



HUSSON
UNIVERSITY

Research & Scholarship Day 2026

April 16th, 2026

Beardsley Meeting House
& The Gracie Theatre



Welcome to Husson University's 16th Annual Research and Scholarship Day.

The Research and Scholarship Day celebrates the spirit of academic curiosity, intellectual exploration, and the meaningful contributions made by our students, faculty, and staff. It reflects Husson's commitment to fostering a dynamic learning environment where inquiry, innovation, and collaboration are at the center of the academic experience.

The abstracts presented in this collection represent a wide range of disciplines and perspectives, highlighting the depth and diversity of scholarship across the University. From scientific investigation and clinical research to creative works and applied projects, each submission demonstrates a dedication to advancing knowledge and addressing real-world challenges.

Research and Scholarship Day underscores the importance of experience-based learning. Through these projects, students engage deeply in their fields, develop critical thinking skills, and contribute to ongoing conversations within their disciplines. These experiences not only enrich their education but also prepare them to lead, innovate, and make an impact in their professions and communities.

We are especially honored to welcome Dr. Jude Maul as this year's keynote speaker. Dr. Maul serves as a Research Ecologist with the United States Department of Agriculture-Agricultural Research Service (USDA-ARS) in the Sustainable Agricultural Systems Laboratory.

We extend our sincere appreciation to the Annual Research and Scholarship Day Planning Committee, chaired by Drs. Cody Edson and William 'Bill' Lindblad, for their leadership and dedication in organizing this event. We also thank the many faculty and staff whose mentorship and support make this work possible. Their guidance is instrumental in cultivating a culture of inquiry and academic excellence at Husson University.

We commend our student researchers and presenters for their initiative, creativity, and commitment. Your work is a testament to the strength of our academic community and the promise of future discovery.

Thank you for being part of this important tradition and for celebrating the achievements represented in these pages. We hope you find this collection engaging and inspiring.

Victor M. Brown, PhD, MBA
Vice President of Academic Affairs and Provost

HUSSON UNIVERSITY

Sixteenth Annual Research and Scholarship Day
Beardsley Meeting House & Gracie Theatre
April 16, 2026

Schedule of Activities

8:00 – 9:00 AM	Posters put-up in the Atrium of the Gracie Theatre
8:00 – 9:00 AM	“Cheers & Jeers” – Research demonstration Gracie Theater
9:00 – 11:00 AM	General viewing of posters (authors need not be present)
11:00 – 1:00 PM	Poster viewing w/authors (last ½ hr not mandatory)
9:30 – 1:00 PM	Oral presentations – The Gracie Theatre
11:30 – 1:00 PM	Box luncheon for all presenters
1:00 – 2:25 PM	Plenary session – The Gracie Theatre
	Opening Remarks & Distinguished Faculty Research Award
	Presentation: Victor M. Brown, PhD, MBA, Vice President for Academic Affairs and Provost
	Distinguished Faculty Research Award – Presented to:
	Michael Camrie, MBA, PhD, Director of Corporate Partnerships, Program Coordinator, College of Business, School of Business and Management
	Comments from the Distinguished Faculty Research Award Recipient
	Introduction of Keynote Speaker: Cody Edson, PhD, Chair – Research and Scholarship Day Committee
1:25 – 2:25 PM	Keynote speaker: Jude Maul, PhD Research Ecologist United States Department of Agriculture – Agricultural Research Service, Beltsville, Maryland

Plenary Speaker Brief Biography

Dr. Jude Maul serves as a Research Ecologist with the United States Department of Agriculture's Agricultural Research Service (USDA-ARS), where he works in the Sustainable Agricultural Systems Laboratory. He began his academic journey with a Master of Science in Plant Biochemistry from the University of Kentucky and went on to earn his Ph.D. in Horticulture and Biogeochemistry from Cornell University in 2008.

Dr. Maul's research centers on molecular ecology at the critical intersection of plants, soil, and water. His work explores how these systems interact to influence plant health, nutrient uptake, and overall agricultural productivity. By applying advanced molecular and metagenomic techniques, he investigates the roles of both beneficial and harmful microorganisms associated with soil and plants, with the goal of understanding how these microbial communities affect crop resilience and performance.

Through this research, Dr. Maul contributes to the development of practical strategies that help farmers manage plant diseases more effectively and reduce crop losses, ultimately supporting more sustainable and efficient agricultural systems. In addition to his research, he plays a key leadership role as head of the Soils Working Group within the USDA Long-Term Agroecosystem Research Network. In this capacity, he is helping to build a national soil data repository designed to enhance large-scale soil health research and improve consistency in data collection across regions.

Dr. Maul collaborates extensively with scientists and stakeholders across the country, advancing understanding of how environmental conditions and land management practices influence soil systems over time. His work has had a significant impact in the fields of soil science and agroecosystem research, as reflected by more than 5,800 citations and an h-index of 34.

Previous Plenary Session Speakers

2010	Janet M. Hock, BDS, PhD Executive Director, Maine Institute for Human Genetics & Health
2011	Leslie Devaud, PhD Professor & Chair, Department of Basic Pharmaceutical Sciences, Husson
2013	Habib J. Dagher, PhD B.I.W. Professor of Structural Engineering, University of Maine
2014	Edison Liu, MD President and CEO, The Jackson Laboratory
2015	Rita E. Freed, PhD John F. Cogan Jr and Mary L. Cornilla Chair, Department of Art of the Ancient World, Museum of Fine Arts, Boston, MA
2016	Elof Eriksson, MD, PhD Joseph E. Murray Professor of Plastic & Reconstructive Surgery, Harvard Medical School, Chief of Plastic & Reconstructive Surgery, Brigham & Women's Hospital
2017	Steven R. Cunningham, PhD Dr. Phil Grant Distinguished Professor of Management & Economics, Husson University
2018	Susan L. Santangelo, ScD Research Professor of Psychiatry, Tufts University School of Medicine, Director, Center for Psychiatric Research, Maine Medical Center Research Institute
2019	Ron Korstanje, PhD Assistant Professor and Co-Director, Nathan Shock Center of Excellence in the Basic Biology of Aging, The Jackson Laboratory
2021	Clifford Rosen, MD Senior Scientist and Director, Center for Clinical & Translational Research, Maine Medical Center Research Institute
2022	Jane L. Snowden, PhD, FAMIA Deputy Chief Science Office, Science Operations, IBM Watson Health, T.J. Watson Research Center

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| 2023 | Iain Drummond, PhD
Professor and Director, Kathryn W. Davis Center for Regenerative Biology and Aging, MDI Biological Laboratory |
| 2024 | Roger Phipps, PhD
Emeritus Professor of Pharmaceutical Sciences, Husson University |
| 2025 | Lon Cardon, PhD, FMedSci
President and Chief Executive Officer, The Jackson Laboratory |

Previous Recipients of the Distinguished Faculty Research Award

2010	Dr. Phil Grant Professor of Management, School of Business
2011	Dr. Shuhua Bai Assistant Professor of Pharmaceutics, School of Pharmacy
2012	Dr. William J. Lindblad Professor of Pharmacology, School of Pharmacy
2013	Dr. Ben Sidaway Professor of Physical Therapy, College of Health and Education
2014	Dr. Karl Bishop Associate Professor of Chemistry, School of Science and Humanities
2015	Dr. Tianzhi Yang Assistant Professor of Medicinal Chemistry, School of Pharmacy
2016	Dr. Anthony Casapao Assistant Professor of Pharmacy Practice, School of Pharmacy
2017	Dr. Cristanna Cook Associate Professor, School of Business & Management, College of Business
2018	Dr. Yanyan Li Assistant Professor of Nutrition, College of Science and Humanities
2019	Paul Morrow, Sr, JD Associate Professor, School of Business and management
2020	Dr. Tao Zhang Assistant Professor, School of Pharmacy
2021	Dr. Jonathan Bayless Professor, College of Science and Humanities
2022	Dr. Karen Huhn Professor and Chair, Physical Therapy Program
2023	Dr. Samuel Caito Assistant Professor, School of Pharmacy

2024	Dr. Ben Sidaway Geneva Allen Distinguished Professor, School of Physical Therapy
2025	Dr. Jun Dajung Assistant Professor, College of Business

ABSTRACTS

MULTIMEDIA PRESENTATIONS

College of Business
NESCOM

Abstract No. BU-1

PRODUCT PACKAGE DESIGN & THE CREATIVE PROCESS

Emma Blow, Nicole Brooks, Emmalisa Dearing, Eli Delano, Emily Gallagher, Keegan Plourde, Samantha Raymond, Annabelle Reardon

(Faculty Advisor: Theresa Ayotte)

The United States accounts for approximately 28–34% of the global packaging design market, making it one of the largest and most influential markets worldwide. This is reflected in consumer behavior, with 72% of consumers saying packaging design influences their purchasing decisions. As a result, packaging design has become one of the fastest-growing areas within the graphic design field.

In Graphic Design II, one of the assignments is to design a product package. Before beginning the design work, students create a process book that documents the development of their packaging solution. This project addresses a specific design problem and target audience while focusing on introducing a new product and developing a cohesive packaging system that clearly communicates its purpose, appeals to intended users, and stands out in a competitive market.

Research is a key component of this process. Students analyze competitors, industry trends, and target demographics to inform their design decisions. This research supports both functional requirements and branding goals, while visual and competitor analysis helps identify opportunities for differentiation. The creative process involves brainstorming and developing ideas through sketches, mood boards, and explorations of typography and color, leading to a refined visual direction. Feedback from peers and the instructor further supports the evolution of the concept, improving clarity, hierarchy, and overall design effectiveness.

The final deliverables include both a completed process book and the assembled product packaging. Together, these components demonstrate the full design process, from initial research and concept development to a finished solution that responds to both industry standards and consumer needs.

College of Business
School of Technology and Innovation

Abstract No. BU-2

EXTENDED REALITY PROJECTS IN XR277: IMMERSIVE, INTERACTIVE, AND INTEGRATED ENVIRONMENTS

Alexa Nadeau, Anthony Thy, Logan Chaput, Ash Kennett, Connor Dorr

(Faculty Advisor: Brave Williams)

A collection of student projects from XR277 at Husson University presents extended reality (XR) experiences developed around three core criteria: immersion, interaction, and integration. During the Spring 2026 semester, students created individual projects that are spatially registered in three-dimensional space, enabling users to engage with digital content in a physically coherent environment.

Each project supports interaction within three-dimensional space, requiring active user engagement through movement, input, or system response. Projects also incorporate integration by combining real and virtual elements into unified mixed-reality experiences.

The work demonstrates a range of applications and design approaches, highlighting how foundational XR principles can be translated into functional experiences. Through iterative prototyping, students addressed challenges related to spatial computing, user interaction, and real-time responsiveness.

Collectively, these projects illustrate the potential of XR as a medium for immersive and interactive experiences while emphasizing the role of hands-on development in building technical and conceptual understanding. This showcase reflects how students apply core XR principles to create meaningful, real-time applications within an academic setting.

College of Business
School of Technology and Innovation

Abstract No. BU-3

AI CHATBOT FOR PUBLIC FACING BUSINESS WEBSITE

Norbert Shema, Michael Desjardins

(Faculty Advisor: Michael Knupp, PhD)

The ScoobySquad AI Agent is an intelligent customer support and workflow automation system designed to enhance the efficiency and scalability of a small service-based business specializing in pet waste removal. This capstone project integrates modern artificial intelligence techniques, including natural language processing and retrieval-augmented generation (RAG), to create a responsive chatbot capable of answering customer inquiries, guiding service requests, and supporting internal operations. The system is built using a combination of web-based technologies, a vector database for semantic search, and automation workflows powered by n8n to connect customer interactions with business logic. At its core, the AI agent leverages a structured knowledge base stored in a cloud database, where frequently asked questions and operational data are embedded into vector representations. When a user submits a question through the website chat interface, the system retrieves the most relevant information using similarity search and generates a context-aware response. This approach allows the AI agent to provide accurate, conversational answers while continuously improving as new data is added. Additionally, n8n enables seamless orchestration of backend processes, such as handling incoming requests, routing data between services, and supporting potential integrations like scheduling and customer management systems. The value of this project lies in its ability to demonstrate how advanced AI technologies can be applied to small, local businesses to improve customer experience and operational efficiency. By reducing the need for constant manual communication, the ScoobySquad AI Agent allows business owners to focus on service delivery while maintaining high-quality customer engagement. This project highlights the growing importance of AI-driven solutions in modern business environments and showcases a practical implementation of intelligent automation.

College of Business
School of Technology and Innovation

Abstract No. BU-4

IMMERSIVE DIGITAL AUDIO WORKSTATION

Colby Hope, Dylan Avelange, Eric Ahlers

(Faculty Advisor: Michael Knupp, PhD)

This project is a spatially driven Digital Audio Workstation (DAW) concept that reimagines the typical music creation process by placing the user inside a digital recreation of a studio environment using virtual reality. This project explores how music composition, collaboration, and performance can be made more intuitive and accessible by positioning musical creation tools within a virtual 3D space. Users can interact with instruments and engage with elements of the music creation process through immersive, hands-on experiences in virtual reality. In some cases, this approach can make these tools more accessible to individuals who may not have access to a dedicated mixing or music creation space. Our focus is on emulating as much of the music creation and mixing process as possible while ensuring the environment runs smoothly on standalone VR hardware, usability, and realism.

College of Science and Humanities
Fine Arts**Abstract No. SH-1****IN PROGRESS (ALWAYS) – A RETROSPECTIVE EXHIBITION**

Janelle Delicata, BFA, MFA; Kathi Smith, BFA, MFA

Janelle Delicata, MFA, adjunct faculty in Fine Arts will present 25 mixed media artworks, which include a combination of paintings, drawings and assemblage in the WBRC Gallery, Gracie Theatre. In the discipline of Fine Arts, scholarship includes the dissemination of creative works through exhibition. This body of work encompasses visual exploration with abstract and landscape-based forms created over the last 30 years. The works in this show were selected from pieces from the 1990s to 2025. As the artist looked through the work, she recognized recurring forms and shapes. Delicata looks beyond the surface of her motifs and explore what's not readily visible. Her explorations start in reality but she works intuitively. Delicata believes that her art, like in her life, is a work in progress. It's an ongoing journey, a constant search and exploration—in progress, always. This sentiment is shared both conceptually and aesthetically by many Modernist art movements, including but not limited to the Abstract Expressionist, Cubists, and even Surrealist artists of the 20th century. Delicata takes a contemporary lens to a familiar subject of form inspired by landscape.

Delicata believes that all art is autobiographical in that each artist's work is influenced and informed by his/her perceptions and life experiences. She interprets influences and forms from land, water, sky and elemental forces to create a personal iconography and language. Her earlier work incorporates more dimensional elements whereas the more recent work, while layered, has more flat surfaces. All include explorations in texture, color, line, and movement.

Janelle Delicata was born and raised in Newton, Massachusetts. She lived and worked throughout the eastern United States and Canada before settling in Maine in 1986. She works in several media and likes to "mix things up," incorporating elements from one medium into another.

Delicata earned a BFA at the Maryland Institute, College of Art, Baltimore, MD in 1975 and an MFA at Rochester Institute of Technology's School for American Crafts, Rochester, NY in 1983 with a major in Weaving & Textile Design and a minor in Jewelry & Metals. She is an artist member of the Maine Crafts Association and a member of the Union of Maine Visual Artists. She owns a small business creating and selling my jewelry and artwork.

ABSTRACTS

POSTER PRESENTATIONS

College of Business
School of Technology and Innovation

Abstract No. BU-5

EARLY WARNING FOR CAMPUS CYBER RISKS

Elvis Mwiseneza

(Faculty Advisor: Marlon Lagulos)

Cyberattacks are a growing problem for colleges and universities. A single phishing email, stolen password, or infected device can interrupt classes, expose private records, and create major costs for colleges and universities. This project presents XCampus cyber risk monitor, a small lightweight cybersecurity risk monitor designed to give early warning signs before a major or minor incident happens. Instead of only detecting attacks after they begin, the system looks for behavior patterns by learning the pattern and that shows risk is increasing over time. It analyzes six main types of activity such as login failures, suspicious IP access, unusual file downloads, new device connections, phishing email patterns, and privileged access attempts from users. Because real campus security data is private, the project uses realistic designed synthetic data to simulate activity across departments such as finance, admissions, registrar, library, research, and student services. The data is cleaned and grouped by department and system, then transformed into features such as off-hours activity, sudden event spikes, and changes in external access. These features are used in three approaches which are; a machine learning model for risk prediction, an anomaly detection model for unusual behavior, and a rule based baseline for comparison. The system combines these outputs into a final risk score and classifies each department or system as low, medium, or high risk. Results from the prototype, it shows that the predictive model performed better than the rule based method, while anomaly detection helped to show suspicious patterns. The final product includes a simple dashboard for viewing risk levels and trends. This study shows that a practical and low cost early warning system can help universities move from reactive security toward proactive cyber risk management.

College of Business
School of Technology and Innovation

Abstract No. BU-6

A BROWSER-EMBEDDED XR SIMULATION MODEL FOR EXPERIENTIAL ANIMAL BEHAVIOR TRAINING IN ONLINE STEM EDUCATION

Tharun Thiyagarajan

This paper looks at a common issue in online education, where many courses still depend heavily on readings, slides, and recorded lectures. While these are useful for delivering content, they often do not give students enough opportunities to actively engage or learn through experience. This is especially noticeable in areas like animal behavior education, where students are expected to interpret subtle cues, understand context, and develop observational skills. In a fully online setting, access to real environments and live animals is limited, and repeated use of animals also raises safety and ethical concerns.

To address this, the project presents a browser-based, XR-ready simulation designed specifically for online learning. The system allows students to explore a virtual veterinary clinic, interact with the environment, and switch between human and canine perspectives to better understand behavior. Since the simulation runs directly in a web browser, it does not require VR headsets or specialized hardware, making it easier to access across different devices.

The design focuses on keeping the system lightweight and usable within typical online learning constraints. This includes managing performance in the browser, optimizing assets, and supporting interaction through standard input devices. The simulation can be used in both live sessions and self-paced learning environments.

This work is presented as a design and implementation effort that explores how browser-based XR can be used to support more active learning in online STEM and STEAM education. A more structured evaluation of learning outcomes is planned as a next step.

College of Business**School of Business and Management****Abstract No. BU-7****A REVIEW, ANALYSIS, AND RESTRUCTURING OF THE HUSSON STOCK INDEX**

Henry Fraser

(Faculty Advisor: Jia Liu, MS, MS, MS, PhD)

The Husson Stock Index (HSI), developed by Marie Kenney under the supervision of Associate Professor J. Douglas Wellington, aims to track the performance of the Maine Economy through the tracking of various publicly traded companies. These companies are either Maine-based or contribute significantly to the economy in Maine through revenue or employment. Since its introduction, numerous companies have been removed from the index, bringing the total down to 23. Additionally, there has not been a major statistical review of the tracking efforts of the index since its creation. This study aims to identify new companies to be added to the index, create a new weighting system that more accurately represents each company's contribution to the state, and conduct a statistical review of past performance in relation to the Maine economy. The addition of four new companies and the reformatting of the index proves to be necessary to further the development of the index. The statistical review has shown that the HSI and other relevant large stock indexes are ineffective in tracking the real GDP growth of the Maine economy. Beyond laying the groundwork for future additions of companies and new weighting methods, we also seek to open a new path towards the creation of a tracker for the real GDP growth of the State.

College of Business**School of Business and Management****Abstract No. BU-8****SWIPE RIGHT ON LEADERSHIP – GEN Z’S WORK EXPERIENCE PREFERENCES**

Michael Camire, PhD; Elizabeth Bland, DBA

As Generation Z (born 1997–2012) enters the workforce, managers face a potential shift in expectations and supervisory dynamics. Unlike previous cohorts, Gen Z has been shaped by a fully digital upbringing, resulting in both advanced tech fluency and heightened anxiety from navigating between online and offline worlds. Existing research has focused largely on Baby Boomers, Generation X, and Millennials, leaving a gap in understanding how Gen Z’s needs may differ from those of the leaders who will manage them. This study investigates Gen Z’s preferences for supervisory behaviors and workplace conditions through an anonymous online survey distributed via social media platforms. Participants identify their generational cohort, rank ten workplace priorities, and describe ten supervisory practices they most value. Preliminary hypotheses suggest that Gen Z will prioritize meaningful, engaging work, authentic leadership, and stronger work–life balance over traditional career-centered approaches. By illuminating generational differences, this research seeks to inform leadership strategies that foster connection, authenticity, and productivity in the modern workplace.

College of Health and Professional Studies
School of Nursing**Abstract No. NU-1****EFFECTIVE NON-PHARMACOLOGICAL PAIN MANAGEMENT IN PEDIATRIC
INTENSIVE CARE UNIT PATIENTS**

Addison Rizzo

(Faculty Advisor: Sarah Bedi, DNP, FNP-C)

Effective pain management in pediatric intensive care unit (PICU) patients is a critical nursing responsibility. When pain is not properly managed, it can lead to negative physical and psychological outcomes, including increased blood pressure, weakened immune function, delayed healing, and prolonged recovery. Pain also affects a child's emotional well-being, sleep quality, and behavior, which may extend hospital stays. Because children in the PICU often have limited ability to communicate their pain, fear, and frustration, it can heighten their emotional distress. Hospitalization and unfamiliar procedures can be overwhelming, making individualized pain management strategies essential.

This evidence-based practice review explores how non-pharmacological pain management strategies, such as distraction techniques, compare to pharmacological interventions in reducing pain and anxiety among pediatric ICU patients. The clinical question guiding this review asks: In pediatric ICU patients, how do non-pharmacological pain management measures, such as distraction techniques, compared to pharmacological measures, affect pain reduction and the need for medications during the ICU stay? Evidence for this review was gathered from the CINAHL, PubMed, and Cochrane Library databases using key terms including non-pharmacological interventions, distraction techniques, pediatric intensive care unit, and pain management.

Research demonstrates that non-pharmacological strategies such as music therapy, audiobooks, and hand massage can significantly reduce pain and fear in pediatric patients. These approaches provide comfort, decrease anxiety, and address children's developmental and emotional needs during hospitalization (Akay et al., 2024b). While pharmacological interventions remain important for managing pain and supporting recovery, they carry risks such as respiratory depression and oversedation. Integrating non-pharmacological methods alongside medication can reduce these risks while improving patient comfort and overall outcomes (Alemdar et al., 2023d). Expanding nurse training and incorporating these strategies into care plans may enhance pediatric pain management and create a safer, more supportive environment for children and their families.

College of Health and Professional Studies
School of Nursing**Abstract No. NU-2****EXPLORING THE RELATIONSHIP BETWEEN GENETIC VULNERABILITY AND
ADDICTION IN DRUG-INDUCED PSYCHOSIS**

Sophia Martinez

(Faculty Advisor: Sarah Bedi, DNP, FNP-C)

The primary question of this study is whether a family history of psychosis and an increased risk for an individual who struggles with addiction to experience drug-induced psychosis? The study aims to identify what drug-induced psychosis is and how it differs from other variations of psychosis, while exploring underlying factors. The overall research is a literature review of three separate sources with a patient sampling ranging from 48-148 individuals. The first study discovered there are risk factors, such as drug use, that can increase an individual's likelihood of developing this disease. While the second study focuses on a family history of psychosis and substance abuse, both separated and combined in individuals, to identify if one influences the other. The final study was a comparison of individuals who had primary psychosis with comorbid drug abuse and drug-induced psychosis: Diagnostic and clinical evolution at follow-up. The study revealed that overall, both groups showed similar diagnosis stability over time. There was no evidence that symptoms in drug-induced psychosis groups improved more after stopping substance abuse. Collectively, the evidence suggests that a family history of psychosis and a history of substance abuse are independent factors. Indicating a family history does not directly influence the likelihood of developing drug-induced psychosis if the individual is struggling with addiction. While these factors may not directly influence each other, both of them can increase the risk of the individual experiencing drug-induced psychosis.

College of Health and Professional Studies
School of Nursing**Abstract No. NU-3****CORRELATION BETWEEN SOCIAL MEDIA AND MENTAL HEALTH IN ADOLESCENTS**

Faith Tillotson

(Faculty Advisor: Sarah Bedi, DNP, FNP-C)

In adolescents, how does limiting social media use or not using it at all, compared with using social media often, affect symptoms of anxiety and depression over 6-12 months? A search was conducted using CINAHL and PsycINFO through the Husson University Library database. For the searches, the keywords used were social media, mental health, and adolescents. Along with this, filters were added for peer-reviewed, full-text, and published within the past 10 years. Social media among adolescents is a growing public health concern. There has been a concerning association between the increase in anxiety and depression symptoms. Evidence from the studies reviewed shows the correlation between excessive or addictive social media use and mental health challenges. These mental health challenges include mood disturbances, sleep disturbances, and self-diagnosed anxiety and depression. The research reviewed suggests that the quality and addictive patterns of social media use, rather than just the duration, are essential factors that play a role in the mental health of adolescents. Limiting social media usage or addressing addictive patterns early on may reduce these mental health risks in adolescents. The data support evidence-based nursing practice by emphasizing the importance of routine psychosocial screenings. These screenings would include social media habits, sleep patterns, and self-reported mental health symptoms. Nurses could play a key role in reducing the effects of social media on mental health. Educating families, setting realistic boundaries, and referring adolescents to resources for mental health can prevent or decrease anxiety and depression symptoms. Implementing routine screening for social media use and mental health symptoms during adolescents' yearly physicals or school nurse visits to educate and identify adolescents who may be at risk of developing mental health concerns due to their social media usage. The next step would be to conduct longitudinal research to evaluate how these interventions can impact symptoms of anxiety and depression in adolescents over a period of time to provide more substantial evidence for clinical guidelines and education development.

College of Health and Professional Studies
School of Occupational Therapy**Abstract No. OT-1****Supporting Occupational Engagement in Forensic Settings: An Evidence-Based Review**

Victoria Stengel, OTS.; Kailey Brogno, OTS, BS.; Kimberly A. Davis, OTD, MS, OTR/L, FAOTA

(Faculty Advisor: Kimberly A. Davis, OTD, MS, OTR/L, FAOTA)

Background: Forensic occupational therapy is a small yet expanding practice area focused on helping individuals in the criminal justice system build skills, regain independence, and successfully re-engage in meaningful daily life. Occupations treated most consistently include education, employment, and housing. Financial management, family/parenting, and social skills were addressed however, less often. Basic needs (food and clothing), transportation, physical health (including sexual health/HIV risk), obtaining identification (driver's license/social security card), and religion or spirituality are rarely explored (Moore et al., 2020).

The purpose of this review is to determine if occupation based interventions will reduce recidivism and the potential impact of having occupational therapy services available for individuals who are currently incarcerated. Determine the outcome when services are provided and if that impacts the ability to remain in the community after release.

Using the scoping review methodology framework from Arksey & O'Malley, 2005, we completed the six stages to answer the research question. The stages include identifying the research question; identifying relevant studies; study selection; charting the data; collating, summarizing, and reporting results. Reporting will be guided by the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).

College of Health and Professional Studies
School of Occupational Therapy**Abstract No. OT-2****ASSESSING THE COMMUNITY MOBILITY NEEDS OF COMMUNITY DWELLING
OLDER ADULTS**

Taylor Beaulieu, Katelyn Munro, Andrea Richardson, Hanah Salter

(Faculty Advisor: Cavanaugh Kelly, PhD, MS, OTR-L)

Community mobility is defined as the ability to navigate through the world safely and independently, which allows people to participate in daily life, stay connected, and get where they need to go. Community mobility enables individuals to access resources, participate in meaningful activities, maintain independence, and stay socially connected within their communities.

Populations impacted by community mobility barriers include older adults, individuals with disabilities, people with chronic health conditions, and those living in rural or socioeconomically disadvantaged areas. Older adults, in particular, face multiple barriers to community access, including limited financial resources, inaccessible built environments, and insufficient transportation options. Age-related physical, sensory, and cognitive changes further complicate safe navigation and use of transportation. Rural isolation, long-traveled distances, and lack of nearby services intensify these challenges. Together, these barriers restrict participation in meaningful activities, increase dependence, and contribute to social isolation and poor health outcomes.

There are multiple solutions to improve community mobility and reduce accessibility barriers. Telemedicine and mobile clinics are two key approaches to improving access to healthcare in rural areas. Skilled mobility device and balance training, patient-centered medical homes, and coordinated care, can also help to lower costs, and improve functional mobility. Additionally, supports for transportation, such as subsidized driving assistance, have been noted to enhance independent community participation and access.

In this study of individuals in an elderly housing complex, community mobility barriers will be identified through the Occupational Therapy Checklist of Community Mobility Skills (CCMS) survey, and qualitative interviews, to examine issues regarding transportation access, financial limitations, physical mobility, safety concerns, and social supports. Data will then be used to target potential solutions, such as referral to local ride-share programs, travel buddy systems, Personal Support Specialists (PSS) for community tasks, increased access to telehealth, and student liaison assistance through a resource app to coordinate needs.

College of Health and Professional Studies
School of Occupational Therapy**Abstract No. OT-3****ADHERENCE VARIANCE OF DIFFERING EXERCISE PROGRAMS FOR INDIVIDUALS
WITH UPPER EXTREMITY TENDONITIS**

Laura Martel

(Faculty Advisor: Cavanaugh Kelly, PhD, MS, OTR-L)

Upper extremity tendonitis is a broad and common diagnosis that may be improved by conservative treatment methods, such as rehabilitative exercise programs to reduce pain and improve function. Upper extremity exercise programs for tendonitis have been shown to enhance quality of life through improved pain experiences, physical functioning, and functionality of the affected limb. A key aspect of exercise interventions is a home exercise program (HEP), where patients are asked to do prescribed exercises outside the clinic. HEPs are becoming an increasingly prevalent delivery methodology for exercise programs due to the increasing cost of therapy and need for transportation to outpatient therapy services. Home exercise programs can be delivered in a variety of forms. Due to a multitude of factors, such as limited medical insight, forgetfulness, and limited social support, home exercise programs may result in a lack of adherence from clients that can lead to persistent pain and limited functionality.

The aim of this research study is to determine the variance of adherence rates between three identified types of home exercise programs, written only, written with images, and individualized videos. In order to determine the variances between the three identified home exercise programs, a study is proposed to compare surveyed HEP patient compliance at an outpatient occupational and physical therapy clinic. The survey to be completed by patients is the Adherence to Exercise for Musculoskeletal Pain Tool (ATEMPT). The ATEMPT survey has demonstrated validity in assessing compliance behaviors, confidence to perform each exercise, and perceived difficulty of the exercises prescribed. Following the collection of data samples from participants, statistical analysis will compare the three established home exercise programs to determine which home exercise program provided the greatest adherence rates. Data from the analysis will then potentially drive future decisions and design of HEPs at the clinic to maximize patient participation and benefit.

College of Health and Professional Studies
School of Occupational Therapy**Abstract No. OT-4****PEDIATRIC OCCUPATIONAL THERAPISTS' PERSPECTIVES ON BARRIERS AND FACILLITATORS TO HOME PROGRAM PARTICIPATION**

Mara Poulin, OTS; Lydia Boucher, BS, OST; Maureen O'Roak, OTS

(Faculty Advisor: Lauren Fysh, OTD, MS, OTR/L)

This study explores pediatric occupational therapists' perceptions of barriers and facilitators that influence a family's participation in home programming for their child. Home programs are a central component of pediatric occupational therapy practice and support skill development and the generalization of therapeutic gains across different environments. Research suggests that embedding interventions within a family's natural routine can actively promote meaningful participation in children. This can be through the occupations such as play, feeding, and everyday activities. Factors such as caregiver stress, socioeconomic constraints, geographic location, and characteristics of the home environment may negatively affect the family's engagement and overall adherence to the program's structure during their interactions with the program. Creating routines can help with providing structure, predictability, and security for both the children and their caregivers. This makes routines more effective in the context of the intervention. Despite the given evidence, there are still barriers to successful home program implementation.

A qualitative survey design was used to gather perspectives from licensed pediatric occupational therapists who work in outpatient clinical settings. Open-ended survey questions were distributed electronically to outpatient pediatric clinics in Maine to collect descriptive information on therapists' experiences, the perceived barriers families face, and strategies used to support engagement in home programming. Participation was voluntary and anonymous to encourage honest and detailed responses. The collected data were analyzed using thematic analysis to identify recurring patterns across the responses.

Findings from this study aim to inform more contextually responsive home programming approaches and identify strategies that may improve family implementation. Having a stronger understanding of therapists' perspectives on the barriers and facilitators of programming can help identify and enhance the implementation, engagement, and long-term sustainability of pediatric occupational therapy interventions delivered in the home context.

College of Health and Professional Studies
School of Occupational Therapy**Abstract No. OT-5****PARENT-PERCEIVED BARRIERS AND FACILITATORS TO ACCESSING PUBLIC LIBRARIES FOR CHILDREN WITH SENSORY PROCESSING DIFFERENCES**

Haylee Salter, OTS; Amelia Morrison, OTS; Hailee McCoy, BS, OST;

(Faculty Advisor: Lauren Fysh, OTD, MS, OTR/L)

Sensory processing differences in children often create challenges with accessing environments and participating in community settings due to how they process and respond to sensory input. One public setting that may present challenges for these children is the public library. Public libraries are important community spaces that help support reading, learning, and social connection. However, environmental stimuli such as noise, bright lighting, visually busy spaces, and unpredictable social interactions can make it difficult for some children and their families to comfortably use these spaces. Despite growing awareness of sensory-friendly practices in community settings, there is limited research exploring parent perspectives on access to public libraries.

The purpose of this qualitative study is to examine parent-perceived barriers to accessing public libraries for children with sensory processing differences and to identify environmental factors and supports to facilitate inclusive participation. Participants must be a parent or caregiver of a child who is experiencing difficulty accessing public spaces, such as a library, due to sensory processing difficulties. Participants were recruited through a voluntary online survey comprising nine open-ended parent-focused questions, distributed via social media and community groups.

Survey responses will be analyzed using descriptive thematic analysis to identify common themes related to environmental barriers and facilitators. This study presents no more than minimal risk to participants. The findings of this research can inform future public library practices and community programming to prompt more inclusive access and participation for children with sensory processing challenges. Gathering parent perspectives on environmental barriers and facilitators may inform future changes to improve access to public libraries.

College of Health and Professional Studies
School of Occupational Therapy**Abstract No. OT-6****EVIDENCE-BASED OCCUPATIONAL THERAPY SOLUTIONS FOR SYMPTOM
MANAGEMENT IN PEDIATRIC ONCOLOGY**

Mary Anthony, Stephanie Donovan, Hayley Roberts

(Faculty Advisor: Katey Howland EdD, MS, OTR/L)

This project explored the literature surrounding interventions in occupational therapy that combat common symptoms experienced in pediatric oncology clients. A review of the literature is the first step in understanding evidence-based practice for occupational therapists working with pediatric oncology clients. The incidence of pediatric oncology has grown to approximately 15,000 children diagnosed with cancer annually in the U.S. (Ricci et al, 2024). The highest incidence rates are found in leukemias, brain tumors, and lymphomas (Siegal et al, 2018). Prevalence is notably higher among non-Hispanic White children, and residents of the Northeast (Price et al, 2025). Survival outcomes have improved significantly since the mid-1970s, with recent data showing five-year survival rates between 83.2% and 87.8% across pediatric age groups (Price et al, 2025). Improved survival rates lead to concurrent and post-cancer symptoms which often go underrecognized, impacting quality of life prompting the need for evidence-based interventions (Price et al, 2025). To further understand the evidence in occupational therapy surrounding treatment of symptoms, the authors analyzed the literature using a level of evidence framework. Levels of evidence are assigned to studies based on the research design, quality of the study, and applicability for clinical practice (Hissong et.al, 2015). A review of the literature narrowed symptoms commonly treated in occupational therapy to; fatigue, emotional regulation and responses, cognition, neurosensory, neuromotor and pain. Using reliable databases to further examine evidence-based interventions, the researchers examined and summarized best practices. After the literature was analyzed, the authors created an easy to read guide in understanding the evidence surrounding the effectiveness of occupational therapy treatment for each symptom. The findings emphasize an importance for integrating evidence-based occupational therapy interventions within a variety of treatment contexts for pediatric oncology clients.

College of Health and Professional Studies
School of Physical Therapy

Abstract No. PT-1

ARE YOU TIRED? TREATING FATIGUE WITH PAIN NEUROSCIENCE

Dr. Kim Steinbarger PT, MHS, DHSc; Kiara Bromley, BS, SDPT; Lindsay Cote, SDPT; Ellie Hohlfelder, SDPT; Cameron Myles, SDPT; Lexi Williams, BS, SDPT

(Faculty Advisor: Kimberly Steinbarger PT, MHS, DHSc)

Background: Fatigue is a prevalent and debilitating symptom among individuals with chronic disease and is often resistant to conventional management strategies. Emerging evidence suggests that fatigue may share neurophysiological mechanisms with central sensitization and chronic pain. Pain neuroscience education (PNE), which targets central mechanisms through cognitive reframing and symptom reconceptualization, may represent a promising non-pharmacological intervention for centralized fatigue.

Purpose: To determine whether an educational intervention grounded in pain neuroscience education and the concept of centralized fatigue can improve symptoms of fatigue and central sensitization in individuals with chronic disease.

Methods: This prospective, single-group pre-post study was conducted over eight weeks. Participants completed baseline measures including the Chalder Fatigue Scale (CFS) and the Central Sensitization Inventory (CSI). Following baseline assessment, participants attended a one-hour virtual educational session addressing the neurophysiology of fatigue, central sensitization, and practical management strategies. Follow-up assessments were conducted at four weeks (qualitative check-in) and eight weeks (CFS and CSI re-administration). Repeated measures t-tests were used to compare baseline and eight-week scores.

Results: Eight female participants completed the study. At eight weeks, there was a statistically significant reduction in CFS scores ($p = 0.007$) and CSI scores ($p = 0.016$). At four weeks, 44% of participants reported decreased fatigue, 33% reported no change, and 22% reported increased fatigue. Post hoc power analysis indicated low statistical power (0.09).

Conclusion: Education based on pain neuroscience principles may reduce symptoms of fatigue and central sensitization in individuals with chronic disease. While findings are limited by small sample size and low power, results support further investigation of educational interventions as accessible, non-pharmacological strategies for managing centralized fatigue.

College of Health and Professional Studies
School of Physical Therapy**Abstract No. PT-2****TEACHING INTRAMUSCULAR DRY NEEDLING IN ENTRY-LEVEL DPT EDUCATION: A MIXED METHODS EVALUATION OF STUDENT OUTCOMES AND PERCEPTIONS**

Howland C., Archuleta P., Grant Z., Gumprecht A., Lombardo M., Maxsimic K.

(Faculty Advisor: Chad Howland, PT, DPT, DSc)

Objectives:

To evaluate learning outcomes and student beliefs following an introductory intramuscular dry needling (IDN) course within an entry-level Doctor of Physical Therapy (DPT) program.

Methods:

A mixed methods design assessed learning outcomes via readiness and summative assessments, student beliefs via a post-course survey, and planned qualitative exploration through a focus group interview. Participants were from a single DPT cohort. Institutional Review Board approved the study design (Protocol #25PT03). The study ran from May 2025 to March 2026.

Results:

Thirteen participants completed the course, learning assessments, and post-course survey. Median scores were 100% (IQR: 100–100) on both readiness and summative assessments across safety, anatomy, technique, and professional domains, with no significant differences between assessments ($Z = -1.00$ to 0.41 , $p = .783$ – 1.00 ; $r = -0.11$ to 0.28). All participants achieved competency in skills assessments across six separate muscles. Survey results showed high satisfaction across course goals, content appropriateness, instructional balance, pacing, lab practice time, faculty facilitation, peer support, ethical/legal awareness, and overall learning experience (median = 5/5; 92–100% agreement). Confidence in performing IDN and understanding of theory and clinical decision-making was comparatively lower (median = 4/5). Participants reported no adverse effects or adverse events. Qualitative analysis of the post-course survey showed themes specific to experiential learning, instructor feedback, course structure, and clinical reasoning. These results guided question development for the focus group interview (analysis in progress).

Discussion/Conclusion:

Entry-level DPT students showed strong foundational knowledge prior to in-person training, along with skill acquisition following IDN instruction. Findings support early integration of IDN training within entry-level curricula using small-group, experiential learning models that emphasize immediate feedback. Future curricular refinement should prioritize clinical reasoning and confidence for clinical application. The qualitative analysis from the focus group interview aims to describe students' perspectives about IDN education following their clinical education experiences.

College of Health and Professional Studies
School of Physical Therapy**Abstract No. PT-3****ENHANCING STUDENT PT/PTA TEAMWORK THROUGH SIMULATION: A CASE STUDY**

Jennifer Bochynski PT, DPT, EdD, CLT; Makayla Fishburn, SPT; Olivia McCarty, SPT; Armanda Nicknair, SPT; Bryanna Poirier, SPT; Makaelyn Porter, SPT; Madison Zeigler, SPT

(Faculty Advisor: Jennifer Bochynski PT, DPT, EdD, CLT)

Purpose:

This simulation experience case study is to explore how collaborative learning between physical therapist (PT) and physical therapist assistant (PTA) students enhances clinical preparedness and confidence while understanding individual roles. By engaging in a realistic patient scenario, students learned to develop interprofessional communication skills and a clearer understanding of roles. The simulation aims to better prepare students for real-world clinical settings where effective collaboration is essential for patient care and student confidence.

Case Description:

PT and PTA students were divided into mixed groups consisting of 1st-year DPT students, 1st- and 2nd- year PTA students, and a 3rd-year DPT student acting as a clinical instructor. Groups received a pre-brief reviewing PT/PTA roles and responsibilities, including case-based application of the APTA's PTA supervision and direction algorithm. During the one-hour simulation, students developed and implemented a treatment plan for a standardized patient. The standardized patient presented with clinical red flags, prompting PTA students to determine appropriate next steps. A structured debrief followed, focusing on communication, roles, and clinical decision-making. Voluntary pre- and post-simulation surveys were completed.

Outcomes:

Fifty-four students completed both pre and post surveys (65.5% 1st year DPT students, 16.4% 1st year PTA students, and 18.2% as 2nd year PTA students. Mann-Whitney U tests analysis showed statistically significant improvements in four of the five domains: role understanding ($p=.029$), communication confidence ($p=.024$), preparedness for teamwork ($p=.034$), and recognizing scope boundaries ($p=.017$). PTA students demonstrated higher scores than DPT students pre- and post-simulation ($p<.01$). Prior clinical experience in various settings was associated with higher confidence levels.

Discussion:

While most simulation research emphasizes interprofessional education, limited literature addresses intraprofessional PT/PTA training. Findings suggest simulation enhances student confidence, role clarity, and communication. Simulation appears to be a valuable strategy for fostering confidence and role identification in the clinical setting.

College of Health and Professional Studies
School of Physical Therapy

Abstract No. PT-4

**AN EXPLORATION OF POTENTIAL DISPARITIES IN PHYSICAL THERAPISTS'
DECISIONS BASED ON RACE AND ETHNICITY OF PATIENTS**

Sondra Siegel, PT, PhD; Ambrose Lovely, BA, SPT; Haesel Osuna, BS, SPT; Cassandra Wells, BS, SPT

(Faculty Advisor: Sondra Siegel, PT, PhD)

Background/Purpose: Research shows that health care providers exhibit evidence of implicit bias when treating non-white patients. Most existing evidence is concerned with medicine and nursing, while very few studies have been conducted on physical therapists (PTs). Thus, the purpose of this study was to explore the presence of racial or ethnic bias in PT decisions.

Methods: A vignette-based survey was created and distributed via email to licensed PTs within the Husson University Clinical Instructor database. The vignette described a patient with shoulder pathology who was receiving care in an out-patient PT setting. Three versions of this vignette were used which were identical except for the patient's name and an AI-generated image. The variations were intended to represent three distinct racial or ethnic identities, though these were not explicitly stated. One patient appeared to be white, while the other two appeared to be non-white minorities. Participants responded to questions regarding prognosis, plan of care, treatments, expected outcomes, and recommended referrals. Data were analyzed using Fisher's Exact Test for frequency comparisons.

Results: Thirty-eight out of 331 recipients completed the survey, yielding three groups of respondents based on the case each person received. Participants were primarily from the Northeastern region of the USA, with 92% identifying as white. The analysis revealed no statistically significant differences among the groups in all measures assessed. However, two interesting trends were noted. Minority patients were most associated with expectations of longer duration of care and were the least often referred to an orthopedic specialist after limited progress.

Conclusion: In this survey, PTs displayed no disparities based on patient race or ethnicity when recommending treatment for shoulder pathology in an out-patient setting. This differs from a large body of literature showing disparities in other health care disciplines, but is mostly consistent with one other similar survey of PTs.

College of Health and Professional Studies
School of Physical Therapy**Abstract No. PT-5****STRENGTHENING INTRAPROFESSIONAL PRACTICE: OUTCOMES FROM STUDENT-LED DPT/PTA WORKSHOPS GROUNDED IN IPEC COMPETENCIES**

Michelle Slike PT, DPT, EdD; Emma Abbott, BS ES, SPT; Aidan Crone, BS ES, SPT; Marlon Bernardo, BS HHS, SPT; Emily Hinckley, BS ES, SPT; Jessica Pomerleau, BS ES, SPT; Mitchel Reynolds, BS ES, SPT

(Faculty Advisor: Michelle Slike PT, DPT, EdD)

Background & Purpose:

Education on the collaborative relationship between Doctor of Physical Therapy (DPT) and physical therapist assistants (PTA) remains limited despite its recognized importance (Sellheim et al., 2020). This gap is particularly important given evidence that PT/PTA collaborative models yield patient outcomes comparable to PT-only care, while facilitating more efficient discharge (Baumann et al., 2023). Prior research indicates that team-based learning enhances student comfort with collaboration and emphasizes the need for improved role clarity and intentional curricular integration (Hawthorne et al., 2018; Hayward et al., 2021). This study evaluated the impact of student-led workshops on PT and PTA students' understanding of roles, communication, and teamwork, while also exploring strategies for integrating intraprofessional education into entry-level curricula aligned with accreditation standards.

Description:

DPT students designed and facilitated two workshops for DPT and PTA students. A literature review and a clinician informed needs assessment identified the key themes of collaboration, role clarity, and communication. The Interprofessional Education Collaborative (IPEC) Core Competencies guided the content. Workshops included didactic sessions on roles, ethics, patient simulations, anatomy dissections, and team-building activities. Pre- and post-surveys assessed understanding of roles and collaboration, with satisfaction surveys evaluating perceived value.

Results:

A total of 160 participants (113 DPT, 47 PTA) engaged in the workshops. Quantitative analysis showed improvements across all measured domains. Median scores rose from 3 pre-workshop to 4 post-workshop for preparedness, role understanding, communication, delegation, and readiness for collaboration. Mann-Whitney U tests confirmed these gains were statistically significant ($p < .05$). Participants cited simulations as most impactful for understanding roles and communication, and dissections for fostering teamwork. Suggestions included extending activities and adding more complex cases.

Conclusion:

Findings support structured, student-led intraprofessional education as an effective method to enhance PT/PTA collaboration. Integrating such models into entry-level curricula may improve role clarity, teamwork, and readiness for team-based care.

College of Health and Professional Studies
School of Physical Therapy**Abstract No. PT-6****BLOOD FLOW RESTRICTION TRAINING FOR CHRONIC QUADRICEPS ATROPHY AND WEAKNESS**

Wayne Scott, MPT, PhD, PT; Braden Dick, BS; Tara Gravit, BS; Hayden Hunter, BS; Tyler Proulx, BS

(Faculty Advisor: Wayne Scott, MPT, PhD, PT)

Blood flow restriction training (BFRT) is an exercise modality that utilizes blood flow occlusion in the affected extremity during low-load training. Partially occluding blood flow leads to a hypoxemic state in the affected limb, resulting in build-up of anabolic metabolites, cellular swelling, and increased recruitment of fast-twitch muscle fibers. BFRT stresses muscles differently from typical high-load training. The purpose of this study was to determine if BFRT can reverse long-standing quadriceps atrophy and weakness in an individual following an ACL reconstruction and meniscus repair.

A single subject with residual quadriceps atrophy, weakness, and functional impairment trained with BFRT for 8-weeks. The subject participated in two training sessions per week targeting the affected extremity, consisting of three quadriceps exercises at 80% occlusion following a 30, 15, 15, 15 repetition protocol. Outcome measures included thigh circumference and lower extremity strength, which were tested prior to, every 2 weeks during the intervention, and one-week post-training. Functional outcomes were assessed with video analysis of movement and the Knee Injury and Osteoarthritis Outcome Scale (KOOS) at the start and end of the study.

After the 8-week training period, a 1-week F/U was conducted to reassess the subjects' knee extensor strength (MVIC), thigh circumference, and KOOS. Thigh circumference decreased across measurement sites (involved limb: 45 to 43 cm at 5 cm superior to the top of patella and 53.5 to 50.5 cm 15 cm superior to the top of patella). Strength asymmetry declined from 69.8% to 49.8% of the uninvolved limb. KOOS improved from 81.55 to 88.10 with subscale increases in symptoms (57.14 to 67.86), sport/rec (70.00 to 90.00), and QoL (50 to 62.5).

This study suggests that despite decreases in quadriceps strength and size, BFRT may improve functional outcomes.

College of Health and Professional Studies
School of Physical Therapy**Abstract No. PT-7****KNEEHAB MULTIPLE ELECTRICAL STIMULATION AND MUSCLE FATIGUE**

Wayne Scott, MPT, PhD; Alexander Bryant, BS; Victoria Meeker, BS; Lindsey Russell, BS

(Faculty Advisor: Wayne Scott, MPT, PhD, PT)

Excessive muscle fatigue (MF) is a limiting factor when using neuromuscular electrical stimulation to strengthen muscles. Stimulation strategies minimizing MF may result in increased strength gains. The purpose of the study was to compare MF produced in the quadriceps muscle via a multipolar Kneehab electrical stimulation garment (MKESG) versus a monopolar stimulator. We hypothesized that MKESG would produce less MF than the monopolar stimulator.

Fifteen participants were tested using a Biodex dynamometer to measure isometric knee extensor torque. Maximum volitional isometric contraction (MVIC) muscle torque of the right leg was measured. MKESG intensity was increased to the maximum tolerated intensity for a 10-second contraction. After 5-minutes rest, a 15-contraction fatigue protocol was conducted using a 10-second on/off ratio. Peak torque of each contraction was recorded. The protocol was then repeated using the left leg and a monopolar Grass Stimulator (MGS). Intensity was set to elicit a similar initial percentage of the MVIC torque as tolerated on the right. Fatigue indexes were calculated for both conditions by dividing final contraction peak torque by initial. Average peak torque was also recorded. Paired t-tests were used for statistical analysis.

We did not observe significant differences. The mean fatigue index for the MKESG was 0.44 ± 0.13 as compared to 0.43 ± 0.14 for the MGS ($p = 0.34$). Average peak torque for the MKESG was 31.17 ± 17.77 Nm versus 27.65 ± 16.05 Nm for the MGS ($p = 0.07$).

Our results suggest that the MKESG stimulator does not reduce electrically elicited MF as compared to the MGS, clinicians wishing to do so should explore alternative strategies.

College of Health and Professional Studies
School of Physical Therapy**Abstract No. PT-8****DPT STUDENTS' PERCEPTION OF CLINICAL READINESS AND CONFIDENCE IN THEIR KNOWLEDGE, SKILLS, AND ATTITUDES (KSAS) BEFORE THEIR FIRST FULL-TIME CLINICAL EXPERIENCE**

Jadyn Holmes, SPT; Emily Piper, SPT; Cierra Richardson, SPT; Caileigh Saucier, SPT; Akira Warren, SPT

(Faculty Advisor: Stephanie LaPrino, PT, DPT)

Introduction

Clinical experiences are essential in physical therapy education to bridge the gap between didactic learning and clinical practice. Early, contextualized opportunities, such as a student-run Pro Bono clinic, enhance skill development, confidence, and preparedness. Prior research suggests early clinical exposure improves self-perceived readiness for practice (Kalistratova et al., 2024). Additionally, competency frameworks have identified essential knowledge, skills, and professional behaviors required before initial clinical experiences. This study used a survey-based approach to evaluate Doctor of Physical Therapy (DPT) students' perceived readiness and confidence prior to clinical placement.

Methods

A clinical readiness checklist adapted from Timmerberg et al. (2019) was organized into 13 domains encompassing knowledge, skills, attitudes, and professional behaviors. Participants rated perceived competence using a four-point Likert scale (Unfamiliar to Proficient). Eligible students completed an anonymous electronic survey via Google Forms after providing informed consent. No identifying information was collected.

Results

Students reported lower perceived competence in common diagnoses (36%), pathology (50%), infection control (31.8%), and self-introduction (40.9%), despite expected performance of "at least emerging." In areas such as self-care, measuring muscle length, sensory assessment, legal considerations, and patient-provider relationships, 70–80% met expectations, while approx. 22% did not. For professional skills, 80–90% met expectations, with deficits noted in manual muscle testing and HIPAA (18.18%) and Code of Ethics (14.6%). In contrast, 90–100% met expectations in communication, interventions, patient handling, and documentation, with only 4.5% below expectations in aerobic exercise-related tasks.

Conclusion

DPT students reported higher confidence in communication and professional behaviors compared to clinical skills and reasoning. These findings suggest a gap between knowledge acquisition and clinical application, highlighting the need for earlier, structured clinical experiences to enhance readiness and self-efficacy.

College of Health and Professional Studies
School of Physical Therapy**Abstract No. PT-9****WALKING THE PLANK IMPROVES GAIT SPEED AND BALANCE CONFIDENCE IN
COMMUNITY-DWELLING OLDER ADULTS.**

Ben Sidaway, PhD, PT

A third of community-dwelling older adults will fall at least once per year with walking being the leading cause of such falls. In such individuals, the greatest postural instability during walking occurs in the mediolateral direction and thus lateral instability is a significant risk factor for falls. The current study uses one-month of beam walking as a means to challenge the dynamic mediolateral stability of older adults in an attempt to improve balance confidence and falls risk. Participants were 24 community dwelling older adults over 70 years of age (Mean = 83.5 yrs.). Baseline assessment included a fear of falling questionnaire, the Activities-specific Balance Confidence (ABC) scale, the Dynamic Gait Index (DGI), and collection of multiple gait parameters during normal and quick walking. Participants were then assessed on their ability to walk along a series of six wooden beams (6 m long, 2 cm thick) of decreasing widths. Following pretest measurements participants practiced walking on the beams for 20 minutes twice a week for 4 weeks. Gait parameters were collected on the final training day, and all pretest measures were repeated one week later. At pretest, the 24 participants reported 38 falls in the previous six months. A six-month follow-up showed 11 falls after training. At pretest, 83% of participants were somewhat afraid of falling, compared with 37% at retention. Analysis of the ABC data revealed a significant improvement in balance confidence from the pretest (M = 61%) to the retention test (M = 90%). The DGI also improved from the pretest to the retention test. Gait analysis revealed that stride length and gait velocity increased significantly following beam training while stride length and stride width variability decreased. Beam training appears to be a simple intervention that can improve dynamic mediolateral stability consequently reducing the falls risk of older adults.

College of Science and Humanities**Psychology****Abstract No. SH-2****CLINICAL MENTAL HEALTH COUNSELORS' EXPERIENCES WITH MANDATED REPORTING OF CHILD ABUSE AND NEGLECT IN PENNSYLVANIA**

Todd Vermileon, PhD, LPC, NCC

Many phenomenological factors influence counselors when navigating mandated reporting and deciphering reasonable suspicion, such as beliefs, emotions, culture, decision-making, training opportunities, and past experiences (Levi & Crowell, 2011). The purpose of this qualitative study was to explore the experiences of clinical mental health counselors with mandated reporting of child abuse and neglect in Pennsylvania. A hermeneutic phenomenological approach was used to analyze the lived experiences of eight clinical mental health counselors. The hermeneutic circle guided data analysis in a parts-to-whole process, which enabled interpretations to transform into phenomenologically crafted texts (Gadamer, 1988, 2004; Heidegger, 1962). Findings revealed global themes among participants relating to the reporting process, decision-making factors, and preparation for the role of mandated reporter. The identification of global themes addressed the study's research questions and gaps in the counseling field. Implications from the study will be used to inform counselors' reporting practices, counselor educators' curricula when training masters-level counseling students, and awareness to facilitate systemic change.

College of Science and Humanities**Psychology****Abstract No. SH-3****ENHANCING OR ALTERING FOOD FLAVORS OR TEXTURES TO ENCOURAGE HEALTHIER EATING**

Colby Davis; Jessica Hacker, PhD

(Faculty Advisor: Jessica Hacker, PhD)

This paper is a literature review of recent developments in olfactory reception and general sensory influences on food perception. Different brain processes coordinate to formulate taste perception, including the orbitofrontal cortex, insula, nucleus of the solitary tract, cranial nerves V, VII, IX, and X, and taste buds (Shaikh et al., 2023, p. 2). One can train these sensory receptors to be more open to healthy foods. Various methods have been identified, such as positive imaging while eating (Kaya et al., 2025), listening to pleasant music (Guedes et al., 2025), and utilizing proper mindful eating techniques to alter appetite (Coletta et al., 2009). Combining mindful eating, pleasant presentation, environmental manipulation, and less restrictive eating can help one overcome misconceptions about healthy foods and improve one's diet.

Keywords: taste perception, healthy eating, obesity, emotional food connection, visual masking

College of Science and Humanities**Psychology****Abstract No. SH-4****LYING AND DECEPTION IN DOMESTIC VIOLENCE RELATIONSHIPS**

Alyiah McLaughlin

(Faculty Advisor: Rachelle M. Smith, PhD)

Domestic violence is widely recognized as a significant social and psychological issue, however, much of the research has historically focused on physical violence while less attention has been given to the role of deception within abusive relationships. The following literature review examines how lying and deception function within intimate partner violence (IPV), particularly as mechanisms of control used by perpetrators and as survival strategies used by victims. Major psychological concepts discussed include gaslighting, coercive control, trauma bonding, cognitive dissonance, and power-and-control dynamics. Peer reviewed research from psychology and interpersonal violence journals was gathered from Husson University Library, including Academic Search Ultimate. They were then reviewed to understand how deception operates within abusive relationships and the psychological consequences of such deception. Findings across these studies suggest that deception is frequently used by perpetrators to manipulate victims, deny abusive behavior, and maintain power within the relationship. Research also indicates that victims may engage in deception as a protective strategy to avoid escalation of violence or social stigma. To add to this, chronic exposure to deception, particularly gaslighting, has been linked to psychological distress, including anxiety, depression, self-doubt, and trauma symptoms. Overall, the literature supports that deception plays a central role in sustaining abusive dynamics and complicating victims' ability to seek help. Understanding the psychological mechanisms behind deception in domestic violence relationships is critical, as it can help improve intervention strategies, clinical assessment, and support services for survivors.

College of Science and Humanities
Psychology**Abstract No. SH-5****SELF-DECEPTION IN SUBSTANCE USE DISORDER: A BARRIER TO RECOVERY**

Mikayla F. Pickoski

(Faculty Advisor: Rachelle M. Smith, PhD)

Substance use disorder (SUD) is characterized by the continued use of substances despite significant cognitive, behavioral, and physiological consequences. One factor that may interfere with recovery from SUD is self-deception, which involves unconscious biases in information processing that favor comforting or desirable beliefs over unpleasant or threatening information. In addition research, self-deception is often closely related to the concept of denial, and both may prevent individuals from fully recognizing the negative consequences of their substance use. The purpose of this literature review was to examine whether self-deception negatively affects recovery outcomes, particularly abstinence duration, among individuals with SUD. I collected articles through the APA PsycINFO database using search terms related to SUD. Scholarly research articles published between 1986 and 2025 were analyzed. The studies included adult participants diagnosed with SUD who were involved in residential or outpatient treatment programs. Across the studies, researchers used qualitative, quantitative, and mixed method approaches, with many relying on self-report measures to gather data. The findings suggest that higher levels of self-deception are associated with shorter durations of abstinence and lower engagement in treatment-related activities. Research also indicates that participation in recovery programs, particularly 12-step meetings, may be linked to lower levels of self-deception and greater honesty about substance use behaviors. However, reliance on self-report data may introduce response bias. Overall, the literature suggests that self-deception can act as a significant barrier to recovery by limiting self-awareness and accountability in individuals with SUD.

Keywords: substance use disorder, self-deception, denial, addiction recovery, abstinence, locus of control

College of Science and Humanities
Psychology**Abstract No. SH-6****BENEFITS OF THERAPEUTIC LIES IN DEMENTIA CARE**

Jayda Johnson

(Faculty Advisor: Rachelle M. Smith, PhD)

Although deception in healthcare is generally considered to be unethical, therapeutic lies are often used in dementia care, creating a controversial ethical dilemma. Given the frequent use of therapeutic lying by nurses, family members, and other healthcare professionals, I conducted a literature review to investigate the possible benefits of therapeutic lies in dementia care. I hypothesized that patients with dementia would benefit from therapeutic lies, primarily because such lies would reduce their distress. Studies were collected from databases from the Husson University Library, including Academic Search Ultimate, and the National Institute of Health. Participants in the studies reviewed included healthcare workers, family caregivers, and dementia patients. Eighty-eight percent of the studies examined demonstrated clear benefits associated with therapeutic lies. Specifically, despite ethical concerns regarding deception, these lies were found to help decrease distress and lessen agitation for people with dementia. Although one study emphasized the negative impacts of lying to patients with dementia, all other evidence showed that when used appropriately, therapeutic lies provided more psychological and health benefits than telling the truth. The advantages of using therapeutic lies with people with dementia was found to be situation-dependent. Such lies only provided benefits when the patient was unaware of the deception and when honesty would exacerbate distress. These results provide healthcare workers with insight into caring for their patients by using therapeutic lies and highlight the importance of context to ensure ethical behavior. Future research is needed to compare the psychological outcomes between patients who are exposed to therapeutic lying with those who are only told the truth. Additionally, given the empirical benefits of the use of therapeutic lies, guidelines need to be developed to help ensure cohesive and ethical use.

College of Science and Humanities**Psychology****Abstract No. SH-7****MORALITY, PIRITUALITY, AND RESIDUAL RELIGION**

Clifton Guthrie, PhD; Daryl Van Tongeren, PhD

The Residual Religion Hypothesis (RRH; Van Tongeren et al., 2021) proposes that religious influence persists following disaffiliation, gradually fading over time across moral, cultural, and spiritual dimensions. This study tested the RRH among three groups: currently religious individuals, religious "Dones" (formerly religious), and "Nones" (never religious), using measures less commonly applied in this literature.

A sample of 1,304 U.S. adults (from an initial 1,500) was recruited via Prolific in March 2025. Participants completed the Morality as Cooperation Questionnaire (MAC-Q), two Gallup-derived items assessing perceptions of moral decline, and the SHALOM 2G spiritual well-being scale. Dones additionally reported time since disaffiliation and whether their prior religious commitment was intrinsic or extrinsic.

Contrary to predictions, the MAC-Q revealed no significant group differences in cooperative moral values, including group-preserving domains (Family, Heroism, Deference) hypothesized to be highest among the Religious and to show residual decay among Dones. Religious participants were modestly less pessimistic about the state of U.S. moral values, though this finding warrants caution given the sample was collected in early 2025, a period of significant partisan mood fluctuation following a presidential election. On spiritual well-being, Religious participants reported less dissonance between their ideals and lived experience, but Dones did not differ significantly from Nones, again failing to support RRH.

An exploratory finding proved notable: only 20% of Done respondents described themselves retrospectively as having been deeply committed to religious beliefs and practices. This suggests the Done category may be too heterogeneous for clean hypothesis testing and points toward the need for finer-grained classification of religious disaffiliation in future research. A follow-up study (not represented on this poster) was conducted to test this hunch.

College of Science and Humanities
Graduate Counseling**Abstract No. SH-8****“LIKE LITTLE NICKS TO THE SOUL”: FIRST RESPONDERS EXPERIENCES WITH MORAL SUFFERING AND RESILIENCE**

Amanda Dooley, PhD, LPC-MHSP

First responders are an interdisciplinary group of professionals who are the first to answer calls for help in emergency situations. A widespread problem first responders are facing across disciplines is an increased risk of a myriad of mental health issues and inadequate access to appropriate resources and supports to address such concerns. A potentially significant contributing factor that has been largely unexamined in the scientific literature and remains widely unknown among first responders themselves is moral suffering. Moral suffering refers to a continuum of physical, psychological, and spiritual symptoms that can occur after exposure to a moral stressor. A moral stressor is any event that creates an inner conflict with one's moral values. First responders frequently encounter moral stressors on duty due to the nature of their work. The purpose of this qualitative study was to 1) gain a deeper understanding of first responders' lived experiences with moral suffering and resilience and how they cope with moral stressors encountered in the line of duty and 2) use this knowledge to contribute to addressing the problem through raising awareness with relevant community stakeholders, including first responders themselves, policy makers, and mental health professionals. A small, purposive sample of participants shared their experiences through semi-structured interviews. A detailed analysis using the methodological approach of Interpretative Phenomenological Analysis (IPA) yielded four themes and seven sub-themes that describe participants' experiences with moral stressors through the types of moral stressors they encountered, how they were affected by their experiences, and how they coped with their experiences. Awareness was raised through the creation of a training presentation on moral suffering and resilience in first responders. The results of this study add to the small, but growing body of research that suggests moral suffering is a significant occupational hazard for first responders.

College of Science and Humanities
School of Teacher Education**Abstract No. SH-9****TEACHER CANDIDATE'S PEDAGOGICAL REASONING AND REFLECTIVE PRACTICE
USING A RESEARCH-EMBEDDED LESSON PLANNING TEMPLATE**

Evan Mooney, PhD; Shelly Tennet, EdD; Vanessa Klein, PhD

Teacher candidates routinely complete lesson plans as part of their preparation; however, recent research demonstrates that many candidates approach lesson planning as a procedural compliance task rather than as an act of pedagogical reasoning (Cevikbas & Kaiser, 2023; Lammert, 2025). Despite national standards emphasizing reflective practice, equity, and research-based instruction (InTASC; Danielson), teacher candidates often struggle to justify instructional decisions with evidence, apply educational research meaningfully, and reflect systematically on student learning.

In response to this gap, teacher educators are increasingly called to design instructional scaffolds that make pedagogical reasoning explicit, promote formative reflection, and embed equity-oriented planning (CAST, 2024; Shih, 2024). While lesson planning templates are widely used, few studies examine how specific template structures shape candidates' thinking, identity development, and research-to-practice reasoning.

This basic interpretive qualitative (Merriam & Tisdell, 2016) study addresses this gap by examining how preservice teachers use and experience a research-embedded lesson planning template that requires explicit justification of instructional decisions, structured reflection, and equity-oriented design.

Our research questions included:

1. How do teacher candidates use the "Plan + Why/Research Link" structure to justify instructional decisions?
2. How does the template shape candidates' ability to connect educational research to classroom practice?
3. How do candidates' written reflections reveal growth in reflective practice over time?
4. How do candidates interpret and enact equity through the Equity, Differentiation, and CRP section of the template?
5. How does use of the template influence candidates' perceptions of professional identity and instructional confidence?

This study seeks to understand how candidates:

- Develop pedagogical reasoning through justified planning,
- Engage in reflective practice across planning and teaching,
- Interpret and enact equity and culturally relevant pedagogy (CRP),
- Construct professional identity and instructional confidence through structured reflection.

College of Science and Humanities**Biology****Abstract No. SH-10****HERBACEOUS PLANT COMPOSITION IN THE HUSSON UNIVERSITY FOREST PRIOR TO INVASION BY EMERALD ASH BORER**

Rowan Talbott; Kathy Crowley, PhD; Aly McKnight, PhD; Austin Menzmer, PhD

The Emerald Ash Borer (*Agrilus planipennis*, EAB) is an invasive species quickly killing ash trees across the eastern United States. With the EAB soon to arrive on our campus forest, we proposed a study to establish baseline pre-invasion data on woody, herbaceous, avian, and small mammal populations. Husson's ash forest contains both upland deciduous forest and wetlands. We established six sites in the forest, each with multiple ash trees present: three in the upland and three in the wetland. Following the collection of pre-invasion herbaceous data in July 2025, we analyzed the diversity, composition, and canopy openness between site types. We found a significant difference in composition between the upland and wetland sites, but no difference in diversity or canopy openness. The lack of difference in diversity between upland and wetland plots may be due to an overall low number of species throughout the forest, while the lack of difference in canopy openness suggests that the cause of the compositional difference between the upland and wetland is not related to varying levels of light reaching the forest floor. Indicator species analysis revealed five species that represented the upland ($p=0.01, 0.03, 0.03, 0.04, 0.04$) and two species that represented the wetland ($p=0.01, 0.001$). We recommend monitoring the water table and measuring nutrient availability as a possible means to explain the compositional difference between the wetland and upland environments. Collecting data earlier in the season may reveal the presence of transient wetland species. Research post-invasion should focus on the species identified as indicators of their respective environments.

College of Science and Humanities**Biology****Abstract No. SH-11****WETLAND VS. UPLAND HABITAT VEGETATION INFLUENCES ON SMALL MAMMAL ABUNDANCE**

Mackenzie Maher; Josie Cornell; Chris Gibney

(Faculty Advisor: Aly Mcknight, PhD)

Small-mammal communities are strongly influenced by vegetation complexity and structure. This study compared small-mammal abundance between wetland and upland habitats on the Husson University campus in Bangor, Maine, to understand how vegetation structure shapes community dynamics. We conducted live trapping across four 30 m × 30 m grids (two wetland and two upland) over seven consecutive nights for the fall season, totaling 448 trap nights. We baited Sherman traps, checked them within 12 hours of setting, and identified, weighed, and, when possible, tagged captured individuals for recapture data. We developed an encounter history for each individual and used encounter histories to (1) evaluate whether capture-mark-recapture modeling assumptions were met, and (2) estimate capture rates, recapture rates, and population sizes for each focal species. Species observed included voles, mice, shrews, and squirrels. Based on previous research, we hypothesized that wetland habitats would support higher small mammal abundance due to increased vegetation complexity and resource availability. Results from this study contribute to understanding how specific habitat differences influence small mammal populations and provide insight into the role of vegetation structure in shaping community dynamics.

College of Science and Humanities**Biology****Abstract No. SH-12****WETLAND VS. UPLAND HABITAT INFLUENCES ON SMALL MAMMAL SPECIES
BIODIVERSITY IN CENTRAL MAINE**

Josephine Cornell; Aly McKnight, PhD; Mackenzie Maher; Chris Gibney

(Faculty Advisor: Aly McKnight, PhD)

Species biodiversity is a key indicator of ecosystem health, often indicating the status of the organisms within the system. This study investigated how environmental type affects small-mammal biodiversity, focusing on wetland versus upland environments. Small mammals are crucial seed dispersers within their habitats. We tested the hypothesis that wetland environments support greater small-mammal biodiversity because they are more likely to provide all the resources that multiple species rely on. To test this hypothesis, we carried out a capture-mark-recapture study on small mammals in both environments in the Husson University campus forest during the fall of 2025 and spring of 2026. Small mammals in the study were captured with Sherman live traps, ear-tagged with serially numbered tags, massed, and sexed. We used closed capture models in program MARK to evaluate CMR model assumptions and generate capture rate and population size estimates. We then used population size estimates in calculating biodiversity metrics for each species, including species richness, evenness, and Shannon-Weaver index values. Results showed that upland sites had a greater average biodiversity level, $1.42 [\pm 0.34]$, than the wetland sites, which were $1.08 [\pm 0.21]$. Both sites showed consistent species evenness; both upland sites were $0.89 [\pm 0]$, while the wetland sites had a slightly lower evenness at $0.87 [\pm 0.03]$. This means that, regardless of resource variances between the habitats, both support a similar number of individuals per species, but a different abundance of species. For example, the Deer Mouse (*Peromyscus maniculatus*) was more commonly found in upland plots, while the Southern Red-Backed Vole (*Clethrionomys gapperi*) was more likely to be captured in the wetland. Our next steps this spring will be to investigate questions about seasonal shifts in habitat use, which is especially valuable information in temperate climates.

College of Science and Humanities
Chemistry**Abstract No. SH-13****SALIVARY DIAGNOSTICS AND BIOMARKERS IN DISEASE DETECTION**

Gavin Dow

(Faculty Advisor: Emilia Purington, PhD)

Saliva has emerged as a promising noninvasive medium for health monitoring and disease detection. This review synthesizes current research on salivary diagnostics with a focus on biomarkers, metabolomics, and the oral microbiome. Studies have indicated that inflammatory biomarkers and metabolites in saliva can reflect certain conditions including cancer, diabetes, cardiovascular disease and inflammatory diseases. Advances in the technology and techniques have significantly improved the ability to identify disease-related biomarkers in saliva supporting its growth as a reliable diagnostic tool.

College of Science and Humanities
Chemistry**Abstract No. SH-14****SEED IT OR LEAVE IT: A LOOK AT CELL SEEDING EFFECTS ON TISSUE ENGINEERED VASCULAR GRAFTS**

Thomas Hinton;* Dr. Delaney Villarreal,⁺ Dr. James Reinhardt,⁺ Dr. Mackenzie Turner,⁺ Mitchell Briggs,⁺ Jad Hussein,⁺ Dr. Joseph T. Leland,⁺ Sahana Rajesh,⁺ Sugath Suravarapu,⁺ Dr. Tatsuya Watanabe,⁺ Dr. Jay Humphrey,⁺ Dr. Abhay Ramachandra,⁺ Dr. Christopher Breuer⁺

(Faculty Advisor: Cody Edson, PhD*)

Congenital heart disease is one of the most common causes of birth defect mortalities in infants. Reconstructive surgery is often the only form of treatment yet causes life-long complications for survivors. The reconstructive Fontan operation for congenital heart disease currently uses synthetic polytetrafluoroethylene (PTFE) vascular grafts. Although effective, PTFE grafts pose risks such as calcification and thrombosis, and cannot grow with the patient, which may necessitate multiple surgical interventions and ultimately affect long-term outcomes.

Tissue engineered vascular grafts (TEVGs) are a promising alternative to PTFE grafts. TEVGs consist of a biodegradable polymer scaffold, which fully degrades within one year after implantation, leaving behind a neovessel formed from the patient's own cells. Most importantly, TEVG neovessels can grow with the patient and self-repair, like native tissue.

The main clinical complication precluding widespread adaptation of the TEVG is graft narrowing, or stenosis, which was determined to be inflammation driven. Currently, clinical TEVGs are seeded with the patient's bone marrow mononuclear cells (BM-MNCs), which are believed to reduce graft immunogenicity and potentially reduce the incidence and severity of stenosis. However, this approach limits scalability in clinical settings and adds yet another operative procedure for the patients.

Our goal is to understand the short- and long-term effects of cell seeding on TEVG neovessel growth and development. For this study, we assessed TEVG growth and degree of narrowing longitudinally with biomedical imaging in a large-animal ovine model. We determined that unseeded TEVGs had the same development profiles as cell seeded TEVGs. This suggests that we may be able to remove the need for cell seeding procedures in our clinical trial without compromising any aspect of TEVG development and remodeling.

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College of Science and Humanities
Chemistry**Abstract No. SH-15****ANTIBACTERIAL EFFICACY AND SACCHARIDE COMPOSITION OF HONEY
DETERMINED BY MICROBIAL ASSAYS AND GC-MS**

Sierra Beaulieu

(Faculty Advisor: Cody Edson, PhD)

Honey is a food product that has been used for centuries as a natural remedy. In light of growing concern regarding antibacterial resistance, honey has been investigated as an antibacterial agent. This presentation considered the efficacy of honey as an antibacterial agent and quantified biochemical properties that may allow honey to be used as an alternative therapy. To determine this, testing began by utilizing an agar disc diffusion method to determine how different types of honey inhibited the growth of bacteria, these included *E. coli*, *P. aeruginosa*, and *B. subtilis*. No significant differences were observed between the two honey types, where a raw honey product and a commercially available honey were each tested. Further analysis was conducted to determine a minimum inhibitory concentration of honey, where each honey type was diluted 10-fold in a 96-well plate containing an *E. coli* and *B. subtilis* culture. Further testing was performed to deduce what biochemical properties contribute to the antimicrobial characteristics of honey. A two-step derivatization process allowed gas chromatography-mass spectrometry (GC-MS) to be used as the main method to identify saccharides in honey samples by utilizing retention index values compared to a set standard. Further testing was performed to calculate the exact concentrations of fructose, glucose, and sucrose in each honey sample. Additional testing on the heavy metal contents of honey was also carried out as a means to further compare the raw and commercially available honeys, along with their antibacterial efficacy. Together, these methods help determine the value of honey as an alternative therapy. This presentation highlights the need for further research on alternative antibacterials and provides a foundation for methods and possible antimicrobial agents.

College of Science and Humanities
Chemistry**Abstract No. SH-16****PAPAIN-CATALYZED SYNTHESIS OF ALTERNATING ARGININE-TRYPTOPHAN
PEPTIDES FOR ANTIMICROBIAL APPLICATIONS**

Kaleb Nichols

(Faculty Advisor: Cody Edson, PhD)

Antimicrobial peptides represent a promising strategy for combating multidrug resistant pathogens. However, the conventional synthesis strategy using Solid Phase Peptide Synthesis (SPPS) relies on harsh reagents, extensive solvent use and costly, multi-step protocols. In this study, we investigate a greener and more efficient approach to synthesizing peptides using Protease-Catalyzed Peptide Synthesis (PCPS) to generate short arginine-tryptophan (Arg-Trp) peptides, molecules known to possess antimicrobial properties. We examine the enzymatic coupling of Arg-Trp dipeptides using papain, a well-documented protease, as a biocatalyst under mild conditions, promoting peptide bond formation through aminolysis rather than hydrolysis. The reaction products are characterized by MALDI-TOF mass spectrometry to assess peptide formation and composition. This approach aims to provide a cost-effective and environmentally sustainable alternative to traditional peptide synthesis, with findings that will inform future studies on alternative syntheses and antimicrobial efficacy of Arg-Trp peptides produced via PCPS.

College of Science and Humanities
Chemistry**Abstract No. SH-17****ALPHA-CHYMOTRYPSIN PROTEASE-CATALYZED PEPTIDE SYNTHESIS OF
ALTERNATING ARGinine-TRYPTOPHAN PEPTIDES AND THEIR ANTIMICROBIAL
PROPERTIES**

Timothy Lessa

(Faculty Advisor: Cody Edson, PhD)

Antimicrobial peptides (AMPs) are an increasingly popular topic in research due to their effectiveness against drug-resistant bacteria and pathogens. These peptides target the cell membrane of the bacteria and that makes them very difficult for bacteria to build resistance to. Due to this, AMPs are being developed to help treat viral infections, aid in wound healing, act as a safe preservative for agriculture, and could be used to target cancer cells. The conventional synthesis methods for antimicrobial peptides however often involve harsh chemicals, large amounts of waste, and high costs. Therefore, to investigate more environmentally and economically favorable synthesis strategies for AMPs we used an alternative synthesis method in Protease-Catalyzed Peptide Synthesis (PCPS). PCPS is conducted using water as a solvent and is relatively cheaper, uses less toxic reagents, and utilizes renewable protease enzymes as catalysts. We specifically sought to form a repeating Arginine-Tryptophan amino acid sequence because of tryptophan's ability to anchor to a cell wall and arginine's ability to destroy it, making them a great antimicrobial agent. The protease enzyme I chose to investigate this synthesis with is Alpha-Chymotrypsin, because while it favors the hydrolysis of Tryptophan-Arginine amide bonds, we can target the reverse aminolysis reaction by using Arginine-Tryptophan dipeptide units which interact with the active site of the enzyme differently and favor aminolysis over hydrolysis. We predict that the Alpha-Chymotrypsin will yield a bell-curve like distribution of alternating peptide chains ranging from 2-16 amino acids in length, which is the typical range of amino acid chain length for PCPS reactions. We will also conduct an antimicrobial assay to determine the oligopeptide's effectiveness against gram + and gram - bacteria and determine the minimum inhibition concentration.

ABSTRACTS

ORAL PRESENTATIONS

College of Business**Abstract No. BU-9****INNOVATION**

Brien Walton, JD, LLM, ALM, MEd, EdD

Dr. Robert E. Clark Distinguished Professor in Business and Innovation

Innovation is the disciplined and intentional process of transforming ideas into practical, scalable solutions that create sustained value for individuals, organizations, and communities. Although innovation is frequently associated with technological advancement or disruptive change, it more accurately represents a strategic capability rooted in problem identification, creative recombination of resources, and effective execution. True innovation extends beyond novelty; it requires alignment with mission, responsiveness to stakeholder needs, and the capacity to deliver measurable outcomes. As such, innovation is not an isolated event but a repeatable process supported by leadership, culture, and institutional learning systems.

In contemporary economic, educational, and organizational environments, innovation has become essential to resilience and long-term competitiveness. Rapid technological change, shifting workforce demographics, regulatory uncertainty, and increasing demands for accountability have elevated innovation from a discretionary activity to a core strategic function. Organizations that cultivate innovative capacity are better positioned to adapt to disruption, improve operational performance, and identify new opportunities for growth. This capacity is strengthened through structured experimentation, data-informed decision-making, and cross-sector collaboration that bridges academic, public, and private domains.

Equally important, effective innovation must be human-centered and ethically grounded. Sustainable innovation prioritizes inclusivity, accessibility, and social impact, ensuring that new solutions address real-world needs rather than reinforcing existing inequities. When innovation is guided by clear values and integrated into governance and evaluation frameworks, it becomes a powerful mechanism for translating vision into action. In this way, innovation functions not merely as a source of competitive advantage, but as a catalyst for institutional relevance, economic vitality, and social progress.

College of Business
School of Legal Studies

Abstract No. BU-10

ANALYZING THE IMPACT OF FOCUSED DETERRENCE STRATEGIES IN REDUCING CRIME

Christopher W. Bruce, DCJ, MS

Focused deterrence, also known as “pulling levers,” emerged in the 1990s as one of the most promising crime reduction strategies of its age. The model involves identifying high-risk offenders, bringing them into individual or group “intervention-style” meetings, and warning them that future offending will be addressed with severity, swiftness, and certainty. These “threat” messages may be accompanied by offers of support from family and community members, offers of assistance from social service agencies, or both.

A 20-year body of literature attests to the success of focused deterrence programs in many locations and for many types of offenses, although most implementations focus on gang-related violence or drug markets. Although there is much evaluative research, there are few research studies that explain the success of focused deterrence from a criminological perspective. The few that exist focus almost exclusively on deterrence theory and its classic variables of severity, certainty, and swiftness. While it seems likely that deterrence theory plays a primary role in the success of these programs, we should not discount the additive or multiplicative possibilities of other criminological theories, such as strain theory, differential association theory, social bond theory, and techniques of neutralization. Unfortunately, the literature on focused deterrence programs does not provide enough detail to confirm or refute the influence of these mechanisms, but it does provide intriguing material for future practice and research.

College of Business
School of Accounting

Abstract No. BU-11

GOVERNANCE AND MISSION ACCOUNTABILITY IN NONPROFITS

James Shimko, DBA, CPA

Nonprofit organizations are typically mission-driven rather than profit-driven institutions. However, many reporting and evaluation systems used in nonprofit management emphasize financial performance and compliance measures. While financial accountability is essential, an overemphasis on financial metrics can obscure whether organizations are effectively achieving their mission and may limit stakeholders' ability to evaluate the ethical stewardship of organizational resources.

This presentation introduces ongoing research examining how nonprofit governance structures shape the ways organizations evaluate and communicate mission performance. The central research question guiding this work is: how can governance and reporting systems help nonprofit organizations measure and communicate mission success more effectively than traditional financial metrics alone?

To address this question, the research explores how governance design, role clarity, and internal reporting systems influence the development of indicators that better reflect mission quality and organizational purpose. The study adopts a conceptual governance and accountability perspective to examine how organizational structures shape the information used to evaluate mission performance.

Drawing on research on governance, transparency, and accountability in nonprofit organizations, this work examines how governance frameworks and disclosure practices shape the ways organizations document mission outcomes, interpret organizational performance, and communicate mission-related value to stakeholders and the broader public.

The presentation shares emerging ideas from this research and considers how nonprofit organizations may develop governance and reporting practices that support mission-centered accountability, strengthen ethical stewardship, and improve public understanding of nonprofit performance. The session will also invite discussion on how this area of research may contribute to improving nonprofit effectiveness in practice.

College of Business
School of Business and Management

Abstract No. BU-12

ARTIFICIAL INTELLIGENCE COPYRIGHT ANALYSIS AND FIDUCIARY CONSIDERATIONS

Paul J. Morrow, Sr., JD

This paper explores the dimensions of Artificial Intelligence Law and Breach of Fiduciary duty when using AI research models. The paper also explores Artificial Intelligence in the international realm providing a basis for educating international firms. Reading this paper is worth your time because: (1) you will learn about copyrights and artificial intelligence; (2) you will also learn about artificial intelligence and the fascinating developments in money and banking; (3) you will read about the best practices in the disciplines, and international firm concerns and applications of U.S. AI dispositions. This paper will give you parameters so that one may navigate the legal landscape to help you plan and avoid the courts. As we all know, inflation is prevalent, and the best use of resources is essential to stay in business avoiding closure. Those firms domestic and global, who are not aware of the dangers suffer the perils that follow poor resource management practices. Our corporate psychologists and organizational managers heartily agree.

College of Business
School of Business and Management

Abstract No. BU-13

2026 U.S. ECONOMIC FORECAST AND ANALYSIS

Steve Cunningham, PhD

Dr. Phil Grant Distinguished Professorship in Management and Economics

I analyze the current state of the U.S. economy and provide a forecast for the remainder of 2026 and early 2027. The analysis must be based on the current political and economic environment, but the discussion is purely economic.

Division of Online and Distance Education**Abstract No. ON-1****SUPPORTING REFLEXIVITY IN HUMAN-ANIMAL STUDIES CURRICULA**

Taylor Rezvani, PhD; Corey J. Butler, MEd

Over the last four decades, the field of Human Animal Studies (HAS) has consistently grown with substantial increases in course offerings, minors, majors, and research. Relevant to many lines of inquiry, HAS offers meaningful opportunities for exploration that furthers student growth across fields such as veterinary science, animal science, wildlife management, and zoology. Student reflection has been integrated into HAS curricula, revealing student navigation of challenges to perspectives and a broadening of awareness. Reflexivity is a practice of situating oneself within research and recognizing the role of subjective perspectives. The application of reflexive practices has been supported across a variety of disciplines. The purpose of this study is to assess whether pairing objective review with subjective reflection can effectively support student reflexivity in a graduate-level human-animal studies course. Following an explanatory mixed-methods framework, the study consists of a thematic analysis of student coursework that informs an online questionnaire for deeper analysis of student perspectives. Results from the coursework review will highlight themes in students' reflections and indicate shifts in perspective over the seven weeks of the course. Findings from the questionnaire will illustrate trends in students' perspectives on their shifts in related understanding and views, as well as how they experienced the course. Participants include students who have completed the Anthrozoology: Animals, People, and Society (AB 610) graduate course at Husson University (N=64), which includes five cohorts across the 2024/25 and 2025/26 academic years. Findings from the study can inform the design of future curricula on the topic that foster student reflexivity, support student growth, and deepen understanding of the content.

College of Science and Humanities**Biology****Abstract No. SH-18****DOCUMENTING SALT MARSH BIODIVERSITY, INCLUDING LOW MARSH DIE-OFF, IN COBSCOOK BAY, MAINE: IMPLICATIONS FOR MAINE'S BLUE CARBON STRATEGY**Austin Menzmer, PhD;¹ Robin Hadlock Seeley, PhD²

The health of Cobscook Bay salt marshes, particularly low marshes, in Washington County, Maine, has declined over the past decade (R. H. Seeley, pers. observation and Seeley and McCullough, unpublished data). Maine's blue carbon strategy counts on healthy coastal salt marshes to sequester carbon, but there is no published work yet on these marshes in decline. We propose a first-year pilot study to document salt marsh vegetation from the forest edge to the low marsh intertidal zone in two Cobscook Bay marshes, and thereby set the stage for a long-term study describing, quantifying, and analyzing the causes of low marsh die-off. We will establish four vertical transects at each of two marshes: one in Dennysville and one in Edmunds. Along each transect, each month of the year, we will photo-document (and later analyze in the lab) plant species in 0.5 m² quadrats, spaced regularly along each vertical transect. Plant species samples will be collected and retained as voucher specimens at the University of Maine Herbarium. In addition, we will collect water temperature and salinity data at each marsh through monitoring units fixed in the marsh. Documenting the patterns of microgeographic and seasonal variation in salt marsh vegetation will establish a baseline for testing hypotheses after 2026 about the mechanisms that underlie those patterns.

¹: Husson University²: Maine Rockweed Coalition

Designs for the 2026 Research and Scholarship Day Abstract Booklet were submitted by students in Theresa Ayotte's Graphic Design I and II classes. The winning design was created by Husson University student **Sarah Grant**.

The Research and Scholarship Day Committee extends their deepest thanks to the following students for submitting designs.

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- **Elle Marshall**
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