016, https://extensismall-scale-poultryhousing#:~:text=Poultry%20require%20a%20dry%2C%20draft,high%2C%20well%2Ddrain ed%20areas. on.psu.edu/

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Benefits of a Nuclear Family

Kendall Taubert, Texas A&M University – Kingsville

Faculty Mentor: Dr. Kenneth Price, Department of Language and Literature, Texas A&M University – Kingsville

Executive Summary

Nuclear families have been in discussion about the positive and negative connotations that come with it. In this paper it covers the benefits and restrictions that come with nuclear and non-nuclear family outcomes. This research was gathered through online websites and articles, my own experience, and scholastic writings on the topic.

I found that it is very important for children to be raised in a stable home with stable parents. My recommendations are based on the wants of those reading and what would be best benefited by them. Depending on what long-term outcomes you are looking for and personality type.

Introduction

Nuclear families have been in discussion about the positive and negative connotations that come with it. In this paper it covers the benefits and restrictions that come with nuclear and non-nuclear family outcomes. This research was gathered through online websites and articles, my own experience, and scholastic writings on the topic.

Terms and Definitions

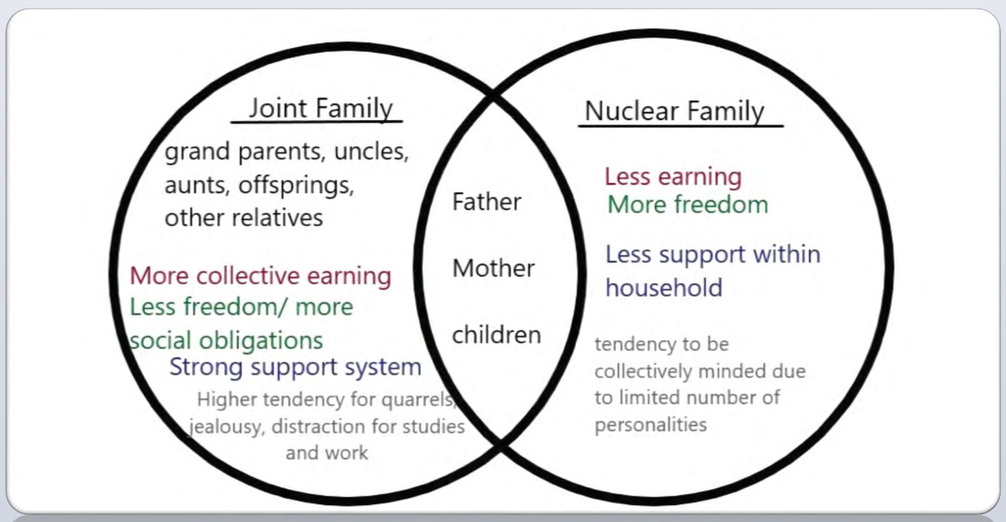
Terms	Definitions
Nuclear Family	Parents and their children living in the same home
Singular Family	A single person living in a home
Joint Family	An extended family, usually consisting of multiple generations, living in one home
Cooperate Family	A family created for the success of a business; usually consisting of multiple adults and children living in one home/on the same property

Methods

To create this recommendation, I gathered information based on the key factors that make a difference in a person's life depending on the family structure they are a part of.

- Number of Parents in the Home
- Parents being married
- Other family members living in the home
- Financial differences

When looking at American history, specifically the 1800s, majority of people were farmers. Being a farmer back then meant needing much more labor for the success of the business. It was not uncommon for families to have 8+ kids. You can argue that this was due to not having birth-control access, religion having a say in people choosing to have children, and even how society reacted to this. In addition to the multiple children were usually stray relatives (like aunts and uncles), servants, apprentices, farmhands, and in some situations the slaves were all living together on the same property. Families like this can be referred to as “corporate families”, or units organized as a family for a business's success. In the 1800s, about 90% of elders lived with their “corporate families”. Being involved in an extended family has several benefits. So, if extended families worked, why did we switch to nuclear? Around 1950-1965 nuclear families rose to fame. The divorce rates were lower and the fertility rates higher, making it more appealing to others. Over those years though, an almost unsettling version of being together was happening. People were reporting that others not being married were sick and immoral. During this time is when the idea of the perfect family was created. Instead of encouraging marriage they were bashing those not participating. Many historians argue that the nuclear family window was just a weird time in history.



Results

With all research gathered we can decide that having a nuclear family structure does have the best probability of success, but those that decide it isn’t for them have technology and advancements in society to help them compared to before. Example being gay parents. With changes in societal views there are options for same-sex couples to have blood related children that are raised under the same roof. Another being single mothers. While there is still more against them than helping, there are many more resources available to help single parents succeed.

Conclusion

With all research gathered we can decide that having a nuclear family structure does have the best probability of success, but those that decide it isn’t for them have technology and advancements in society to help them compared to before. Example being gay parents. With changes in societal views there are options for same-sex couples to have blood related children that are raised under the same roof. Another being single mothers. While there is still more against them than helping, there are many more resources available to help single parents succeed.

While both versions of a family have good and bad aspects, I will always recommend having a nuclear family. While the short-term appeal of being free is intriguing, the long term shows otherwise. Nuclear family means there is less risk for being alone, especially as an elder when you need support, and the ability to pass your genetics for the future generations.

References

Scott M. Stanley, 2020, *The Nuclear Family Was No Mistake: A Response to David Brooks*, Psychology Today, April 11 2023, https://www.psychologytoday.com/us/blog/sliding-vs-deciding/202002/the-nuclear-family-was-no-mistake-response-david-brooks

Peter Laslett, 1980, *Characteristics of the Western European Family*, London Review of Books, April 11 2023, https://www.lrb.co.uk/the-paper/v02/n20/peter-laslett/characteristics-of-the-western-european-family

David Brooks, March 2020, *The Nuclear Family Was A Mistake*, The Atlantic, April 11 2023, https://www.theatlantic.com/magazine/archive/2020/03/the-nuclear-family-was-a-mistake/605536/

Unknown Author, May 05, 2019, *Changes in a Family*, April 11 2023, https://en.wikipedia.org/wiki/Nuclear_family https://textbooksupport-ncert.blogspot.com/2019/05/grade-3-social-science-chapter-1.html

Acknowledgments

Use the QR code below for my presentation video

MYTHOLOGY 1301: INTRODUCTION TO CLASSICAL MYTHOLOGY (A COURSE PROPOSAL)

HANNAH BURGOS DR. KENNETH PRICE ENGL 2314-901

INTRODUCTION

Mythology is an important tool that should be used at many levels of education to ensure that all skills are being utilized and taught. Due to the recent lack in mythology lessons being taught at the secondary level of education (middle and high school), I am proposing a course. This course is for Texas A&M University-Kingsville, and is called, Mythology 1301: Introduction to Classical Mythology. It is my suggestion that TAMUK's administration heavily considers creating a course based on Greek mythology. Some of the many benefits would include an increase in creativity, logic, and an understanding of the values of life.

DISCUSSION

Greek mythology is a crucial subject in critical thinking and application of logic. It is often described to understanding different cultures, views, opinions, and theories. In addition, they allow us to learn valuable lessons in life. A Greek mythology is a vital tool in the education of children. Without it, they may not learn the many virtues of life (Adavis). However, following the new regulations to public education, many children do not get the chance to learn from the intriguing stories. At the higher education level, there are fewer restrictions, implying that the vital virtues would be taught without censors.

FIGURES

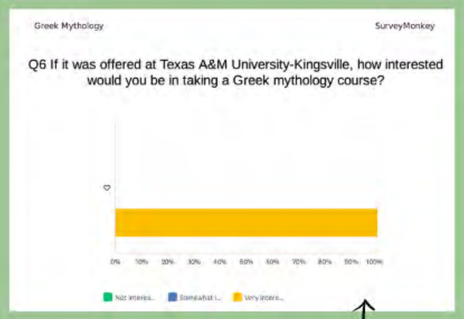


Figure 1: Question 6 on Greek Mythology Survey

Figure 2: Why are Myths and Legends so Important for Humanity?

PLAN OF ACTION

Once the proposal is approved by the administration and faculty departments at Texas A&M University—Kingsville, the course will become active in the Fall 2023 semester. It will qualify as an alternative for students that are interested in taking it instead of History 1302: American History since 1877. The goal is for students to complete the course with an average grade of 80% or higher. Depending on the results, future curriculums could be added, all expanding from the Mythology 1301: Introduction to Classical Mythology course. For example, the future of the course path could venture to individualized courses such as Norse, Greek, Roma, Aztec, and Taino mythology. It is the ultimate hope and goal that the topic of mythology continues to gain traction, possibly with the end goal of an undergraduate degree plan for those wanting to gain a bachelor's degree in the subject.

CONCLUSION

- The values that learning mythology carry
- Provides students with an improved understanding of diversity and cultural comprehension
- Build important tools such as intercultural views and mono myths, writing skills, new discoveries, conspiracy theories, socioeconomic skills, and media education
- Potential course content
- Materials needed for instruction
- Weighted grading
- Expectations that are set for students to fulfill
- Methods
- Suggested method of teaching, such as the push for creative and critical thinking without academic penalty
- Plan of action
- Students should take and then analyze their experience with the proposed course, thus approving or disapproving for it to be added to the permanent course catalog for Texas A&M University—Kingsville.
- If the results remain consistently positive, additional and similar courses may be proposed for and approved of.
- Eventually, it is possible that in gaining respect for the subject, students will support and possibly enroll in TAMU—K as an undergraduate mythology major.

WORKS CITED

- Adavis. "Why Study Greek Mythology?" Gloria Deo Academy, 19 Nov. 2021, https://gloriadeoacademy.org/2017/09/10/why-study-greek-mythology/.
- Bobby. "The Controversy Over Percy Jackson: Exploring the Debate Over Whether the Books Should Be Banned or Not." Tagari.com, 19 Dec. 2022, https://www.tagari.com/the-controversy-over-percy-jackson-exploring-the-debate-over-whether-the-books-should-be-banned-or-not/.
- Burgos, Hannah. "Greek Mythology." Survey. Survey Monkey. Retrieved 8 April 2023.

OBJECTIVES

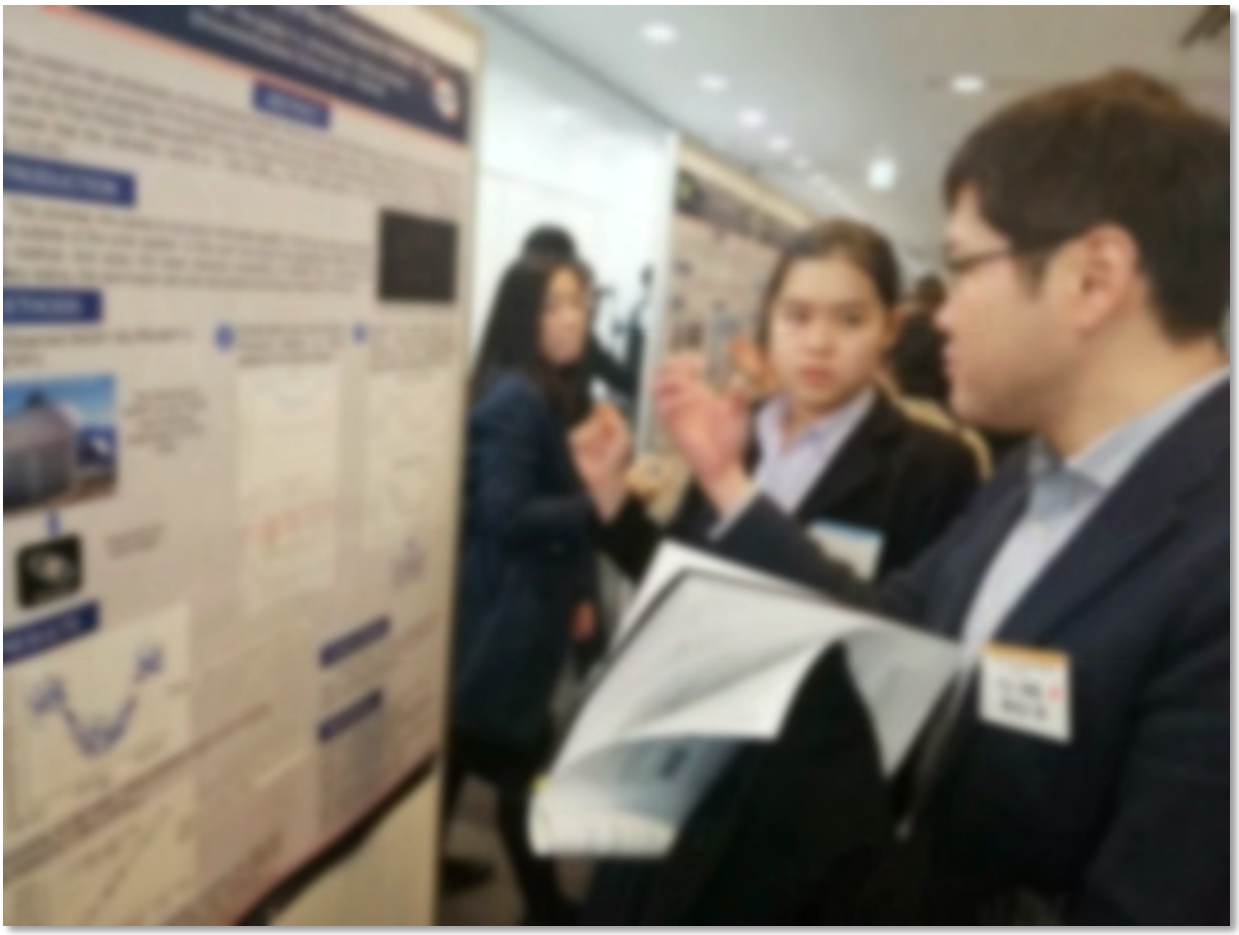
- Read and analyze texts from or regarding the Classical period to examine the stories, myths, and history within them
- Use critical thinking to determine the parallels between the myths and real life
- Cultivate a mindset that is more understanding of diversity between different cultures
- Participate in facilitated class discussions, whether they be in-person or online
- Explore the intellect and intelligence that was used during each time period in relation to the application of logic in the writing

INFORMATION

Scan for PDF

Scan for Presentation

Appendix C: Distance Oral Presentation Student Artifacts



Voice-over YouTube Oral Presentation Assignment

Distance Oral Presentation of Technical Report or White Paper

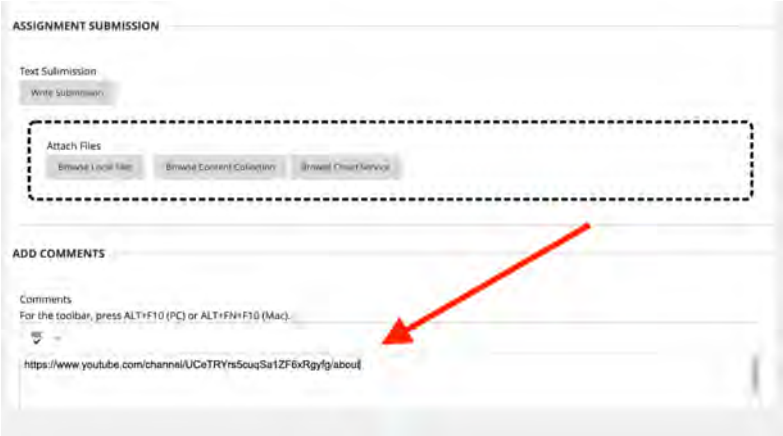
You will develop a 10 to 15-minute voice-over remote oral presentation of your technical report or white paper that you will post to YouTube.

Your presentation should have the following elements:

- A personal statement about yourself: hometown, major, future aspirations
- A conceptual model of your report
- Why you wrote on the topic
- Your methodology for researching the document: online sources, interviews, questionnaire/surveys
- A discussion of your findings

Once you have created the presentation slides, edit it using the Oral Presentation Rubric. Then upload the URL. You should submit only the URL to your YouTube oral presentation—not the PowerPoint file that you weren't able to publish into a format acceptable to YouTube (MOV or MP4), or a screenshot of the old version of PowerPoint running on your computer that does not have this functionality, or an email with a crying face emoji explaining that your computer doesn't have a camera (even though it did earlier in the semester when you completed Journal 1), etc.

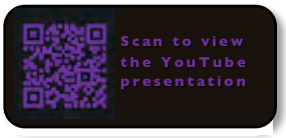
All I want is the URL copied and pasted into the ADD COMMENTS form field.



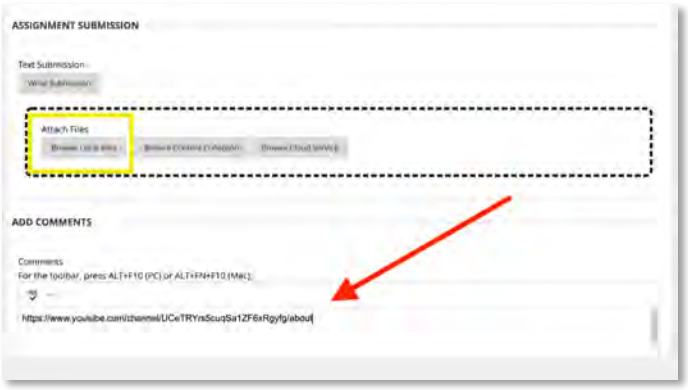
When I click the URL, the only thing I want to see is your face narrating the presentation.

QR Code Exercise

Create a QR code that you hyperlink to the URL of your voice-over oral presentation once you have uploaded it to YouTube. **You will include this QR code in your research poster.**

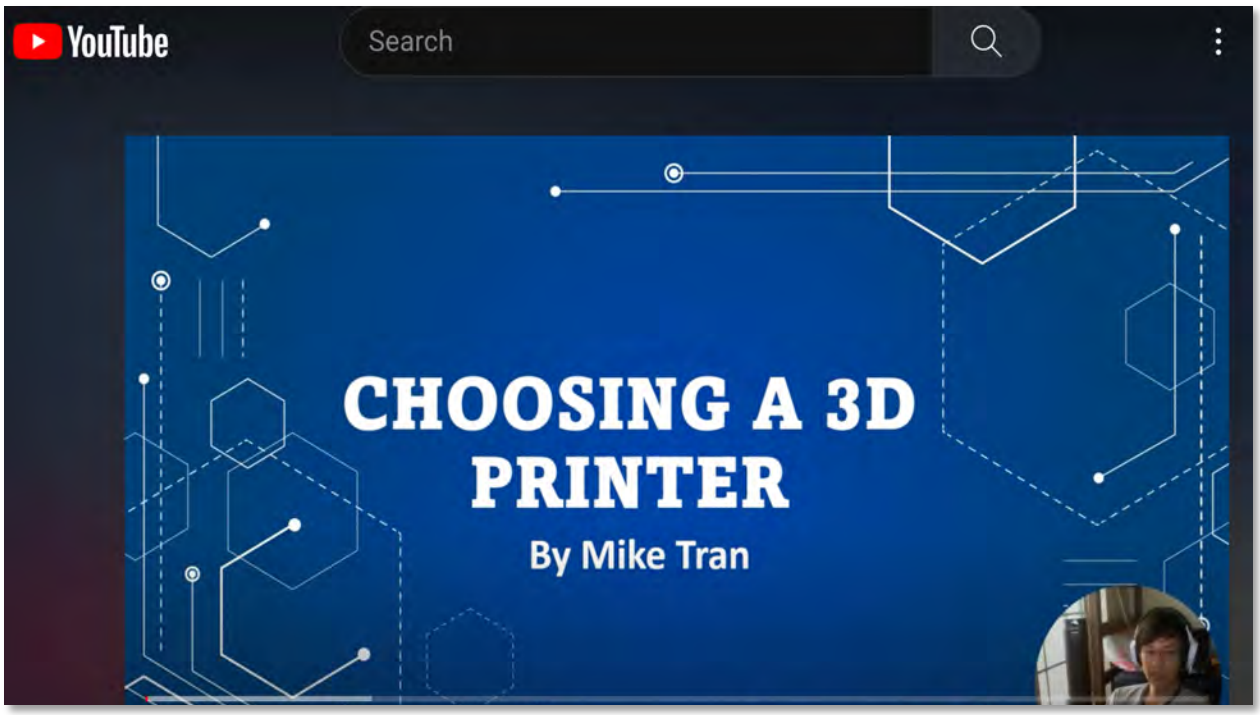


You should submit the QR Code PNG file as an attachment with the URL for your YouTube presentation.

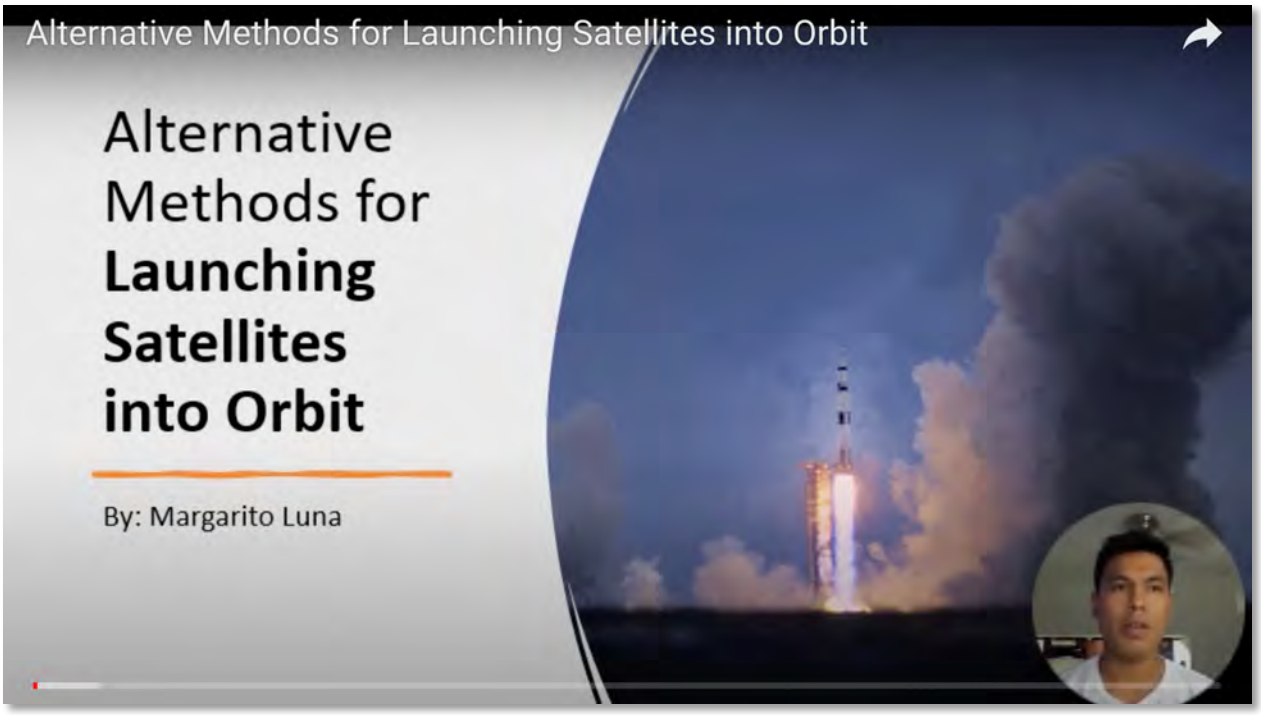


Kyleigh Davis – Prime Job Locations For Mechanical Engineers in the U.S.

Mike Tran – Choosing a 3D Printer



Margarito Luna – Alternative Methods for Launching Satellites into Orbit



Soyoung Kwon, Associate Professor of Sociology
Department of Psychology & Sociology

Project Title

Engaging Students in the Practice of Statistics: Mini-Projects in an Online Introductory Statistics Course

Project Summary

Statistics is often seen as a difficult subject because it is often taught in a way that does not connect with real-world situations. Concepts are introduced seemingly out of nowhere, which can be confusing for students. However, the true essence of statistics lies in its application to real-life scenarios. The only way to truly understand statistics and use it correctly is to practice it in real-world applications and comprehend the implications of the results of statistical analyses in those contexts.

As Aristotle said in the Nicomachean Ethics, “For the things we have to learn before we can do them, we learn by doing them." Tis holds true for learning how to apply statistical techniques to real-world data. It requires practice and a clear understanding of how statistical concepts relate real-world problems.

To provide authentic statistical practice to students, it is important to give considerable thought and care in the instructional design. Simply providing a dataset to a student and saying “go” is not sufficient. As a faculty advisor, I broke down the learning into a series of statistical mini-projects that students will work on throughout the semester. Each mini-project corresponded to a specific lesson, allowing students to make connections between what they have learned in each lesson and how it relates to real-world data and examples. Through this iterative process, students will gain a deeper understanding of statistics and develop their skills in applying statistical techniques to real-world problems.

Methodology

Throughout the semester, a total of five mini-statistical projects were implemented to enhance students’ understanding of statistics.

In the first project, “statistics in media,” students focused on identifying statistical terms used in the media and real-life situations, which helped them to learn basic concepts and terms of statistics in the initial unit of the lessons.

In the second project, students were introduced to descriptive statistics and were asked to select a dataset of at least 25 cases. They then picked categorical and quantitative variables of their interest and analyzed the data in StatKey. In doing so, students learn how to effectively leverage the statistical software and interpret the results. Finally, students discussed the results and interpreted their findings in the context of the particular data situation.

For the third, fourth, and fifth projects, students learned about inferential statistics and brought all their accumulated knowledge into the hypothesis test project. They picked the data, formulated hypotheses, identified case, independent and dependent variables, level of measurement, population parameter and sample statistics, and ran the analysis in MagicStat. In this project, students provide the outputs of the independent samples-t-test, ANOVA, Chi-square test. These projects helped students to develop their statistical skills in hypothesis testing.

Student-Learning Outcomes

The mini-projects are designed to help students develop their statistical skills by applying their knowledge to data. Students gained experience in analyzing and interpreting data, as well as in hypothesis testing and drawing conclusions based on statistical evidence. By the end of the course, students are able to confidently use statistical techniques to solve real-world problems and make data-driven decisions.

Detailed Project Description

To ensure that students have the support they need to successfully complete each project, the instructor provides tutorial videos and PDF guidance files. In these resources, the instructor walks students through how to work on the project using example data. Additionally, the instructor holds a Zoom meeting to demonstrate how to run statistical analysis with a statistical software and articulate the expected learning outcomes to students.

These mini-projects provide students with more hands-on experience working with data and conducing analyses independently. The goal is to move beyond simply answering and solving math questions, and instead focus on applying statistical techniques to real-world problems. By completing these projects, students gain valuable experience in working with data, analyzing results, and interpreting statistical output.

Assessment and Results

Throughout the course, five mini-statistical analysis projects were implemented to enhance students' understanding of statistics. These projects were designed to help students apply statistical concepts and techniques to real-world data using different software tools.

The assessment of the projects was based on the students' ability to select appropriate statistical methods, identify variables, analyze data, interpret results, and draw conclusions based on their findings. For each project, students were evaluated based on a total of 40 points.

The results of the assessments showed that students performed well in all the projects, with Project 2 receiving the highest average score of 38 points out of 40 points. Project 1 received an average score of 30 points out of 40 points, while Projects 3, 4, and 5 received an average score of 35points out of 40 points.

In addition to the assessments, students were required to write a brief reflection on each project, which allowed them to reflect on their learning and progress. The selective reflective comments received from the students demonstrated that they had increased their self-efficacy for statistical analysis and understanding. The students expressed how the projects had helped them to develop their analytical and critical thinking skills and gave them the confidence to apply statistical concepts to real-world scenarios.

"T*his inferential statistics analysis project was enjoyable and using MagicStat made it easier to comprehend and understand. I have a much better concept of one-way ANOVA and I am more confident in my ability to solve problems concerning this topic"*

"Overall, my experience with this inferential statistics analysis was easy to use and understand."

Overall, the five mini-statistical projects were successful in enhancing students' understanding of statistics and helping them to develop the necessary skills to apply statistical concepts and techniques. The projects provide students with hands-on experience in data analysis and interpretation, which is crucial for their academic and professional success.

Continuation of Project

I am planning to continue incorporating mini-data analysis projects into my teaching. However, there is a challenge due to the limited access to statistical analysis software, such as SPSS, which is commonly used in undergraduate statistics courses. Excel is another commonly used statistical analysis software. However, Excel and SPSS can be difficult for students to use, as they are designed for professionals and not necessarily for students. On the other hand, software such as MagicStat and Statkey I had my students use for the projects are more user-friendly and can automate calculations and graphs, making it easier for students to access and use. These tools are designed to make learning statistics easier. While the data analysis projects are beneficial to students in developing marketable skills, using traditional statistical software can take a significant amount of time to learn. By user-friendly, web-based statistical analysis tools such as StatKey and MagicStat, students can efficiently learn to analyze data and develop their skills without the added burden of learning complex statistical software.

Matthew Alexander
Department of Chemical and Natural Gas Engineering

Project Title: Incorporation of Active Learning for Improved Critical Thinking Skill Development in CHEN 2372

Project Summary

The chemical engineering course CHEN 2372 Conservation Principles II is one of the foundational courses in our chemical engineering curriculum here at TAMUK, and is offered in the spring semester each year. In this course, it is important for our students to obtain a firm understanding of several different chemical principles in order to be successful in upper level CHEN courses. Dr. Alexander has taught CHEN 2372 twice previously, in Spring 2020 and Spring 2022, and has found that some chemical principles in the areas of multiphase systems and energy balances present significant challenges for student comprehension, as determined by exam scores on problems. There were 21 students enrolled in CHEN 2372 in spring 2023 (one was enrolled in an honors section of the course), and one student assistant, senior chemical engineer Ysenia Granados, was hired to assist Dr. Alexander in the implementation of the active learning exercises into the course.

Methodology:

For each class session in which Dr. Alexander incorporated an active learning exercise to improve student understanding of difficult chemical engineering concepts, he had assistance in this implementation from Ms. Granados, course student assistant. Dr. Alexander implemented these exercises approximately four times during the course of the semester. The active learning techniques incorporated were:

a. Think-pair-share employs individual contemplation of the posed problem, followed by discussion between pairs of students and subsequent discussion amongst the entire class.

b. Fishbowl activity, in which a sub-group of students in the middle of the classroom are asked to discuss their understanding of a particular concept while those students on the outside only listen.

The challenging topics in which this technique was utilized in this year's offering of CHEN 2372 included:

a. vapor-liquid equilibria for binary systems;
b. ternary (3-component) phase diagrams;
c. Gibbs phase rule;
d. Various forms of the energy balance equation.

Dr. Alexander first presented his lecture on each of the topics identified above, and then either on the same day or in the subsequent class period, he and Ms. Granados implemented the active learning exercise with the students. This exercise occurred prior to assigning homework that included one or two problems on the topic of interest. The

assessment of the effectiveness of the active learning exercise was gauged by student performance on exam problems on each of the chemical principles.

Student-Learning Outcomes

Two existing CHEN 2372 student learning outcomes (from CHEN 2372 course syllabus) related to the need for improved student performance are:
1. Demonstrate the ability to build and solve conservation balances based on both mass and energy equations.
2. Demonstrate the ability to understand and apply principles for multiphase chemical systems.

Detailed Project Description

The objective of this course redesign grant has been to integrate experiential learning activities into lectures on several topics, with the intent to improve student's critical thinking skills, and thus positively impact exams scores. Therefore, the research question addressed in implementation of this course redesign was "Can incorporation of active learning strategies in a sophomore-level chemical engineering course improve student's critical thinking skills and exam performance on challenging chemical engineering principles?".

The classroom environment afforded by active learning approaches is intended to enhance student critical thinking skills and comprehension of the more challenge engineering concepts. Our chemical engineering undergraduate degree program is highly structured and dependent on a strong technical foundation in early engineering courses to maintain student success through the latter (junior and senior year) part of the curriculum. For chemical engineering instructors who teach upper level courses, it is evident that students who struggle in their upper-level engineering major courses are frequently those same students that do not fully grasp basic concepts from the foundational lower level courses (GEEN 1201, CHEN 2371, and this course CHEN 2372) in the curriculum.

Assessment and Results

The average scores for exams in CHEN 2372 are used here to assess the efficacy of this new approach in the course. Table 1 below shows the class average exam scores (before any application of a curve or opportunity for students to perform re-work for added points) for two course offerings prior to this spring 2023 offering in which this redesign has been implemented. In each course offering, three in-semester exams and one final exam are administered. Dr. Alexander does not drop a lowest exam score, so therefore students are expected to do their best in all exams. There was not a third exam administered in the course in spring 2020 due to the COVID upset to teaching at that time. As seen in the data in Table 1, markedly lower scores are evident in exams 2 and 3, as well as for the final exam, in prior years 2020 and 2021. This is attributed to the fact that the material covered at the beginning of the course is somewhat of a review and minor extension of material from the predecessor course CHEN 2371. Subsequently, the material presented and tested in the second and third exams is that material, to a large extent, that is new and different, and challenging for our nascent chemical engineering students. This is believed to be the reason for the lower class average exam scores on the second and third exams. In

comparing the data for class average exam scores from 2023 with the prior year data, it is clear that there was a marked improvement in the exam 2 score, and then only minor improvement in exam 3 and final exam scores. Therefore, this is good evidence that the approach for student scores improvement is a valid approach and can work for our CHEN courses.

Table 1. Comparison of Student Average Exam Scores for Past Three Course Offerings

Year	Exam 1	Exam 2	Exam 3	Final Exam
2020	87.5	63.5	NA	68.8
2022	89.5	61.0	65.5	69.4
2023	87.2	82.1	67.7	71.5

The course evaluation administered by the OIR office has been completed by the students (only 50% of the students completed the evaluation), however the course evaluation results have not yet been shared by the OIR office with Dr. Alexander.

Continuation of Project

The redesigned CHEN 2372 Conservation Principles II course, as redesigned for this effort, does not require further financial support from the department for future offerings. Based upon the success in this offering, Dr. Alexander intends to continue including this approach of utilizing active learning and experiential learning exercise in subsequent offerings of the course. Institutionalization of the redesign will principally involve refining the active learning approach based on comments from students and reflection on the assignment efficacy by Dr. Alexander.

Narrative Report for Course Redesign Spring 2023
Course: ITEN 3313: ENERGY SYSTEMS
Instructor: Md. Monirul Islam, Ph.D.
Department of Industrial Management and Technology
College of Engineering

Project Title

Developing an interactive smart grid simulation platform using virtual reality for effective teaching and engagement in energy systems engineering

Project Summary

One of the biggest frontiers in power systems engineering is the design, development, and maintenance of smart grid systems. Due to the integration of a massive number of system components and associated complex technologies, the grid architecture is considered the largest complex machine in the world. The objective of the project is to develop a smart grid simulation platform using virtual reality for classroom education and power system research. The platform can help the participants/students to experience a three-dimensional artificial smart grid environment in an immersive way through simulation. Due to the ability to incorporate human interaction and reproduce the new environment based on the response, the platform can also be used widely to understand the complexity of the architecture effectively and safely.

Methodology

The research activities are accomplished by the students through four different project review assignments and a demonstration of the final model. Every assignment is focused on the understanding and development of the modules (described in the section **Detailed Project Description**). A brief outline of the assignments for completing the research activities is given below:

Project Review 1: Conceptualizing the smart grid architecture and VR technology- At this stage, the student will investigate the fundamental of the smart grid and VR technology.

Project Review 2: Designing a 3D scenario of the smart grid environment -Details mentioned in Module I;

Project Review 3: Rendering the scenario for animation- Details mentioned in Module II;

Project Review 4: Analyzing the sensitivity of input parameters through the interaction of the participants- Details mentioned in Module III;

Student-Learning Outcomes

The student gains comprehensive knowledge and skills in smart grid design, development, and control methods throughout the proposed research project. The specific learning objectives are as follows:

a) Acquire fundamental knowledge of smart grid architecture (Discipline-specific knowledge and capabilities)
b) Apply the basic principle of power systems engineering to design a microgrid system (Discipline-specific knowledge and capabilities)
c) Evaluate the control variables and efficiency of the microgrid (Critical thinking)

d) Apply problem-solving skills to identify creative and innovative solutions to microgrid design (Critical thinking)
e) Examine the capabilities of advanced VR technology to design a complex system of systems architecture (Discipline-specific knowledge and capabilities)
f) Demonstrate analytical skills and software-based approaches to assess the interaction and dynamics of the simulated microgrid environment (Problem-solving)
g) Demonstrate collaboration for effective leadership and decision making

Due to the high level of integration, interaction, and understanding, as well as the reduction of time, cost, and hazard, the simulation platform is an effective and safe method for student training in the field of energy systems engineering and Industry 4.0. Students with prior hands-on research experience in designing, developing, and controlling smart grid technology will help the students to be confident and motivated about higher studies in industrial technology and power systems engineering.

Detailed Project Description

The smart grid incorporates different types of electricity generation sources such as solar PV, wind turbines, nuclear reactors, etc. The generation of the sources is utilized to meet the demand of the consumption sources such as residential buildings, industries, hospitals, electric vehicles, etc. Both the demand and supply of electricity are uncertain. However, the grid is required to maintain a constant balance between supply and demand every single second for reliable operation. The detailed methodology for developing such a complex platform and its dynamics is illustrated in Figure 1. Three integrative modules designed to develop the proposed platform are described below:

Module I (Drawing 3D Objects): The first module represents the designing and drawing of 3D objects which includes the smart grid system (solar PV, wind turbine, and battery storage systems), demand centers (residential buildings, manufacturing plant, etc.), and the transmission network. The SketchUp software is used to draw the 3D model. This module helps the student to identify every component in the microgrid system and develop the transmission network.

Module II (Developing 3D Interactive Model): The second module is used to create the interactive simulations of the power system network through the joint implementation of the application programming interface (API), and its interaction with the rendering software Unity3D combined with C# language. The simulation platform allows the users to observe different times of the day (e.g., morning, noon, evening, etc.) and seasons (e.g., summer, fall, spring). Depending on the time of the day and season, the variations in generation and consumption can be visualized through the platform. For instance, solar PV generates significantly more energy during the summer, while wind turbine generates a higher amount of energy during windy nights. This module helps the student to gain practical knowledge about the principles of power flow, control variables, energy efficiency, and dynamics of the network.

Module III (Deployment of the model in virtual reality headset): The third module is used for deploying the virtual smart grid environment into the virtual reality headset, controlling the

variables, and identifying the feedback to improve the operations of the smart grid. The user can get an experience of 360^0 views of the entire environment with the various entities of the smart grid. The user can control the time and observe the dynamics of different entities based on the change of grid variables. Through this module, the student can evaluate the system's performance for different scenarios and apply their problem-solving skills to identify innovative solutions for intermittent generation, uncertain demand, and the associated integration challenges.

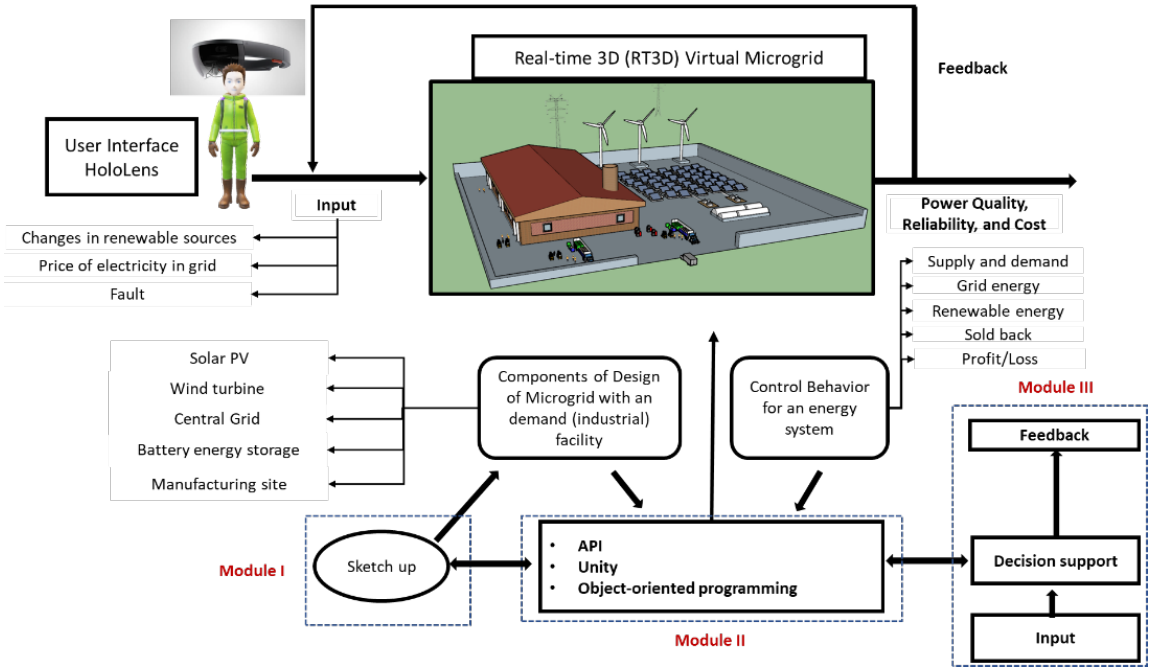


Figure 1: Methodology of developing the virtual smart grid simulation platform

Assessment and Results

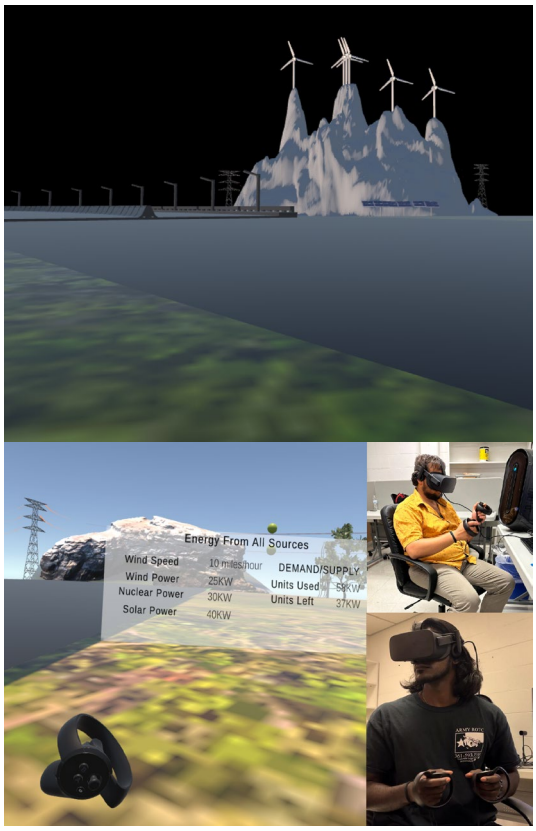
The students' learning outcomes are assessed based on the four different project review assignments and a demonstration of the final model while the outcomes of the project are assessed by the pre- and post-survey.

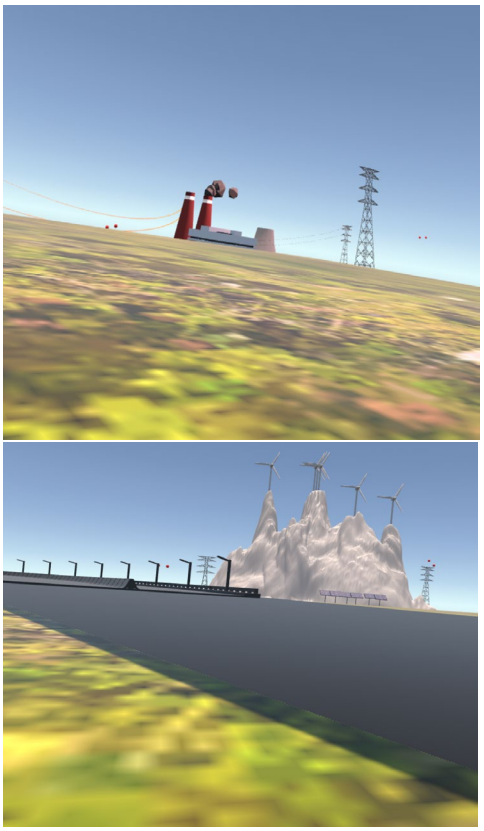
The result of the survey showed that the research has a significant impact on understanding the architecture of the smart grid, its operational principle, control variables and efficiency of the grid, interaction and dynamics of the environment, challenges for future integration of the renewable sources, and innovative solutions for improving the current challenges.

Continuation of Project

New research activities will be incorporated into the redesigned course ITEN 3313 ENERGY SYSTEMS in the future. The developed platform will be improved further with the integration of real-time weather data, location, and intelligent energy management mechanisms.

Photographs of Student Activities


Energy From All Sources
Wind Speed
10 miles/hour
Wind Power
25KW
Nuclear Power
30KW
Solar Power
40KW
DEMAND/SUPPLY
Units Used
Units Left
37KW



Olivia P. Modesto, Ed.D.
Teacher and Bilingual Education

Project Title: Learning Qualitative Research Data Collection by Conducting Classroom Observations

Project Summary

I have included a research and experiential learning component in EDRG 4330, Classroom Reading Assessment and Remediation, by teaching the following: importance of observation as a data gathering method, using field journals to record classroom observation data, and writing a reflective paper that is supported by their observations. Students, who are also teacher candidates, observed the teachers and students in their field observation classroom for 50 minutes, seven times within the semester. They recorded data using the field observation journal that was provided by this grant. I checked their journals during the semester. They wrote a paper to summarize the themes they have noticed in their data. Twelve students were enrolled in this course.

Methodology

To apply observation as a research data collection method, students or teacher candidates were required to notice the classroom environment, teacher to student interactions, student to student interactions, instructional materials used, instructional activities and games implemented, and assessments done in class, related to English Language Arts and Reading instruction. The observations are not meant to criticize their mentor teachers, but for them to be keen about the workings of an elementary classroom, particularly English language arts classes.

Student-Learning Outcomes

1. gain an understanding of the characteristics and uses of qualitative research in educational settings, assessed through written assignments and discussions,

2. develop skills in observing reading instruction and assessment practices in a public elementary classroom, assessed through the application of field notes rubrics and

3. apply APA conventions such as the use of in text citations, references and formatting, assessed through the production of a basic qualitative research paper.

Detailed Project Description

EDRG 4330 – Classroom Reading Assessment & Remediation is required for undergraduate students seeking elementary teaching certification. It deals with formal and informal methods of reading assessment, with attention given to special needs of the learning disabled and gifted readers. Course completion is comprised of face-to-face and online classes and 80 hours of field assignment. Students are placed in elementary schools to observe classes and learn from a mentor teacher. Enrolment is 12 students.

Below are questions I provided to students which were used as focal points for observations:

1. How does the teacher implement a read aloud?
2. What reading materials are used in the classroom (basal readers, trade books, ebooks, fiction/nonfiction books)? How do the students use such materials?
3. How does the teacher encourage the students to write?
4. How does the teacher group students for reading instruction?
5. How do the students interact among each other? Do they work in partners, triads, or small groups?
6. How are the students made to reflect about what they are learning?
7. How does the teacher engage students with higher level thinking skills (synthesizing, analyzing, comparing and contrasting, evaluating/making judgments)?
8. How are the English language arts lesson objectives or standards displayed and communicated in class?
9. How does the teacher differentiate instruction in teaching English language arts?
10. What do you notice about the kinds of questions (literal, inferential, or evaluative) the teacher asks students?
11. Is technology incorporated in the English language arts lessons?
12. How does the teacher reinforce good behavior and address unacceptable ones?
13. Are there English language learners in the class? How many are they? How are their needs being addressed? Are there materials that are used that specifically support their language needs?
14. Do you notice anything that the teacher does to build a positive relationship with parents?

Assessment and Results

All twelve students completed the requirements for the research component of the course. They were able to submit their field observation journals that contained the raw data that was used to write their papers.

Below is an excerpt from one student's paper:

> "…as a student I feel that field observations are very important. They provide a meaningful learning experience for future educators in accordance with the state mandated guidelines for teacher preparation. Through field observations, I had the opportunity to observe best practices and techniques for effective classroom management. Without a doubt, classroom observation is an important part of teaching… I was able to learn in a real world setting and see firsthand what it's like to be a teacher to real students."

In the process of monitoring their work, I noticed that most students were very detailed in writing down their observations. They included the class schedules, seating arrangements, and dialogs between students and teachers. They used complete sentences, bulleted points and drawings to record data. For those students who did not write enough details, I provided instruction and constructive feedback.

Continuation of Project

It is appropriate to include a research project focused on using observation as a data collection method in this course. The students were already placed in the elementary classrooms, so the logistics was not difficult to accomplish. It was not something more added to their plates. Doing this project allowed students to make real life connections to what they learned in my class. They also enjoyed writing in the beautiful journals that this grant provided for them. Writing in their field observation journals built a strong sense of ownership and engagement. One student commented that although it may be a challenge to keep up with the work, seeing herself accomplish the tasks required by this project developed her self-confidence. I plan to continue doing this research project in the coming semesters.

Rajashekar Mogiligidda & Hong Zhou
Department of Mechanical and Industrial Engineering

Project Title

Wind Energy Research for Undergraduate Students of TAMUK

Project Summary

MEEN-1320 (Elementary Numerical Methods & Engineering Problem Solving) introduces fundamental engineering numerical methods to freshman undergraduate students and utilizes them to solve engineering problems. The numerical methods include manipulations of matrices, solving systems of linear equations, interpolation and curve fitting, numerical integrations and differentiations. The Lecture Part of MEEN-1320 covers introducing those numerical methods while its Lab Part focuses on solving engineering problems through MATLAB programing of numerical methods. MEEN-1320 is a required course for all Mechanical Engineering undergraduate students and is offered in both Spring and Fall semesters each year. The course is redesigned by incorporating wind energy research in it.

Wind energy is one of the most reliable renewable energy sources. Wind is everywhere, but a day can be windy or windless. During a windy day, wind speed varies a lot, which makes wind power supply from a wind turbine or a wind farm inconsistent. In addition, wind does not carry high power density like burning coal or gasoline. The disadvantages of wind power bring challenges for promoting wind energy. Research on wind energy plays a critical role in surmounting these challenges. In this project, undergraduate students learn wind energy fundamentals and conduct research on analyzing wind power and wind torque under different wind speeds, interpolate wind power conversion efficiency under different speeds, generate wind speed profile in a wind farm.

Methodology

It is much more cost-effective and time-efficient to use engineering software MATLAB to model, design and analyze mechanical devices than building physical prototypes and testing their performances. Wind turbines are mechanical devices that convert kinetic energy of wind into electrical energy. A wind farm or wind park (also called a wind power station or wind power plant) is a group of wind turbines in the same location used to produce electricity. A wind farm can be either onshore or offshore.

In this project, research on wind energy is conducted on either wind turbine or wind farm by students. Wind energy fundamentals, analysis and design of wind turbines and wind farms are introduced. The kinetic power available in wind under different speeds within the swept area of a wind rotor is analyzed. The torque on the shaft of a wind rotor, its torque and power curves are analyzed. The wind speed distribution and its profile of a wind farm are generated and simulated. Wind turbines or wind farms are evaluated based on their analysis and simulation results.

Student-Learning Outcomes

1. Students improved their understanding of wind energy generation.
2. Students improved their ability to analyze wind energy.
3. Students improved their programming skills by using modern software for engineering analysis.
4. Students gained interest in research projects.
5. Students gained experience on working in groups.
6. Students gained experience on writing technical reports and presenting research findings.

Detailed Project Description

Students were divided into groups of 4 or 5 members to work on the research project. Students were given proper instructions during the lecture and lab sessions to work on the project. Students were introduced to different analysis techniques, which were later used for the research project. The project was assigned at the mid semester point. Students first selected a team research topic in wind energy. They then related and compared variables by conducting research for relevant analysis data. Students used engineering analysis techniques learned in the course to analyze the researched data to come up with conclusions and recommendations. Students presented their findings and submitted team technical reports.

Following is the set of research assignments to the students.

1. Select a topic on analysis of wind energy, build hypothesis and assign roles for each team member.
2. Research and collect all necessary data.
3. Study and filter the data.
4. Analyze the data using MATLAB and check the program by doing a sample hand calculation.
5. Prove the relationship between the variables (Correlation).
6. Perform regression analysis if there is any correlation between the variables.
7. Optionally perform interpolation/extrapolation, if there is not enough data for analysis.
8. Visualize the findings in the form of graphs
9. Express/convince the findings in the form of written report (IEEE format) and power point presentation.

Here are some of the topics selected by the students for the research project.

1. Effect of wind turbine rotor diameter compared to power capacity.
2. What wind turbines are better in Texas? Has Texas followed the trend in lower specific energy turbines?
3. Does the cost to build a wind farm justify the output of energy produced?
4. Wind energy produced in Corpus Christi Vs San Antonio, which one is effective?
5. Wind energy generation in Texas Vs New Mexico, comparing the winds and topography of each location.

Assessment and Results

The course was evaluated by using the following assessments.

1. Assignments and lab exercises were used to assess the students' understanding of the concepts discussed during the lecture and lab sessions.
2. Students were assessed on the research project presentation and report.
3. Real world problems were given for the exams and the students were assessed based on their performance.
4. Students' ability to analyze using engineering software MATLAB.

The results for this research project showed that some students struggled at the beginning. This might partly be due to the course being a freshman course and having no experience in research. Having the lab sessions and exercises helped the students to understand and perform research better. Overall, the students enjoyed working on the research project.

Continuation of Project

The course research project will continue in the future offering of MEEN-1320.
The research components in this course will be implemented through different approaches to encourage the student's interest in research.

Steven Boot Chumbley
College of Ag & Natural Resources
Dept. Agriculture, Agribusiness and Environmental Science

Project Title

Conflict Communication Research in Agriculture Leadership

Project Summary

Takin place over the Spring 2023 semester, this project sought to apply conflict communication and basic social science research within the AGRI 4350 Collective Leadership in Agriculture Course. This included collecting data related to students' conflict styles, authentic leadership styles and situational leadership after hosting two on campus service learning events. The student were exposed to a variety of assessments during this time and used descriptive statistics to map changes in styles, behaviors and perceptions related to communications. We found the largest impact was on student confidence (authentic leadership) and more direct communication styles (ICS & SL). The original goals were met with 2% of students scoring an 85 or higher on their descriptive statistics assessments.

Methodology

Students were assessed through multiple formats. This included the structured lectures dedicated to conflict communication styles and situational leadership. They completed online assessments in blackboard related to graphing, social science research and descriptive statistics. A presentation of research findings at the midpoint and end of the semester (one from the situational leadership group and another from the ICS research group), regular group discussions about research progress and individual consultation with students who need additional support were also used to assess learning.

Student-Learning Outcomes

- An increased understanding of social science research and descriptive statistics (measures of central tendency).
- The ability to efficiently graph findings, compare mean differences and understand relationships as they relate to collected data.
- All student will have a fuller appreciation for service learning, effective communication styles and the impact of transformational leadership.

Detailed Project Description

The research component of this proposal directly relates to the discovery of how leadership is applied on campus by students at TAMUK in the context of conflict communication styles. Using an established research instrument, the Intercultural Conflict Style Inventory (ICS), students compared their communication styles within the AGRI 4350 Collective Leadership class in the Spring 2023 semester. Students (with help from instructor & current graduate student), collated the collected data and investigated any patterns of students' communication styles. The same group of students also completed an assessment of their situational leadership style at the beginning of the Semester. The same assessment was completed at the end of the semester, after having taken part in two large service learning activities (The Area X FFA Career Development Event and the Annual TAMUK Ag Mechanics Show). Students compared the results of these two assessments to determine what impact, if any, the participation in these events had on their situational leadership practices. The class was be broken into two groups, one focused on running data on the ICS and the other on the comparative data on the Situational Leadership assessments. This team-based approach helped make data collection go faster and allowed them to apply the concepts of this course.

AGRI 4350 focuses on the understanding and application of various leadership theories (situational leaders, authentic leadership, etc.). Within this research component, students were able to see how these leadership characteristics are applied in an action research setting. This helped to introduce students to social science research and data collection.

Assessment and Results

We found that the largest impact was on students' confidence scores and motivation on the Authentic Leadership pre/post assessment. Students Intercultural Conflict Style scores moved more towards the direct communication styles; supporting the authentic leadership scores related to confidence. The high scores on the descriptive statistics assessment support the increased knowledge in statistical analysis and data collection.

Continuation of Project

We plan to continue the application of descriptive statistics and data analysis in this class. From the pre/post surveys given by the grant project director, we found that more focus needs to be made on the benefits of research and data collection tot heir daily lives. Making these concepts more applicable will help to improve the adoption of these new skills.

Velda Basak Soydas
Industrial Management and Applied Engineering

Project Title: Finite Element Analysis of the Wind Turbine Structures Utilized in Chapman Ranch Wind Farm

Project Summary

The class was redesigned to integrate research to provide students with the knowledge and hands-on experiences necessary to understand and validate or verify industrial design processes and to determine or assess the physical and mechanical design parameters associated with the vast array of designs at their disposal. This innovative class reconstruction aims to bring a different perspective to design processes to elevate students' soft skills and fundamental research investigation. To implement this foundation, Chapman Wind Farm is selected as the research topic and location for all students since there is a close connection with the neighboring facility and easy access to collaborative research.

Methodology

- Students were divided into groups of no more than five students.
- The groups was provided with a turbine blade design utilized at Chapman Ranch Wind Farm.
    - This data is already extracted and readied for the students by the instructor.
- Each group worked on wind efficiency correlated with the blade design currently utilized.
- Students was assigned weekly research papers to understand and assess the current designs (each group will review five papers every other week).
    - The instructor provided access or recommendations to the necessary scientific resources to obtain the required research data and information.
    - Students were expected to have a field study to comprehend the design of the blades and the wind harvesting technology.
- Each group submitted a brief review paper about their findings and previous studies, comparing them to the current designs and evaluate the new possibilities to improve the wind harvesting potential.
    - The instructor reviewed each group's research paper to ensure the groups have sufficient information to develop a possible blade design that can harvest more energy.
- Once the lecturer approved the proposed design, students will simulate the blades to compare their research findings to the simulated data.
- Students then take their 3D designs to the 3D printing lab to print and build the prototype of the proposed design.
    - The instructor assisted students in the 3D printing lab to ensure the prototypes are scaled-down and ready to print.

- The students assembled their prototype, test the energy outcome, and compare their experiments to the research and simulation results.
    - The instructor assisted students in building a circuit to observe the power outcome.
- The groups then prepared a formal lab report containing all the data comparisons and the final results.
    - The instructor provided a formal report format to ensure academic writing excellence.
- Each group also presented their finding to their peers and have a discussion session with different groups' findings and compare their results.

Student-Learning Outcomes

- ✓ Students gained experience in creating and exporting complex 3D parts and assemblies.
- ✓ Students can create animations showing the assembly and operation of a complex mechanical device using computer-generated graphics.
- ✓ Students are able to design a variety of simulations related to the mechanical properties of the final product.
- ✓ Students learned to develop empirical relationships between literature data and computer-aided simulations.
- ✓ Students are able to construct a lab report based on design simulations.
- ✓ Students learned how to verify the accuracy of their results from theoretical data or accepted values.

Marketable Skills

- Well-rounded knowledge in 3D design simulations.
- Cooperative teamwork, simultaneous 3D design creation.
- The planned execution of technical process design is based on observed data points and results.
- Critical thinking skills.
- Impeccable understanding of scientific research and obtaining accurate data and data comparison.

Detailed Project Description

The Advanced Graphics and Modeling (ITEN 3345) course is part of the core curriculum for undergraduate students in the Industrial Technology and Applied Engineering Technology department. This class is offered every spring semester and is limited to 30 students; enrollment ranges typically between 20-30 students each semester. The objective of this course is to elevate students' knowledge in the computer-aided design field. This course is designed to help students develop, modify, and optimize their design process. The software chosen for this class is Solidworks and Fusion360 since the students are familiar with this software due to their prerequisite class, Technical CAD (ITEN 1311). The course structure

is mainly based on multiple weekly design exercises using the selected design software in computer labs. The course assignments are designed to be completed by each student working individually and responsible for completing a set of 3D assembly parts, stress test simulation, and surface modeling exercises over the semester. Although the curriculum is strong, it is less extensive to improve students' research, critical thinking, and teamwork skills. The related industry and higher education fields especially require design engineers to be able to work on the same project simultaneously and have extensive knowledge in the area of 3D simulations.

The class was redesigned to integrate research to provide students with the knowledge and hands-on experiences necessary to understand and validate or verify industrial design processes and to determine or assess the physical and mechanical design parameters associated with the vast array of designs at their disposal. This innovative class reconstruction aims to bring a different perspective to design processes to elevate students' soft skills and fundamental research investigation. To implement this foundation, Chapman Wind Farm is selected as the research topic and location for all students since there is a close connection with the neighboring facility and easy access to collaborative research.

Assessment and Results

In this course, student performance was evaluated according to the following set of criteria:

- Attendance and participation in class accounted for 10% of the overall grade.
- Assignments and homework contributed 20% to the final grade.
- Research papers and a final prototype presentation, which involved independent research and analysis, accounted for 20% of the final grade.
- The midterm exam contributed 25% to the overall grade.
- The remaining 25% of the final grade was determined by the final exam.

Students received excellent standing in class, and the overall average was a B.

Continuation of Project

It is great to hear that the students were able to emphasize design consistencies and the overall design parameters of the wind turbine blade structure.
Building on this success, I would like to focus on further developing the design parameters of the wind turbine blade structure in order to create a 3D-printed blade that can extend beyond the current length of 6-10 ft and sustain environmental impacts. This will provide an opportunity for the students to apply their knowledge and skills in a practical and tangible way and to make a meaningful contribution to the field of wind energy.
This project will require collaboration across multiple disciplines, including engineering, materials science, and environmental science. It will provide students with the opportunity to develop a wide range of skills and knowledge. I am excited to see what the students are

able to achieve through this project and to continue offering them meaningful and impactful learning experiences.

Velda Basak Soydas
Industrial Management and Applied Engineering

Project Title: Integration of Process Bottleneck Analysis into Lean Production System Flow

Project Summary

The course was redesigned to integrate a research component that provides students with the research background and hands-on experience required to achieve the industry's high standards. The core curriculum was restructured to integrate case studies that often occur in the field to boost students' confidence to employ critical thinking, hands-on problem solving, team member mindset, and determination to assess process flaws. In order to achieve this goal, the class was organized into groups of 5 students. Each group of students will be given an industry-related case study (directly extracted from local companies' production processes) about a process bottleneck to evaluate and produce possible solutions. A formal poster presentation was created to document their results. Each group presented its findings to the class as a poster presentation. This research opportunity allowed students to gain hands-on experience associated with industrial design.

Methodology

Students are divided into groups of at most five students in each group.

➢ The groups selected a local company they would like to work with and contacted them to visit their plant and learn about their processes.

➢ Each group member was assigned weekly research papers about the (each group will review five papers every other week) company that they selected and did thorough research.

- o The instructor provided access or recommendations to the necessary scientific resources to obtain the required research data and information.
- o Students contacted companies to obtain more information as needed.

➢ Students submitted a brief review paper concerning the bottlenecking problem and possible solutions related to their selected company and process.

- o The instructor reviewed each group's research paper to ensure the groups had sufficient information to develop a workflow analysis.

➢ Each group utilized cooperative workstation software where more than one person could work on the documentation and develop flow analysis.

- o The instructor provided periodic guidance by accessing each group's progress report and offering constructive feedback.

➢ Each group was required to present their findings as a formal report (report format will be given to students at the beginning of the semester)

➢ In addition to the formal report, students are also given a visual presentation in front of their peers and industry professionals.

Student-Learning Outcomes

Student Learning Outcomes (SLOs)

✓ Students gained experience in reviewing an industry case study.
✓ Students analyzed the current process flow and determined the bottlenecking points.
✓ Students designed and constructed the restructured flow plan.
✓ Students learned to develop empirical relationships from simulations and digital manufacturing methods.
✓ Students learned to construct a lab report based on design simulations.
✓ Students learned how to verify the accuracy of their results from theoretical data or accepted values.

Marketable Skills

➢ Extensive knowledge of production flaws and bottlenecking issues.
➢ Solid commands in digital manufacturing.
➢ Cooperative teamwork and simultaneous data building.
➢ The planned execution of technical process design is based on observed data points and results.
➢ Critical thinking skills.
➢ Impeccable understanding of scientific research and obtaining accurate data

Detailed Project Description

The lean Production (ITEN 3349) course is a part of the core curriculum for undergraduate students in the Industrial Management and Applied Engineering Technology department. This class is offered every Spring semester, and each session is limited to 24 students; each semester course is mainly offered in multiple sections. This course aims to teach the fundamental knowledge of lean production, a process that helps businesses create value by streamlining production and eliminating waste. The lean process begins with creating value for the end customer by providing the right product at the right time for the specified price. Students learn about the various concepts and tools associated with lean production, such as types of waste, visual management, value stream analysis, flow, Just in Time, pull, and Kaizen. This course is designed to help students understand how to improve efficiency and eliminate waste in multi-disciplinary engineering. Although the course curriculum is robust, students need an industry integration component since there is a lack of communication with professionals from the field and limited case studies. The industry leans into employing graduates with not just theoretical knowledge but case study experience, research background, and critical thinking skills.
The course was redesigned to integrate a research component that provides students with the research background and hands-on experience required to achieve the industry's high standards. The core curriculum is restructured to integrate case studies that often occur in the field to boost students' confidence to employ critical thinking, hands-on problem

solving, team member mindset, and determination to assess process flaws. In order to achieve this goal, the class was organized into groups of 5 students. Each group of students was given an industry-related case study (directly extracted from local companies' production processes) about a process bottleneck to evaluate and produce possible solutions. A formal report will be created to document their results. Each group will present its findings to the class as a PowerPoint presentation. This research opportunity will allow students to gain hands-on experience associated with industrial design.

Assessment and Results

In this course, student performance was evaluated according to the following set of criteria:

- Attendance and participation in class accounted for 10% of the overall grade.
- Assignments and homework, which required students to apply the TPS lean production model to various scenarios, contributed 20% to the final grade.
- Research papers and a final poster presentation, which involved independent research and analysis of the TPS lean production model, accounted for 20% of the final grade.
- The midterm exam contributed 25% to the overall grade.
- The remaining 25% of the final grade was determined by the final exam.

Given that this was a writing-intensive course, students were assigned 12 research-based assignments related to the TPS lean production model. Overall feedback regarding the assessment policies was overwhelmingly positive.

Concerning the research component, the primary objective was to assess students' ability to conduct independent research and report their findings concisely and effectively. Additionally, I placed great emphasis on how each student worked in groups and their ability to engage with industry professionals to ask critical questions and gain a deeper understanding of the TPS lean production model.

Continuation of Project

The research project was very well-received by the students, who reported that the opportunity to connect with industry professionals and conduct relevant research greatly expanded their knowledge and boosted their confidence. Building on this success, I plan to incorporate lean six sigma principles into the project to offer students an opportunity to obtain certification in this area.

In addition, I intend to run another study that involves different companies and field areas of research to offer students a more diverse range of experiences and opportunities. This will allow them to apply the principles they have learned to new situations and gain a deeper understanding of how these principles can be applied in different contexts.

Tim Oblad & Haley Coleman
Psychology & Sociology

Project Title: Bridge the Gap

Project Summary: Bridge the Gap is meant to provide undergraduate students with partner-assisted experience in planning, development and observation of evaluation and intervention practices led by graduate students. Undergraduates are able to see first-hand the level of commitment and effort to succeed in a graduate program. In class, students receive training on various research methods and human development (e.g., normative/non-normative). Outside of class the students shadowed and worked with CSDO graduate students on various research projects that included tele-health instruction with clients, working with small groups of children from the CYC and created activities to help clients with exercises and stimulation techniques to improve speech.

Methodology

One grad student maintained the schedules and log information. The students-maintained logs that were completed after each of their sessions-which varied depending on their graduate student they were paired with. These logs were reviewed to determine learning outcomes. Hours of participation varied between pairs, for example some students put in 20 hours over the semester, especially if they observed tele-health, compared to just 9 hours for those who assisted with lab set up, etc.

Student-Learning Outcomes

Students will be able to effectively create a research plan guided by theoretical principals and models (informed literature review, hypotheses, methods, implementation and results).
2. Students will learn to effectively plan and carry out procedures with their graduate mentors.
3. Students will develop professional behaviors in clinical settings.
4. Students will present results from their project at our on-campus symposium or conference.

Detailed Project Description

CSDO faculty created the "Bridge the Gap" program. This mentorship program allowed for undergraduate students to observe graduate-level work in terms of creating activities for clinical sessions, observe these sessions and help create plans of action with grad students. The hope was that students exposed to this work would begin to develop an interest and passion for research and have a better understanding of what graduate school will be like. First, students received research methods instruction and learned about undergraduate and graduate research opportunities and why it's important as well as completed certification for IRB research. Second, students shadowed and worked with CSDO graduate students on various research projects that included tele-health instruction with clients, working with small groups of children from the CYC and created activities to help clients with exercises and stimulation techniques to improve speech. The vast majority of the class reported a desire to continue research and felt more confident in their abilities to conduct research later on.

Assessment and Results

All of the students enrolled in the course were able to complete training as expected but not all students participated in Bridge the Gap. Two students were distance-learning only and one of them could not coordinate for tele-health training and observing. In class feedback was overwhelmingly positive, in that students reported excitement, eye-opening experience with working graduate students and seeing how they behave and how quickly grad students move with their work. 9 students completed the final post-survey and results also show high levels of confidence in conducting research and interpreting results. Title V grant has provided a tremendous experience for this class and I know of a few specific students who took full advantage of the opportunity as well as other students who have heard about this and wish to join.

Continuation of Project

Bridge the Gap will continue and there is high demand for this from CSDO undergraduates. This project was primarily offered to students of general studies, education, kinesiology and other majors but the experience with graduate students was greatly beneficial to all.

Name: Dr. Yongsok Kim
Department: History, Political Science and Philosophy with Criminal Justice

Project Title

- Integrating social science research learning into an undergraduate writing-intensive course

Project Summary

- I planned to have the course students experience incorporating criminological theoretical understanding into practical crime or delinquency prevention/reduction strategies while using scientific research elements, especially through the students' one of the course tasks of developing PowerPoint slides on crime prevention strategy and its evaluation. In this way, the students were expected to better understand one of the important scientific research approaches, deductive reasoning. Under hypothetical scenario-based community situations, it was instructed that each student should develop specific crime prevention strategies based on the fundamental ideas from one (some) of the class-covered criminological theories and that the students would prepare the evaluation measures for the strategies. Therefore, the most commonly used research methods of experiment and survey have been instructed to the students so that they could apply the learned research knowledge to their crime prevention strategies (experimental interventions) and their evaluation measures.

Methodology

- Student performance was evaluated by multiple writing assignments in which students were instructed to try to apply their research-specific knowledge to their own work, such as applying the independent and dependent variables from Social Disorganization Theory to their creative TAMUK setting for figuring out relevant moderating factors to improve TAMUK community.
- Also, students were instructed to develop and submit PowerPoint slide file containing crime prevention and evaluation strategies under the hypothetical community crime situations, while incorporating their research-associated knowledge to their evaluation strategies content.

Student-Learning Outcomes

- A student will be able to learn the value of theoretical approaches, which tend to be perceived to many students as a difficult but impractical learning contents, through their own application of theory-based knowledge and critical thinking skills to practical crime prevention strategy development experiences.

- Under the hypothetical community crime/delinquency situations, each student will assume their role as one of police chief, mayor, crime prevention specialist, NGO leader or community leader, who is planning

and developing the strategies and evaluation measures. This experiential learning experience will enhance students' future career aspiration and confidence in the varying career role capabilities, including researching skills for implementing Evidence Based Practices (EBP).

Detailed Project Description

- Considering many students' lack of understanding of basic research components and processes, gradual and holistic instructions and assessments were employed. For this, relevant discipline-specific academic journal articles were provided for improving students' familiarity with research fundamentals, such as developing research questions, various scientific ways of answering the questions, deductive reasoning applications, research population choice and sampling, and measures of intervention and evaluation. As the course progressed, when students became familiar with the course contents and research fundamentals, they were given assignments in which they were instructed to apply what they have learned to practical circumstances. For example, an assignment was provided students for developing structural, moderation and outcome measures of TAMUK campus' social disorganization status based on one of the important crime theories of Social Disorganization Theory. For facilitating students' understanding of the subject matters, multiple real-time online discussion opportunities were implemented via the Blackboard discussion boards. During the discussions, students asked their questions about varying issues on these research-oriented course tasks, got the answers to their inquiries from the instructor and other participating students, and exchanged their viewpoints. The final assessment for each of the student works was carried out by having each student develop and submit PowerPoint slides containing the presentation contents on the scenario-based crime prevention strategy implementation and its evaluation.

Assessment and Results

- Many of the class students expressed that they could feel much more confident in what they should and can do for the completion of varying research-integrated course tasks, especially the PowerPoint slide task and multiple writing assignments as the course progressed. From the three real-time online discussions, it was detected through the student postings that having open forum opportunities where all the students could freely ask questions of which they were unsure and share the answers from the instructor and other students was highly beneficial for enhancing students' understanding and confidence.

Continuation of Project

- In view of the positive achievements from the current research-oriented course redesign project, I would like to plan, apply and carry out another research-integration course redesign project for my upcoming Criminal Justice Theory course (CRIJ 4301) for Fall 2023.