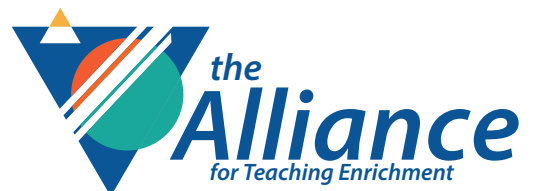


'19

ALLIANCE TEACHING SHOWCASE



October 24th, 2019
The Steel Dynamics Keith E. Busse
Alumni Center



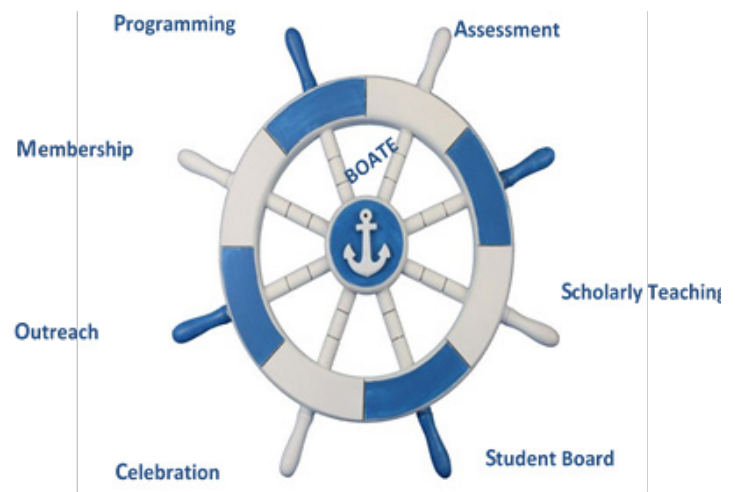
WELCOME ABOARD

MISSION STATEMENT

The Alliance is a community of educators committed to the celebration, development, and elevation of a diverse culture of teaching at Purdue Fort Wayne and in our region. We seek to enrich teaching and learning by fostering a collaborative community to serve faculty, staff, and students dedicated to the pursuit of authentic learning. The Alliance promotes creativity, boldness, enjoyment, and growth as pathways to excellence in teaching and learning.

VALUES

- Collaboration
- Boldness
- Diversity and inclusion
- Enjoyment
- Meaningful work
- Mutual service and support
- Creativity
- Organizational Structure



POSTER PRESENTATIONS 4:45 - 5:30

1. Michael Kirchner, Ph.D.

Assistant Professor, Organizational Leadership, Department of Organizational Leadership in ETCS
Improving Students' Training and Leadership Competence Through Applied Research: An Interdisciplinary Approach

2. Natalie Neuenschwander

Junior, Elementary Education

Jeong-il Cho, Ph.D.

Associate Professor, College of Professional Studies

Investigation of Learning Environments for Students at Purdue University Fort Wayne

3. Sue Mau, Ph.D. & Yvonne Zubovic, Ph.D.

Associate Professor, Department of Mathematical Sciences

Terri Swim, Ph.D.

Professor, School of Education

The Great Windows Inspection

4. Naomi Gurevich, Ph.D.

Assistant Professor, Communication Sciences & Disorders (CSD)

Creative opportunities for student research involvement: Sharing the research experience with students at all levels

5. Dina Mansour-Cole, Ph.D.

Associate Professor, Organizational Leadership, Department of Organizational Leadership in ETCS

Passionate Poetry and Leadership Podcasts? It's Collaborative Active Learning!

6. Andres Montenegro, M.F.A.

Associate Professor, Department of Art and Design

Creating and implementing the use of visual metaphors to teach new media in Virtual Reality and Augmented Reality

7. Matthew Perkins Coppola, Ph.D.

Assistant Professor of Science Education, School of Education

Improving Communication: Integrating Google Voice into Practice

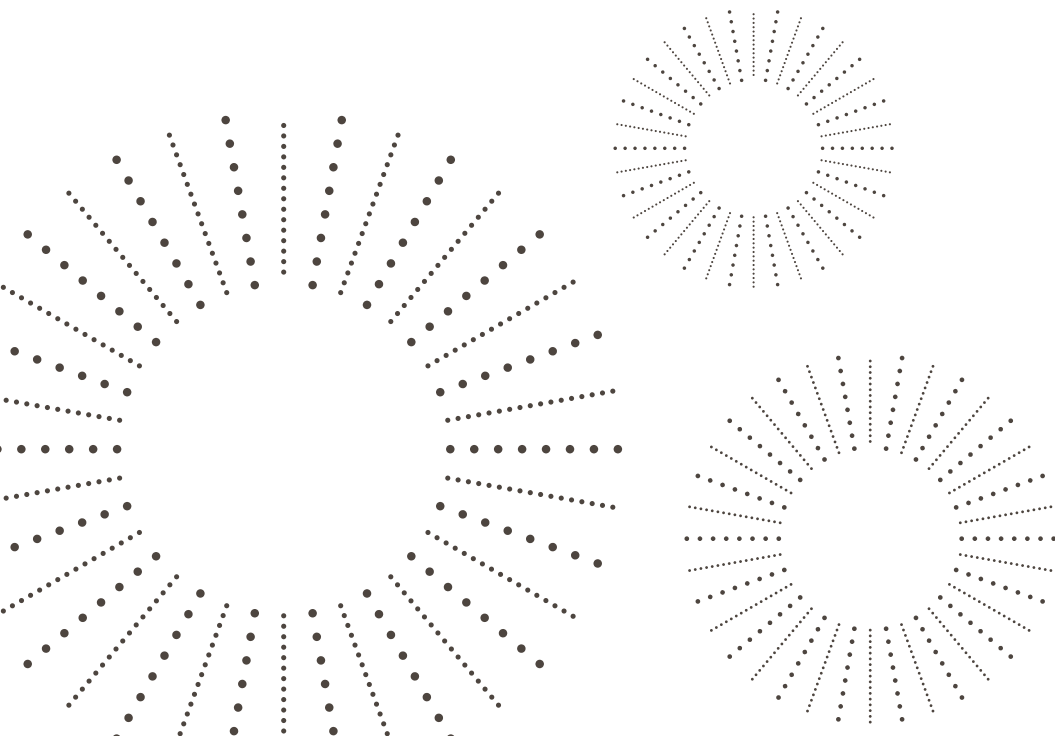
8. Behin Elahi, Ph.D.

Assistant Professor, Department of Manufacturing, Construction, and Engineering Technology (MCET), School of Polytechnic

A Successful Project-Based Learning Experience: Case Study of Fort Wayne Metal Research Project in "Measurement and Evaluation in Industrial Technology" Course (IT 507)

IGNITE TALKS 6:15 - 7:00

- 1. Daniel Boylan, Ph.D.**
Assistant Professor, Accounting, Department of Accounting
Does Course Syllabus Affect Student Grades
- 2. M. Gail Hickey, Ph.D.**
Professor, Educational Studies, College of Professional Studies and PFW Director, Scholarship of Service-Learning
Connecting Campus and Community through Service-Learning Experiences
- 3. Sarah Symonds LeBlanc, Ph.D.**
Assistant Professor, Communication, College of Arts and Sciences
Connecting to the Material Through Collaboration on Case Studies: How PBL is Going CBL
- 4. Jack Li, Ph.D.**
Assistant Professor, School of Polytechnic
Summarizing Material to Help Students Learn Quickly
- 5. Matthew Perkins Coppola, Ph.D.**
Assistant Professor of Science Education, School of Education
Learning and Teaching in Physics – Training TA's, LA's, and Tutors



CONVERSATION WITH AWARD WINNING TEACHERS

7:00 - 7:30

- 1. Mark Masters, Ph.D.**
Chair and Professor, Physics
Featured Faculty for Teaching
- 2. Jane Leatherman, Ph.D.**
Associate Professor and Program Director, Education
Friends of the University Outstanding Teaching
- 3. Luke Rodesiler, Ph.D.**
Assistant Professor, Education
Leepoxy Award for Excellence in Undergraduate Teaching
- 4. Rama Cousik, Ph.D.**
Associate Professor, Education
Naomi Gurevich, Ph.D.
Assistant Professor, Communication Sciences & Disorders
Excellence in Online and Hybrid Teaching Award
- 5. Zesheng Chen, Ph.D.**
Assistant Professor, Computer Science
Sigma Xi 2019 Science Teacher of the Year Award
- 6. Lee Roberts, Ph.D.**
Associate Professor, International Language and Culture Studies
FACET

Alliance Teaching Showcase

October 24, 2019

Tips for Addressing Diverse Learners

Jane Leatherman, PhD
email leatherj@pfw.edu

Special Education Associate Professor

Syllabus

Making connections: make sure students can contact you in a variety of ways. Office or cellphone (if you accept text or not); course Blackboard, PFW email, course websites.

Don't make syllabus and handouts in fancy fonts; difficult to read for some students and electronic readers have difficulty with some fonts.

CELT offers syllabus templates for in-class or online

<https://www.pfw.edu/offices/celt/online-teaching/index.html#planningforanonlinecourse>

UDL syllabus suggestions: http://udloncampus.cast.org/page/planning_syllabus

Participation in class discussions

1. Allow think-pair-share first, then ask for volunteers to share for the whole class.
2. In small groups, assign students roles such as scribe, class presenter, etc. that way even shy or student who have a difficult time speaking in groups can have a job and can participate in the group discussion.
3. Provide discussion questions in advance so students who need more time to prepare their answers are ready.
4. Use electronic clickers for responses. If not available, use colored post cards for quick reference if students are getting the concepts. Assign meaning to colors; ie yellow = still fuzzy, or green = yes, or blue = A or B depending on the question.

<https://cft.vanderbilt.edu/guides-sub-pages/setting-up-and-facilitating-group-work-using-cooperative-learning-groups-effectively/#look> Cooperative learning ideas

Suggestions for discussions that may be emotionally charged or difficult to navigate because of beliefs, culture or religion.

<https://provost.tufts.edu/celt/teaching-resources/difficult-dialogues-hot-moments-classroom/>

Present materials in a variety of ways

Powerpoints with and without narration posted online; short videos that students should access before class; podcasts on different topics related to class discussions; supplemental texts that expand on certain topics; ppt on line from other universities.

For more ideas about presentation of materials

http://www.ldonline.org/article/Accommodations_and_Compliance_Series%3A_Employees_with_Learning_Disabilities

<https://cft.vanderbilt.edu/cft/guides-sub-pages/making-better-powerpoint-presentations/>

Study Skills

All students can use ideas to improve their study skills <http://www.ldonline.org/indepth/study>

Time management skills <https://chadd.org/for-adults/organization-and-time-management/>

How to study <http://www.howtostudy.org/overview.php>

Assignments

For multiple step/component assignments use a checklist for students to make sure to include all components

Allow multiple ways to show mastery of subject matter: test, written narrative paper, speech (written or oral), drawing, video or audio with demonstration and understanding of concepts

UDL means of expression: <http://udlguidelines.cast.org/action-expression>

Other Resources

CELT Teaching Resources: <https://www.pfw.edu/offices/celt/teaching-resources/>

PFW Services for Students with Disabilities <https://www.pfw.edu/offices/disabilities/faculty-resources.html>

Universal Design for Learning (UDL) is a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn.

UDL websites of interest

<http://www.cast.org/about>

<http://udloncampus.cast.org/home>

Some adults may not know their best way to learn new material. Tips about how to improve learning, i.e. if a visual learner.

The VARK Questionnaire <http://www.vark-learn.com/english/page.asp?p=questionnaire>



The Writer's Memo

Karol Dehr
Department of English & Linguistics

When students turn in a polished draft for a grade, they are asked to submit this self-assessment memo (or cover letter). It allows them to both identify what they've done to improve upon and revise their paper and also provides insight into what they deem important in their writing process and the rhetorical choices they made. I read this Memo before I read their final draft for grading and it assists me in streamlining the process.

Writer's Memo Guidelines (for students):

For each of your major writing assignments, I will ask you to include a Writer's Memo, which details one or two of the major revisions you made when completing the final draft of your major writing assignment. The memo should be at least one bigger paragraph of at least 1/2 or 2/3 page and should be submitted as you turn in your draft.

Please answer these three questions:

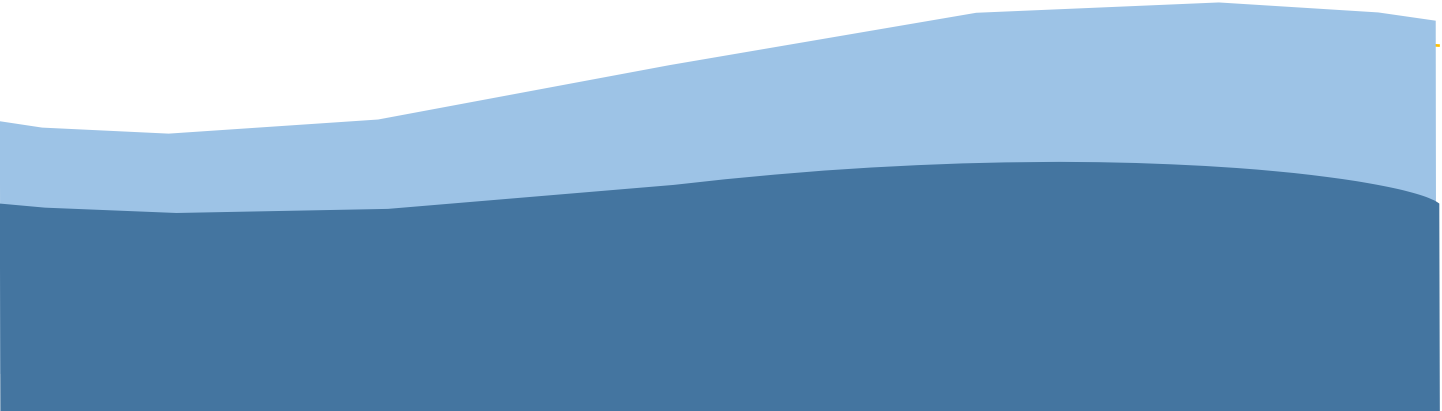
1. WHAT major revisions did you make in completing the assignment?

- For our purposes, "major" revisions means what we have called "Higher Order Concerns" (HOCs) or significant changes you have made in content to your draft: organization; thesis statements; introduction and/or conclusion; inclusion of a particular source; documentation decisions, etc. It does not mean what we have called "Lower Order Concerns" (LOCs), such as grammatical issues, editing, and surface level matters.

2. WHY did you make these revisions?

- Your reasons could address the feedback you received from your peers and me, and your own critical thinking process. This part of the memo might address what was incomplete or weak in your writing and/or what was missing in an earlier draft that has now been added.

3. HOW did these revisions improve your paper?

- In this part of your response, you can address how these changes improved or enhanced your paper and brought it closer to meeting the demands of the rhetorical situation (the assignment's guidelines). You can refer to the criteria listed on the assignment sheet and/or the grading rubric for specific items. In other words, you are to address how your paper is now clearer, more organized, analytical, etc.
- 

Improving Student Training and Leadership Competence Through Applied Research: An Interdisciplinary Approach

Michael Kirchner, Ph.D., Assistant Professor of Organizational Leadership
Purdue University-Fort Wayne

Needs Analysis Meeting



Background

OLS 475:

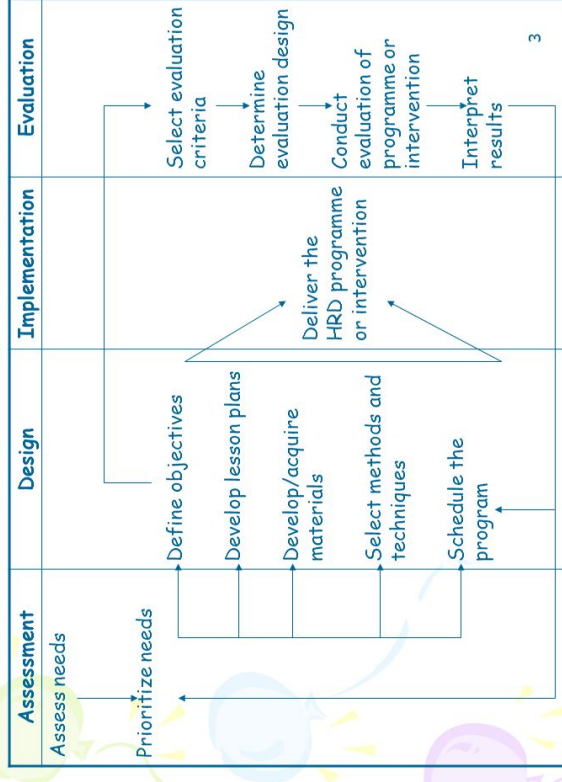
"Human Resource Development"

- Primarily juniors and seniors
- Class size—up to 24 students
- Course content: (1) *HRD process*, (2) *employee development*, (3) *career development*, (4) *organization development*
- Two partner companies per semester
- Two teams per company
- Partner companies have included: Fort Wayne Metals, OmniSource, Ultra Electronics, Gladieux Refinery, Franklin Electric, Rea Magnet Wire

Project Description

- Semester-long project w/local employer
- "Training and HRD Process Model" guides the course/project (see adjacent image)
- Needs analysis begins w/instructor meeting company representatives prior to start of semester
- Students listen to audio recording of initial meeting
- Students continue training needs analysis by meeting w/company representatives on campus
- Follow-up tour of facility
- Follow-up surveys and interviews conducted w/employees
- Diagnosis of training needs
- Development of a training program identified through needs analysis
- Student-facilitated training on-site to partnering company employees
- Evaluation of training

Training and HRD Process Model



Challenges/Limitations

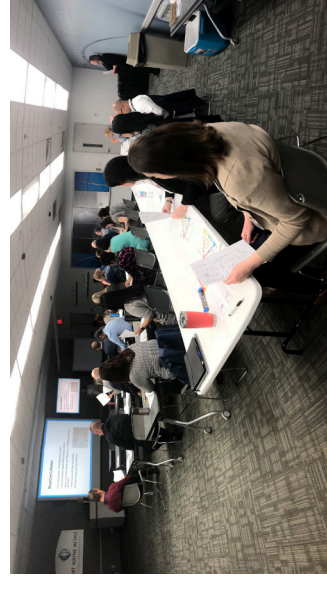
Challenges:

- Employer support & communication
 - Student schedules
 - Student buy-in
 - Social loafing
- Limitations:
- One semester timeframe (start to finish)
 - Time distribution between lecture and group work on project
 - Group sizes
 - Local employer interest

Outcomes/Impact

- Students hear and observe the many challenges plaguing today's organizations
- Students receive first-hand opportunity to develop, provide, and assess training
- Resume-builder
- Increase community engagement
- Builds brand awareness of degree program/campus
- Multiple students have received job offers as a direct result of project participation
- Replicable across disciplines, including education, business, engineering, and healthcare

Student-led Training at FW Metals



Abstract

An ethnographic essay was developed by a student in an elementary education major and an honors program. The classroom environments at Purdue University Fort Wayne were evaluated based on her two years of experiences. The observational data on multiple views toward the Purdue FW's classroom environments were gathered from faculty and students in three months as the student researcher participated in university events with other students, faculty, and staff at Purdue FW. The results show a discrepancy between the established socio-emotional, behavioral, physical, teaching, and evaluation/grading environments and environments students want. The current presentation shared adaptation and improvement ideas.

Model: The Systematic Approach for Adapting the Learning Environment [SAALE]

It is not what we teach, but how we teach that opens doors for students who learn differently. Universal Design of Learning (UDL) and identification of "Mismatches" are key points.

Three Major Environments

- I. Learning Environment
 1. Socio-emotional
 2. Behavioral
 3. Physical
- II. Teaching Environment
- III. Evaluation and Grading Environment

Source: Wood, J. W. (2006). *Teaching students in inclusive settings: Adapting and accommodating instruction* (5th ed.). Upper Saddle River, NJ: Merrill/Prentice Hall

Literature Review

- College students learn better when their physical classroom reflects the culture of the class itself. For example, students prefer having bold wall colors that reflect their learning excitement and experience (Cotterill, 2015).
- Students began to feel pressure from their classes when they are overloaded with many assignments, tests, and dates that are close to one another. (Rathmann, Herke, Hurrelmann, & Richter, 2018).
- Students who learn new material in a student-centered learning environment are more likely to remember the material and then recall it on their tests. (Kearney, Smith, & Maika, 2016).
- A study conducted among special needs students of the most effective strategies that they believed helped them succeed in their classes. The strategies include assistive technology, direct assistance, and strategy instruction (Zeng, Ju, & Hord, 2018).

Method

- **Participant and Setting:**
 - ❖ The researcher is a student in the Elementary Education major at Purdue University Fort Wayne (PFW) and she is also pursuing an honors program certificate. She evaluated the classroom environments at PFW based on her experiences for two years as a student and developed an ethnographic essay.
- **Data Source**
 - ❖ The student researcher gathered the data from faculty and students for a period of three months in university events, such as *Teaching in Today's Students Workshop* and *Alliance Student/Faculty Event (Don't Miss the BOATE! Bringing Students Onboard)*, that are designed to share multiple views of students, faculty and staff on classroom environments at PFW.

Results - Issues

- **Socio-Emotional Environment**
 - Job demands on top of schoolwork
 - PFW Events are not well communicated to students
- **Physical Environment**
 - Wall colors vary in each classroom
 - Small desks make it difficult to place laptops and other materials on
- **Behavioral Environment**
 - Different set of policies for each class based on professor
 - Strict attendance policy of only a few absences for each class
- **Teaching Environment**
 - Professors moving too quickly and using complicated language
 - Professors being unfamiliar with how to work with students with special needs
- **Evaluation and Grading Environment**
 - Students feeling unfamiliar with their professor's style of written assessments
 - Majority of grades determined by performance on assessments

Results – Adaption Ideas

- **Socio-Emotional Environment**
 - Allowing students to walk out of their class for certain reasons
 - School newspapers or sidewalk advertisements to inform students of PFW events
- **Physical Environment**
 - Neutral wall colors in classrooms
 - Larger table space on desks or long tables with separate chairs
- **Behavioral Environment**
 - A set list of rules for all classes provided by the university and professors adhering to rules specific to their class
 - Policy where professors cannot give absences for factors that the student does not have a control over
- **Teaching Environment**
 - Student-Centered Learning where students help teach the lessons
 - Assistive technology for students with special needs
- **Evaluation and Grading Environment**
 - Practice quizzes for students
 - Final grades based not only on assessments, but other activities

Limitations and Implications

- In order to triangulate the views, interviewing other students on classroom environments would be needed in the future ethnographic essay.
- With the gathering and knowledge of these different learning environments through the perspective of both the faculty and students, the student researcher was able to better understand the PFW environment and support the faculty advisor to adapt each of the environments to students.
- By knowing unique needs of students, the student researcher could understand how the classroom effects college students can stay engaged and understand what they are being taught.
- Through a research focusing on PFW environment, the student researcher in the elementary education major could reflect on effective learning environment for elementary school students with and without disabilities.

Conclusion

Students at PFW need various supports for their learning. The classroom environments (socio-emotional, physical, behavioral, teaching strategies, and evaluation/grading) that are critical for the learning of K-12 students are also key success factors for college students.

Classroom environments affect students' learning experiences at Purdue University Fort Wayne no matter what their race, age, grade, or the diagnosis of a disability are.

By recognizing students' needs and possible adaptations to meet these needs, we can change our perspective of how we teach which can then help our students to succeed in their academic life in college.

2019 Alliance Faculty and Student Showcase

Strategy

Student involvement in research transforms the static nature of reading about research into the active and dynamic nature of creating research. The researcher and the student both benefit from such a relationship. **But are these opportunities afforded to all students?**

Opportunities abound for academically successful honors students and motivated self-learners. Desire or motivation can be fostered to grow the number of students who would benefit from hands-on mentorship and participation in scholarly exploration.

- Make the process accessible to students with a range of academic skills and goals.
- Share your love & enjoyment of the research process with undergraduates who never saw themselves as potential researchers.
- Focus on individualized ways to provide a positive learning experience, shaving off pieces of bigger projects into manageable tasks.
- Reduce anxiety and self-doubt and help inspire student participants to be invested in the outcome and to get excited about how their project will shape future decisions and clinical practice.

No thesis: not honors; transfer student can't fit thesis in schedule; out of reach and complex; no opportunities;

No problem: participate in stages, learn about the full process from own contribution.



Student Projects

Student 1

Prior research: Important, but out of reach
Project title: Barriers to Recruitment of Racial Minorities into Communication Disorders
Involvement: Research question and design development, literature review, data collection and interpretation, dissemination (poster preparation)
Timeline: > 1.5 years

Student 2

Prior research: None
Project title: Barriers to Recruitment of Racial Minorities into Communication Disorders
Involvement: Data entry and analysis; potentially data collection and interpretation
Timeline: 1 semester (possibly 2)

Student 3

Prior research: General interest but no time, no opportunities

Project title: Intelligibility Evaluation System
Involvement: Stimuli (word-list) analysis & transcription; potentially data interpretation
Timeline: < 1 semester

Student 4

Prior research: Interested but didn't know if was eligible (not honors), or if had time (transfer student)
Project title: Dysphagia management and interprofessional practice (IPP) between nurses and SLPs in healthcare with respect to diet modification decisions
Involvement: Literature review, data interpretation, and dissemination (poster preparation)
Timeline: 1 year

Student outcomes

Manageability of project: very, but does require active balance of school and work

Interest level: extremely interesting; addicting; important work

Generalizing the work: interest in eventual results; implications for the field & impact on health of patients; thinking about bigger pictures and future research questions relevant to current work

Dissemination: student-authored posters (2), contributions to manuscripts, acknowledgements

(Concrete) things Learned: expanding interest in sub-areas in our field & commitment to CSD; learning to manage time; learning to see patterns in data

Specific benefits: practice transcription; increase vocabulary; master spreadsheets; academic development; prepare for grad school; help with grad applications; opportunity to present

Future involvement: would like to continue involvement in this project; will look at future opportunities

Current Projects (fall 2019)

Student Stories

Students can be inspired by their own potential...

"I'm interested to know the findings and I would love to continue to be part of research to create new knowledge"

"I believe research allows us to challenge and test new ideas, and new possibilities"

"It can be challenging, but it's rewarding"

"I hope that we will be able to expand this research in the future, because it is such an important topic"

"I do find myself thinking about how this research is related to other questions in the field"

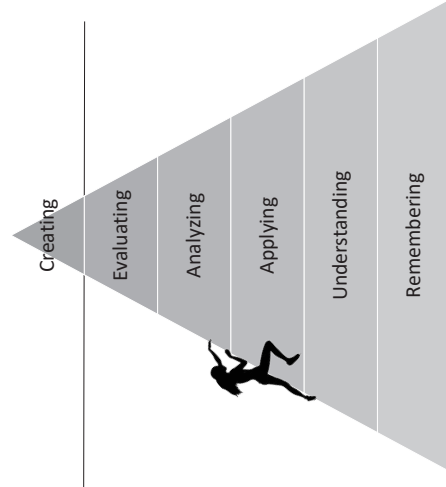
"I think my lack of interest [in research] came from a lack of experience"

"It really helps being so fascinated with what we're doing! I haven't second-guessed my decision to start this research with you"

"Before working with you I would have assumed my lack of academic excellence would exclude me from working on research with a faculty member"

"Working on this research opens up academic avenues that were otherwise closed off to me"

...and help inspire us



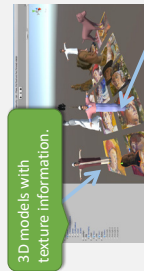
CREATING AND IMPLEMENTING THE USE OF VISUAL METAPHORS TO TEACH NEW MEDIA USING VIRTUAL REALITY AND AUGMENTED REALITY

THE RESOURCES UTILIZED IN THESE TEACHING STRATEGIES WERE PROVIDED BY "THE WEDDING CHAMBER," PROJECT THAT IMPLEMENTS THE VIRTUAL DECONSTRUCTION OF THE EMINENT FRESCO OF ANDREA MANTEGNA LOCATED AT THE SAINT GIORGIO CASTLE, IN MANTUA, ITALY.

ANDRES MONTEGRO, ASSOCIATE PROFESSOR OF COMPUTER ANIMATION, DEPARTMENT OF ART AND DESIGN, ASSOCIATE CO-RESEARCHER, PROFESSOR AUDREY USHENKO, DEPARTMENT OF ART AND DESIGN

THE IMPLEMENTATION OF AUGMENTED REALITY AS A LEARNING AND TEACHING EXPERIENCE

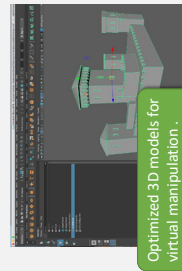
A metaphor that epitomizes a direct augmented reality experience is the "image target". 3D content is glued to a physical object or image to be overlaid or displayed digitally in the real world.



3D models emerge when a device camera or sensor spots the image target.

"THE IMAGE TARGETS"

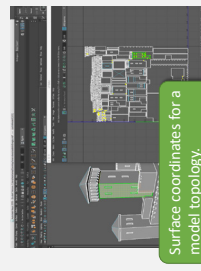
Augmented reality requires 3D models. In order to produce a meaningful experience, the user has to manipulate the model. The model must have a low poly count in order to display an effective interaction.



Optimized 3D models for virtual manipulation.

"THE OVERLAY": 3D MODELS

The most important component for a dynamic visualization in augmented reality is the texture and UV mapping deployment. AR interaction creates a compelling experience due to the realism of the models.



Surface coordinates for a model topology.

"THE SURFACE" MAPPING AND TEXTURING

Augmented reality allows the use of multiple "subtext", and its organization can be displayed through a hierarchical order.

TEACHING RESOURCES UTILIZED: IMAGE TARGET AND ANIMATION

Teaching new media such as Virtual Reality and Augmented Reality involves the use of a number of computing abstract definitions and processes that are not always easy to grasp. This work exposes how visual metaphors can help to understand this language, and how those can be implemented for an effective teaching methodology.

THE USE OF VIRTUAL REALITY AS A LEARNING AND TEACHING EXPERIENCE

The virtual reality project "The Wedding Chamber" is a research/creative endeavor instance where teaching has obtained a direct benefit from the active deconstruction of its components. A number of metaphors have surfaced as a result of the application of 3d modeling and mapping to display the content of the fresco. The more outstanding ones are: "The open room," "The Vaulted Ceiling," "The Small Models," "The Piazza," and "The Inspector".

These metaphors have a double value:

- Facilitate the understanding of the historic context of the fresco.
- Enable the configuration of a virtual space to teach the composition of the fresco.

"THE OPEN ROOM"

This metaphor was conceived to understand the architectural component of the myth narrative associated with the events taking place in the main fresco.



3D models with texture information.

This metaphor can be applied to any visual situation where objects need to be studied, in a wide range of disciplines:

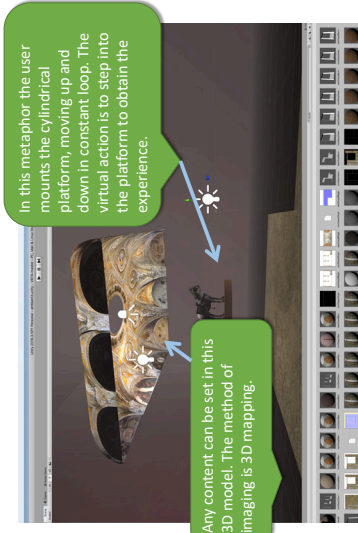
- Geosciences
- Biology
- Chemistry
- History

Center illumination to cast volumes and shadows.

This can be understood as a teaching device where the 3D models can be studied in an immersive space. In the open room the user can move or teleport to study each element.

"THE VAULTED CEILING"

This is the deconstruction of the ceiling of the fresco. In this specific case, the immersive experience of exploring from below, facilitates the understanding of a complex geometric layout.



Any content can be set in this 3D model. The method of imaging is 3D mapping.

In this metaphor the user mounts the cylindrical platform, moving up and down in constant loop. The virtual action is to step into the platform to obtain the experience.

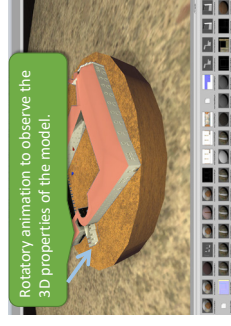
TEACHING RESOURCES UTILIZED: TELEPORTING AND PHYSIC ANIMATION

THE IMPLEMENTATION OF METAPHORS TO ACHIEVE LEARNING EXPERIENCES

Viewers are used to manipulating intuitively common computing metaphors such as *Window*, *Desktop*, or *Recycle Bin* among others. However, the creation of brand new metaphors will customize learning experiences through a hierarchy of navigation. In this specific case the contact with the subject is very close, in which then the object will display call outs, tooltips, roll overs, and visual cues as hypertext.



Object content displayed in a hierarchical mode.



Rotary animation to observe the 3D properties of the model.



Models set for grabbing and closer manipulation using hand controllers or hand tracking sensors.

TEACHING RESOURCES UTILIZED: INTERACTABLE OBJECT AND HAPTICS

"THE INSPECTOR"

This is a standard user interface metaphor in computer graphics, however, it can be used in multiple functions to display levels of content.

"THE PIAZZA"

In this case the metaphor is based on a rotary action. Users can appreciate precise details.

"THE MINIATURES"

In this case the metaphor is activated by the interactive object status of the small models.

References.

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- Usman of Samosata. *The Works of Usman: The Hall*. A.M. Translation. Yale University. 1972. Harvard University Press. P176-207.

A Successful Project-Based Learning Experience: Case Study of Fort Wayne Metal Research Project

Behin Elahi, Ph.D.

Assistant Professor

Department of Manufacturing and in Construction Engineering Technology, School of Polytechnic
Purdue University at Fort Wayne, 2101 East Coliseum Boulevard, Fort Wayne, Indiana 46805-1499, USA

elahi@ptf.wvu.edu

Introduction

- Project-based learning is an instructional approach planned to provide students with the opportunity to develop knowledge and skills through engaging projects set around the challenges and problems they may tackle in the real world.
- Such a technique presents opportunities for deeper learning in context and for the development of important skills tied to college and career readiness (Shaffer et al., 2014; Alves et al., 2012).
- Students' involvement in research projects is attracting more attention in the last decade (Shaffer et al., 2010; Harrison et al., 2011; Gavin 2011).
- Such experience allows students and instructors to collaboratively bridge the research and classroom and provide research experiences for students relative to traditional individual mentored research.
- Students who are engaged in research projects report cognitive gains such as a) learning to think and analyze, b) affective gains such as delight, c) psychosocial gains such as belonging to a team, identifying as an effective engineer, and d) behavioral gains such as motivations to pursue graduate education or careers in engineering (Downing et al., 2011; Amamou and Cheniti-Belcadi 2018; O'Sullivan 2013).

Objectives

- Improve the students' self-efficacy (like self-confidence and responsibility)
- Improve the students' attitude towards measurement techniques
- Enhance the students' understanding of the relevance of subject matter to life and society
- Improve the student's ability in decision making, problem solving skills, and applying concepts
- Enhance the ease of learning the subject matter for the students
- Enhance team working for the students
- **Second Project:** Students focused on an innovative idea to design, make, and test 3D printed fabrics to be used as a flexible skin for future spacecraft, spacesuits, or for deployable antennas.

Study Area & Problem Definition

- ✓ In Spring 2016, faculty asked students to apply one of course techniques on a numerical example as a course project while in the Spring 2018 the faculty decided to engage students in a real research project to apply an effective technique " Design of Experiment (DOE) " to solve a real problem in industry.
- ✓ Graduate student involvement in a research project to improve cutting glass process in an Auto-glass manufacturing company in IT 507 (Measurement and Evaluation in Industrial Technology) course in Spring 2018.
- ✓ The research projects provided an opportunity for the students to work in teams, enhance professionalism, and knowledge of contemporary issues – creating 'well rounded' and 'job market ready' engineers upon graduation. The research projects somehow improved students' understanding of measurement techniques, making over some other approach.
- ✓ **First Project:** Cold drawing is widely used metal forming process with integral advantages such as closer dimensional tolerances, better surface finish and improved mechanical properties as compared to hot forming processes. A team planned to focus on improving the ultimate tensile strength of L-605 @ wire by determining significant factors. L-605 @ wire has a number of applications in the aerospace industry and medical industry due to the fact that it maintains moderately high strength even in high temperatures. The cold drawing process has many variables that should be controlled to produce consistent wire properties. Their research focused on evaluation of the effect of speed, tension, and lubrication temperature on the ultimate tensile strength of the cold drawn L-605@ wire via the design of experiment technique. The data analysis verified that speed and tension factors, along with the interaction of speed and temperature, have significant effects on the ultimate tensile strength of the drawn L-605 wire.

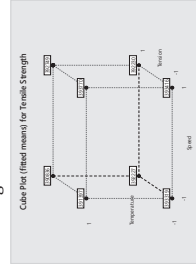


Figure 1. Using Measurement techniques (Contour plot and cubed plot) to analyze data.

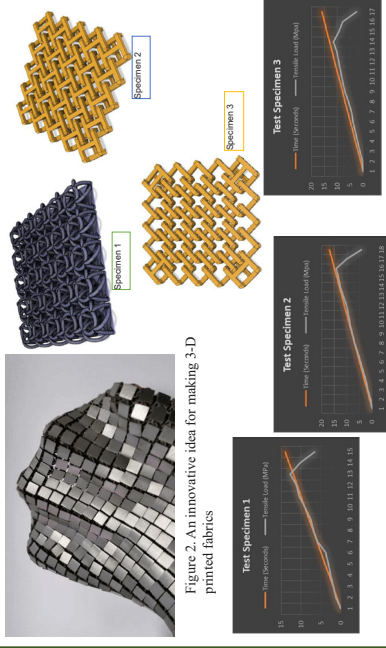


Figure 2. An innovative idea for making 3-D printed fabrics

Figure 3. Using Measurement techniques (Tensile test and statistical analysis) to analyze data.

Results, Discussion, & conclusion

Table 1. Post Survey Comparison between Course Offerings (Scale Likert 4 points)

Question	Spring 2016			Spring 2018			t-Test Statistic	P-Value	H0 Hypothesis at the 95% Confidence Level
	Mean	Std Dev.	Sample Size	Mean	Std Dev.	Sample Size			
1. The instructional materials, class activities, link assignments, and other research projects were integrated in a way that made my learning more effective.	2.86	0.89	319	3.19	0.73	249	2.49	0.012	Accepted
2. The instructor's projects, class research projects, and assignments helped me to learn the course topics.	2.54	0.99	362	3.62	0.76	234	2.34	0.001	Accepted
3. The instructional materials and research project assignments increased my self-confidence.	3.14	0.78	382	3.82	0.74	256	2.56	0.001	Accepted
4. The instructional materials and working on a research project with the instructor increased my confidence in learning by using the instructional materials and working on a research project with the instructor.	2.16	0.94	369	3.69	0.72	227	2.27	0.001	Accepted
5. The instructional materials and the assignment to research project helped me assume a greater responsibility for personal learning.	2.56	0.88	316	3.16	0.8	242	2.42	0.001	Accepted

Year	MGT 50700 Exam			Final Exam		
	Average	Standard Deviation	Number of Students	Average	Standard Deviation	Number of Students
2016	81.3	6.9	85.6	4.2	4.2	39
2018	89.6	5.2	91.2	5.2	3.9	39

Selected References:

- Alves, A.C., Moreira, E., Lima, R., Sousa, R., Dinis-Carvalho, J., Mesquita, D., Fernandes, S. and van Hatlum-Janssen, N., 2012. November. Project Based Learning in first year, first semester of Industrial Engineering and Management: some results. In ASME 2012 International Mechanical Engineering Congress and Exposition, pp. 111-120. American Society of Mechanical Engineers.
- Harrison M., et al. (2011). Classroom-based science research at the introductory level: changes in career choices and attitude. CBE-Life Sci. Educ. 10, 279-286.
- Shaffer, C.D. et al. (2014). A Course-Based Research Experience: How Benefits Change with Increased Investment in Instructional Time. CBE-Life Sci. Educ. 13, 111-130.

STUDENT RESOURCES

QUICK GUIDE 2019

HEALTH AND WELLNESS NEEDS

- Student Assistance Program (SAP)
Counseling Services
 - PFW/ Headwaters Counseling
- Child Care - The Learning Community
- Safe Zone
- Campus Health Clinic
- University Police

ACADEMIC SPECIAL PROGRAMS

- Honors
- International Programs
 - International Education, Office of Student Exchange Program
- CO-OP Program
 - Office of Academic Internships, Cooperative Education and Service Learning, OACS
- Internships (OACS)

RESOURCES FOR SPECIFIC GROUPS

- Center for Women and Returning Adults
- Services for Students with disabilities
- Diversity and Multicultural Affairs
 - TRIO - diverse students particularly first generation
- Office of International Education
- Mastodon Academic Performance Center (Athletes)

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- Financial Aid
- Housing Information
- Brown Ink Society

ACADEMICS SUPPORT

- Math and Science Tutoring Center
- Writing Center
- Tutoring Center - Library
- Help Corner - Engineering
- Foreign Language Lab

TEACHING SUPPORT

- CELT
- The Alliance
- FACET

