Welcome to Thinking Matters 2019!!

As Faculty Chair of Thinking Matters and the Director of the Honors Program, I am proud to offer our community an event that showcases all the deeply engaged, rigorous, and applied learning experiences we offer our students at the University of Southern Maine. Today, our students come together to share their research and community projects with each other and with the greater Portland community.

This year, Thinking Matters is bigger than ever! I hope you'll join us for breakfast at 8:30 and stay for the day—we have 3 sessions of poster and oral sessions happening concurrently, with students from across the university showcasing their scholarship. At noon, grab a boxed lunch and join us in Hannaford Hall for our Keynote event: the second annual Lightning Talks! This year, we'll showcase six of our strongest students will share their research projects in a lively and engaging format. Together, we'll learn about cutting-edge work in a variety of fields, including the integration of yoga in recovery, Maine's abortion history, citizen-scientist initiatives, and so much more. Thanks to Adam Burk and the Treehouse Institute for supporting our Lightning Talk winners, and to President Cummings and Meghan Cadwallader’s Educational Partnership for generously funding this Keynote event.

I am grateful to many people for their support in the planning and execution of this event. First and foremost, my thanks go to my gracious colleague Sarah Jane MacKay, whose careful planning and attention to detail are remarkable and indispensable. Thanks also to Adam Burk of Adam Burk & Co. served as a phenomenal coach and mentor for our six Lightning Talk scholars—his support of our students has been invaluable. Sarah Lucchesi, Bill Grubb, Jessica Hovey and the USM Library staff deserve special thanks for leading workshops on designing posters and effective oral presentations. Thanks also to Vinton Valentine, who prints our beautiful posters each year. USM’s Public Affairs team makes sure that our event is publicized far and wide, and our Marketing team produces our paper and electronic materials. I would also like to recognize our colleagues at SMCC and KVCC: thank you for continuing to promote Thinking Matters on your campuses, and for encouraging your students to attend and present here.

As always, the biggest thanks go to our students, faculty, and staff. This event would not be possible without your continued dedication and support. Thinking Matters is not just an annual symposium, it is an opportunity for us to come together and share our hard work with our friends, colleagues, and communities. Thank you for joining us here today, as we celebrate learning, innovation, and creativity in Maine!

Rebecca Starr Nisetich, Ph.D.
Honors Program Director
Thinking Matters Chair
CONFERENCE SCHEDULE

9:00 - 10:15 AM  Poster/Oral Session 1
10:30 - 11:45 AM  Poster/Oral Session 2
12:00 – 1:00 PM  Lightning Talks (Hannaford Hall)
1:15 - 2:30 PM  Poster/Oral Session 3
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<td>Daniel Moore</td>
<td>Abigail Griffin</td>
<td>The SRY Gene Determines Gonad Development</td>
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<tr>
<td>Daniel Moore</td>
<td>Ahmed Abbas</td>
<td>A small mutation in the Zika virus has made it much more dangerous</td>
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<tr>
<td>Caroline Shanti</td>
<td>Aiden Campbell, Renee Stronach</td>
<td>The Effectiveness of Mindfulness-Based Stress Reduction Among BSW and MSW College Students</td>
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<td>Daniel Moore</td>
<td>Alina Katanov</td>
<td>Is the world ready for “designer babies”?</td>
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<tr>
<td>Tammy Bickmore</td>
<td>Alyssa Emerson, Maggie Demetros, Kayla Gelinas</td>
<td>From Evidence Based Practice to Level I Fieldwork: Exploring Occupation in a Prison Setting</td>
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<tr>
<td>Caroline Shanti</td>
<td>Benjamin Knapp</td>
<td>Opioid use Treatment via Telemedicine; Treatment Options for Rural Maine</td>
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<td>Caroline Shanti</td>
<td>Britteny Dunham, Andrew Paine</td>
<td>Injection habits of intravenous drug users accessing the Portland Needle Exchange</td>
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<td>Daniel Moore</td>
<td>Christopher Aniapam</td>
<td>Epigenetics And Its Role In Obesity</td>
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<tr>
<td>Rachel Casey</td>
<td>Daniel Rosenheck, Sarah Dion, Benjamin Richards</td>
<td>Mindfulness Practices and Recovery</td>
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<td>Mary Anderson</td>
<td>Diana Kovinsky</td>
<td>Do Visual-Motor Interventions Improve Fine Motor Skills in Children Identified with Cross Dominance?</td>
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<td>Mary Anderson</td>
<td>Emma Kokkinos, Alexandra Gardiner</td>
<td>Cross Dominance in Children</td>
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<td>Caroline Shanti</td>
<td>Hannah Shifflett-Kohler, Andrew Breault</td>
<td>Experiences of Veterans with PTSD and SUD in an outpatient setting</td>
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<td>Caroline Shanti</td>
<td>Hannah Watson, Megan Kemna</td>
<td>The Impact of Life Experiences on Future Hopes and Aspirations</td>
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<td>Caroline Shanti</td>
<td>Holly Balvin</td>
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<td>Cyberbullying and Suicide Among LGBTQ Youth: Is There a Connection?</td>
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<td>Caroline Shanti</td>
<td>Jackie Klock, Kelsey Hayes</td>
<td>Professional Impressions and Experiences of the Complex Needs of Human Trafficking Survivors</td>
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<td>Rachel Casey</td>
<td>Jennifer Luja, Meg O’Malley</td>
<td>What is the Experience of Children under the Care of an Individual with Mental Health Issues?</td>
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<td>Daniel Moore</td>
<td>Jeremy Marsh</td>
<td>Two human populations with a need for more red blood cells carry mutations that help do this</td>
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<td>Rachel Casey</td>
<td>Jesse Audet</td>
<td>Perceptions and Observations of School-Based Bullying</td>
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<td>Mary Anderson</td>
<td>Josephine Hatch</td>
<td>Evidence and Interventions for Children with Handwriting Deficits</td>
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<td>Kasey Villeneuve, Erin Kelly</td>
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<td>Katie Morissette, Chloe Mead</td>
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<td>Kay Hanson, Kimberlee Lamothe, Amelia Smith</td>
<td>The Role of Adverse Childhood Experiences in Relationship to Opioids</td>
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<td>Kayla Tuttle, Sophie Schraeter</td>
<td>Tablet Use and Children’s Fine Motor Development</td>
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<td>Tammy Bickmore, Sarah Grinder</td>
<td>Kelly Farris, Eileen Ulmer</td>
<td>The Forgotten Leisure Occupation: Travel</td>
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<td>Mary Anderson</td>
<td>Lauren Bennett</td>
<td>Occupational Therapy Interventions are Effective in Remediating Handwriting Deficits Among Children?</td>
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<td>Daniel Moore</td>
<td>Matthew Davis</td>
<td>Manihot and Solanum food crops benefit from novel gene editing techniques</td>
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<td>Rachel Casey</td>
<td>Megan Curtis, Danielle Ryder</td>
<td>LGBT+ Teens, Social Media Use &amp; Depressive Symptoms</td>
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<td>Daniel Moore</td>
<td>Mohammed Mahdi</td>
<td>Male determining gene Nix may bring an end to transmission of diseases through mosquitoes</td>
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<td>Tammy Bickmore</td>
<td>Nicole Keniston</td>
<td>Best Practices for Providing Oral Care within the Dementia Population</td>
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<td>Noelandi Hansen</td>
<td>Education on Burnout and Self-Care at the University of Southern Maine: A Case Study</td>
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<td>Rachel Casey</td>
<td>Rebecca Crandall, Jinni Campbell</td>
<td>Investigating Professional Grief Following the Death of a Client in Mental Health Professionals</td>
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<td>Daniel Moore</td>
<td>Samar Khuder</td>
<td>For Successful Blood Transfusion Your Blood Type May Be More Than ABO</td>
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<td>Caroline Shanti</td>
<td>Sean Thomas, Henry Myer</td>
<td>Exploring connections between Adverse Childhood Experiences and Homelessness</td>
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<td>Daniel Moore</td>
<td>Serena Weston</td>
<td>X-inactivation</td>
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<td>Daniel Moore</td>
<td>Sharon Jordan</td>
<td>Understanding the genetics of Huntington’s Disease may lead to treatment and a cure</td>
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<td>Rachel Casey</td>
<td>Stephen White, Bridget O’Keefe</td>
<td>What Safe Gun Storage and Child Access Prevention Policies do People Think would be Effective in Reducing Accidental Gun Deaths in America?</td>
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<td>Rachel Casey</td>
<td>Teresa Sosa, Emelda Ogweta</td>
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<td>Daniel Moore</td>
<td>Zainab Miguel</td>
<td>CRISPR used in mosquitoes and mice as gene drive technology</td>
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<tr>
<td>Paula Gerstenblatt</td>
<td>Sally Papciak</td>
<td>Lived Experiences of Veterans Family Members in Maine</td>
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**SESSION 2 – 10:30 - 11:45 AM**

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<td>Sharon Timberlake</td>
<td>Amy Blaisdell</td>
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<td>Brenda Joly</td>
<td>Andre Trzaskowski</td>
<td>Age Differences in Illicit Drug Use in Maine</td>
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<tr>
<td>Elizabeth Goryunova</td>
<td>Andy McClement</td>
<td>Generational Differences in Organizational Culture</td>
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<tr>
<td>Reuben Addo</td>
<td>Anna Schindler</td>
<td>Gender Based Harassment &amp; Discrimination in the Workplace</td>
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<tr>
<td>Brenda Joly</td>
<td>Ashley Dougherty</td>
<td>Asthma &amp; Quick-Relief Medication in Maine</td>
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<tr>
<td>Brenda Joly</td>
<td>Brian King, Hassan Mahmoud, Anthony Pastore</td>
<td>Developing an International Health Curriculum for Medical Residencies</td>
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<tr>
<td>Joseph Staples</td>
<td>Daniel Hutchings</td>
<td>Container size, development, and mortality in mosquito larvae Culex pipiens (Linnaeus) (Diptera, Culicidae)</td>
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<tr>
<td>Brenda Joly</td>
<td>Emily Bauer</td>
<td>Interrupted Progress: Water and Sanitation in Haiti</td>
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<tr>
<td>Elizabeth Goryunova</td>
<td>Jared Bourget</td>
<td>Managing Small Teams &amp; Leadership: The Best Method to Leading a Small Team</td>
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<tr>
<td>Elizabeth Goryunova</td>
<td>Jaye Mendros Goulet</td>
<td>Virtual International Leadership Within Organizations: Overcoming Cultural, Language, and Physical Barriers</td>
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<tr>
<td>Elizabeth Goryunova</td>
<td>Jennifer Mull-Brooks</td>
<td>Building Bonds on Teams: How Team Building Positively Impacts Young Athletes</td>
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<td>Elizabeth Goryunova</td>
<td>Joshua Ferguson</td>
<td>Fake Service Dogs: Leading by Example</td>
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<td>Elizabeth Goryunova</td>
<td>Kasey Gallant</td>
<td>Authentic Leadership and its Effects on Employee Turnover and Job Satisfaction in Relation to Supervisor Accessibility</td>
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<tr>
<td>Brenda Joly</td>
<td>Katelyn Malloy</td>
<td>Child Poverty, Physical &amp; Mental Health in Maine</td>
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<tr>
<td>Robert Sanford</td>
<td>Katherine-Helene Sullivan</td>
<td>Updating the University of Southern Maine Arboretum</td>
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<tr>
<td>Sarah Grinder</td>
<td>Kayley Johnson, Taylor Eells</td>
<td>The Influence of Caregiver Coaching for Children with Oppositional Defiant Disorder</td>
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<tr>
<td>Lucille Benedict</td>
<td>Laura Walters</td>
<td>Determining the Relationship of Proteins and Iso-a-acids to Foam Retention in Various Beers</td>
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<tr>
<td>Lucille Benedict</td>
<td>Liesel Krout</td>
<td>Synthesis and analysis of 6-acetyl-1,2,3,4-tetrahydropyridine, a major contributor to ‘mousy’ off-flavor in sour and wild beers</td>
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<tr>
<td>Brenda Joly</td>
<td>Lyvia Gaewsly</td>
<td>Baseline Evaluation of Clinical Professionals’ Knowledge, Perceptions, and Institutional Best Practices Surrounding Female Genital Cutting/ Mutation</td>
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<tr>
<td>Sharon Timberlake</td>
<td>Maria Kindelan</td>
<td>Exploring the Antecedents of Those who Practice Servant Leadership</td>
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<tr>
<td>Lucille Benedict</td>
<td>Megan Greenwood</td>
<td>Measure water turbidity anywhere with your smartphone</td>
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<tr>
<td>Catherine McGuire</td>
<td>Mike Lapika</td>
<td>Measuring Birth Trauma Rates in Maine Using Public Data.</td>
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<tr>
<td>Lucille Benedict, Marcia Ackerman</td>
<td>Nicolas Mesloh, Zach Bodah</td>
<td>Investigation into the potentially devastating diastatic activity of the hop</td>
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<td>Catherine McGuire</td>
<td>Oghenetega Dibie</td>
<td>Telehealth Use in the State of Maine</td>
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<td>Elizabeth Goryunova</td>
<td>Paul Froman</td>
<td>Emotional Intelligence as an attribute of Fire Service Leadership</td>
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<tr>
<td>Sarah Grinder</td>
<td>Priscilla Motley, Meaghan Hamel, Kaitlyn Hay</td>
<td>Sensory Based Interventions For Adolescents With Autism Spectrum Disorder in the Classroom</td>
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<td>Karen Wilson</td>
<td>Sam Matey, Kala Wistar</td>
<td>Functional Feeding Groups of Aquatic Macroinvertebrates on Natural and Artificial Leaves in Forested Stream Habitats in the Sebago Lake Land Reserve</td>
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<tr>
<td>Sarah Grinder</td>
<td>Samantha Sheehan, Megan Hutcherson</td>
<td>Occupational Therapy in Post-Secondary Education Using Supported Education Interventions in Individuals with Mental Illness</td>
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<td>Katherine Ahrens</td>
<td>Sarah Gabrielson</td>
<td>Opioid use disorder at delivery hospitalization in Maine: Prevalence and characteristics (2009-2017)</td>
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<td>Sharon Timberlake</td>
<td>Sylvia Dion</td>
<td>Leadership Development in a Virtual Work Environment</td>
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<td>Tarynne Scott</td>
<td>Post Millennial Generations in the Workforce</td>
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<td>Reuben Addo</td>
<td>Taylor Hartley</td>
<td>Perceptions of Human Trafficking methods among college students</td>
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<tr>
<td>Elizabeth Goryunova</td>
<td>Tracy St. Pierre</td>
<td>The Incidence and Impact of Workplace Incivility: A Quantitative Study Comparing Public University Staff Member Experiences in the Northeast</td>
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**SESSION 3 - 1:15 - 2:30 PM**

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<tr>
<td>Joseph Staples</td>
<td>Adeline Casali, Daniel Hutchings</td>
<td>Comparing methods and technologies for assessing vertical size distribution of American beech leaves (Fagus grandifolia Ehrh)</td>
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<tr>
<td>Linda Samia</td>
<td>Anna Frances Chase</td>
<td>Accuracy of self-collected vaginal swabs in the diagnosis of bacterial vaginosis, vaginal candidiasis, and trichomoniasis</td>
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<td>Mariusz Jankowski</td>
<td>Brendan McSweeney</td>
<td>8-bit CPU implemented on FPGA</td>
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<td>Douglas Currie</td>
<td>Brent Martin, Margo Ruby</td>
<td>Effects of 3D culturing on viability and metabolism of arsenic exposed cells.</td>
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<tr>
<td>Susan Noyes</td>
<td>Cleo Miller</td>
<td>Facilitating Return to Work Among Individuals with Mental Illness Through Occupational Therapy Interventions</td>
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<td>Adam Schmitt</td>
<td>Darcie Drew</td>
<td>Perspectives on Malaga Island: From Scorn to Shame to Sympathy</td>
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<td>Bernadette Kroon</td>
<td>Emma Waterhouse, Rebecca Orcutt</td>
<td>What is the Role of Occupational Therapy in Increasing Medication Adherence in Adults Receiving Home Health Services?</td>
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<td>Rachel Lasley-Rasher</td>
<td>Erica Ferrelli, Marissa McMahan</td>
<td>Spatial and temporal variation in European green crab (Carcinus maenas) population dynamics along the coast of Maine</td>
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<td>Bernadette Kroon</td>
<td>Erica Madera, Nicholas Beach</td>
<td>Establishing a Relationship Through Play: Reducing PTSD Symptoms in School-aged Children</td>
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<tr>
<td>Rachel Lasley-Rasher, Karen Wilson</td>
<td>Erin Bucci</td>
<td>Zooplankton composition and diversity in the Penobscot Estuary</td>
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<td>Susan Noyes</td>
<td>Evangeline Abraham, Jaime Wilard</td>
<td>The Role of Motivation and Cognition in Adults with Schizophrenia</td>
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<tr>
<td>Rachel Lasley-Rasher</td>
<td>Hannah Haskell, Britney Evangellista, Alex Loftis, Joshua Slater</td>
<td>Quantifying Atlantic Sea Scallop (Placopecten magellanicus) Larval Abundance throughout Cape Elizabeth, Maine</td>
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<td>Garry Wickerd</td>
<td>Hannah Luken</td>
<td>Classroom Discipline Practices: Connecting With Teacher Perspectives</td>
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<td>Mehrdaad Ghorashi</td>
<td>Ilty Savion</td>
<td>Modeling an articulated Helicopter Blade hinge mechanism and the CFD analysis of the blades in hover</td>
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<td>Rachel Larsen</td>
<td>Jesse Florendo, Adam Barzelay</td>
<td>Aquaponics Pathogen Exploration</td>
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<td>Rachel Larsen</td>
<td>Joshua Trombley, Haley Depner</td>
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<td>Jessica Ouellette</td>
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<td>Susan Noyes</td>
<td>Katherine Uschmann, Zachary Childs</td>
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<td>Bernadette Kroon</td>
<td>Kayla Chamberlin, Deanna Richards</td>
<td>Does Instrument Assisted Soft-Tissue Mobilization (IASTM) Benefit Adults with Physical Dysfunction?</td>
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<td>Rachel Lasley-Rasher</td>
<td>Mariah Ross</td>
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<td>Mark Jacobs, Lindsey Dorval, Michelle Gardiner, Carolyn Jensen</td>
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<td>Rachel Larsen</td>
<td>Micaela Watermolen, Katherine Gamage</td>
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<td>Amerpreet Kohli, Zhenning Xu</td>
<td>Michael Cohen</td>
<td>The use of blockchain technology to solve common challenges in the supply chain</td>
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<td>Michael Currier</td>
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<td>Joseph Staples</td>
<td>Molly Meagher, Katherine-Helene Sullivan</td>
<td>Salt Tolerance in Larval Culex Pipiens</td>
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<td>Noel Neptune</td>
<td>Nathan Cook</td>
<td>Benefits of onsite health programs in the corporate setting</td>
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<td>Rachel Larsen</td>
<td>Nathan Melo</td>
<td>Microbial distribution of aquaponics systems and their division of labor.</td>
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<td>Bruce MacLeod</td>
<td>Nickolas Littlefield</td>
<td>Convolutional Neural Networks for Protein Image Classification</td>
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<td>Vaishali Mamgain</td>
<td>Sandra Bassett</td>
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<tr>
<td>Caroline Shanti</td>
<td>Sarah Gordon, Danielle Mack</td>
<td>Beliefs and Attitudes of Sexual Assault and Bystander Intervention for College Students in Rural Private College</td>
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<td>Carlos Lück</td>
<td>Seth Percy, Josh Perry</td>
<td>Multimeter Design Kit for Circuit Theory Education</td>
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<td>Ivan Most</td>
<td>Seth Percy, Earl Fall, John Gaudet, Nicholas Nelson, Mike Zagorianakos</td>
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<td>Thomas Hill</td>
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<td>Maureen LaSalle</td>
<td>Tiana Burton, Allison Pickering</td>
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<td>Reza Jalali</td>
<td>Trisha Trinidad</td>
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<td>Michael Davis</td>
<td>Tyler Mathieu</td>
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<td>Rachel Lasley-Rasher</td>
<td>Valerie Huston, Teresa Martel, Zimzim Mohamed</td>
<td>The Density of Hemigrapsus sanguineus and Carcinus maenas Crabs in Kettle Cove, Cape Elizabeth, Maine</td>
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<td>Christine Maher</td>
<td>Zachary Lankist</td>
<td>Influence of indirect cues and vegetation density on foraging behavior in snowshoe hares (Lepus americanus)</td>
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<td>Matthew Bampton</td>
<td>Dianna Farrell</td>
<td>A Case Study of High Latitude North Atlantic Historical Climate Change and Human Response</td>
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<td>Daniel Martinez</td>
<td>Emma Sawyer</td>
<td>Testing the Accuracy of Inexpensive Air Quality Sensors and Forming an On Campus Network</td>
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<td>Susannah Gordon-Messer</td>
<td>Joseph Towns</td>
<td>Constant Force Spring Loaded Bicycle</td>
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<td>Nathan Hamilton</td>
<td>Julia Gustafson</td>
<td>The North Atlantic Realm: Mapping Environmental and Climatic Change Through Archaeology</td>
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<td>Robert Sanford</td>
<td>Kelly Lynch</td>
<td>Burn Cash Eat Trash: USM food waste study</td>
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<td><strong>CLASSROOM 2 - ABROMSON 214</strong></td>
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<tr>
<td>Robert Thompson</td>
<td>Cristin McDonough</td>
<td>Do children’s concepts of achievement and knowledge reflect their upbringing and parenting backgrounds?: Adding to the debate through a literature-based investigation and empirical study</td>
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<tr>
<td>Sarah Grinder</td>
<td>Erin Murphy</td>
<td>Occupation and Early Childhood Power Mobility: An Exploratory Case Study of Family Perspectives Through Participation in Go Baby Go</td>
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<tr>
<td>Jeanne Heil</td>
<td>Foster McNamara</td>
<td>Learned Attention and English Morphology</td>
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<tr>
<td>Dana McDaniel</td>
<td>Liam Morris</td>
<td>Nyuspeling: Towards a New English Spelling System</td>
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<tr>
<td>Judy Shepard-Kegl</td>
<td>Rachelle Mendola</td>
<td>Differences between LSF and ASL regarding the variable ordering of independent noun phrases corresponding to figure and ground constructions</td>
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<td><strong>CLASSROOM 3 - ABROMSON 215</strong></td>
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<tr>
<td>Michaela Reagan</td>
<td>Anastasia D’Amico</td>
<td>How human donor variability can influence myeloma’s response to chemotherapeutic drugs when in the presence of adipocytes</td>
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<td>Christine Maher</td>
<td>Britney Evangelista</td>
<td>Methods to Manage Woodchucks</td>
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<td>Karen Wilson</td>
<td>Emma Dennison</td>
<td>Behavioral habits in juvenile alewife using Highland Lake as a Nursery Habitat</td>
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<td>Margaret Hausman</td>
<td>Haley Depner</td>
<td>The chemical properties of soil in the vicinity of two genera of ant belonging to the subfamily Myrmicinae; /Aphaenogaster/ and /Myrmica/</td>
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<td>James Ford</td>
<td>Jean Paul Habumugisha</td>
<td>Quantification of unreacted styrene in composites laminate using SPME/GC techniques</td>
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<td>Vaishali Mamgain</td>
<td>Cody Mower</td>
<td>Iron Compassion</td>
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<td>Lenny Schedletsky</td>
<td>Emily Adams</td>
<td>Bullshit: What is it?</td>
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<td>Vaishali Mamgain</td>
<td>Katie Tomer, Sandra Bassett</td>
<td>Wabanaki Healing Circles in Maine’s Correctional Facilities</td>
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<td>Vaishali Mamgain</td>
<td>Shaman Kirkland</td>
<td>Compassion in Public Service</td>
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<td>Robert Thompson</td>
<td>Clover Nichols</td>
<td>Theory to Practice: Connecting Empirical Research and Professional Development</td>
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<td>James Ford</td>
<td>Prashiddhi Pokhrel</td>
<td>Analysis of the transition of chemistry students from high school to the university</td>
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<td>Joseph McDonnell</td>
<td>Sara Fawcett née Flowers</td>
<td>Can Folkeøjskole Help Make Taking a Gap Year Function as a Higher Education First-year Experience?</td>
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<td>Joseph McDonnell</td>
<td>Sara Flowers</td>
<td>A Higher Education Response to Rampage Violence</td>
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<td>Daniel Panici</td>
<td>Tessa Winship</td>
<td>The Power of Disclosure: How Students and Advisors Reduce Uncertainty</td>
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<td><strong>SESSION 2  -  10:30 - 11:45 PM</strong></td>
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<tr>
<td>Anthony Moffa</td>
<td>Ashley Fagan</td>
<td>The Effects of the Internet on Regulations</td>
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<td>Maureen Ebben</td>
<td>Heather Roberts</td>
<td>The Effects of Online Harassment on Feminist Cyber Communities</td>
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<td>Daniel Panici</td>
<td>Julie Pike</td>
<td>Independence Among Students Newspapers at Public Universities in New England</td>
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<td>Robert Klotz</td>
<td>Kathryn Letellier</td>
<td>The Effect of Media Literacy in Recognizing Fake News</td>
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<td>Ann Spencer</td>
<td>Yihui Yao</td>
<td>Video Games and the Future of Capitalism</td>
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<td><strong>CLASSROOM 2 - ABROMSON 214</strong> (This panel will end at 12:00 PM)</td>
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<tr>
<td>Wendy Chapkis</td>
<td>Caroline Wheeler</td>
<td>Querying the Past: Maine LGBTQ Oral History Project</td>
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<td>Wendy Chapkis</td>
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<td>Wendy Chapkis</td>
<td>Jack Barrett</td>
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<td>Wendy Chapkis</td>
<td>May Honman</td>
<td>Querying the Past: Maine LGBTQ Oral History Project</td>
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<td>Wendy Chapkis</td>
<td>Skylar Hebert</td>
<td>Querying the Past: Maine LGBTQ Oral History Project</td>
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<td>Wendy Chapkis</td>
<td>Tiana Cope-Ferlind, Cosette Holmes</td>
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<td>Mustafa Guvench</td>
<td>Anh Duong</td>
<td>Development of Ammonia Gas Sensors Printed on Flexible Kapton Substrates</td>
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<td>Mustafa Guvench</td>
<td>Joshua Perry</td>
<td>Testing and Characterization of MEMS Narrow Band Biomimetic Directional Microphone Based on the Fly Ormia Ochracea</td>
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<td>Paul Nakroshis</td>
<td>Mackenzie Libby</td>
<td>The construction of Muon detectors as a basis for research at USM</td>
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<td>Carlos Lück</td>
<td>Seth Percy</td>
<td>Microbot™ Modification for Redundancy Resolution</td>
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<td>David Champlin</td>
<td>Alaa Makki</td>
<td>The Role of Collagen Triple Helix Repeat-Containing 1 Signaling in Adipogenesis and Lipolysis</td>
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<td>David Champlin, Lucy Liaw</td>
<td>Bethany Fortier, Gene Ables, Joshua Boucher, Emily Cooper, Robert Koza</td>
<td>The Effect of Methionine Restriction on the Thermogenic Phenotype of Perivascular Adipose Tissue</td>
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<td>Robert Koza</td>
<td>Lilia Brooks</td>
<td>Determination of the biological consequences of abnormal Mest expression</td>
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<td>Aaron Brown</td>
<td>Rachelle Mendola, Chad Doucette, Daniel Nguyen</td>
<td>Analysis of anti-diabetic exosomes secreted from beige adipocytes</td>
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<td>Lucy Liaw</td>
<td>Samantha White, Joshua Boucher, Anne Harrington, Larisa Ryzhova</td>
<td>Development of transgenic mouse models to investigate RAB27a regulation of perivascular adipose tissue</td>
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<td>Rikki Miller</td>
<td>Andrew Cook</td>
<td>Recovery, Substance Misuse, and Relapse</td>
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<td>Derek Tharp</td>
<td>Christopher Hickey</td>
<td>Health Insurance Marketplace Taxonomy and its Influence on Consumer Perception of Plan Suitability</td>
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<td>Dennis Gilbert</td>
<td>Griffin Germond</td>
<td>Checking In, Concussions Out: Body Checking in Maine Girls’ High School Ice Hockey &amp; Beyond</td>
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<td>Erika Ziller</td>
<td>Morgan Horn</td>
<td>The Prevalence of and Risk Factors for Suicidal Ideation among Rural Populations in the United States</td>
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<td>Erika Ziller</td>
<td>Zachariah Croll</td>
<td>Health Status and Access to Care Among Maine’s Low-Income Childless Adults: Implications for State Medicaid Expansion</td>
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<td>Leif Oxburgh</td>
<td>Casey Ahlmenyer, Ed Jachimowicz</td>
<td>Developing an Assay to Determine the Presence of Human Urine by Identifying Tamm Horsfall Protein in Samples</td>
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<td>Douglas Currie</td>
<td>Emily Gibbs, Taylor Lyman</td>
<td>Arsenic Exposure Effects on Glial Brain Cells</td>
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<td>Clifford Rosen</td>
<td>Pratima Bajgain</td>
<td>Role of a-Synuclein in Bone Formation</td>
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<td>Sergey Ryzhov</td>
<td>Teaka Jackson, Amanda Favreau-Lessard, Sarah Peterson, Michael Robich, Douglas Sawyer</td>
<td>Level of circulating vascular endothelial growth factor (VEGF) after coronary artery bypass grafting (CABG) surgery</td>
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<td>Hady Phoulady</td>
<td>Zachary Rohman</td>
<td>Automated Grading of Histology Slides for Breast Cancer Prognosis with Convolutional Neural Networks</td>
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<td>Francesca Vassallo</td>
<td>Carole Grant</td>
<td>European Nationalism in The Age of Populism</td>
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<td>Elizabeth Bischof</td>
<td>Emma Quinn</td>
<td>Myth, Metaphor, and Memorialization: A History of the Spanish Civil War through Pablo Picasso’s Guernica and Robert Capa’s photography</td>
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<td>Elizabeth Bischof</td>
<td>Jack Martin</td>
<td>Memoirs of a City: A Contemporary Walking Tour of Historic Bath, Maine from the 17th century to the 20th</td>
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<td>Tracy Michaud</td>
<td>Wendy Gallant</td>
<td>Community Tourism Development in Naples, Maine</td>
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<td>Rosemary Cleary</td>
<td>Adele Hayward</td>
<td>Agency and Attunement of Youth Seeking Resources Through Preble Street.</td>
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<td>Rosemary Cleary</td>
<td>Deyvin Winter</td>
<td>Toxic Masculinity and Programs of Intervention in Maine</td>
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<td>Rosemary Cleary</td>
<td>Maisarah Miskooven</td>
<td>Viewing Refugee Resettlement Programs through an Intersectional Lens</td>
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<td>Rosemary Cleary</td>
<td>Mariah Reed</td>
<td>Abortion in Maine: A Historical Inquiry into Abortion Access</td>
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<td>Rosemary Cleary</td>
<td>Mel Batchelor</td>
<td>The Importance of Intersectionality in Recovery Spaces</td>
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<tr>
<td>Jessica Ouellette</td>
<td>Bianca Sturchio</td>
<td>Digitally Mediated Spaces as Sites for Counterpublic Discourse among LGBTQ+ and Disabled Adults</td>
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<td>Elizabeth Tracy</td>
<td>Chelsea Stephens</td>
<td>Undergraduate Social Work Students Perceptions of Developmental Disability</td>
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<td>Jessica Ouellette</td>
<td>Emma Donnelly</td>
<td>A Feminist Rhetorical Analysis of Abortion Access in Maine</td>
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<td>Katherin Ahrens</td>
<td>Jaclyn Janis</td>
<td>Female age at first sexual intercourse by rural-urban residence</td>
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<td>Wendy Chapkis</td>
<td>Johnna Ossie</td>
<td>The significance of Cross-Generational Connection in the Queer Community</td>
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<td>Sharon Timberlake</td>
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**Lightning Talks**

12:00 - 1:00 PM (Hannaford Hall)

| Brenda Zollitsch               | Kiley Wilkens              | Applying Social Work Generalist Practice Skills to Larger Social Systems |
| Rosemary Cleary                | Mariah Reed                | Maine’s Abortion History: A 19th and 20th Century Perspective |
| Caroline Shanti                | Mary Stanton               | Alternative Treatment for People in Recovery: The Impact of Yoga on Recovery |
| Joseph Staples                 | Samuel Matey               | I Led a BioBlitz- And You Can, Too! |
| Assunta Kent, Mark Multane     | Sigrid Sibley, James Phillips | Voicing the Past: On-Site Performance in Iceland and New England |
TITLE: A small mutation in the Zika virus has made it much more dangerous
AUTHOR(S): Ahmed Abbas
FACULTY MENTOR(S): Daniel Moore
AFFILIATION: SMCC
ABSTRACT: Zika virus is spread by the mosquito, Aedes aegypti. Signs and symptoms of infection are maculopapular rash, joint and muscle pain, headache, and non-purulent conjunctivitis. More recently, babies born to affected mothers are microcephalic (small head). This literature review examines the history of Zika virus cases and a new mutation that produces effects in neural tissue. Evidence suggests this Zika virus mutation may be the cause of new effects. The mutation changes an amino acid in a protein that the Zika virus instructs cells to make. That protein is called prM. The change in prM may not be the entire reason that Zika virus causes microcephaly, but it led to the death of some brain cells. It may kill enough neural tissue to cause the birth defect. Some evidence suggests it makes Zika dangerous in a different way; it makes it easier for the virus to infect mosquitoes.

TITLE: The Role of Motivation and Cognition in Adults with Schizophrenia
AUTHOR(S): Evangeline Abraham, Jamie Wilard
FACULTY MENTOR(S): Susan Noyes
AFFILIATION: USM
ABSTRACT: Our work is based around the holistic nature of the field of occupational therapy. This evidence-based project initially began, at the request of our community partner, with the intention of finding one or more assessments that may help identify the cause of a lack of motivation among group home residents at Tri County Mental Health in Lewiston, ME who suffer from schizophrenia. Schizophrenia is a chronic and severe mental illness that is now diagnosed as a spectrum disorder. It is characterized by distortions in the perception of reality and impairments in cognition and motivation. Schizophrenia can be categorized into three types of symptoms: positive, negative, and cognitive. Negative symptoms were the subject of interest for this project because we found that they present as the absence of typical functional behaviors and often consist of a lack of motivation for social participation, impairment in the initiation of activities, and flat affect, or a reduction in emotional responsiveness. The specific population is adults with schizophrenia who present with a significant lack of motivation to engage in daily activities such as bathing, dressing, and grocery shopping. The results have produced several options for assessments and interventions as well as distinct themes that contribute to a greater understanding of motivation and cognition in adults with schizophrenia.

TITLE: Bullshit: What is it?
AUTHOR(S): Emily Adams
FACULTY MENTOR(S): Lenny Schedletsky
AFFILIATION: USM
Abstract: The question this study is trying to answer is as follows: Is there any relationship between a person's worldview and the speed at which she/he reacts to statements? Furthermore, is their reaction time to statements related to whether or not the statement supports their worldview? The study consists of three phases: practice, trial phase, and a survey. Subjects, fifty-years old and older, practiced responding as fast and as accurately as possible to ten computer presented statements, choosing either “Bullshit” or “Not Bullshit,” by pressing a key on the computer. Subjects responded as fast as they could to statements representing Individualist, Communitarian, Hierarchical, and Egalitarian worldviews. They indicated how confident they were in their response. Finally, they indicated their degree of strength of agreement with statements representing the four world views. Preliminary results show that the strength of belief affects the subject’s reaction time. Subjects responded faster to disconfirming statements than to confirming statements. These findings are discussed in view of Mercier & Sperber’s (2017) intuitionist theory of reasoning and Kahneman’s (2011) thinking on fast and slow thinking.

TITLE: Developing an Assay to Determine the Presence of Human Urine by Identifying Tamm Horsfall Protein in Samples
AUTHOR(S): Casey Ahlemeyer, Ed Jachimowicz
FACULTY MENTOR(S): Leif Oxburgh
AFFILIATION: MMCRI
ABSTRACT: Human kidney tissue can be created from stem cells and we can implant that tissue into mice, but so far we have no good way to measure if it is functioning. If we could detect human urine mixed in with the mouse urine, then that would give us an excellent function marker. One of the major proteins that is excreted in human urine is: Tamm Horsfall Protein. Tamm Horsfall Protein (THP) or also called, Uromodulin, is a glycoprotein that is produced by renal nephron epithelium cells in the loop of Henle. This protein thought to have an anti-bacterial function, but the important thing is that it is shed in large quantities, so it would be a sensitive biomarker if we could find...
a human-specific antibody. For this experiment, I have tested different antibodies and their ability to specifically detect human THP via western blotting. Currently, the project is in progress and further studies have been planned to verify human THP specificity and the validity of the work done so far. Here’s the major question: can we develop an assay that specifically detects human urine?

**TITLE:** Epigenetics And Its Role In Obesity  
**AUTHOR(S):** Christopher Aniapam  
**FACULTY MENTOR(S):** Daniel Moore  
**AFFILIATION:** SMCC  
**ABSTRACT:** The association of obesity and epigenetics will be discussed in this literature review. Researchers found that variations in the epigenetic coding of certain genes (such as Nnat, Peg3, Cdkn1c, and Plag1) is likely to be a cause of obesity in adults. FTO is a gene found in both mice and humans that has been shown to be associated with obesity despite a low, or high, fat content diet. FTO encodes a nucleic acid demethylase. Methylation of DNA is part of epigenetic regulation. Another gene, Trim28, has major effects on how adipocytes store or burn the lipids within them. Heterozygous mice with only one good copy of the Trim28 gene are polyphenic. The weight distribution for these mice has two peaks. The adults are either normal or obese despite having the same genes. The product of Trim28 is involved in heterochromatin deposition and silencing, both parts of epigenetic regulation.

**TITLE:** Perceptions and Observations of School-Based Bullying  
**AUTHOR(S):** Jesse Audet  
**FACULTY MENTOR(S):** Rachel Casey  
**AFFILIATION:** USM  
**ABSTRACT:** There is substantial research on the topic of bullying in schools regarding identities of both victims and perpetrators of bullying. However, one aspect of bullying that has not been fully explored is how bullying perceptions of school-aged children may differ from those of the adults supervising them. The aim of this study is to obtain a better understanding as to how 5th and 6th grade students and school officials at one public elementary school identify and interpret bullying. An anonymous, quantitative survey was distributed to over 100 students and school administrators. The findings of this study could help to identify the perceptions that the students and school administrators have on bullying along with using the finding to help further educate students and school administrators about ways to reduce bullying at an elementary school.

**TITLE:** Role of α-Synuclein in Bone Formation  
**AUTHOR(S):** Pratima Bajgain  
**FACULTY MENTOR(S):** Clifford Rosen  
**AFFILIATION:** USM  
**ABSTRACT:** α-Synuclein is a soluble small protein (140 amino acids) best known as the main hallmark of the Parkinson’s Disease. Bone microarchitecture of these patients is severely impaired leading to high risk of fracture. In order to maintain a normal bone mineral density, it is required to have a coupling between bone formation and bone resorption. Recent studies have suggested that α-Synuclein regulates bone remodeling. Therefore, we analyzed osteogenic and osteoclastogenic differentiation by isolating bone marrow cells, and inducing HSCs with osteogenic media (basal media, α-glycerophosphate and ascorbic acid) for osteogenic differentiation, and with osteoclastogenic media (basal media, RANKL and MCSF) for osteoclastogenic differentiation in wild type (+/+−Snca-f/f) mice and α-Synuclein osteoprogenitor-deleted (Prx1-Cre/Snca-f/f) mice for 21 and 4 days respectively. Osteogenesis was analyzed through alkaline phosphatase and von Kossa staining, and cells with 3 or more nuclei were counted as osteoclast after Tartrate-resistant acid phosphatase (TRAP) staining for osteoclastogenesis. There was no significance difference between the two strains of mice for both staining for osteogenesis. The total osteoclast number resulted in higher number of osteoclast cells in Prx1-Cre/Snca-f/f than in wild type in both male and female mice. Further studies are needed in order to determine the importance of these findings on the skeletal remodeling, particularly for the osteoclast studies.

**TITLE:** Paws For Education  
**AUTHOR(S):** Holly Balvin  
**FACULTY MENTOR(S):** Caroline Shanti  
**AFFILIATION:** USM  
**ABSTRACT:** This research seeks to explore the impact of animal assisted education on school experience of students at Greely High School in Cumberland, Maine. The purpose of this qualitative study is to find out if this phenomena had a positive or negative impact on
students. This phenomenological study involved eight in person interviews of high school age students ranging from freshman to seniors ages fourteen to eighteen. The researcher hopes to bring more animal assisted education programs like this into fruition across the country. Keywords: Animal assisted education, phenomenology, high school, empowerment

TITLE: Querying the Past: Maine LGBTQ Oral History Project  
AUTHOR(S): Jack Barrett  
FACULTY MENTOR(S): Wendy Chapkis  
AFFILIATION: USM  
ABSTRACT: As part of the Querying the Past: Maine LGBTQ Oral History Project, I conducted a life history interview with a local community member, Skip Brushaber. The interview and transcription is available to researchers and the public on the USM digital commons: http://digitalcommons.usm.maine.edu/querying_ohproject/index.html. In this Thinking Matters presentation, I will discuss the process of, and insights obtained through, the oral history interview, and I will reflect on Skip's experience with LGBTQ activism in Portland, Maine and his work on Our Paper, a newsletter based out of Portland that focused on LGBTQ issues during the AIDS epidemic. I will address the importance of recording that history and describing what lessons it can teach us to help us in current struggles.

TITLE: Healing Circles  
AUTHOR(S): Sandra Bassett  
FACULTY MENTOR(S): Vaishali Mamgain  
AFFILIATION: USM  
ABSTRACT: Our intentions are in the best interest of our people in the circles. We bring hope, a safe place to share, a solution with respect to tradition and culture. We use mindful practices, pray, and meditation, scared medicines. Recently we have been bringing Passamaquoddy language into the prisons. It has to be the greatest connection we have to each other. Smudging and drumming outside is also powerful to the healing process. It is a piece of feeling normal again in a system that does not feel normal. Our intentions are to have our people know we are here for them and that they matter. That we heal together, we share, and what is said in our circles is sacred to us. Their circles, we show up, and we facilitate the changes in their communities are powerful.” —Sandra Bassett

TITLE: The Importance of Intersectionality in Recovery Spaces  
AUTHOR(S): Mel Batchelor  
FACULTY MENTOR(S): Rosemary Cleary  
AFFILIATION: USM  
ABSTRACT: Through my internship with the Recovery Oriented Campus Center at University of Southern Maine, I focused on if applying an intersectional framework to recovery-oriented spaces improves the accessibility and supportiveness of those spaces. My research for the group I facilitated about this topic yielded that there are many barriers to access recovery spaces and these barriers can be reduced with taking an intersectional approach to recovery. By focusing on forms of intersecting oppressions that manifest in institutions like schools and hospitals, mental health and substance use conditions can not only be better addressed, but prevented.

TITLE: Interrupted Progress: Water and Sanitation in Haiti  
AUTHOR(S): Emily Bauer  
FACULTY MENTOR(S): Brenda Joly  
AFFILIATION: USM  
ABSTRACT: Haiti has faced damaging environmental and social impacts, which have interrupted progress towards clean drinking water and adequate sanitation facilities for its over 10 million people. Natural disasters, disease outbreak, political corruption and economic instability have contributed to poor health and social outcomes for the small, island nation. This study used the most recent data from the World Health Organization and United Nations Children’s Fund Joint Monitoring Programme (WHO/UNICEF JMP) to assess national trends in water source and sanitation facility improvements from 1990-2015. WHO/UNICEF JMP defines water improvements as piped or non-piped protected water, and sanitation improvements as networked, flushed or on-site toilets connected to septic systems. Of the national data collected by the JMP, Haiti experienced interrupted improvement in water sources and sanitation facilities. For both urban and rural regions of the country, 69% had improved water sources in 2010, but improvements declined to 64% in 2015. Sanitation improvements dropped to 17% from 2000-2010 but grew to 31% in 2015. Water has improved since 1990 at 62%, but sanitation has made little progress from 18%. Recent interruptions are likely linked to the 7.0 magnitude earthquake and foreign-borne cholera outbreak of 2010. The results of this study demonstrate the need for significant water and sanitation investments for universal access to clean water and adequate sanitation in rural and urban regions of Haiti.
TITLE: Occupational Therapy Interventions are Effective in Remediating Handwriting Deficits Among Children?
AUTHOR(S): Lauren Bennett
FACULTY MENTOR(S): Mary Anderson
AFFILIATION: USM
ABSTRACT: Handwriting is a key component for children to access their education both academically and social. Writing is a tool that is used for communication which allows students to explain their feelings, thoughts, ideas. When broken down, handwriting is dynamic with multiple components requiring memory, organization, and motor processes. Handwriting requires lower-level perceptual motor skills and higher-level cognitive processing, proposing that deficits cannot be generalized and should be individually evaluated (Case-Smith & O'Brien, 2015). With students spending twenty-five percent of their classroom day with pencil-and-paper tasks, writing deficits can heavily impact a student’s academic achievement and development. Handwriting deficits have been on the rise due to a myriad of reasons, most recently due to the presence of technology in classrooms. This evidenced-based project aimed to identify occupational therapy interventions that can be used to remediate handwriting deficits among children. There is minimal research completed in this area, but the articles that do exist recommended interventions that directly relate to the child’s skill deficits, either legibility, visual-motor integration, or speed. Research collected determined that interventions combining a cognitive approach with the motor learning theory have been the most successful (Hoy, Egan, and Feder, 2011).

TITLE: Engaging a Multi-Generational Workforce: Understanding and Managing Generational Differences in the Filtration Industry
AUTHOR(S): Jeff Bernier
FACULTY MENTOR(S): Sharon Timberlake
AFFILIATION: USM
ABSTRACT: The changing nature of our economy with across-the-board international tariffs, price to win defense contracts, diminishing legacy systems, and intergenerational workforces have caused small niche industries to rethink their current business model and adopt a more strategic leadership approach. Given the importance of this strategic initiative, it is critical these industries become more efficient by using current resources to better understand each generation’s characteristics, values, and motives in order to facilitate collaboration, innovation, communication, and retention of its workforce. The purpose of this quantitative study is to examine generational differences in a blue-collar manufacturing workforce in regards to productivity, communication, and retention. The sample population will come from two manufacturing plants; one located in Northern Maine and the other in Central Virginia. Demographic information about the respondents will be divided into the following categories: age, gender, education, and work centers. Data for this study will be collected through a four-part survey consisting of demographic information, job productivity, communication, and retention. Generations i.e., Baby Boomers, Gen Xers, and Gen Nexters will represent the independent variable, and the preferred characteristics of blue-collar cohorts will represent the dependent variables. Upon conclusion of the study, results will be shared among the senior leadership of the two manufacturing plants.

TITLE: Coaches in Maine Have an Ethical Responsibility as Leaders to Disclose the Risks of Sport Specialization
AUTHOR(S): Meredith Bickford
FACULTY MENTOR(S): Sharon Timberlake
AFFILIATION: USM
ABSTRACT: Sadly, the days of playing outside in the mud, building cabins, eating dinner as a family, pizza nights, and family vacations are all but a memory. Children used to participate in organized sport throughout the school-year. Summer months and school vacation weeks were filled with the simplicities of life and the boredom that sometimes came with being a teenager. These days seem to be lost to the hustle and bustle of today's busy world, especially the time and commitment it takes to participate in specialized sports. In the past, it was considered normal for a young boy or girl to participate in more than one sport throughout their athletic career. Children are shifting from participating in multiple sports to participating solely in one sport. Many of our youth, are deciding to focus on one sport early on in their careers and this decision is leading to burnout, injuries, and lower participation numbers. Coaches have a responsibility to educate and lead young athletes to understand the risk factors associated with sport specialization. Coaches have great power in the decision-making process for team selection, playing time, and elite showcase selection. The transformation of a multisport athlete to a sport specialized athlete may have caused great concern for sport related injuries, financial hardships and burnout. This paper intends to explore the physical, emotional, academic, and family related issues caused by sports specialization.
TITLE: Managing Small Teams & Leadership: The Best Method to Leading a Small Team
AUTHOR(S): Jared Bourget
FACULTY MENTOR(S): Elizabeth Goryunova
AFFILIATION: USM
ABSTRACT: According to the U.S. Small Business Association or SBA, in 2010, there were 27.9 million small business identified. This number alone sets precedence how many more businesses could be estimated worldwide. These businesses operate with employees in multiple industries and sectors. In most cases, managing the employees is necessary in the workplace. Leaders generally have the titles of presidents, vice presidents, directors, managers, supervisors. Most importantly, beneath these leadership roles are the individuals who take direction and said leadership that will potentially further the success of a team and of the company for that matter. Employees are a critical function to the success of a company. Managing a team is absolutely important to maximize that success. Managing even a small group of individuals can be extremely time-consuming and stressful. The leadership should be seeking to optimize, organize, and design their team so that there is close to perfect efficiency and competence. The importance of management understanding the necessary work to be completed and to be clearly communicating the responsibilities to the employees would be initial factors in managing a small team. The research at hand further explores what are some of the best managing methods and tactics to use when leading a small team.

TITLE: Determination of the biological consequences of abnormal Mest expression
AUTHOR(S): Lilia Brooks
FACULTY MENTOR(S): Robert Koza
AFFILIATION: USM
ABSTRACT: The imprinted gene mesoderm specific transcript (Mest), a potential epigenetic determinant of obesity, has high inter-individual variation of expression in adipose tissue among genetically identical mice that is significantly and positively associated with development of obesity. Further studies revealed that inactivation of Mest in adipose tissue of mice reduced obesity and improved glucose homeostasis. To elucidate the function of MEST, we developed a novel mouse model with adipose tissue-specific transgenic expression of Mest (iMest-TgAd). In this study, we characterized the iMest-TgAd mice using in vivo and in vitro models. We showed that iMest-TgAd mice only expressed Mest in adipose tissue and levels were comparable to dietary-fat induced endogenous Mest. Studies with mesenchymal and adipocyte progenitor cells from iMest-TgAd mice showed no differences in adipogenic differentiation compared to control cells. However, analyses of adipose tissue from iMest-TgAd mice showed a significant increase in the number of large adipocytes compared to control mice. These results suggest that iMest-TgAd mice recapitulate the in vivo phenotype observed in dietary fat fed control mice and thus provide a valuable tool to investigate MEST’s role in facilitating adipose tissue expansion.

TITLE: Zooplankton composition and diversity in the Penobscot Estuary
AUTHOR(S): Erin Bucci
FACULTY MENTOR(S): Rachel Lasley-Rasher, Karen Wilson
AFFILIATION: USM
ABSTRACT: Estuaries provide many ecosystem services such as buffering the negative impacts of storms, offering recreation and commercial fishing opportunities, and they serve as a critical habitat corridor for migratory fish. In New England, estuarine habitats have been dramatically altered over the last 200 years due to dam construction; migratory fish such as Atlantic salmon and alewives have suffered. Recently, there have been several dam removal projects in Maine aimed to restore these populations – the largest of these efforts being the Penobscot River Restoration Project. In 2013, two dams were removed from the Penobscot River Estuary, opening more than 2,000 miles of rivers and streams to sea-run fish. Since 2013, migratory fish such as blueback herring and alewives have dramatically increased in number. In this study, we are measuring the effects on their zooplankton prey. Field surveys reveal an initial six-fold decrease in zooplankton abundance. Currently, we are exploring changes in species composition and diversity. These findings contribute to the understanding of trophic dynamics after following habitat restoration.

TITLE: Hospitality, Tourism and Sustainability: A comprehensive study comparing Iceland and Maine.
AUTHOR(S): Tiana Burton, Allison Pickering
FACULTY MENTOR(S): Maureen LaSalle
AFFILIATION: USM
ABSTRACT: The small Nordic Island of Iceland, as well as the State of Maine are home to an abundance of natural resources and attractions that are seeing a dramatic increase in tourist traffic. This study seeks to compare and contrast tourism and hospitality in these locations. Areas of study will include the organization structure of the Icelandic hospitality industry compared to the structure in Maine,
as well as the supply and demand in both destinations. Additionally, the Icelandic experience and Maine experience will be explored and further researched to develop data about the target markets and the unique qualities of each area. This will include nature tourism, cultural tourism, as well as the sustainable practices being developed in the industry. Through the use of primary and secondary research, a conclusion will be drawn in regards to the similarities and differences between Iceland and Maine’s sustainable tourism and hospitality, advising ways in which they can succeed as a tourism destination moving forward.

**TITLE:** Querying the Past: Maine LGBTQ Oral History Project  
**AUTHOR(S):** Hannah Cain  
**FACULTY MENTOR(S):** Wendy Chapkis  
**AFFILIATION:** USM  
**ABSTRACT:** As part of the Querying the Past: Maine LGBTQ Oral History Project, I conducted a life history interview with a local community member, Ralph Cusack. The interview and transcription is available to researchers and the public on the USM digital commons: http://digitalcommons.usm.maine.edu/querying_ohproject/index.html. In this Thinking Matters presentation, I will discuss the process of, and insights obtained through, the oral history interview, and I will reflect on intergenerational mentoring within the LGBTQ+ community, gay bars and their importance as safe spaces, and the benefits of younger generations of the LGBTQ+ community learning about the stories of the older members of the community.

**TITLE:** The Effectiveness of Mindfulness-Based Stress Reduction Among BSW and MSW College Students  
**AUTHOR(S):** Aiden Campbell, Renee Stronach  
**FACULTY MENTOR(S):** Caroline Shanti  
**AFFILIATION:** USM  
**ABSTRACT:** All college students face stress in regards to their academics, finances, ability to build social networks and plan for future careers that may severely impact their level of functioning. Bachelors of Social Work (BSW) and Masters of Social Work (MSW) students experience not only these primary stressors, but also program demands, field placements, exposure to secondary trauma, and the broad spectrum of populations served in this field. These factors can lead to burnout before graduation and impact one's ability to succeed in their career. When students use effective stress management and emotional regulation techniques, they become better equipped to make healthy choices, develop healthy relationships and are more resilient to face challenges related to college and university stress (Dvorakova, K. et al., 2017). Mindfulness-Based Stress Reduction and awareness can decrease potential burnout by reducing stress and increasing self-awareness and insight. In this exploratory quantitative project, researchers distributed a quantitative survey to BSW and MSW students at the University of Southern Maine to assess their levels of daily stress and their use of mindfulness practices and or mindfulness awareness. The goal of the study is to explore connections between levels of stress and the use of mindfulness practices. The researchers will present the share the findings with the USM School of Social Work in the hopes of promoting the use of mindfulness across the curriculum to support students.

**TITLE:** Comparing methods and technologies for assessing vertical size distribution of American beech leaves (Fagus grandifolia Ehrh)  
**AUTHOR(S):** Adeline Casali, Daniel Hutchings  
**FACULTY MENTOR(S):** Joseph Staples  
**AFFILIATION:** USM  
**ABSTRACT:** The American beech (Fagus grandifolia Ehrh) is a deciduous species that occurs throughout the eastern United States and Southeast Canada. This species grows 20–35 meters in height and is tolerant of a range of environmental conditions. Because beech occurs over a wide geographical and ecological range, it is ideal for comparative studies between sites or environmental conditions. Here we report on the relative size of beech leaves collected from different heights above the forest floor. We then determine if morphological trends between upper and lower canopy were consistent between live fall leaves and senesced mid-winter leaves that remain attached to the branches. Leaf area was analyzed from digital images using ImageJ software, multiple smartphone apps, and directly using handheld laser leaf area meter. The objectives for this study were two-fold; 1) to determine if the vertical size distribution of beech leaves remained consistent between live fall leaves and remaining senesced winter leaves, 2) to assess different methods and technologies of measuring leaf area for research and educational purposes.
TITLE: Does Instrument Assisted Soft-Tissue Mobilization (IASTM) Benefit Adults with Physical Dysfunction?
AUTHOR(S): Kayla Chamberlin, Deanna Richards
FACULTY MENTOR(S): Bernadette Kroon
AFFILIATION: USM

ABSTRACT: This project began in partnership with the Inland Hospital occupational therapy department in Waterville, Maine. The therapists were interested in evidence on the effectiveness of instrument assisted soft-tissue mobilization (IASTM) as a therapeutic intervention for their patients. This technique is an alternative form of therapeutic massage, which uses metal instruments to treat soft-tissue adhesions. This project looked into therapeutic outcomes of IASTM for use on adults with physical dysfunction, specifically those experiencing pain or loss of range of motion. The project reviewed numerous studies on the topic of IASTM. Eleven articles were selected to be included in the final project based on highest level of evidence, relevant outcome measures, and use of IASTM tools. Findings suggest that IASTM gives relief from the signs and symptoms of carpal tunnel syndrome as well as low back pain in the long-term. Standard IASTM treatment times do not appear to be effective at improving muscular performance. IASTM appears to be effective at increasing peripheral blood flow to the area being treated. Several studies also demonstrate that IASTM is effective at decreasing pain and increasing musculoskeletal range of motion, although more evidence is needed to determine which specific diagnoses, treatment areas, and treatment strategies will result in the most beneficial clinical outcomes.

TITLE: Querying the Past: Maine LGBTQ Oral History Project
AUTHOR(S): Emma Chapin
FACULTY MENTOR(S): Wendy Chapkis
AFFILIATION: USM

ABSTRACT: As part of the Querying the Past: Maine LGBTQ Oral History Project, I conducted a life history interview with a local community member, Meredith McEachern. The interview and transcription is available to researchers and the public on the USM digital commons: http://digitalcommons.usm.maine.edu/querying_ohproject/index.html. In this Thinking Matters presentation, I will discuss the process of, and insights obtained through, the oral history interview, and I will reflect on the intersection of mental illness with an LGBTQ+ identity, the importance of interviewing young adults as well as community elders, the importance of an understanding college community, and creative writing as an outlet to aid trauma recovery.

TITLE: Accuracy of self-collected vaginal swabs in the diagnosis of bacterial vaginosis, vaginal candidiasis, and trichomoniasis
AUTHOR(S): Anna Frances Chase
FACULTY MENTOR(S): Linda Samia
AFFILIATION: USM

ABSTRACT: Vaginitis is the most common gynecological problem seen in primary care. It is estimated to account for 10 million primary care visits each year. The most common causes of vaginitis - responsible for up to 90% of cases - are bacterial vaginosis (BV), vaginal candidiasis (“yeast infections”), and trichomoniasis. The purpose of this evidence-based project was to evaluate whether self-collected vaginal swabs are as accurate as those collected by a provider during a speculum exam in the diagnosis of BV, yeast infections, and trichomoniasis. In order to appropriately diagnose and treat vaginitis, samples from a vaginal swab are often required. These are most frequently collected by a provider through a speculum exam. However, speculum exams are invasive and may be a barrier to care for some patients. They can be especially problematic for patients with a history of trauma or in younger or non-sexually active patients. However, undiagnosed and untreated some causes of vaginitis may lead to complications such a preterm labor, pelvic inflammatory disease, and endometriosis. Evidence for diagnostic efficacy of self-collected swabs for BV, yeast infections, and trichomoniasis was appraised using systematic methods. Results suggest that self-swabs for these conditions are equally reliable as provider obtained swabs. Dissemination of these findings may help to reduce barriers to care for our patients while providing equally safe and effective diagnostic screenings.

TITLE: The use of blockchain technology to solve common challenges in the supply chain
AUTHOR(S): Michael Cohen
FACULTY MENTOR(S): Amarpreet Kohli, Zhenning Xu
AFFILIATION: USM

ABSTRACT: When blockchain was first invented by Satoshi Nakamoto in 2008 it was thought to only be used for Bitcoin; a digital currency. It had been used to record transactions made without needing a third party authenticator. Blockchain showed the ability to reduce costs, speed up transactions, and reinvent the processes of how things are done. Once people fully understood what blockchain does, entrepreneurs and investors realized it could be used for much more than just a cryptocurrency. It could be applied to transportation,
products sold, food, the medical industry, and much more. With the help of blockchain, industries can operate in a decentralized way without needing a verification system. With this, they can still achieve the same functionality with the same amount of reliability. Another major benefit of this is that industries can now work quicker and remove steps to processes they must do, making them more efficient. This results in quicker results and quicker solutions that can be applied. It also creates a higher security level because of how every transaction is reported. By using blockchain, it changes economies to become more circular, rather than linear. A linear economy follows; take, make, and dispose. With a circular economy, one makes, uses, recycles, then repeats. By using a circular economy it allows an economy to become self-sufficient as it can start to rely on itself.

TITLE: The Science Behind Service Dogs and Stress Relieving Therapy
AUTHOR(S): Kristina Coneeny
FACULTY MENTOR(S): Sharon Timberlake
AFFILIATION: USM
ABSTRACT: Stress relieving therapy can be used in many different ways including relaxation techniques such as yoga and meditation, exercise regularly, eat healthy, and seek treatment of some sort to help the stress and anxiety. Dogs are being used for stress relieving therapy and have become popular for people that have a mental, emotional and/or physical disability. Each of these disabilities can require a particular type of service dog. These dogs can be trained as a service dog, emotional support dog, or a therapy dog. How do interactions with a dog become a stress relieving therapy for someone? This study will explore the different ways of how a dog interactions with humans can effectively relieve stress, define the different types of service dogs, and the encounters people have experienced with these dogs. The researcher of the study was diagnosed with severe anxiety in tenth grade. The immense daily pressures of school, work, friendships, and sports consumed were overwhelming. So much so, that when hit with an anxiety attack, the researcher of the study would be overtaken with a fast heart rate, frozen in place, become drenched in sweat and deaf to anyone trying to help. Having a dog, reduced the researchers stress while at home tremendously. Just sitting next to the dog, reduced the researcher’s anxiety and ease the nerves. Dogs are more than just pets, helping people with their daily routines and becoming more and more in need.

TITLE: Benefits of onsite health programs in the corporate setting
AUTHOR(S): Nathan Cook
FACULTY MENTOR(S): Noel Neptune
AFFILIATION: USM
ABSTRACT: Worksite health care clinics and corporate wellness programs are becoming a staple of companies at all levels. Companies are finding that having onsite healthcare clinics as well as comprehensive wellness programs are not only good incentives for employees but actually able to save large amounts of money with injury prevention, decrease in lost productivity and a number of other factors. A 2010 meta-analysis looking at the Return-Of Investment (ROI) found that there was an average of $3.27 per dollar spent on wellness initiatives ROI. Yearly savings can be upwards of $225,000 in some cases as the Sygenta Crop Production Company have found. Some companies, depending on the industry also offer specific injury prevention programs utilizing different medical professionals. For example, Boeing offers an industrial athlete program that is ran primarily by certified athletic trainers (AT). For this program they measure success based on pain and discomfort reduction as well as number of lost workdays due to injuries. For pain and discomfort Boeing reported that there was typically a decrease of pain by 2.33 and they found that patients who saw the AT staff only missed approximately 0.2 days of work on average. This presentation will look at why every company small and large can benefit by utilizing on site health care or a wellness plan and how AT’s can play an integral role in that development.

TITLE: Recovery, Substance Misuse, and Relapse
AUTHOR(S): Andrew Cook
FACULTY MENTOR(S): Rikki Miller
AFFILIATION: USM
ABSTRACT: Substance use disorders (SUD) result in degradation of health, and many preventable deaths. Research suggested that commercial health insurance or Medicare increase the likelihood of treatment success, while Medicaid or no health insurance decreases chances of treatment completion. Additionally, depressive and anxiety disorders were often comorbid with SUD. The goal of this study was to identify variables that mediate success and failure rates of participants in substance use recovery and relief programs around Maine. Specifically, this study predicted that health insurance, previous mental health diagnosis, seeing a mental health professional, the Anxiety assessment, and Depression assessment will be correlated with length of time in recovery, and number of individual relapses. Individuals were 18 years or older, and were self-selected volunteers recruited through a flyer from treatment and recovery facilities
surrounding Portland, Maine. Participants completed an anonymous, self-report survey (Relapse, Substance Misuse, and Recovery Survey) administered online via Qualtrics. Compiled data will be analyzed in SPSS using simple, and multiple linear regression. If the hypotheses are supported by the data analyses, this study will espouse the pertinent literature that health insurance is a key factor in reducing relapse and maintaining treatment.

TITLE: Querying the Past: Maine LGBTQ Oral History Project  
AUTHOR(S): Tiana Cope-Ferland, Cosette Holmes  
FACULTY MENTOR(S): Wendy Chapkis  
AFFILIATION: USM  
ABSTRACT: As part of the Querying the Past: Maine LGBTQ Oral History Project, I and my partner Cosette Holmes conducted a life history interview with a local community member, Eric Kawamoto. The interview and transcription are available to researchers and the public on the USM digital commons: http://digitalcommons.usm.maine.edu/querying_ohproject/index.html. In this Thinking Matters presentation, I will discuss the process of, and insights obtained through the oral history interview, and I will reflect on the importance of oral histories in capturing and preserving the voices of those who have been overlooked or hidden in history. By this, I mean that I want to focus on aspects of Kawamoto’s interview that stood out to me and that made me realize the this truly was an enlightening opportunity. Aspects like being a person of color and a gay man, living in the state of Maine, his experience as a younger gay man and now. All in all, I want to as best as I can convey the importance Kawamoto’s interview had on me and I’m sure many other queer people of color.

TITLE: Investigating Professional Grief Following the Death of a Client in Mental Health Professionals  
AUTHOR(S): Rebecca Crandall, Jinni Campbell  
FACULTY MENTOR(S): Rachel Casey  
AFFILIATION: USM  
ABSTRACT: There is minimal research focusing solely on mental health professionals (MHPs) and their support systems or professional trainings surrounding the topic of grief. Our research explores the experience of grief following the death of a client and seeks to learn where there are strengths and gaps in professional support and training. This study was conducted using an online anonymous survey for MHPs in the Portland area who had experienced the death of a client. The most common experiences of client death were from substance overdose or suicide. Sixty-five percent of those who took the survey wish that they had more training or education and eighty-three percent had never received any sort of grief training. Many MHPs reported that they felt unsupported or unprepared to deal with the death of a client and would have benefited from more education and training. Integrating more topics of death and dying in the curriculum for those going into the mental health field would be valuable.

TITLE: Health Status and Access to Care Among Maine’s Low-Income Childless Adults: Implications for State Medicaid Expansion  
AUTHOR(S): Zachariah Croll  
FACULTY MENTOR(S): Erika Ziller  
AFFILIATION: USM  
ABSTRACT: The Affordable Care Act allows states to expand Medicaid coverage to low-income childless adults with income at or below 138% of the federal poverty level. Following a 2017 statewide referendum, Maine began enrolling eligible residents in expanded Medicaid in January 2019. While prior research suggests Maine’s low-income childless adults may face health problems and barriers to accessing services, their health status has not been well documented. The roll-out and ongoing implementation of Maine’s Medicaid expansion may be hampered by incomplete information on the characteristics and health status of the low-income childless adult population. This study used 2011-2016 Maine Behavioral Risk Factor Surveillance System data to examine socioeconomic characteristics, health status, and access to care among Maine’s low-income childless adults, and offers recommendations to policymakers, providers, and other stakeholders working to implement Medicaid expansion and address the health needs of this vulnerable population. Results show that Maine’s low-income childless adults are more likely than other non-elderly adults to be aged 55-64, uninsured, and live in rural areas. They are less likely to have a personal doctor, more likely to delay needed care due to cost, and face a higher prevalence of chronic health conditions including high blood pressure, high cholesterol, cardiovascular disease, arthritis, obesity, and diabetes; higher rates of smoking; and mental health conditions including anxiety and depression.
TITLE: Design & Manufacturing of a Metal Forming Machine
AUTHOR(S): Michael Currier
FACULTY MENTOR(S): Mehrdaad Ghorashi
AFFILIATION: USM

ABSTRACT: The creation of complex sheet metal parts required by the high-end automotive restoration industry generates the need for many different metal shaping machines. Integral to any successful coachbuilding shop is the shrinker-stretcher, used to manipulate and form sheet metal flanges and curves. The need exists for a simple, reliable, and self-contained machine to perform these duties. Current industry offerings are complex and expensive. In the senior design project, the present researcher designed a new metal forming machine utilizing sound engineering principles to ensure safety and convenience for the operator, while providing a dependable device at a competitive cost. In that work design parameters were explained in detail and justified. Manual and computer-based calculations were completed to ensure sufficient mechanical strength of the machine when subjected to various static and dynamic loadings imposed by forces and moments. The completed design has been proven to be a strong addition to a fabricator seeking to improve their company infrastructure and tooling. The machine that was designed in the senior project phase is now being manufactured as the main objective of the Advanced Design Project. The end deliverable is the operational machine that will be tested for functionality and effectiveness.

TITLE: LGBT+ Teens, Social Media Use & Depressive Symptoms
AUTHOR(S): Megan Curtis, Danielle Ryder
FACULTY MENTOR(S): Rachel Casey
AFFILIATION: USM

ABSTRACT: Sexual and gender minority youth are statistically more likely to face severe mental health challenges than their cisgender, heterosexual peers; they consistently comprise a disproportionate percentage of youth who report experiencing depression, suicide ideation and attempted suicide in the United States every year (e.g. Abreu & Kinney, 2018). The aim of this study was to fill a gap in the current literature base by investigating the effects of social media use on sexual and gender minority youth mental health. The researchers conducted an online anonymous questionnaire targeted toward American LGBT+ (Lesbian, Gay, Bisexual, Transgender, etc.) youth ages 14 to 18, which included two separate measurement scales: The Social Network Sites (SNSs) Usage Questionnaire (Shi, Luo, Yang and Liu, 2014) and the Pediatric Depressive Symptoms Survey, which is a shortened version of the Patient-Reported Outcomes Measurement Information System (PROMIS) (Irwin et al., 2010). Preliminary results of a Pearson’s Correlation analysis did not indicate a significant relationship between social media use and self-reported depressive symptoms. This study’s results could potentially be used to educate practitioners, instructors or queer youth about the relationship between mental health and the use of SNSs.

TITLE: How human donor variability can influence myeloma's response to chemotherapeutic drugs when in the presence of adipocytes
AUTHOR(S): Anastasia D’Amico
FACULTY MENTOR(S): Michaela Reagan
AFFILIATION: MMCRI

ABSTRACT: In the bone marrow microenvironment adipocytes and multiple myeloma have an intricate relationship with one another. Research shows fatty acid metabolism actually increases myeloma cell proliferation 40–70% (Tirado-Velez 1) which has lead us to look into the role that a specific secreted adipokine, Fatty Acid Binding Protein 4 (FABP4) may have with multiple myeloma. This role of fatty acid metabolism begs the question of whether or not these bone marrow adipocytes induce drug resistance in multiple myeloma cells via FABP4 signaling. However, during the experimental process, complications arose in reproducing results that would prove that FABP4 signaling rescues the myeloma cells from Dexamethasone (a chemotherapeutic drug) induced cell death. With this in mind, I hypothesize that not all HBMAT donors are supportive of this drug-induced resistance that myeloma shows in the presence of adipocytes and that there are other factors that may have larger consequences on cell viability than previously thought. I implemented several experimental designs between donors where comparisons are drawn between the amount of cell death in myeloma cells with or without dexamethasone (a chemotherapeutic drug) and FABP4 after 72 hr indirect and direct culture. The results were analyzed using BLI, an effective tool in measuring the amount of live cells.
TITLE: Manihot and Solanum food crops benefit from novel gene editing techniques
AUTHOR(S): Matthew Davis
FACULTY MENTOR(S): Daniel Moore
AFFILIATION: SMCC
ABSTRACT: Cassava (Manihot esculenta) and potato (Solanum tuberosum) are important crops for the global food supply. However, both are considered difficult crops for plant breeding. Cassava is highly heterozygous. Potatoes are tetraploid (4n); the additional chromosomes complicate traditional breeding. A review of recent research into altering these crops at the genetic level shows the increasing importance of genome banks for crops and genetic modification techniques, such as CRISPR (Clustered regularly interspaced short palindromic repeats) - Cas9 (CRISPR-associated protein 9), in conjunction with more traditional breeding using homozygous inbred lines. Researchers at University of Wisconsin and at Solynta in the Netherlands have had success in developing diploid (2n) potato varieties, which should allow for more efficient traditional breeding programs, and allow for utilization of multiple gene traits. Researchers at ETH Zurich and the University of Liege have shown a technique for utilizing CRISPR-Cas9 to alter cassava.by targeting specific genes and then crossing out the editing construct through flowering techniques. Exploring combinations of all these techniques may provide increased efficiency in global food food production systems.

TITLE: Behavioral habits in juvenile alewife using Highland Lake as a Nursery Habitat
AUTHOR(S): Emma Dennison
FACULTY MENTOR(S): Karen Wilson
AFFILIATION: USM
ABSTRACT: Highland Lake and juvenile alewife (Alosa pseudoharengus) have a delicate relationship that may be cause for toxic algal blooms and inconsistent nutrient cycling. Understanding where alewife are primarily spending their time living and feeding will help better our knowledge of how alewife may be impacting the ecology of Highland Lake in Windham, ME. Morphological differences between the juvenile alewife will also hold a key part in distinguishing their eating habits overall. After several different nighttime sampling events were conducted, we were able to deduce that these juvenile alewife spent their time in the pelagic zone (“open water”) of Highland Lake. As the alewife grew in size, the total number of alewife caught decreased. In June and July our larval fish tows and juvenile fish trawls were catching on average 101 fish total and each fish weighed less than 1g each, many weighing less than 0.1g. In September and October the amount of fish caught significantly decreased, averaging 17 fish per trawl and weighing on average 1.00g-5.00g. The alewife caught were dissected and their stomachs were used for diet analysis and muscle tissues were processed to be tested for stable isotopes. Depending upon the concentration of 13C we can further deduce what areas of the lake the alewife are spending most of their time in. This data collected will further our knowledge on the possible impacts that alewife have on small freshwater systems.

TITLE: The chemical properties of soil in the vicinity of two genera of ant belonging to the subfamily Myrmicinae; Aphaenogaster and Myrmica
AUTHOR(S): Haley Depner
FACULTY MENTOR(S): Margaret Hausman
AFFILIATION: USM
ABSTRACT: It is well established that trends exist for both chemical and physical property gradients in soils found in the proximity to colonies of ground-nesting species of ant. This can be the result of both the activity of ants as well as the suitability of sites selected for colony formation. This observational study seeks to expand on our body of knowledge of chemical trends in soil related to distance from the nests of two genera of belonging to the subfamily Myrmicinae; Aphaenogaster and Myrmica. This study is intended to serve as a precursor of future research intended to ultimately determine the extent that ants affect the chemical composition of soils surrounding their nests versus how much of the variation we see being due to selection of desirable nesting sites. In addition, we are developing a protocol involving the use of portable XRF in conjunction with atomic absorbance as a means of efficient and thorough elemental analysis of soils. Ants are a common agricultural pest and are found across most terrestrial habitats. A more thorough understanding of the influences ants have on our environment would allow deeper insight as to their role in the ecosystems they inhabit. Further knowledge of the relationship between these two common genera of ground-nesting ants and the soils they colonize is applicable to agricultural, developmental, and conservational activities.
TITLE: Telehealth Use in the State of Maine
AUTHOR(S): Oghenetega Dibie
FACULTY MENTOR(S): Catherine McGurie
AFFILIATION: USM
ABSTRACT: The emergence of technology—and the internet in particular—has been a catalyst for growth and development in various sectors such as business, health, and social sciences etc. The embrace and leveraging of technology by healthcare providers and professionals is revolutionizing the healthcare sector, specifically in the area of healthcare access. Telehealth is the perfect union between technology and healthcare, as it leverages the power of technology to capture the ultimate dream of healthcare altruists—that is to ensure that all people have access to quality healthcare. Telehealth services such as live video, store and forward technology, and remote patient monitoring allow for strategic expansion of healthcare systems and services. Maine’s telehealth use has been on the rise due to favorable policies, including the 2009 adoption of a parity law for private insurance, which ordered private insurers to cover telehealth to the same extent as in-person services. Maine’s All-Payer Claims Database (APCD) allows for the examination of telehealth use across various payers (Medicaid, Medicare, and commercial), localities (urban vs rural), and procedures (speech therapy, Psychotherapy, Medical Nutrition Therapy) over time. By applying various statistical methods to Maine’s APCD data, I found that telehealth use increased by a factor of approximately thirteen (13) between 2009 and 2016. My work examines telehealth use in Maine across various payers and procedures between 2009 and 2016.

TITLE: Leadership Development in a Virtual Work Environment
AUTHOR(S): Sylvia Dion
FACULTY MENTOR(S): Sharon Timberlake
AFFILIATION: USM
ABSTRACT: The precise definition of “telecommuting” varies, but it is generally defined as the performance of work tasks from home (Glass and Noonan, 2016, p. 6). More broadly, the Telework Enhancement Act (2010) defines telecommuting as “a work flexibility arrangement under which an employee performs the duties and responsibilities of such employee’s position, and other authorized activities, from an approved worksite other than the location from which the employee would otherwise work” (2010, p. 1). Leadership development in virtual work environments has been explored from the leader perspective, with much of the existing research focusing on the leader’s behaviors, skills, and interactions with the virtual employee workforce. This “top down” research approach minimizes the importance and value of the follower/telecommuting employee’s experience and maintains the focus on the people in roles that have legitimate power and how those people demonstrate leadership behavior with employees who are not co-located. Employees working in a virtual or remote work environments might see their location as an obstacle to gaining leadership development coaching, and the way these employees want to receive leadership development support may differ from their in-office peers. My research leverages Leadership and Communication theories to advance an understanding of leadership development in the virtual work environment through the lens of the telecommuter.

TITLE: A Feminist Rhetorical Analysis of Abortion Access in Maine.
AUTHOR(S): Emma Donnelly
FACULTY MENTOR(S): Jessica Ouellette
AFFILIATION: USM
ABSTRACT: Maine is one of only seventeen states where the principles of Roe v. Wade are codified in either the state’s constitution or in state statute. Effectively, if Roe v. Wade were to be repealed or changed in any way by the federal government, abortion would still be legal in the state of Maine so long as state legislators do not decide to repeal the statute. However, there are only three abortion providers in the state, with poverty rates exceeding the national poverty rate in six counties, and a general lack of access to transportation and health insurance. Furthermore, when considering the various pieces of legislation put into practice which further restrict access to abortion, it becomes clear that the limited access to abortion in Maine is insufficient compared to the need. This feminist rhetorical analysis seeks to analyze and critique access to abortion under capitalism in the state of Maine using a theoretical framework comprised of both Marxist-feminism and Reproductive Justice lenses.
Title: Asthma & Quick-Relief Medication in Maine
Author(s): Ashley Dougherty
Faculty Mentor(s): Brenda Joly
AFFILIATION: USM

ABSTRACT: Asthma is a serious chronic condition that causes wheezing, breathing difficulties, increased vulnerability to illness and can cause life-long damage to the lungs. The disease remains one of the most common and costly diseases in the United States (U.S.) today. The estimated annual economic burden of asthma in the U.S. is in the billions. Maine has one of the highest incidences of adult asthma in the country. Using data from the Centers for Disease Control and Prevention’s Behavioral Risk Factor Surveillance System, Asthma Callback Survey, this study explored the prevalence rates of asthma in Maine versus the U.S. Additionally, this study reviewed rates of reported overuse (two or more times per week) of quick-relief medication and rates of reported fair or poor health for those who have asthma. In 2016, the U.S. prevalence rate for adult asthma was just over 8% while the prevalence rate in Maine was above 11%. The overuse of quick-relief medication was also higher in Maine versus the U.S. With rates of approximately 30% and 24%. Self-reported fair or poor health among Maine adults with asthma was slightly below the U.S. at approximately 31% and 33% respectively. Overuse of quick-relief medication can indicate poor asthma maintenance and this data shows that it could be a factor in perceived fair or poor health. Using these results, public health efforts should focus on increased maintenance and decreased overuse of quick-relief medications.

Title: Perspectives on Malaga Island: From Scorn to Shame to Sympathy
AUTHOR(S): Darcie Drew
FACULTY MENTOR(S): Adam Schmitt
AFFILIATION: USM

ABSTRACT: Malaga Island off the Maine coast was a home to a small interracial fishing community from 1860 to 1912, at which point the State of Maine evicted the residents. Several islanders were subsequently at Pineland School; the rest were left to rebuild their lives elsewhere. Local and national perspectives of the state’s action and those of the islanders themselves have changed substantially from the time of settlement to today. I researched these perspectives in order to create a week-long unit for a 7th grade Social Studies class here in Portland. My investigation included various primary sources: photographs of the original settlement, newspaper articles from around the country about the community and its dissolution (1900s and today), documentary video and audio, non-fiction texts about Malaga and Pineland, contemporary art and song on the subject, archeological objects from Malaga, and fictional texts about the story of the island. My lesson plans were then built in workshop style, so students would have a chance to interact directly with the primary sources and their differing viewpoints. The unit culminated in an authentic project wherein students created their own memorials to the people of Malaga Island. The unit served a multitude of educational purposes. Students learned about their local history, how to analyze primary sources, how important it is to consider multiple perspectives before forming an opinion, and how to contribute to a community conversation about history.

Title: Motivating and Engaging Pulmonary Rehabilitation Patients
AUTHOR(S): Shelly DuBois
FACULTY MENTOR(S): Sharon Timberlake
AFFILIATION: USM

ABSTRACT: The purpose of this study is to investigate the various strategies that pulmonary rehabilitation leaders innovate to keep patients motivated and engaged to complete pulmonary rehab. This qualitative research will focus on innovating ways in which leaders in pulmonary rehab have successfully kept patients motivated enhancing their performance and attaining their goal of completing pulmonary rehab. To gain a better understanding of the various ways that leaders keep patients motivated to complete pulmonary rehab successfully, this researcher will administer an open-ended questionnaire asking participants questions pertaining to being a successful pulmonary rehab leader. The results of this study may help both the pulmonary rehabilitation leaders as well as patients. It may help leaders learn better innovative strategies to keep patients engaged in pulmonary rehab as well as motivated to complete rehab. It may help pulmonary rehab leaders to discover more innovative approaches to retain and motivate patients in attending pulmonary rehabilitation to completion.

Title: Injection habits of intravenous drug users accessing the Portland Needle Exchange
AUTHOR(S): Brittney Dunham, Andrew Paine
FACULTY MENTOR(S): Caroline Shanti
AFFILIATION: USM

ABSTRACT: While the ideas behind needle exchange programs (NEPs) can be controversial, research shows that NEPs are rooted in
public health, drastically reduce rates of disease transmission, are cost effective, and provide a place for safe and sanitary disposal of used syringes and injection equipment. In the United States, syringe access has been made legal in 41 states including the state of Maine. But with injection drug use on the rise in Maine due to the opioid epidemic, the rates of Hepatitis B and C and incidents of HIV have also risen over the last 5 years. This quantitative research utilized a questionnaire to collect data from participants accessing the largest NEP in Maine, the Portland Needle Exchange with the goal of finding out if participants believe that they have enough access to clean syringes, injection supplies, and access to proper disposal to meet their self-identified needs by asking about their injection habits.

**TITLE: Development of Ammonia Gas Sensors Printed on Flexible Kapton Substrates**
**AUTHOR(S): Anh Duong**
**FACULTY MENTOR(S): Mustafa Guvench**
**AFFILIATION: USM**
**ABSTRACT:** Over the past decade, printed electronics has become a new modern technology that explores the creation of electronic circuits on flexible substrates. This research is to investigate how printed electronics can be applied to make low-cost and low-power wearable flexible ammonia sensors. PEDOT: PSS ink was used to build chemiresistor ammonia sensors on Kapton film. The printed sensors were exposed to ammonia solution in a closed chamber at room temperature for testing. They output the ammonia concentration by reading the percentage voltage increase after being exposed to the gas. A commercial humidity sensor chip was incorporated in the printed circuit to examine the effect of different relative humidity level to the sensor response. Finally, an alert system was designed to sound an alarm as ammonia gas concentration reaches the safety level. The success of this research is a step towards possibility to commercialize lightweight, low-cost, low-power ammonia sensors that can be used in various fields such as toxic gas monitoring and control in laboratory, industry, and food processing.

**TITLE: From Evidence Based Practice to Level I Fieldwork: Exploring Occupation in a Prison Setting**
**AUTHOR(S): Alyssa Emerson, Maggie Demetros, Kayla Gelinas**
**FACULTY MENTOR(S): Tammy Bickmore**
**AFFILIATION: USM**
**ABSTRACT:** One of the challenges our society faces is that our criminal justice system is more punitive than rehabilitative resulting in numerous obstacles for those who seek to help former prisoners integrate successfully into society. Inmates experience occupational deprivation upon arrest. When released, they are often given little to no supports for reintegration and are expected to survive and succeed independently. This poster will describe the experience of three OT students. Following their appraisal of current literature, students experienced a new and innovative OT fieldwork experience in a prison setting with an embedded hospice program. Students were introduced to prisoners who challenged their preconceived ideas of who they would meet. Students were able to articulate that research articles do not equate to the real-life experience of learning from the prisoners. This includes topics relevant to students’ personal lives, humanity, and their chosen profession of OT. The prisoners were able to articulate the value of sharing their knowledge, their experiences, and their insights into life in prison and their desire to positively contribute to the student experience in this setting. Students were able to increase their knowledge surrounding the gaps in services that currently exist in this setting and the potential for occupational therapy within this setting.

**TITLE: Methods to Manage Woodchucks**
**AUTHOR(S): Britney Evangelista**
**FACULTY MENTOR(S): Christine Maher**
**AFFILIATION: USM**
**ABSTRACT:** Woodchucks (Marmota monax) damage residential properties by eating vegetation and burrowing, which may lead to people translocating woodchucks. However, translocation is not always humane and creates other problems. Thus, our objective was to offer alternatives to translocating wildlife. We used an online survey to compile examples of successful and unsuccessful methods that people use to manage woodchucks and to understand human attitudes toward those methods. We examined methods used in rural, urban, and suburban areas, and we compared attitudes toward control methods in those areas. Of 475 respondents, 72% lived in a rural area. Throughout all areas, blocking or filling holes was the most unsuccessful method (32% of responses). However, in urban areas, blocking or filling holes and translocation were the most successful methods (20% and 18%, respectively). In rural areas, shooting and reliance on predators accounted for 44% of successful methods. Comparing across locations, shooting was the most successful method only in rural areas. The most cited reasons for not using particular methods were personal beliefs (21%) and negative effects on other animals (19%). Reasons did not differ depending on location. Ironically, the same control method may work for some people but not for other people, and
we suspect that other factors play a role, such as how those methods are deployed. Despite these differences in methods, people showed similar concerns when making decisions about the types of control they opt to use.

**TITLE:** The Effects of the Internet on Regulations  
**AUTHOR(S):** Ashely Fagan  
**FACULTY MENTOR(S):** Anthony Moffa  
**AFFILIATION:** USM  
**ABSTRACT:** This study examines the difference in length and complexity of regulations before and after the invention of the internet. For two decades now, regulations have been increasing in length and complexity. Regulations are important to our nation because they protect our citizens and maintain order within our society. Therefore, it is crucial that regulations are detailed expansively to cover all aspects of the regulation. My hypothesis is that the invention of the internet is the cause for the rapid increase in the length and complexity of regulations. The internet has created the need for new regulations and the lengthening of regulations because it is something that requires regulating extensively. Before the internet, there was never worries of cyber-attacks. Fraud and identity theft have increased tremendously, and personal information is sold on the internet daily. Regulations needed to be created and increased to control each of these crimes. In our data set, we included the year and length of each regulation. Our findings suggest that the invention of the internet has impacted the length and complexity of regulations significantly and that it is one of leading causes. However, there are several other factors that have impacted regulations over the past two decades. As a result, this study rejected my hypothesis because there are other significant factors impacting the length and complexity of regulations over the past two decades, despite the internet being one of the leading causes.

**TITLE:** A Case Study of High Latitude North Atlantic Historical Climate Change and Human Response  
**AUTHOR(S):** Dianna Farrell  
**FACULTY MENTOR(S):** Matthew Bampton  
**AFFILIATION:** USM  
**ABSTRACT:** Subarctic communities face the unique challenge of surviving in harsh environments lacking terrestrial biodiversity. They must rely on seasonally abundant marine resources and human ingenuity to survive. There is historical evidence of both abandoned villages and extant villages that were able to adapt and survive changing climatic conditions. Such communities provide a model for exploring human adaptation to climate change. Although change occurs on a global scale, effects are experienced locally. Scotland’s Shetland Islands provide at least four case studies of settlement destruction by blowing sand during periods of storminess driven by North Atlantic climate change at Jarlshof, Old Scantness, Sandwick, and Broo. Additional examples of such communities beyond Shetland include Skara Brae (Orkney), Kenfig (Wales), Donegal, (Ireland), and Thy (Denmark). Modeling local-scale impacts of basin-wide climate processes requires cross-scalar analysis of small scale long term trends in conjunction with large scale simulation of individual events. We will use long-term (>300 year) reconstructions of two major Atlantic Basin climate forcing mechanisms, the North Atlantic Oscillation (NAO) and the Atlantic Meridional Overturning Circulation (AMOC), storminess records from the Greenland Ice Core, contemporary weather observations, and historical maps and records to study the relationship between past climate change, micro-topography, land-use, and sand movement in the United Kingdom and surrounding regions.

**TITLE:** The Forgotten Leisure Occupation: Travel  
**AUTHOR(S):** Kelly Farris, Eileen Ulmer  
**FACULTY MENTOR(S):** Tammy Bickmore, Sarah Grinder  
**AFFILIATION:** USM  
**ABSTRACT:** The occupation of travel is severely under-researched for those experiencing disabilities. Accessibility to airports, remote areas, or tourist attractions is limited and under-developed. This results in persons with disabilities participating in the occupation to a lesser degree than able-bodied persons. Occupational therapists are uniquely skilled to modify the environment, alter the activity, or change the person to enable maximum independence in occupations. Modifications to the environment include training of the airport staff on safe transfers, offering braille or large print signs/pamphlets, or purchasing beach wheelchairs with wide tires. Altering the activity may include participation of travel during low census hours for those that may be overstimulated by crowds, reserving a handicapped accessible hostel, or organizing a wilderness hike for the blind. Changing the person may include addressing intrinsic factors such as disempowering thoughts, projected embarrassing situations, or beliefs that travel is not for those who experience disabilities. Occupational therapy can play a large role for the leisure or occupation including universal design, accessibility, problem-solving, and empowerment. Unfortunately, the role of occupational therapy in regard to the participation of travel with this population is significantly limited.
TITLE: Can Folkehøjskole Help Make Taking a Gap Year Function as a Higher Education First-year Experience?
AUTHOR(S): Sara Fawcett née Flowers
FACULTY MENTOR(S): Joseph McDonnell
AFFILIATION: USM
ABSTRACT: Two college transitions models get a great deal of discussion lately: taking a gap year, and higher education sponsored first-year initiatives. A number of institutions support the deferral of first-year acceptance and even more specifically support the behavior of taking a gap year. Now consider the folkehøjskole model of the Scandinavian states where andragogical theory states that many students need more time to develop before joining the adult and working world. What kind of synergy can the models of gap year, first-year initiative, and the folk high school create to address the diverse learner making the transition into higher education? Three critical questions guide this inquiry for how three models can coalesce to enhance student learning, engagement, and persistence. First, what is the gap year field doing to gain a foothold in the higher and continuing education sector opening the doors to accreditation and federal funding? Second, what are the critical elements of first- and entry-year experience education in higher education where collaboration can enhance? Third, are there partnership opportunities with our Nordic neighbors that will allow us to create programming that is more valuable that simply the sum of its parts? Can we be working smarter in college transitions?

TITLE: Fake Service Dogs: Leading by Example
AUTHOR(S): Joshua Ferguson
FACULTY MENTOR(S): Elizabeth Goryunova
AFFILIATION: USM
ABSTRACT: This qualitative research examines public awareness pertaining to the protocols surrounding service dogs and their handlers, known collectively as the service team. The use of service dogs has been on the increase as more people discover the benefits provided by service dogs. The increase in the number of service dogs fosters questions about safety, training, the dog’s purpose, and its legitimacy. Previous studies suggest that many individuals are falsely claiming their dogs as service dogs or “fake service dogs.” This research explores what trends are leading to increases in service dog use and how fake service dogs affect people involved. An autoethnographic methodology allowed this principal investigator to act as the key instrument for data collection during normal daily public interactions using a personal service dog. Data was assessed by scoring 87 individual interactions between the service team and a public employee and scaled based on how the interaction should have gone versus how it occurred. The results indicate that public awareness about how to engage service teams is below average and that the largest segment of people educating themselves are the people who want to use fake service dogs. The study suggests that businesses with Human Resource personnel or other training personnel have better awareness about service dog protocol while smaller businesses require additional education.
Keywords: service dog, disability, ADA, assistance animals.

TITLE: Spatial and temporal variation in European green crab (Carcinus maenas) population dynamics along the coast of Maine
AUTHOR(S): Erica Ferrelli, Marissa McMahan
FACULTY MENTOR(S): Rachel Lasley-Rasher
AFFILIATION: USM
ABSTRACT: The aquatic invasive Carcinus maenas (European green crab) arrived on the U.S. Eastern Seaboard in 1817 via ship ballast water and has undergone dramatic increases in abundance during recent decades. On the Maine coast, green crabs decimate vital eelgrass habitat, prey on local shellfish populations, and outcompete native crab species. While the negative effects of green crabs are widespread, their relative abundance and population demography varies along the coast of Maine. In this study, population dynamics were studied using biweekly intertidal field surveys at two sites throughout midcoast and Southern Maine. Data collected included sex, carapace width, and shell condition. Our research suggests spatial and temporal variation in size, sex frequency, and molt condition of green crabs at both sites surveyed. This research is part of a larger study that is investigating the economic viability of a green crab fishery.

TITLE: Aquaponics Pathogen Exploration
AUTHOR(S): Jezze Florendo, Adam Barzelay
FACULTY MENTOR(S): Rachel Larsen
AFFILIATION: USM
ABSTRACT: Aquaponics is a combination of aquaculture and hydroponics in a closed sustainable system. Fish raised in holding tanks provide nutrients for plants that then filter the water to be reintroduced back to the fish. If operating optimally the system is self-sustaining and only requires minimal maintenance and upkeep. Due to the closed system the use of antibiotics is discouraged and any fish that are...
ill are moved to a salt water recovery tank. We are exploring the bacterial communities that exist on the fish and within the fish holding tanks through both culturing and DNA sequencing methods. Our goal is to determine the presence of any potential pathogens and if pathogens are found, we will determine their salt tolerance through a series of assays. Additionally, the species that we identify will be further examined to determine their role within the aquaponic ecosystem. This may provide clues on how to better increase efficiency of the aquaponics system.

**TITLE:** A Higher Education Response to Rampage Violence  
**AUTHOR(S):** Sara Flowers  
**FACULTY MENTOR(S):** Joseph McDonnell  
**AFFILIATION:** USM  
**ABSTRACT:** Early on the morning of April 16, 2007, an individual shot 32 students and faculty then took his own life making the Virginia Tech incident the most deadly rampage violence incident on a school campus in modern American history. Leadership response in the face of events like this require us to make sense of the event, make decisions, make meaning, account for the event, and learn lessons that minimize future risk (Boin, t’Hart, Stern, & Sundelius, 2008). What follows is a discussion of how these crisis response principles align with the events of that day, as well as with perspectives of the University of Maine at Augusta administration. The crisis response to one campus incident is a response that must come from all campuses across the nation. As violence breaks out in one’s own bailiwick, the response is immediate, more relevant, and has impact even when the threat is still potentially acute. Across the nation, however, other campuses have to grapple with how to speak to their own community ensuring their safety even when a threat is not imminent. Making sense of the events, making decisions on course of actions, attempting to explain the antecedents, accounting for the breakdowns in the system, then learning from those breakdowns is a process for which the timelines differs. On a campus in the throes of crisis, this happens in moments, hours, days. For campuses looking on, we have the luxury of time, but the steps in responding to crisis and managing risk are no less important.

**TITLE:** The Effect of Methionine Restriction on the Thermogenic Phenotype of Perivascular Adipose Tissue.  
**AUTHOR(S):** Bethany Fortier, Gene Ables, Joshua Boucher, Emily Cooper  
**FACULTY MENTOR(S):** Lucy Liaw, Robert Koza  
**AFFILIATION:** USM  
**ABSTRACT:** Perivascular adipose tissue (PVAT) surrounding blood vessels is thermogenic and secretes adipokines that can be anti-inflammatory and vasoprotective to the vasculature. During obesity, PVAT loses thermogenic capacity, has increased inflammation, and secretes proatherogenic cytokines. Dietary methionine restriction has been previously shown to decrease adiposity and improve lifespan and healthspan of rodents, and can counteract metabolic dysfunction associated with obesity. To determine whether methionine restriction, under conditions of high fat diet, can revert PVAT to a metabolically healthy, cardioprotective phenotype, we studied C57BL/6 male mice. The mice were fed a 60% high fat diet from 6 weeks of age, and then switched to either a 60% high fat diet with 0.86% methionine (control) or 0.12% methionine (restricted), and collected at 31 weeks of age. Immunohistochemical and immunofluorescent staining, and immunoblot were used to analyze adiposity, gene expression, and beiging of PVAT and other adipose tissue. Results showed an increase in thermogenic gene expression in PVAT, and a reduction in adipocyte size and decrease in Notch 2 signaling in both PVAT and other adipose depots among the experimental group relative to the control group. This supports our hypothesis that methionine restriction elicits a number of effects that promote the metabolic health of PVAT and can cause a general beiging effect in other adipose depots.

**TITLE:** Emotional Intelligence as an attribute of Fire Service Leadership  
**AUTHOR(S):** Paul Froman  
**FACULTY MENTOR(S):** Elizabeth Goryunova  
**AFFILIATION:** USM  
**ABSTRACT:** From the beginning of the Boston Fire Department in 1679, the Fire Service has always adapted to take on new challenges that faced the community. The demands are not only changing externally but internally as well. The Fire Service in the future may fail to adapt unless it has solid leadership practices. A new generation of firefighters is joining the workforce. This means hierarchy management practices of the early 1950s will no longer be effective managing tools. Meantime, shortage of leaders and their diminished leadership skills result in increased danger to the members of the fire service, and the citizens they are expected to protect. This study is focused on exploring current leadership practices. Specifically, looking at emotional intelligence as a critical component of contemporary leadership theory. Previous studies categorized the leadership styles of the fire service, however, there is little research addressing the emotional intelligence of fire service leadership. Therefore, this qualitative study attempts to close this gap by exploring the extent to which emotional
intelligence affects the attitude and job performance of rank and file in the fire service. The results of the study so far indicate if the fire service leadership is to be improved, then emotional intelligence should be a clear component of a fire service leaders skill set.

**TITLE:** Opioid use disorder at delivery hospitalization in Maine: Prevalence and characteristics (2009-2017)
**AUTHOR(S):** Sarah Gabrielson
**FACULTY MENTOR(S):** Katherine Ahrens
**AFFILIATION:** USM

**ABSTRACT:** A recent multi-state analysis found Maine had the second highest average annual increase in opioid use disorder (OUD) at delivery hospitalization, with 34.1 OUD per 1,000 delivery hospitalizations in 2012. The objective of this analysis is to describe the prevalence and characteristics of OUD deliveries in Maine using recent data. We used International Statistical Classification of Diseases and Related Health Problems diagnosis and procedure codes (9th & 10th revisions) to identify deliveries among all hospital discharges in Maine, 2009-2017 (n=109,004), and to categorize deliveries according to prevalence of OUD and selected medical conditions. We ran log-binomial regression to assess trends in OUD delivery across study years, and calculated prevalence ratios (PR) and 95% confidence intervals (CI). The mean prevalence of OUD at delivery hospitalization in Maine increased from 21.6 in 2009 to 38.0 in 2017; linear trend p-value:<.01. The mean relative increase per year was 5.8%[95%CI:4.5%,7.2%]. The following were more common among women with OUD vs without OUD: anxiety, 5.1% vs 1.9%, PR=2.7[2.3,3.1]; major depression, 4.0% vs 1.4%, PR=2.9[2.4,3.4]; hepatitis C, 7.6% vs 0.2%, PR=35.2[29.6,41.9]; tobacco/nicotine use 64.0% vs 10.7%, PR=6.0[5.8,6.2]; and cannabis use 5.9% vs. 1.1%, PR=5.5[4.8,6.4]. OUD among deliveries in Maine has increased since 2009 to 1 out of 30 deliveries, and commonly occurs with other medical conditions. Prevention and treatment of OUD among reproductive age women in Maine remains needed.

**TITLE:** Baseline Evaluation of Clinical Professionals’ Knowledge, Perceptions, and Institutional Best Practices Surrounding Female Genital Cutting/ Mutilation
**AUTHOR(S):** Lyvia Gaewsky
**FACULTY MENTOR(S):** Brenda Joly
**AFFILIATION:** USM

**ABSTRACT:** Female genital cutting/mutilation (FGC/M) is a cultural practice most commonly experienced by immigrants and refugees from countries in northern Africa. Clinically and psychologically, the practice of FGC/M can have acute and chronic complications. Due to these complications, FGC/M has been outlawed in many of the countries in which it is practiced. As the population of immigrants and refugees from northern African countries increase in the Portland and Lewiston areas, it is imperative that medical professionals provide informed care. The purpose of this evaluation was to collect baseline data from medical professionals to aid the community-led HER initiative in targeting FGC/M education opportunities with the goal of decreasing gaps in clinical care. In May 2017, a survey was administered to 76 medical professionals throughout Maine. The survey consisted of three sections that measured medical professionals’ clinical knowledge, perceptions, and institutional best practices around FGC/M. The baseline data showed that 39% of medical professionals never received formal FGC/M education during their medical careers. 87% of medical professionals viewed FGC/M as unnecessary, and 59% of professionals reported that their healthcare facilities do not have policies in place for treating women who have experienced FGC/M. The results of this baseline evaluation will assist the HER initiative in targeting intervention opportunities such as providing FGC/M education and encouraging best practices in healthcare facilities.

**TITLE:** Authentic Leadership and its Effects on Employee Turnover and Job Satisfaction in Relation to Supervisor Accessibility
**AUTHOR(S):** Kasey Gallant
**FACULTY MENTOR(S):** Elizabeth Goryunova
**AFFILIATION:** USM

**ABSTRACT:** As technology develops, professionals will have a greater opportunity to work remotely; often using multiple modes of technology to attend meetings, workshops and communicate with colleagues and superiors. The present study explores Authentic Leadership as it is experienced by remotely located employees, and its relationship with Job Satisfaction, Employee Engagement, and Turnover Intention through the construct of perceived supervisor accessibility. Current research on Authentic Leadership fails to explore the quality of remotely located employee/supervisor interactions and whether there is a relationship between Job Satisfaction, leadership style, and intention to leave a position. The present study seeks to fill the gap in existing studies by analyzing and comparing data from a remote department and an on-site department of a Maine-based retailer via survey method. A survey will be used to compare the two departments on several key variables; the proximity to the direct supervisor, Job Satisfaction, Employee Engagement, Turnover Intention and perceived accessibility. Preliminary data analysis has yet to establish a relationship between leadership accessibility perceived
authenticity, though results are currently in collection. Regardless of the finalized data, the study's implications have the potential to impact future workplace structures surrounding communication and leadership styles, both remote and on-site.

TITLE: Community Tourism Development in Naples, Maine
AUTHOR(S): Wendy Gallant
FACULTY MENTOR(S): Tracy Michaud
AFFILIATION: USM
ABSTRACT: Tourism planning is the process of considering the needs of visitors planning a trip and using those factors to determine the resources, programs, and activities a community can provide to serve them. Tourism planning also involves understanding local residents, businesses, natural, and cultural resource needs and wants. Original research through literature review, interviews, and observation, completed in fall 2018 in TAH 241 Tourism Community Development Class informs the coordination of these aspects of tourism together into a Tourism Management Plan for Naples, Maine in order to contribute to this community's conversation about a sustainable, integrated and coordinated approach for long term forward planning in tourism with strong local stakeholder partnerships and a shared vision. It is hoped this work can contribute to guiding growth in tourism in the Long Lake area over the next five to ten years.

TITLE: Checking In, Concussions Out: Body Checking in Maine Girls’ High School Ice Hockey & Beyond
AUTHOR(S): Griffin Germond
FACULTY MENTOR(S): Dennis Gilbert
AFFILIATION: USM
ABSTRACT: Women’s college ice hockey, according to a study released by the NCAA in 2014, has the highest rate of self-reported concussions of any collegiate sport, men’s or women’s. This is shocking, considering the fact that body checking is illegal in women’s ice hockey. Why are these rates so high when there isn’t body checking? This investigative research project aims to realize a novel approach at reducing concussion rates in women’s ice hockey by doing the unexpected: Allowing body checking. I hypothesize that if body checking were allowed, this would reduce the rate of concussions if it were to be implemented and taught under proper standards and techniques. With the increasing concern for concussions in high school hockey, and the current rules and precautions in place, I’m focusing in on girls’ high school ice hockey in Maine. I believe that Maine is the optimal place to introduce body checking into girls’ ice hockey. Researching this topic goes into uncharted depths in the body checking debate, as there is very little information that supports my hypothesis. The research I am pursuing will hopefully support the notion to allow body checking in girls’ high school ice hockey, as opposed to continually disallowing it. Research participants are athletic trainers, coaches, athletic directors, and referees around the state of Maine who have worked with high school ice hockey players. This research project serves as a foundation for future research and implementation of body checking in women’s ice hockey.

TITLE: Beliefs and Attitudes of Sexual Assault and Bystander Intervention for College Students in Rural Private College
AUTHOR(S): Sarah Gordon, Danielle Mack
FACULTY MENTOR(S): Caroline Shanti
AFFILIATION: USM
ABSTRACT: The National Institute of Justice found that twenty to twenty-five percent of women will be a victim of sexual violence during their college experience (Smith, 2016). Research states that experiencing sexual violence in college may result in an increased risk of significant challenges for students. Additional research shows that one third of sexual assaults had a third-party present and that the likelihood of this third-party intervening is heavily impacted by personal beliefs and attitudes of the bystander (McMahon, 2010). Bystander Intervention is a philosophy and strategy for prevention of various types of violence, including sexual violence. Using the ecological systems theory, this cross-sectional research explores how attitudes and beliefs of sexual assault and bystander intervention can impact the prevalence of sexual violence and overall environment on a college campus. The researchers administered an online survey comprised of the Bystander Attitude Items Scale and a modified Illinois Rape Myth Acceptance Scale. Additionally, six semi-structured interviews were conducted at the small college campus in Maine. Researchers hope to explore the attitudes and beliefs of bystander intervention to aid in ongoing prevention education efforts.

TITLE: Measure water turbidity anywhere with your smartphone
AUTHOR(S): Megan Greenwood
FACULTY MENTOR(S): Lucille Benedict
AFFILIATION: USM
ABSTRACT: Turbidity, the measurement of light scattering through a liquid sample due to particle size and density, is an important water-
quality indicator. Highly turbid waters can increase water temperature, reduce sunlight to aquatic organisms, and have more suspended solids providing substrates for harmful microbes, heavy metals, and pollutants. Turbidity meters, which typically measure light scattering through a sample from a 90° angle, are often used to assess water turbidity as they can measure scattered light within the range of particle sizes commonly found in most water sources. Portable laboratory-grade turbidity meters are expensive (up to $1,500) and may not be readily available. Since water quality is a concern in many disadvantaged rural communities, the portability, ruggedness, affordability, and reliability of turbidity meters are challenges current research is attempting to address. This project builds on this research to develop a smartphone turbidity meter using free smartphone applications and the smartphone's camera as a detector. With easy-to-find and/or build components like USB-powered string lights, a simpler construction of the smartphone turbidity meter could lower costs and allow for greater customizability and accessibility. By focusing on these aspects of the current research, I will present a method for smartphone-based turbidity meters to increase availability, reduce cost, and provide researchers and citizen scientists with a way to make bespoke instruments for their smartphones.

TITLE: The SRY Gene Determines Gonad Development
AUTHOR(S): Abigail Griffin
FACULTY MENTOR(S): Daniel Moore
AFFILIATION: SMCC
ABSTRACT: Males of many mammalian species have an X and Y chromosome, while females have two X chromosomes. This literature review examines how the SRY gene encodes an influential protein affecting exterior genitalia formation in males. The SRY gene resides only on the tip of the Y chromosome The SRY gene product initiates a sequence of regulatory steps that simultaneously promotes the growth of testes and suppresses ovary development. Downstream genes include Fgf9, sox9, amh, dhh. SRY is expressed in the supporting cells of the genital ridges between 10.5 and 12.5 days post coitum (dpc), with peak expression occurring at 11.5 dpc. At 10.5 dpc SRY, SF1 and sox9 attach to TESCO (testes specific enhancer of sox9 core) and upregulate sox9 expression. At 11.5 dpc SF1 and sox9 are attached to TESCO to prolong the amplify sox9 expression. Deletions in the human SRY flanking region is associated with XY disorders of sexual development.

TITLE: The North Atlantic Realm: Mapping Environmental and Climatic Change Through Archaeology
AUTHOR(S): Julia Gustafson
FACULTY MENTOR(S): Nathan Hamilton
AFFILIATION: USM
ABSTRACT: The North Atlantic acts simultaneously as a barrier and way of passage for the human settlements that border it. Entire cultures have risen out of the dynamic relationship between humankind and the sea. This study seeks to frame coastal archaeology ranging from approximately 40° N to 65° N latitude within the larger macrocosm of the North Atlantic Realm. Key sites from the Mid (6000 BP) to Late Holocene have been selected on the basis of interdisciplinary research efforts including geology, archaeology, biology, and chemistry. These sites all have significant sets of data-either human, biological, or geological that function as proxy to infer past environmental and climatic conditions. The data sets vary significantly but in combination offer strategic approaches to the theoretical and practical use of archaeological landscape data in several of the world’s most productive and complex marine ecosystems. Among the selected sites is the first major interdisciplinary Environmental Archaeology excavation in New England as well as other major excavations with exceptional faunal analysis, application of geochemical DNA including C-13/N-15, and geological data such as sediment core analysis which help to calibrate regional variations and transAtlantic trends. Special attention will be paid to the period known as the Little Ice Age (AD1300-1850)to emphasize the correlation between human activity and environmental change. This study is presented in the Knightlab Storymap JS and Timeline JS for enhanced communication.

TITLE: Quantification of unreacted styrene in composites laminate using SPME/GC techniques
AUTHOR(S): Jean Paul Habumugisha
FACULTY MENTOR(S): James Ford
AFFILIATION: USM
ABSTRACT: Styrene is used extensively in the manufacture of plastics, rubber, and resins. Unreacted styrene in finished products is a potential health problem and contributes to product defects such as “print through”, a result of the styrene monomer diffusing through the composite. Styrene is released as the product is heated, but direct measurement of the amount of styrene present is complicated by the need for multiple dilutions and potential sample loss. This project investigated the use of solid phase microextraction fibers combined with a gas chromatograph (SPME/GC) to measure the styrene content of headspace vapors over a composite sample. By suitable choice of
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fiber, and by varying the time the fiber is exposed to the sample, a known percentage of styrene can be extracted and quantified via GC.

TITLE: Education on Burnout and Self-Care at the University of Southern Maine: A Case Study
AUTHOR(S): Noelani Hansen
FACULTY MENTOR(S): Caroline Shanti
AFFILIATION: USM
ABSTRACT: Social work practitioners can experience symptoms of burnout at high rates, and sometimes aren’t able to effectively engage in self-care to combat these symptoms. For social work students, learning the signs of burnout and how to practice self-care are crucial tools. However, there is not much information in the literature on burnout and self-care in social work curricula. This case study will look at the education on burnout and self-care in the USM School of Social Work. Social work professors will be interviewed on how they teach about burnout and self-care, and undergraduate and graduate students will be interviewed on their experiences with learning about these topics in their classes. Thematic analysis will be used to analyze interviews. A content analysis will be done on course syllabi, looking at books ordered and articles assigned to see how burnout and self-care are implemented in different classes. The results of this case study will be shared with the USM School of Social Work in the hopes that the information gained will be used to further strengthen the curriculum.

TITLE: The Role of Adverse Childhood Experiences in Relationship to Opioids
AUTHOR(S): Kay Hanson, Kimberlee Lamothe, Amelia Smith
FACULTY MENTOR(S): Rachel Casey
AFFILIATION: USM
ABSTRACT: The aim of this study is to address the current gap in research regarding the relationship between childhood trauma and the misuse of opioids among women ages eighteen to thirty-five. Research participants were recruited at community service agencies throughout the Portland area and completed questionnaires measuring Adverse Childhood Experiences, substance use, and use of community supports. Statistical analyses were conducted to assess whether a correlation exists between childhood trauma and opioid use and whether community supports moderate this relationship. Findings of this study have the potential to confirm the existence of a correlation between childhood trauma and opioid misuse that has been found in other studies (Cicero, T. J., Ellis, M. S., & Harney, J. 2015). Furthermore, findings may discern which types of supports may be experienced by the target population as the most helpful in reducing and/or preventing opioid misuse, therefore, determining appropriate ways to address the prevalent opioid epidemic.

TITLE: Perceptions of Human Trafficking methods among college students
AUTHOR(S): Taylor Hartley
FACULTY MENTOR(S): Reuben Addo
AFFILIATION: USM
ABSTRACT: The importance of understanding the issue of human trafficking among college students and their perceptions has long been ignored. The reality of human trafficking, either with forced labor, sexual slavery or commercial sexual exploitation, requires skilled individuals who understand the severity of human trafficking to advocate and care for victims as well as better research over the concept of human trafficking, how it is initiated and who their targeted victims are. While news reports and history books can keep the public up to date with basic facts, in depth research and action provides the base from where front line advocates apply their knowledge and skills victims of human trafficking. In this review, scholarly literature and quantitative data has been synthesized around human trafficking and these issues to explore the fundamental roles of proper advocacy and information.

TITLE: Quantifying Atlantic Sea Scallop (Placopecten magellanicus) Larval Abundance throughout Cape Elizabeth, Maine
AUTHOR(S): Hannah Haskell, Britney Evangelista, Alex Loftis, Joshua Slater
FACULTY MENTOR(S): Rachel Lasley-Rasher
AFFILIATION: USM
ABSTRACT: As markets for the Atlantic Sea scallop are growing, the need for sustainable and reliable harvesting methods such as aquaculture is more imperative than ever. Due to the difficulty of maintaining sea scallop hatcheries, scallop farmers typically collect larvae from the ocean and raise them until a marketable size on lease sites. In order to efficiently collect scallop larvae, being able to predict when the larvae are most abundant in the water column is crucial. The goal of our research was to learn when scallop larvae are most abundant in the water column and to determine if there is a relationship between environmental factors and relative abundance. Water samples were collected off the coast of Cape Elizabeth, Maine over the course of four weeks and analyzed to determine the density of
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scallop larvae. During water sampling, sonde data was also collected in order to compare scallop larvae density to environmental data such as temperature, chlorophyll concentration, and salinity. A large spike in larvae density was observed on October 12th, followed by a decline in the following weeks. However, peak larval abundance did not correlate with any of the environmental variables measured in the field. These results suggest that larval abundance is perhaps influenced more strongly by adult spawning dynamics or hydrodynamic forcing.

TITLE: Affect and Gambling: What does rhetoric have to do with sales?
AUTHOR(S): Katherine Hast
FACULTY MENTOR(S): Jessica Ouellette
AFFILIATION: USM
ABSTRACT: Affect is a recent branch of rhetoric which is used to describe the immediate emotional occurrence which precedes cognition. Affect differs from the more understood pathos because affect is the unlabeled feeling experienced by one when reading or viewing certain images or texts. Whereas pathos is the emotional connection an author uses to connect the text with the audience—and is therefore drawn from personal knowledge and connections—affect has no particular draw and must then appeal to a much larger audience. In particular, affect is now being used as a marketing ploy in order to target and sell to a mass market rather than a traditional filtered and centered one. With this in mind, I will complete a rhetorical analysis of instant and online lottery tickets and the effect the rhetoric used in these has on gambling addiction in Maine. By looking at images and texts common to multiple versions of instant and online lottery tickets, I can use these commonalities to show how marketers use emotional and logical reactions in order to persuade.

TITLE: Evidence and Interventions for Children with Handwriting Deficits
AUTHOR(S): Josephine Hatch
FACULTY MENTOR(S): Mary Anderson
AFFILIATION: USM
ABSTRACT: The purpose of this project was to determine effective interventions shown to increase fine motor skills in children who experience handwriting deficits related to ADD/ADHD or other attention deficits. The project was prepared for a pediatric outpatient OT at Hasbro Children’s Hospital. The information was found via the USM databases through specific search terms and parameters. This work is significant because many OTs and teachers are working with children who have deficits in handwriting and fine motor abilities. There needs to be additional research conducted specifically with children who have ADD/ADHD and exhibit fine motor and handwriting deficits. The research shows that the most effective interventions consist of three different themes: sensory, motor, and cognitive. The motor interventions include repetitive practice, handwriting clubs, interactive metronome training, and three-dimensional robotic guided repetitive motion fine motor training. The sensory interventions include short-term sensorimotor intervention and a sensorimotor intervention combined with repetitive practice. The cognitive interventions include cognitive orientation to occupational performance (CO-OP) intervention and self-guided and task-oriented interventions. My recommendations were to include intensive handwriting practice combined with worksheets and homework, handwriting clubs with a group where clients are allowed to pick their own writing topic and to assure any intervention occurs twice weekly for at least 20 sessions.

TITLE: Agency and Attunement of Youth Seeking Resources Through Preble Street
AUTHOR(S): Adele Hayward
FACULTY MENTOR(S): Rosemary Cleary
AFFILIATION: USM
ABSTRACT: An extremely high percentage of youth who experience homelessness have sustained repeated physical, sexual, and/or emotional trauma. Because of their vulnerable position as youth, initially dependant upon familial support, it is not uncommon for these young folks to lack agency to interrupt the abuse. Left unaddressed, their traumatic experiences are often reenacted in other relationships because humans are physiologically inclined to develop memory in their nervous system. Social interactions can be retraumatizing for people who have repeatedly experienced abuse and social failures. However, positive relationships are critical protective factors for youth. Polyvagal theory suggests that attunement with other people is crucial to toning the nervous system and addressing unresolved trauma. Many of the youth at Preble Street are already making social connections with one another and because of their shared experience, these individuals have a unique and privileged standpoint from which to generate positive social and emotional relationships. How does the programming of Preble Street Teen Services facilitate prosocial behavior aimed at fostering restorative and attuned relationships? Where might the program be limited? What knowledge can youth provide that would be helpful in improving programming? And most importantly, how do Preble Street youth gain the agency necessary to interrupt current cycles of abuse and avoid it in the future?
TITLE: Querying the Past: Maine LGBTQ Oral History Project
AUTHOR(S): Skylar Hebert
FACULTY MENTOR(S): Wendy Chapkis
AFFILIATION: USM
ABSTRACT: As part of the Querying the Past: Maine LGBTQ Oral History Project, I conducted a life history interview with a local community member, Meredith MacEachern. The interview and transcription is available to researchers and the public on the USM digital commons: digitalcommons.usm.maine.edu/querying_ohproject/index.html. In this Thinking Matters presentation, I will discuss the process of, and insights obtained through, the oral history interview, and I will reflect on Meredith MacEachern’s history regarding her mental health, her passion for activism in regards to indigenous populations in Canada, and her words of wisdom for people in the LGBTQ community. MacEachern focuses on the challenges of her mental health history throughout the interview and how it has impacted her daily life. This particular topic can be overlooked and ignored under some circumstances, therefore it is of strong importance to share her story, especially for those who manage the same conditions. I will also discuss the challenges and benefits of doing oral history research, and the “behind the scenes” efforts that went on all the way through to the finished product. I would also like to touch on the great importance of collecting oral histories and how a project like this can be such a beautiful and special thing -- where the stories may be lost if these oral histories did not exist in our archive.

TITLE: Health Insurance Marketplace Taxonomy and its Influence on Consumer Perception of Plan Suitability
AUTHOR(S): Christopher Hickey
FACULTY MENTOR(S): Derek Tharp
AFFILIATION: USM
ABSTRACT: Within the health insurance marketplace, insurers offer a variety of plans that emphasize different elements of coverage. Comprehending the difference between these options can be confusing to consumers. To aid with plan differentiation, the marketplace uses “metal” categories of bronze, silver, gold and platinum to broadly correspond to the expected share of insured and insurer costs. This study investigates whether these precious metals categories bias consumer choice in selection of plans and may discourage attention to expected utilization and global cost-efficiency. One control of neutral-taxonomy plan options and two treatments, metal categories and technical plan description, were randomly assigned to a group of 600 study participants. Three separate, low-, mid- and high-utilization, cases of healthcare consumption were presented for a generic 48-year old single male with an annual income of $55,000 who was not eligible for a subsidy but felt he could afford all plan options available to him. Each group was asked to choose the most appropriate plan for each case from among three options. Plan options were composed of actual health insurance plans available on the marketplace and differed only in name. Controlling for other variables, results from a series of ordinal logistic regressions indicate that plan taxonomy has a significant effect and that use of precious metal categories exaggerates the perception of plan suitability by consumers when compared with both neutral and technical taxonomies.

TITLE: Modification of the Differential Demo Setup, Simulation & Velocity Output Analysis Using Solidworks
AUTHOR(S): Thomas Hill
FACULTY MENTOR(S): Mehrdaad Ghorashi
AFFILIATION: USM
ABSTRACT: The first part of this project is to redesign the housing and coupler parts for a past differential project. The current designs have met their yield point due to prior design constraints. New designs for the mechanisms will be manufactured and implemented to bring life back the past projects. The second part is to conduct a study on the differential gear mechanism to solve for and verify the velocity outputs of the wheels if one wheel is moving slower (i.e a car turning a corner). This will be completed by experimental, theoretical, and CAD analysis. The differential is equipped with tachometers to measure the speed of each wheel. The experimental speeds should be able to be verified using Solidworks and theoretical solutions. The Solidworks model will include wheels for the purpose of changing the coefficient of friction to demonstrate the velocity compensation of the differential. The project will include a full report that details the process, all data and results, and a conclusion of it’s entirety.

TITLE: Querying the Past: Maine LGBTQ Oral History Project
AUTHOR(S): May Hohman
FACULTY MENTOR(S): Wendy Chapkis
AFFILIATION: USM
ABSTRACT: As part of the Querying the Past: Maine LGBTQ Oral History Project, I conducted a life history interview with a local community
member, Milo Degoosh. The interview and transcription is available to researchers and the public on the USM digital commons: http://digitalcommons.usm.maine.edu/querying_ohproject/index.html. In this Thinking Matters presentation, I will discuss the process of, and insights obtained through, the oral history interview, and I will reflect on the process of preparing and conducting an interview, and the challenges that I faced during the process. I will also discuss how imperative it is to document LGBT+ history and the experience of Queer people. Finally, I will talk about the main themes and findings of the interview, such as problems in the Transgender Male community and Portland area in general, how it feels to be a Transgender individual with America’s current administration, how Milo conceptualizes his identity, and the challenges a Transgender male can have socially and individually while in the transitioning process.

TITLE: The Prevalence of and Risk Factors for Suicidal Ideation among Rural Populations in the United States
AUTHOR(S): Morgan Horn
FACULTY MENTOR(S): Erika Ziller
AFFILIATION: USM
ABSTRACT: According to the Center for Disease Control and Prevention (CDC), suicide is the tenth leading cause of death in the United States. While suicide is a national public health concern, mortality data from the CDC’s National Vital Statistics System revealed rural counties consistently had higher rates of suicide compared to their urban counterparts between 2001 and 2015. Existing literature on disparities between rural and urban prevalence of and risk factors for suicidal ideation is limited. Identifying these disparities could be a pivotal step to mitigating geographic disparities between rural and urban suicide rates in the United States. This capstone project aims to estimate the prevalence of and risk factors for suicidal ideation among adults residing in rural areas in the United States compared with their urban counterparts. Using secondary, publically available data from the National Survey on Drug use and Health, I am conducting descriptive and regression analyses to determine the prevalence of and risk factors for suicidal ideation in rural and urban areas in the United States. Findings from this study will inform public health practice and add to the gap in the existing literature.

TITLE: The Density of Hemigrapsus sanguineus and Carcinus maenas Crabs in Kettle Cove, Cape Elizabeth, Maine
AUTHOR(S): Valerie Huston, Teresa Martel, Zimzim Mohamed
FACULTY MENTOR(S): Rachel Lasley-Rasher
AFFILIATION: USM
ABSTRACT: Our focus for this project is to determine how the population densities of Hemigrapsus sanguineus, Asian shore crab and Carcinus maenas, European green crabs have shifted over a brief period of time. We are comparing data collected on September 17, 2018, to data collected on October 22, 2018. The location where the two sets of data were collected from is Kettle Cove, Cape Elizabeth, Maine. The GPS coordinate was 43°.33.55N70°.13.40N. We discuss what affects the influences of environmental factors such as temperature, salinity, high intertidal versus low intertidal, and percent ascophyllum cover affect have on the population densities of these two invasive species.

TITLE: Container size, development, and mortality in mosquito larvae Culex pipiens (Linnaeus) (Diptera, Culicidae)
AUTHOR(S): Daniel Hutchings
FACULTY MENTOR(S): Joseph Staples
AFFILIATION: USM
ABSTRACT: Previous studies of mosquitoes have reported that container can influence development and mortality rates when larvae are reared in groups. However, relatively few studies have examined the effect of chamber size alone while controlling for influences of competition or access to nutrients and dissolved gasses. In this research, I am assessing methods to isolate the effects of chamber size on the development rate, morphology, and survival of the common urban mosquito known as Culex pipiens from 1st instar to adult emergence. My design uses identical rearing chambers fitted with different sized arenas containing individual larvae. Arenas are constructed of fine mesh to restrict movement of larvae while allowing for the flow of nutrients and dissolved gases. Using a stereo microscope fitted with a digital micrometer, I measured the head capsule width of each larva at each instar. Early results reveal a positive correlation between head capsule width and arena size and an inverse relationship between maturation rates with arena-size consistent with the literature. This ongoing research is part of a larger research program examining the influence of different environmental stressors on mosquito development.
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TITLE: Level of circulating vascular endothelial growth factor (VEGF) after coronary artery bypass grafting (CABG) surgery
AUTHOR(S): Teaka Jackson, Amanda Favreau-Lessard, Sarah Peterson, Michael Robich, Douglas Sawyer
FACULTY MENTOR(S): Sergey Ryzhov
AFFILIATION: MMCRI
ABSTRACT: Myocardial ischemia is known to induce hypoxia-inducible factor 1-alpha activation and VEGF production. We hypothesized that plasma levels of VEGF would be a marker of chronic myocardial ischemia in subjects with coronary artery disease (CAD). We used plasma samples from patients undergoing CABG surgery. Research was performed in accordance with study protocols approved by Maine Medical Center Institutional Review Board, which is accredited by the Association for the Accreditation of Human Research Protection Programs. Plasma was obtained from 73 CABG subjects at five time points: preop, surgery, and 4-8, 24, and 96 hours following surgery. Samples were analyzed by ELISA to determine the concentration of VEGF. VEGF levels were characterized by interindividual variability ranging from non-detectible (below 31.3 pg/mL, 76% of subjects) to 2000 pg/mL. High VEGF levels were identified in 24% of subjects. Circulating VEGF correlated with plasma levels of tumor necrosis factor-alpha and neuregulin-1, markers of inflammation and cardiovascular stress, respectively. No significant differences were found between pre and post-operative levels of VEGF. However, 56% of high VEGF expressors demonstrated a decrease in VEGF post-surgery, which may indicate successful revascularization and relief of ischemia. No significant correlations were found between VEGF levels and glycated hemoglobin or cardiopulmonary bypass time. Further study is warranted to determine the relationship between ischemic heart and circulating VEGF.

TITLE: Mussel Predation Mitigation, Market Analysis and Engineering Design
AUTHOR(S): Mark Jacobs, Lindsey Dorval, Michelle Gardiner, Carolyn Jensen
FACULTY MENTOR(S): Carlos Luck
AFFILIATION: USM
ABSTRACT: The current method of rope-grown mussel aquaculture relies on large cumbersome nets to mitigate predation by Eider Ducks. These nets are subject to biofouling creating safety risks and high labor costs in maintaining them safely. The proposed new system utilizes interlocking buckets which restricts predation, prevents storm loss and reduces safety risks, labor costs and allows for greater scalability in commercial markets.

TITLE: Female age at first sexual intercourse by rural-urban residence
AUTHOR(S): Jaclyn Janis
FACULTY MENTOR(S): Katherine Ahrens
AFFILIATION: USM
ABSTRACT: Background: Previous studies have examined timing of sexual initiation in the United States, but little is known about rural-urban differences in age at first sex. Methods: We used female respondent data from the National Survey of Family Growth (n=29,133; 2006-2010 and 2011-2017) to examine age at first vaginal sex with a male partner. We used the Kaplan-Meier estimator and Cox proportional hazard analyses to assess differences in age at first sex by rural-urban residence. Models were adjusted for respondent characteristics that reflected childhood and the time of interview. All analyses accounted for complex survey design. Results: Overall, rural women experienced first sex earlier compared with urban women (hazard ratio [HR]=1.20, 95% confidence interval [CI]: 1.12, 1.29). By age 18, 62% of rural women had experienced first sex compared with 54% of urban women. After adjustment for respondent characteristics, HRs were attenuated, but rural women were still more likely to have experienced first sex compared to urban women (HR=1.07, 95% CI: 1.01, 1.13). Conclusion: Rural women were generally more likely to have had sex at an earlier age compared to urban women, suggesting that delivery of sexual education and reproductive health services for women in the US may need to take into account rural-urban residence.

TITLE: The Experience of Social Workers Who Utilize Therapy Dogs in Practice
AUTHOR(S): Kathryn Jochems
FACULTY MENTOR(S): Rachel Casey
AFFILIATION: USM
ABSTRACT: Animal assisted therapy, which incorporates animals into structured therapeutic interventions, and its use within social work has been shown to increase social interactions, communication, and the overall health and safety of clients (Nimer & Lundahl, 2007). However, there is a gap in the literature regarding the professional and personal experiences of individual social workers with incorporating certified therapy dogs into their practice. This study examined the approval process, perceived effects on practice, perceived effects outside of practice, and future implications of using therapy dogs in social work through the analysis of qualitative data from seven in-
depth interviews with licensed social workers currently utilizing therapy dogs in their daily practice. Findings from this study may be used to educate other social workers about incorporating therapy dogs into their practice.

TITLE: The Influence of Caregiver Coaching for Children with Oppositional Defiant Disorder
AUTHOR(S): Kayley Johnson, Taylor Eells
FACULTY MENTOR(S): Sarah Grinder
AFFILIATION: USM
ABSTRACT: The purpose of this evidence-based project was to investigate whether caregiver coaching impacts occupational therapy carryover among preteens/teens with oppositional defiant disorder (ODD). The main goal of caregiver coaching is to help parents understand and alter their child’s behavior by teaching them positive and appropriate parenting practices to support the replacement of ODD symptoms with more desirable choices. Two caregiver coaching programs, the Incredible Years Program and the Parent Management Training-Oregon Model were frequently utilized in the evidence located. Both programs were found to decrease conduct behaviors in conduct disorders like ODD, however, no difference was found between the two caregiver training programs, indicating support for caregiver training programs. All caregiver coaching interventions discussed in the research articles can be run by occupational therapists in outpatient practice. Evidence from three systematic reviews, three level 1 articles, and four level two and three articles, indicated that caregiver coaching is a quality method for supporting therapy intervention in a variety of contexts in order to decrease ODD symptoms, as well as positively influence parental interactions when caring for their children. There was no significant difference found amongst the variety of caregiver coaching programs allowing facilities the ability to find a program that is fitting for their location and style.

TITLE: Facebook: How Likes and Followers Affect Users Perception of Leadership
AUTHOR(S): Troy Johnston
FACULTY MENTOR(S): Sharon Timberlake
AFFILIATION: USM
ABSTRACT: The online social network, Facebook, creates a problem in which “likes” and followers give a user the appearance of leadership. The accumulation of likes in the online social network environment, such as Facebook, might offer non-legitimate leader status, similar to campaign donations contributing to the appeal of a candidate. This appearance of Facebook popularity through likes possibly skews the other members’ perspective regarding a user’s leadership competence. The user often looks official, popular, and influential. Any opinions of a user with accumulated likes could be taken with greater weight than a user with significantly fewer likes and followers. The objective of this study is to find out if the accumulation of likes and followers on Facebook leads to perceived user leadership status. The data will include a Facebook user questionnaire survey and subsequent data analysis. This qualitative study may provide a useful expansion of our traditional definition of leadership. The expansion could enhance academic and leadership studies courses with a greater understanding of online social capital. The traditional definition of leadership usually includes a human component, validated expertise, accepted levels of competence, credibility, and trust. In our current climate of online activity, this definition might need to be expanded to include social media activity. This paper explores the validity of perceived leadership status by the metric of accumulated likes and followers.

TITLE: Understanding the genetics of Huntington's Disease may lead to treatment and a cure
AUTHOR(S): Sharon Jordan
FACULTY MENTOR(S): Daniel Moore
AFFILIATION: SMCC
ABSTRACT: Huntington's disease (HD) is an autosomal dominant neurodegenerative disorder. A person who carries the abnormal form of the gene has a 50/50 chance of passing it to their child. Symptoms usually present around the age of 40. A person unaware that they carry the gene may have already had children and passed it along. HD was the first disease associated gene to be mapped. The gene expresses a protein called Huntingtin (HTT). Patients who have a repeating trinucleotide (CAG) of greater than 35 copies develop HD; people with under 35 CAG repeats do not develop HD. The mutant allele (mHTT) causes a toxic gain of function in the Huntingtin protein. Nerve cells in the basal ganglia region of the brain begin to break down with the buildup of the abnormal protein and motor function is affected. Currently there are only treatments to help with the symptoms but there is no cure. Antipsychotics, mood stabilizers, muscle relaxers, anti-anxiety medications can be used to ease some symptoms. Since we understand the mutation, new technology can be used to target the gene directly. Antisense drug therapy is being developed to treat and possibly cure HD. Single strand DNA is used to target the mRNA and prevents translation of the mHTT. Mouse models have shown enough progress that human trials have begun.
TITLE: Is the world ready for “designer babies”?
AUTHOR(S): Alina Katanov
FACULTY MENTOR(S): Daniel Moore
AFFILIATION: SMCC
ABSTRACT: Cluster Regularly Interspaced Short Palindromic Repeat (CRISPR) is a genome editing method originally found in bacteria allowing them to remember viruses that have previously attacked them. CRISPR-cas9 can be adapted to remove and replace gene sequences or to target gene expression. There are ethical questions about genetic modification. Will society accept scientists creating “designer babies”, or will this practice be restricted to helping eradicate severe genetic diseases? This literature review looks at recent genetic engineering efforts that raise ethical issues. Genetically modified human embryos have been created in the United States by injecting a CRISPR construct into eggs at the same time they were fertilized with sperm. There was no intention of implanting these embryos. They were allowed to develop for only a few days. The process is termed “germline engineering”. The purpose was to show it is possible to eradicate or correct genes that cause inherited diseases while developing a better technique that avoids mosaicism (not all copies of the targeted gene are edited) and editing errors in other loci. Scientists in China went further; they used CRISPR technology to make twin girls. There are concerns this yielded many risks with little benefit. Transmission of HIV through only one path of entry, CCR5, was blocked. The girls may be more susceptible to infections. The scientific community is now striving to provide clearer guidelines for the use of CRISPR and its place in our society.

TITLE: Best Practices for Providing Oral Care Within the Dementia Population
AUTHOR(S): Nicole Keniston
FACULTY MENTOR(S): Tammy Bickmore
AFFILIATION: USM
ABSTRACT: Our community partner, Angie Hunt, is the Chief Operating Officer (COO) at The Cedars. The Cedars is a non-profit, tertiary healthcare setting which offers community-based quality care across the aging continuum. The Cedars recognizes the need for enhancing and promoting oral hygiene within the geriatric population with Alzheimer’s or other forms of dementia. The Master of Occupational Therapy (MOT) students have been designated to investigate this topic further through exploration of existing literature and find what evidence-based research has been published. Fifteen articles were chosen for critical appraisal and are included in this paper which all contribute information regarding our clinical question: What interventions support best practice for improving oral health in geriatric population with Alzheimer’s or other form of dementia who reside in long-term care? The Cedar’s need expertise of OT to contribute to the “triple aim of health care”, which seeks to improve population health, improve health care, and reduce costs, (Braveman, 2016, p.62). Occupational therapists who practice in this setting will support both inpatient and outpatient programs by creating a healthy, safe environment for promoting maximized independence through means of implementing individualized interventions that will enhance quality of life. Keywords: oral care, dementia, long-term care, interventions

TITLE: For Successful Blood Transfusion Your Blood Type May Be More Than ABO
AUTHOR(S): Samar Khuder
FACULTY MENTOR(S): Daniel Moore
AFFILIATION: SMCC
ABSTRACT: Our immune system responds to antigen markers on the membrane surface of the red blood cells. For example, if you have Type A blood, you will have Type A antigens. The body produces antibodies that attack the antigens of other blood types. We inherit our blood type from our parents. The ABO blood group is one example. This has six genotypes (AA, AO, BB, BO, AB, and OO) and four phenotypes (A, B, AB, and O). The Rhesus blood group system is either negative or positive. Matching ABO blood types and Rhesus during transfusion or transplant is very important. In this literature review, other blood group antigens such as Kell, Kidd, Duffy, and MNS, will also be discussed. The genes for these antigens are highly polymorphic. It is a challenge to find suitable donors for patients. These blood groups are important in certain cases like multi-transfused patients. Duffy is a blood antigen that has affected patient outcomes in at least 4 cases of transfusion. Duffy is a chemokine receptor gene that is located on chromosome 1 (1q22-q23) and has two main codominant alleles, FYa and FYb. Scientists are working to create a universal blood type that camouflages the blood cell antigens to avoid problems during transfusions. In 2007, scientists developed an artificial “plastic blood” to replace actual blood in emergency situations.
TITLE: Exploring the Antecedents of Those who Practice Servant Leadership  
AUTHOR(S): Maria Kindelan  
FACULTY MENTOR(S): Sharon Timberlake  
AFFILIATION: USM  
ABSTRACT: Servant leadership is an under-developed theory coined by Greenleaf (1977), where he proposed servant leaders take care of “the other people’s highest priority needs [first]” (p. 27). Greenleaf (1977) believed “that the great leader is seen as a servant first, and that simple fact is the key to his greatness” (p. 21). Accordingly, preceding studies have been conducted on servant leadership, however there are still many calls for empirical research in many areas of the servant leadership phenomenon (Barbuto, Gottfredson, & Searle, 2014; Beck, 2014; Greenleaf, 1977). The purpose of the study was to explore the preceding essence of the individual who is a servant leader. Through a phenomenological method, the study will explore what brought the participants to utilize servant leadership. The qualitative research study was conducted to answer the question “what are the antecedents of the person who practices servant leadership?”. The researcher’s questions aim to answer how individual leaders resulted in employing servant leadership with their followers. The common antecedents of the servant leader found in this study included military and religious background. Other commonalities of the participants included natural inclination to leadership, empathy as a characteristic, and influences of other leaders. Keywords: servant leadership, antecedents, religion, military, empathy.

TITLE: Developing an International Health Curriculum for Medical Residencies  
AUTHOR(S): Brian King, Hassan Mahmoud, Anthony Pastore  
FACULTY MENTOR(S): Brenda Joly  
AFFILIATION: USM  
ABSTRACT: Introduction: While internal medicine residents at Maine Medical Center provide care for many refugees and immigrants, there is not a formal international health curriculum to equip residents to care for this vulnerable population. Since 2002, 3,793 refugees have arrived in Maine for resettlement. Our aim was to survey residents about their interest in added international health instruction and design an educational curriculum for these physicians. Methods: We performed a needs assessment of the residents between June 1-8, 2018. We queried trainees on knowledge, attitudes, and experiences caring for refugee and immigrant patients, as well interest in educational interventions. We submitted 6 questions through an online survey. Results: Half of the responding physicians did not feel comfortable with their knowledge of immigrant and refugee health. Interest was expressed for additional training. Popular educational interventions included lunch & learn, grand rounds, academic half-day and formal electives. Most of these physicians plan to take care of immigrants and refugees as providers following graduation. Conclusions: Based on our results, we have initiated several curricular items. These include expanding Friday conference for international health and the creation of a global health club. Future additions may include grand rounds, online modules and international health electives. We will conduct post-surveys after the incorporation of added curriculum to re-assess resident knowledge and comfort.

TITLE: Compassion in Public Service  
AUTHOR(S): Shaman Kirkland  
FACULTY MENTOR(S): Vaishali Mamgain  
AFFILIATION: UMS  
ABSTRACT: I will commence with an explanation of why America and USM’s values hold that we have a natural stake in governance. I will expand upon how activism is our way of claiming that right and how it benefits us individually and as a community. I will speak about me experiences testifying and giving speeches about gun safety. This discussion will explain why compassion is at the center of promoting gun safety. I will speak about my experience in Costa Rice, highlighting interactions with fellow delegates, students and Nobel Peace Laureates. I will also speak about the delegates and PeaceJams larger goals. I will then focus on PeaceJam at USM and outline our founding. I will then move to our actions and events. This will focus on work in schools, with the legislator and in the community. I’ll focus on education specifically, applied to local k-12 and Universities. I will discuss the communal aspect of PeaceJam USM and how it’s mutually beneficial and effective. I will expand the discussion in how we are creating and inspiring leaders. I will tie this into our vision for the future and the massive potential PeaceJam has. I will identify how, through compassion, PeaceJam and similar movements can solve America’s major issues. I will speak about the central role USM would play in that and how PeaceJam could help revitalize Maine. I will make the argument that PeaceJam is an extremely viable avenue of investment for USM and Portland. I will finish by saying every human can be great and accomplish any task or dream.
TITLE: Professional Impressions and Experiences of the Complex Needs of Human Trafficking Survivors  
AUTHOR(S): Jackie Klock, Kelsey Hayes  
FACULTY MENTOR(S): Caroline Shanti  
AFFILIATION: USM  
ABSTRACT: Human trafficking is a monumental and pervasive human rights issue, and one that carries immense physical, psychological, and psychosocial repercussions to its survivors. This project explores the complex needs and service gaps that exist for survivors of human trafficking. Through a qualitative study, with six in-person interviews of professional providers in Maine, we gain access to important information regarding complex needs of human trafficking survivors. Using thematic analysis we analyze common themes throughout the interviews in relation to previous literature. Recommendations for practice are also presented. Keywords Human trafficking - Trafficking - Survivor - Victim - Systems Theory - Barriers - Complex Needs

TITLE: Opioid use Treatment via Telemedicine; Treatment Options for Rural Maine  
AUTHOR(S): Benjamin Knapp  
FACULTY MENTOR(S): Caroline Shanti  
AFFILIATION: USM  
ABSTRACT: The ongoing opioid crisis has overwhelmed the traditional opioid use disorder (OUD) treatment resources across America. The treatment resources in rural communities have been especially hard hit as geographic and financial barriers limit service capacity. Telemedicine, or medicine delivered via remote means, has been proposed as a potential solution to the lack of conventional opioid treatment resources in rural Maine. Current legalities in the US prohibit telemedicine being used to prescribe opioid agonist drugs, and insurance reimbursement for telemedicine remains a major barrier. This qualitative content analysis looks at the existing research on telemedicine’s treatment efficacy for use with OUD as well as the logistical strengths and challenges inherent in the implementation of telemedicine for rural communities. Peer reviewed academic journal articles from the past five years were selected based on their inclusion of content directly related to remotely delivered OUD treatment. Thematic analysis was used to identify key themes in the existing use of telemedicine for OUD treatment delivery. These findings expose the limited data available on telemedicine as an independent OUD treatment modality, but also highlight the strengths of using telemedicine in support of traditional care.

TITLE: Cross Dominance in Children  
AUTHOR(S): Emma Kokkinos, Alexandra Gardiner  
FACULTY MENTOR(S): Mary Anderson  
AFFILIATION: USM  
ABSTRACT: Introduction: A child with cross dominance can exhibit challenges when learning in the classroom and it has been observed to have an effect on academic achievement in the pediatric population. Cross dominance can impact the occupations of a child at school, including copying from the board and handwriting. Objectives: The aim of our research was on the following: 1. Finding out what cross dominance looked like in the pediatric population. 2. Finding out if visual motor interventions had an effect on the fine motor skills of a child who has cross dominance. This poster focuses on the themes and findings with cross dominance in children and future recommendations for occupational therapists when working with this population. Results: Early visuo-motor intervention for children across all level of developmental helps improve fine motor skills, however, there is insufficient information to support that intervention specific to cross dominance is effective. The results were inconclusive as to whether or not visual motor interventions had any type of influence on a child with cross dominance. Conclusion: It is recommended more research needs to be done having the correct evidence on proper intervention to help deal with the processing and learning issues these children have. It will better improve their independence and daily activities of daily living, in addition to school tasks that the children are doing daily.

TITLE: Do Visual-Motor Interventions Improve Fine Motor Skills in Children Identified with Cross Dominance?  
AUTHOR(S): Diana Kovinsky  
FACULTY MENTOR(S): Mary Anderson  
AFFILIATION: USM  
ABSTRACT: This evidence-based practice analysis sought to find out if visual-motor interventions improve fine motor skills in children identified with cross dominance. Cross dominance affects children at the time when the brain begins to establish preference of one side of the body (dominant eye/hand/foot) over the other. In some children both sides of the brain develop dominance and make it hard to perform tasks such as writing, copying from the board or kicking a ball. Children with crossed dominance are found to demonstrate a higher rate of deficits in motor, language, and visual-perceptual skills. Cross dominance is higher in children with developmental delays and
generally referred to as a co-condition. Early fine motor interventions are beneficial for children who demonstrate deficits. However, when implementing visual-motor interventions it is important to establish dominance whether it is mixed or one-sided. There is no evidence that cross-dominance specific interventions are effective. Therapists should not seek to correct or make goals to change dominance patterns but might implement interventions that improve skills on the dominant side, or if mixed, both sides without encouragement to prefer one side over the other. In some cases, especially in sports, cross dominance is found to have a positive effect. A player with cross dominance might use either side to their advantage. Currently, there is a gap in research about the topic which presents an opportunity for further exploration in the future.

**TITLE:** Synthesis and analysis of 6-acetyl-1,2,3,4-tetrahydropyridine, a major contributor to ‘mousy’ off-flavor in sour and wild beers  
**AUTHOR(S):** Liesel Krout  
**FACULTY MENTOR(S):** Lucille Benedict  
**AFFILIATION:** USM  
**ABSTRACT:** Unexpected tastes can negatively impact consumer experience in the beer industry. One such taste, a ‘mousy’ off-flavor, is diminishing the quality of sour and wild beers throughout the brewing community. The unpleasant flavor is a result of the combined presence of three organic compounds: 6-acetyl-1,2,3,4-tetrahydropyridine (ATHP), 2-acetyl-1-pyrroline, and 2-ethyl-3,4,5,6-tetrahydropyridine. Because of its unpredictable nature, brewers must wait for the compound to disappear before distribution, costing them valuable time and revenue. The factors responsible for formation, reasons for persistence, and degradation timelines of the compounds were unknown. A method for quantification was therefore necessary to determine those characteristics, and such quantification depended upon the availability of a pure standard. In response, synthesis protocols, a GC-MS method for qualification, and a method for extraction from beer were developed for ATHP. ATHP was synthesized via a mechanism by which dihydroxyacetone reacts with proline in the presence of sodium bisulfite. The product was synthesized in low yields, so different routes of synthesis were attempted. ATHP product was highly impure as evidenced by GC-MS, so various purification techniques were employed. Extraction protocols were developed on basic profile beers that were spiked with product and progressed to naturally ‘mousy’, complex beers. The ATHP component of the uncontrolled ‘mousy’ off-flavor was synthesized, identified, and purified.

**TITLE:** Influence of indirect cues and vegetation density on foraging behavior in snowshoe hares (Lepus americanus)  
**AUTHOR(S):** Zachary Lankist  
**FACULTY MENTOR(S):** Christine Maher  
**AFFILIATION:** USM  
**ABSTRACT:** Prey avoid chemical cues from predators at feeding sites because the risk of death outweighs the benefit of food. However, we lack information regarding avoidance of chemical cues from competitors as well as how foraging behavior changes alongside vegetative cover. To test if chemical cues and vegetative cover alter prey vigilance, number of visits, and time spent at feeding sites, I observed snowshoe hares (Lepus americanus) in plots containing coyote (Canis latrans; predator) and moose (Alces alces; competitor) urine across a spectrum of vegetation densities. Snowshoe hares significantly reduced the number of visits to feeding plots when coyote or moose urine was administered. In plots containing coyote urine, number of visits decreased significantly as plots became more densely vegetated. Neither chemical cues nor vegetation density had a large effect on snowshoe hare vigilance or time spent in plots. These results suggest that competition between snowshoe hares and moose has selected for an avoidance response. This study also reinforces the idea that an increase in vegetation density could prove disadvantageous to prey, perhaps because sit-and-wait predators use dense vegetation to stalk and ambush while on the hunt.

**TITLE:** Measuring Birth Trauma Rates in Maine Using Public Data  
**AUTHOR(S):** Mike Lapika  
**FACULTY MENTOR(S):** Catherine McGuire  
**AFFILIATION:** USM  
**ABSTRACT:** An increasing number of states are creating databases that collect and organize health insurance claims from public and private health care payers. Since December 2016, at least 18 states have these “all-payer claims databases” (APCDs), including Maine. APCDs are intended to inform cost containment and quality improvement by increasing transparency and informing consumer choice. For this project, we assessed how Maine’s APCD data might be used to produce standardized quality measures across facilities in the state. Specifically, we tested a birth outcome quality measure developed by the Agency for Healthcare Research and Quality (AHRQ), Birth Trauma – Injury to Neonate (PSI17). This measure identifies the proportion of all births within a facility that experienced a defined birth trauma.
These cases include facial nerve injury, spinal cord injury, and a hemorrhage below the scalp. These birth injuries can cause serious impairment to the infant’s body and may even cause neonatal death.

AHRQ provides the statistical analysis software (AHRQ Toolkit) to use in the calculation of this measure using uniform hospital discharge data (UHDDS) collected by all states and submitted to a national database. We tested how this coding could be adapted to Maine’s APCD data and compared results with rates calculated using Maine’s UHDDS. This presentation will present some of the challenges identified in producing a birth trauma measure with APCD data and present results from the analyses for calendar years 2014 and 2016 data.

TITLE: The Effect of Media Literacy in Recognizing Fake News  
AUTHOR(S): Kathryn Letellier  
FACULTY MENTOR(S): Robert Klotz  
AFFILIATION: USM  
ABSTRACT: Fake News’ popularity surged in recent years, mostly because of its debated influence in the 2016 U.S. Presidential Election. News is still breaking on the extent and impact of fake news articles on voters. A democracy however cannot function with an uninformed public, and so we have to combat the issue without censoring the internet. My research proposes an alternate way to combat fake news’ influence: media literacy. My research involves presenting approximately 50 people with credible and fake news articles and having them decipher which are true/false. Some participants will then be provided with media literacy tips to see if they answer better/worse/same the second time around. If my hypothesis is correct, I will share it with Media Literacy Now, an organization that works to get schools to incorporate media literacy into their education.

TITLE: The construction of Muon detectors as a basis for research at USM  
AUTHOR(S): Mackenzie Libby  
FACULTY MENTOR(S): Paul Naroshis  
AFFILIATION: USM  
ABSTRACT: The purpose of this project is to establish the precedent of muon detection research opportunities at USM, through construction of cost-effective muon detectors. Through MIT’s Cosmic Watch project, we were able to achieve this via the funds made available through the UROP program - a remarkable milestone in the cost efficiency of particle detector technologies. Future students will benefit from this by having the opportunity to use the devices to detect the decay products (i.e. muons) of cosmic ray collisions in the earth’s upper atmosphere. By measuring the gradient in muon density over varying altitudes, we can investigate the validity of Einstein’s Special Theory of Relativity. The question yet to be answered is whether the Cosmic Watch device can measure this gradient over small altitudes (e.g. from the top of the Science Building at USM to the coast line in the Old Port); this question will be answered as the weather begins to permit, as well we will test its abilities over greater altitudes to further investigate the relevant theories, and the abilities of the technology being used.  
The primary goal was satisfied in that the physics department at USM now has the resources necessary to allow students to easily investigate this facet of particle physics and continue to kindle the curiosity of the local science community. The secondary goal - of investigating Special Relativity - will be taken on in the spring time, once the weather will permit such devices to spend long periods of time outside.

TITLE: Convolutional Neural Networks for Protein Image Classification  
AUTHOR(S): Nickolas Littlefield  
FACULTY MENTOR(S): Bruce MacLeod  
AFFILIATION: USM  
ABSTRACT: A solution to the Kaggle competition: Human Protein Atlas Image Classification. Using microscopic images of cells provided by the Human Protein Atlas, convolutional neural networks, CNNs, were used to analyze and predict the location of protein patterns. Challenges included working with an unbalanced dataset, finding a correct learning rate, and choosing a correct architecture to solve the problem. To learn how to overcome these challenges and gain more understanding of the problem, various kernels and discussion posts for the competition, as well as papers on different CNN architectures were used.

TITLE: What is the Experience of Children under the Care of an Individual with Mental Health Issues?  
AUTHOR(S): Jennifer Luja, Meg O’Malley  
FACULTY MENTOR(S): Rachel Casey  
AFFILIATION: USM  
ABSTRACT: Children are impacted by their relationships with caregivers. The objective of this research was to develop awareness of
The impact on children being cared for by caregivers with mental health issues by examining the experiences of individuals who had a caregiver with severe and persistent mental health issues during childhood. Researchers also gained insight on how social workers can be more supportive to children in these circumstances. The researchers conducted interviews with five participants, the recordings of which were then transcribed and coded to identify themes. Prevalent themes include critiques of available services, resiliency and challenges of family members as improved awareness of the significance of interpersonal relationships. For participants, compassion and tolerance have flourished since childhood, as well as a desire to help those in need. This research aims to inform and improve current services to children in the care of individuals struggling with severe or persistent mental health symptoms and improve both family and individual functioning. The research also aims to destigmatize the labeling of caregivers with mental health symptoms and improve the service delivery and professional parameters associated with working with children under the care of caregivers with mental health.

**TITLE:** Classroom Discipline Practices: Connecting With Teacher Perspectives  
**AUTHOR(S):** Hannah Luken  
**FACULTY MENTOR(S):** Garry Wickerd  
**AFFILIATION:** USM  
**ABSTRACT:** Teachers sometimes struggle with difficult student behavior, and school psychologists are well positioned to offer guidance to them. To fulfill this consultative role, school psychologists must know what classroom discipline resources teachers use, so they can make inferences about teachers’ knowledge base and inform consultation. Traditional classroom management practices involve consequences to reduce interfering behaviors based on the form of the behavior. For example, if a student talks without permission, a common strategy is to send a nonverbal signal to stop the behavior. This strategy may inadvertently increase “talking without permission” if the behavior is maintained by teacher attention. Such an unintentional mistake can be avoided through a function-based approach. In this study, 10,000 Maine teachers were surveyed about their classroom discipline resource usage, their perceived ability to manage behavior, and how they would handle behavior in fictional scenarios. Most teachers surveyed are confident in their ability to handle behavior, and use mainly other teachers as a resource. In addition, results indicated the books, websites, and webinars used are not function-based. The scenario responses are still being coded, however the researchers hypothesize many teachers did not consider function in their response. According to these results, despite their confidence, teachers are underprepared to effectively manage behavior, due to their focus on addressing the form, rather than function, of behavior.

**TITLE:** Burn Cash Eat Trash: USM food waste study  
**AUTHOR(S):** Kelly Lynch  
**FACULTY MENTOR(S):** Robert Sanford  
**AFFILIATION:** USM  
**ABSTRACT:** For this project I studied the waste from trash receptacles at both our Gorham and Portland campuses here at USM. Waste that had been thrown into trash bins was separated, weighed and recorded as either trash, recyclable material or compostable material. I collected and recorded the data over the course of a year. The results were astounding. All of the receptacles that I took samples from were clearly marked with recycling instructions and options. Yet still, over 80% of materials thrown into the trash were either recyclable or compostable materials. My presentation will be depicting my data as well as some estimates of how much money USM could gain by switching to more logical waste management options. This project was inspired by an incident I experienced on campus about a year ago, I was walking to class when I noticed a pile of individually wrapped, unopened sandwiches had been thrown away. It turned out there were 18 total. Each one had a price tag on it of 5.99, 107 dollars and 82 cents. In the garbage can. That was just one instance of one day. Think of what you would find in a year.

**TITLE:** Establishing a Relationship Through Play: Reducing PTSD Symptoms in School-aged Children  
**AUTHOR(S):** Erica Madera, Nicholas Beach  
**FACULTY MENTOR(S):** Bernadette Kroon  
**AFFILIATION:** USM  
**ABSTRACT:** Childhood trauma is associated with a variety of negative health outcomes that can significantly and negatively impact a child’s occupational performance within school roles, including problems with gross motor coordination, social interaction, and memory. Additionally, children who have experienced trauma may not be socially or emotionally available to participate in more structured occupational therapy or other intervention activities. Because of this, our evidence review explored the question, “Does engagement in the occupation of play support development of a therapeutic relationship that facilitates improvement of PTSD symptoms in school-aged children with a history of experiencing early childhood trauma?” We reviewed the available evidence from seven databases and included
the results from eleven studies of varying quality. There is a wealth of anecdotal evidence supporting the therapeutic use of play for traumatized children, but the availability of quality research is limited. The occupation of play can be used as a method for establishing a trust within a therapeutic relationship, or as an intervention in and of itself, and is perceived as a positive experience both by children and therapists. Although the current evidence does suggest that the therapeutic use of play is effective at reducing PTSD symptoms in children, and that the development of a therapeutic relationship is possibly one reason for that efficacy, the current evidence is far from conclusive, and more research needs to be done.

**TITLE:** Male determining gene Nix may bring an end to transmission of diseases through mosquitoes  
**AUTHOR(S):** Mohammed Mahdi  
**FACULTY MENTOR(S):** Daniel Moore  
**AFFILIATION:** SMCC  
**ABSTRACT:** Female mosquitoes take blood from humans to gain protein needed to produce eggs, and in the process they can transmit viruses, such as Zika, Dengue, and chikungunya, or parasites, such as malaria. Male mosquitoes do not transmit diseases. This literature review will examine what is known about how sex is determined in mosquitoes and how this can be used to manipulate the females that spread diseases to humans. Using CRISPR Cas9, the lab of Zhijian Tu removed the Nix gene from mosquito embryos; all of these were feminized. Ectopic overexpression of Nix gene product in mosquito embryos caused even genetically female mosquitoes to have male genitalia. Nix has been shown to be a regulating factor for doublesex and fruitless, two other genes known to be involved in sex determination. The Nix gene has highly repetitive features similar to other genes in the Y chromosome of other organisms. Researchers in London have already demonstrated that CRISPR technology can be used to disrupt the female form of doublesex in a population of caged mosquitoes. The females become sterile and the population declines. Nix could be used in a similar way to change female mosquitoes to harmless males.

**TITLE:** The Role of Collagen Triple Helix Repeat-Containing 1 Signaling in Adipogenesis and Lipolysis  
**AUTHOR(S):** Alaa Makki  
**FACULTY MENTOR(S):** David Champlin  
**AFFILIATION:** USM  
**ABSTRACT:** Obesity is a critical public health concern in developed countries worldwide. Obesity is particularly devastating because it can lead to a host of negative health consequences, including the onset of type 2 diabetes and cardiovascular diseases. According to the World Health Organization, the United States has the highest obesity rates in the world, with a prevalence of nearly 40% among the adult population. Therefore, in addition to dietary and healthy lifestyle initiatives, there is a pressing need to better understand obesity at the molecular and genetic levels. This makes the “anti-obesity” factor, collagen triple helix repeat-containing 1 (CTHRC1), a significant area of research given our on-going studies demonstrating that 1) CTHRC1 suppresses adipogenesis, the process by which fat precursor cells (preadipocytes) differentiate to become fat cells (adipocytes); 2) CTHRC1 enhances lipolysis, the process by which fats are metabolized as fuel for the body. With respect to adipogenesis, our in vitro studies indicate that CTHRC1 suppresses the expression of the critical adipogenic genes and factors that drive adipogenesis, while also increasing the protein expression of CHOP and SOX9, two anti-adipogenic factors known to directly inhibit the expression and function of PPAR and C/EBP. Taken together, by understanding the discrete molecular mechanisms by which CTHRC1 suppresses adipogenesis and enhances lipolysis, new therapeutic approaches can be developed to help fight obesity and obesity-related diseases.

**TITLE:** Child Poverty, Physical & Mental Health in Maine  
**AUTHOR(S):** Katelyn Malloy  
**FACULTY MENTOR(S):** Brenda Joly  
**AFFILIATION:** USM  
**ABSTRACT:** Children who live below the national poverty line account for nearly one fifth of Maine’s overall population. Child poverty is a determinant of health that can lead to negative health outcomes that affect childhood development, educational achievement, as well as physical and mental health. The purpose of this study was to identify five Maine counties with the highest rates of child poverty according to the national average. Comparison of poverty rates between counties were analyzed along with two leading health indicators — mental and physical distress. This study used 2016 county-level childhood poverty estimates, assessed by the American Community Survey conducted by the United States census. Data collected from the County Health Rankings initiative were used to identify child poverty as well as rates of mental and physical distress rankings by county in 2016. Comparisons of the descriptive data were made to determine connections between these three factors. We found that the five counties with the highest rates of child poverty are Somerset, Washington,
ABSTRACTS

Piscataquis, Aroostook, and Franklin county (30%, 28%, 28%, 22%, 20%). These five counties are also more than ninety percent rural, have a larger measurement of premature deaths, and produce larger violent crime rates per county compared to the remaining eleven state counties. The results from this study will spotlight a vulnerable population including additional health indicators to be addressed when developing best-practice interventions.

TITLE: Two human populations with a need for more red blood cells carry mutations that help do this
AUTHOR(S): Jeremy Marsh
FACULTY MENTOR(S): Daniel Moore
AFFILIATION: SMCC
ABSTRACT: A single nucleotide polymorphism (SNP) is a change of a single nucleotide within the genome. Small mutations can give rise to different traits within a human population. This literature review examines how an SNP has allowed human populations to thrive under different conditions. People in the Bajau tribe of the Southern Philippines are famous for diving while holding their breath. Many tribe members have an SNP in the PDE10A gene that causes an overproduction of the thyroid hormone T4 and is correlated with increased spleen size. Increased spleen size may allow them to hold their breath underwater longer. Their spleens can produce more red blood cells. In another example, many Tibetans that live in the Himalayan mountains have an SNP in the EPAS1 gene. EPAS1 regulates the body’s production of hemoglobin. This SNP causes people from this population to have an above average production of hemoglobin that makes them better fit to survive in the thin air found in high altitudes. Both these populations need more red blood cells to thrive in their environment. Different SNPs have arisen in their populations to meet that need.

TITLE: Memoirs of a City: A Contemporary Walking Tour of Historic Bath, Maine from the 17th century to the 20th
AUTHOR(S): Jack Martin
FACULTY MENTOR(S): Elizabeth Bischof
AFFILIATION: USM
ABSTRACT: In 1879 Levi P. Lemont, a local Bath historian, began compiling notes of the purpose of creating “An Historical Tour of Bath” which was never published. This reexamination of those notes looks to incorporate their information with tax records, maps, and other histories to build a walking tour which is usable in the 21st century and reflective of Bath’s history to date. To that end, sites were selected which exemplified an era or moment in Bath’s history, bore a strong connection to an important figure, or spoke to the unique character of the city and attested to its periods of prosperity and growth. By creating this tour digitally it allows this history to be experienced virtually for those incapable of actually walking the route and, for those who do walk it, makes it easy to juxtapose historic images with contemporary sites, enabling a participant to more easily envision what Bath looked like in these times gone by. This tour is also to be a “living” historic tour, which is to say that it can be added to and expanded upon as new sites of historic importance are discovered or realized, attesting to the fluidity of history and allowing the tour to remain usable, effective, and relevant into the future.

TITLE: The Androscoggin BioBlitz: a Citizen Science Biological Survey in New Auburn, Maine
AUTHOR(S): Samuel Matey
FACULTY MENTOR(S): Joseph Staples
AFFILIATION: USM
ABSTRACT: After several weeks of planning, the Androscoggin Citizen Biological Survey, or “BioBlitz,” took place on August 11th, 2018 in New Auburn, near the confluence of the Little Androscoggin and Androscoggin Rivers. The BioBlitz was a joint project of Maine Conservation Voters and the Androscoggin Land Trust and was conceived of an organized by a USM Environmental Science student interning with Maine Conservation Voters. In this BioBlitz, participants used the citizen science app iNaturalist to photograph wildlife of the river shoreline and add their observations to the app’s database. The Androscoggin BioBlitz project established on the iNaturalist website collected all of the observations made on August 11th in the Lewiston-Auburn river shoreline area into a single report, making it easier to survey the final observation tallies. In the space of approximately 2.5 hours, we observed and cataloged 102 individuals from 74 different species. 66.22 percent of species observed were plants, followed by insects (8.11%), ray-finned fish (6.76%), birds (5.41%), and others. Over 60% of all observations are currently Research Grade, indicating that they are of sufficiently high quality to be used as data points in scientific research. In sum, this BioBlitz was a scientifically and educationally valuable citizen science project led by a USM student.
TITLE: Functional Feeding Groups of Aquatic Macroinvertebrates on Natural and Artificial Leaves in Forested Stream Habitats in the Sebago Lake Land Reserve

AUTHOR(S): Samuel Matey, Kala Wistar

FACULTY MENTOR(S): Karen Wilson

AFFILIATION: USM

ABSTRACT: We investigated preferential insect colonization of natural versus artificial leaves in forested streams to determine the impact of invertebrate-substrate associations on macroinvertebrate community composition and ecosystem nutrient cycling. We created 10 onion bags filled with natural maple leaves and 10 filled with artificial maple leaves, and placed 5 of each in two forested streams, one larger and one smaller, in the Sebago Lake Land Reserve in Standish, Maine. We identified the aquatic macroinvertebrates found on these samples after approximately one month to order-level and used Maine DEP biomonitoring data and functional feeding group taxonomies to classify macroinvertebrates by functional feeding groups. There was a greater difference in Simpson diversity values between habitats than between substrate types and a substantially greater difference in functional feeding group composition between habitats than between substrate types. The patterns in functional feeding group abundance across habitats (specifically the decline in shredder proportions from the smaller stream to the larger stream) match the patterns of the river continuum concept. This indicates an unexpectedly high degree of small-scale ecosystem heterogeneity, with wide potential implications for ecosystem-level macroinvertebrate community structure and nutrient cycling.

TITLE: Wind Tunnel Lab Experience for MEE439

AUTHOR(S): Tyler Mathieu

FACULTY MENTOR(S): Michael Davis

AFFILIATION: USM

ABSTRACT: The Wind Tunnel Lab Experience is a project designed to be utilized in the Fluid Mechanics/Heat Transfer Lab class (MEE439) presented by the Mechanical Engineering depart at USM. The lab experience created during this project fits with the Fluid Mechanics portion of the class while utilizing the AeroLab Wind Tunnel, which is available through the Engineering Department for student use. The lab is focused on the investigation of airfoil designs, as we currently do not have the appropriate apparatus to conduct experiments in the wind tunnel. Following the fabrication of the apparatus, my project will allow student to complete a threestep laboratory which includes experimental data collection, computer simulations and theoretical calculations. In all sections of the lab, students are expected to determine two relationships based on the positioning of the airfoil. The relationships are Drag Coefficient versus Attack Angle and Lift versus Attack Angle. Through these relationships students can compare their results to the well know curve shapes for these relationships to confirm the lecture material satisfies real world experience.

TITLE: Generational Differences in Organizational Culture

AUTHOR(S): Andy McClement

FACULTY MENTOR(S): Elizabeth Goryunova

AFFILIATION: USM

ABSTRACT: As the Baby Boomers exit the workforce, newer and younger generations’ workers will need to be hired and trained to fill these positions. Millennials entering the workforce will require evolving methodologies of leadership to retain talent. Studies to-date have focused on leadership styles and organizational culture and how they affect employee engagement. However, the bulk of these studies use information that may not be relevant to current Gen Z and Millennials. To address existing gap in knowledge, this study explores the differences of the current generations in the modern-day workforce leadership and what Millennials and Gen Z leaders will need to focus on to retain and engage future and current top talent in their respective industries. Specifically, this qualitative study seeks to answer the following research questions: Which styles of leadership do Gen Z and Millennials desire in order to obtain maximum engagement and organizational loyalty? What motivates Millennials and GenZ employment seekers to accept a job and stay at their respective organization aside from monetary compensation? Participant sample includes Millennial and Gen Z age individuals currently between the age of 18-37. Data is collected through surveys and interviews; and analyzed for common themes and patterns. The outcome of the study will help leaders determine what they could offer or improve to retain workers from the Millennial and Gen Z workforce and provide insight of how younger leaders can engage their employees.
TITLE: Do children’s concepts of achievement and knowledge reflect their upbringing and parenting backgrounds?: Adding to the debate through a literature-based investigation and empirical study.

AUTHOR(S): Cristin McDonough
FACULTY MENTOR(S): Robert Thompson

AFFILIATION: USM

ABSTRACT: The current study investigates children’s own awareness and knowledge of intelligence. Phase 1 was an exhaustive literature search, and Phase 2 is an empirical investigation currently taking place in local preschools. In Phase 1, the “Intelligence” construct among adults is found to be both complex and disputed in psychology. Current literature has been found to avoid the term “intelligence” when studying young children’s awareness, instead focusing on concepts such as self-efficacy, knowledge, and mental state awareness; parent and teacher beliefs about children’s intelligence, and children’s motivation and achievement. Phase 1 shows that these concepts may be driven by key parental factors, such as socioeconomic status, and beliefs about success, failure, and achievement. Phase 2 investigates these factors as underlying themes, using naturalistic activities to elicit language and behavior that have been hypothesized to correlate with parenting measures and beliefs. The goal is to highlight the most important factors in determining children’s awareness or understanding of their abilities and motivations, and perhaps their conceptions about intelligence. This also includes which individual differences among young children may help determine how and when they begin conceptualizing abilities and beliefs about themselves. Results of Phase 1 and preliminary empirical findings will be used in the debate of how best to determine children’s emergent concepts of “ability,” “knowledge,” and measures of self-efficacy.

TITLE: Creativity, Innovation, and Transformational Leadership in the Context of the United States Army

AUTHOR(S): Johnathon McGahey
FACULTY MENTOR(S): Sharon Timberlake

AFFILIATION: USM

ABSTRACT: Research on creativity in organizations is both extensive and contradictory. The purpose of this study is to examine the many possibilities of creativity and the benefits of being a creative organization. Once creativity is perceived the paper will detail how corporations adapt to meet such a complex objective. However, understanding what creativity is only breaching the surface when it comes to creating innovative organizations. The research will show that the vital aspect of innovative and creative organizations has the proper leaders in place. Leaders put in place the structure for creativity to thrive and ensure that organizational goals will be met.

Keywords: creativity, leadership, innovation, organizations.

TITLE: Learned Attention and English Morphology

AUTHOR(S): Foster McNamara
FACULTY MENTOR(S): Jeanne Heil

AFFILIATION: USM

ABSTRACT: Native (L1) speakers of English typically express probability using adverbs, while L1 speakers of other languages can implement morphology (including future and conditional) to mark probability. The aim of this study was to investigate whether L1 English speakers interpret future morphology as probability, and if so, under what conditions this interpretation occurs. Previous studies have indicated a relationship between (un)certainty and choice of future morphology in Spanish (Sedano, 1994) and that second-language (L2) speakers of Spanish tend not to have sensitivity to (un)certainty in Spanish future morphology (Gudmestad & Geeslin, 2013). These findings prompt further investigation into factors that affect crosslinguistic interpretation of morphology. Pre-piloting with native speakers has shown that some dialects of English allow for interpretation of (un)certainty indicated by future morphology. In order to evaluate this hypothesis, participants of the study completed two interpretation tasks: a forced choice task and a truth value judgement task. Data from the forced choice task did not show evidence of probability reading, but data from the truth value judgement task did show evidence that English future morphology can indicate probability, thus supporting the hypothesis. These results are significant because they shed light on the relationship between morphology and interpretations of probability in L1 English, and therefore have implications for improving teaching methods in second language acquisition.

TITLE: Salt Tolerance in Larval Culex Pipiens

AUTHOR(S): Molly Meagher, Katherine-Helene Sullivan
FACULTY MENTOR(S): Joseph Staples

AFFILIATION: USM

ABSTRACT: Each year, more than 20 million tons of salt is deposited on roads nationwide, with more than 100,000 tons along Maine
roads in the form of rock salt or mixed with sand. In recent decades, numerous studies from across the northeastern United States have reported impairment of ponds and streams, contamination of wells, or damage to roadside vegetation from runoff or aerosolized salt spray due to fast-moving winter traffic. Research to date has focused on ecological impacts such as reductions in diversity or abundance of amphibians, aquatic invertebrates, and vertebrates, or vegetation. Relatively few studies, however, have reported on innate tolerances to higher salt concentrations in aquatic insects. In this research, we examine the effect of increasing salt (NaCl) concentration on the development and mortality of Culex pipiens, a common urban mosquito species in Maine known to vector a number of diseases including West Nile Virus. Based on our results, we offer recommendations for future ecological studies of salt tolerance on aquatic insects with particular emphasis on identifying specific variables for modeling populations of mosquito species, their competitors, and predators.

**TITLE:** Microbial distribution of aquaponics systems and their division of labor  
**AUTHOR(S):** Nathan Melo  
**FACULTY MENTOR(S):** Rachel Larsen  
**AFFILIATION:** USM  
**ABSTRACT:** Farming practices have always been labor intensive and required a great deal of resources including space, nutrients, heavy equipment, and a great deal care. Hydroponics sought to remedy this with its space saving, small scale-high yield strategy. However, this brought problems of a more sensitive system that requires constant testing and regulation of chemicals and minerals. The addition of an organic fertilizer from fish and filtration system comprised of a community of microbes reduces the taxing rituals of aquaponics and recategorizes the system as Aquaponics. In aquaponics, the plants receive their nitrogen from a the ammonia produced by fish in a tank. This ammonia is converted into usable nitrogen by a series of collection tanks comprised of various microorganisms. Using community genomic sequencing and chemical analysis of isolated locations throughout the aquaponics system we observed which microbes are likely to have a positive influence throughout the system and what intra-microbial challenges they face. Identifying the microbial community and its organismal elements provides for a more precise level of tuning within an aquaponics system with the goal of identifying an optimal micro-macro species relationship that offers maximum system efficiency.

**TITLE:** Analysis of anti-diabetic exosomes secreted from beige adipocytes  
**AUTHOR(S):** Rachelle Mendola, Chad Doucette, Daniel Nguyen  
**FACULTY MENTOR(S):** Aaron Brown  
**AFFILIATION:** USM  
**ABSTRACT:** A high calorie diet coupled to a sedentary lifestyle has triggered a global rise in obesity. White adipocytes (white fat cells) store energy from dietary fats and their accumulation correlates with an increased risk for diabetes. Within white adipose resides a specialized population of “beige” adipocytes that are activated by cold exposure and expend energy contained in fats, which is released as heat. Increasing energy expenditure through beige adipocyte activation correlates with reduced risk of obesity and diabetes. However, activation of beige adipocytes through exposure of patients to cold temperatures is uncomfortable and not a realistic strategy to control body weight. Recent evidence suggests that beige adipocytes also secrete factors that enter the bloodstream and can increase energy expenditure in other tissues (muscle, liver and white fat), making them attractive therapeutic candidates. The mechanism by which these secreted factors act on distant tissues may in part be due to their transport inside extracellular vesicles known as exosomes, which can carry a diverse array of signaling molecules, including microRNAs. The goal of this work was to analyze the microRNA content of beige adipocyte exosomes to determine candidates that may increase energy expenditure. We found that beige adipocyte exosomes contain numerous microRNAs that may play a role in increasing energy expenditure. Future testing of these microRNA candidates may translate to improved therapies for obese patients that develop diabetes.

**TITLE:** Differences between LSF and ASL regarding the variable ordering of independent noun phrases corresponding to figure and ground constructions  
**AUTHOR(S):** Rachelle Mendola  
**FACULTY MENTOR(S):** Judy Shepard-Kegl  
**AFFILIATION:** USM  
**ABSTRACT:** La Langues des Signes Francais (LSF) is a signed language primarily used by the Deaf community in France. LSF is the linguistic ancestor of American Sign Language (ASL), and the two share a grammatical feature of favoring a Ground before Figure ordering, which is unique from both the French and English languages where figure typically precedes the ground. The focus of this research is on the strict ordering of Ground before Figure ordering within the verb and variable ordering of independent noun phrases in French Sign Language (LSF) and American Sign Language (ASL) to learn the similarities and differences in ground/figure constructions in these two historically related languages.
TITLE: Virtual International Leadership Within Organizations: Overcoming Cultural, Language, and Physical Barriers  
AUTHOR(S): Jaye Mendros Goulet  
FACULTY MENTOR(S): Elizabeth Goryunova  
AFFILIATION: USM  
ABSTRACT: Advances in technology are allowing members of a team to collaborate while being geographically and spatially apart. These new teams, known as virtual teams, have benefits for both the organizations to which they belong and to the individual members. Organizations are able to utilize highly-skilled experts without the associated relocation costs. Team members are able to contribute to projects in their field of expertise without having to leave their homeland. These teams require a leader whose interactions build trust and loyalty without the benefit of face-to-face contact with other team members. Although virtual teams are rapidly growing, research is lacking on leadership styles that emphasize interpersonal relationships and building trust within virtual teams, thus increasing their loyalty to organization. As with face-to-face teams, the leader’s style will affect the team’s response that manifests itself in their loyalty and trust. This qualitative study explores the effect that the leader’s style has on a virtual team and the level of engagement amongst members. Current and past members of virtual teams are interviewed and asked to reflect whether certain styles of leadership and communication, as well as expressions of empathy, either by a leader to the team members or between team members, significantly impacted their performance and feeling of belonging.

TITLE: Investigation into the potentially devastating diastatic activity of the hop.  
AUTHOR(S): Nicolas Mesloh, Zach Bodah  
FACULTY MENTOR(S): Lucille Benedict, Marcia Ackerman  
AFFILIATION: USM  
ABSTRACT: The act of “dry-hopping” is a now-widespread technique of introducing hops directly into beer during or post-fermentation, which results in the production of distinctive hop aromas and flavors that are not achievable with traditional practices. However, additional fermentation (over-attenuation) beyond the brewer’s expectation can occur after dry-hopping. Over-attenuation, in this context, has been referred to as “dry-hop creep” or the “freshening power of the hop,” and can lead to excess alcohol content and dangerously high bottle pressures due to additional CO2 volume. Recently, it has been demonstrated that this over-attenuation is catalyzed by enzymes present in the hops that can break down unfermentable sugars into sugars readily digestible by brewing yeast. To better document this phenomena, and to provide recommendations to brewers regarding the management of dry-hop creep, two experiments were conducted. First, dry-hop creep was observed by adding hops and yeast to pasteurized beer and measuring the change in alcohol content. Second, the effect of temperature upon hop enzymes was evaluated by heating the hops before they were added to the media.

TITLE: CRISPR used in mosquitoes and mice as gene drive technology  
AUTHOR(S): Zainab Miguel  
FACULTY MENTOR(S): Daniel Moore  
AFFILIATION: SMCC  
ABSTRACT: Scientists have developed a genetic system that could help to stop the spread of disease. Gene drive is an engineered mechanism to edit, delete or alter the genetic material of cells of organisms by using molecular “scissors”. CRISPR/Cas9 cuts DNA, and a guide RNA shepherds the enzyme to a particular sequence. Gene drive also can be used to repair a gene that has a mutation. In this review of literature, we look at how this technique is being used in mosquitoes with success. In mice, it is working less well. Mice with the Copycat guide RNA were bred to mice carrying CRISPR/Cas9 on another chromosome. The mice that inherited both could cut DNA, creating the first generation of genetic cheater mice. Wild-type mice don’t naturally make Cas9, so the gene drive as it is currently designed wouldn’t be able to spread. Copycat also works only in female mice. Gene drive worked only during a narrow window of time just before eggs and sperm are made, during meiosis. When Cas9 cuts the DNA, cells can repair the break by copying the version of the gene containing the gene drive from its sister chromosome. That copying ensures that all offspring will inherit the gene drive. Gene drive can be beneficial when correcting genetic defects to treat and prevent the spread of diseases, but it could be dangerous because of modifying all the offspring.

TITLE: Facilitating Return to Work Among Individuals with Mental Illness Through Occupational Therapy Interventions  
AUTHOR(S): Cleo Miller  
FACULTY MENTOR(S): Susan Noyes  
AFFILIATION: USM  
ABSTRACT: The side effects of mental illness can affect areas of occupation, including: play, leisure, work, social participation, activities
of daily living, etc. (Brown & Stoffel, 2011). Through collaboration with Riverview Psychiatric Center (RPC) in Augusta, Maine, as well as Maureen Martin OTR/L, an evaluation of relevant research was conducted to determine occupational therapy’s (OT) role in the process of returning to work (RTW) for clients newly discharged from an inpatient psychiatric facility. This evaluation devised three themes: personal factors related to RTW; assessment tools & frameworks used to guide intervention; and OT interventions that can facilitate RTW. Research suggests that two major person factors related to likelihood of RTW are self-efficacy and decreased depressive symptoms (Brenninkmeijer, et. al, 2018), (Bejerholm & Areberg, 2014). Assessment tools that address depression, anxiety, internal locus of control and empowerment were shown to guide effective treatment. Frameworks proven effective aimed to ignite meaningful conversations about the worker role (Lagerveld, Blonk, Brenninkmeijer, & Schaufeli, 2010), (Hitch et. al, 2017). With OT interventions targeting coping skills, stress management, self-efficacy, worker roles and overcoming negative connotations regarding work, the treatment team at RPC can facilitate smooth transition from inpatient psychiatric care to community living and decrease re-admittance rates (Rose & Perz, 2005), (Reme, et. al, 2015), (Lagerveld, et. al, 2012).

**TITLE:** Viewing Refugee Resettlement Programs through an Intersectional Lens  
**AUTHOR(S):** Maisarah Miskoon  
**FACULTY MENTOR(S):** Rosemary Cleary  
**AFFILIATION:** USM  
**ABSTRACT:** My capstone is focused on the intersections of identity of refugees coming into Maine and the effectiveness of the state-mandated Cultural Orientation (CO) program organized by a private non-profit such as Catholic Charities. This will be determined by Pre-Program and Post-Program questionnaires which will center on participants’ knowledge of services around Portland before and after presentations from pre-selected service providers such as Portland Adult Education and Metro Bus System. Using a intersectional lens, I will assess the current program and providers, and outline the specific improvements it requires to meet the needs of refugees of different gender, race, ethnicity, and socioeconomic status through research and feminist theories.

**TITLE:** TBD Women and Gender Studies Capstone  
**AUTHOR(S):** Zakia Momand  
**FACULTY MENTOR(S):** Rosemary Cleary  
**AFFILIATION:** USM  
**ABSTRACT:** My research topic is, how to protect children from being traumatized in the open courts when they are required to testify. This topic is important to me because while interning at the Pine Tree Legal, I encountered a couple of children who were very nervous and anxious about being at the court. Therefore, my research will be based on how can the courts play their roles to protect children from being harm. I believe children should have the voice if they want to testify, however, can the courts provide privacy for the children, so they do not confront the trauma by being in the middle of crewed. I’d do my research through the lens of Feminists advocacies and will find if they can help the children in any other way than being in the open courtroom. Hence, to find answers to all these questions, I’m going to search for books, and interviews that have been done.

**TITLE:** Medication Management and Adherence in Self-Administering Patients Post Discharge  
**AUTHOR(S):** Katie Morissette, Chloe Mead  
**FACULTY MENTOR(S):** Tammy Bickmore  
**AFFILIATION:** USM  
**ABSTRACT:** Medications have become a routine fixture in many individuals’ lives with an estimated 117 million Americans administering medications daily. Within this estimate, many individuals self-administer their medications in a community setting. Of the individual’s self-administering medications an estimated 80% take their medications incorrectly. When medications are administered improperly, high incidence rates of hospitalizations, comorbidities, side effects, worsening health conditions, disabilities, and risk of mortality increase. In this evidence-based practice project our goal was to identify means to successfully promote medication management in older adults residing within a care facility who were eventually discharging back into the community. Our clinical question was: Do medication self-administration training programs for older adults transitioning from a facility to home improve medication adherence post discharge? Outcomes of evidence review revealed the importance of communication among providers and clients, improving methods of record-sharing, providing clients with a sense of autonomy and options, improving clients knowledge about the purpose of their medications, involving social supports to facilitate medication adherence, identifying and accommodating comorbidities and accounting for personal demographics (i.e. income level, access to transportation). All of the factors above were found to improve medication adherence among older adults post-discharge from a facility to the community.
TITLE: Nyuspeling: Towards a New English Spelling System  
AUTHOR(S): Liam Morris  
FACULTY MENTOR(S): Dana McDaniel  
AFFILIATION: USM  
ABSTRACT: Reading English today, even with its modern grammar, is like looking at the fossil of its own ancestors: interesting in its own way, but truly only incidentally corresponding to its current form, that which it is supposed to represent. What is worth is that the descendant is represented as the fossil, which is only a pale derivative of its ancestor, and such a representation cuts the modern form off from not only itself, its own richness, but also from that very heritage. Because of this disjunction of representation and real form, history and historicity, English’s current spelling system is now an unwieldy piece of work. For first- and second-language learners alike, the system is a substantial wall that they must surpass to gain any measure of literacy. Here I will discuss in overview the problems of the traditional English spelling system. and will then propose a new spelling system. This new system strives to be as simple as possible, as consistent as possible, and as phonetic as possible, and also strives, by taking cues from the Old English, Dutch, Frisian, and German spelling systems, to create a distinctive style for English, one which shows the genuine richness of the language, otherwise obscured by the current system’s many layers of abstraction.

TITLE: Sensory Based Interventions For Adolescents With Autism Spectrum Disorder in the Classroom  
AUTHOR(S): Priscilla Motley, Meaghan Hamel, Kaitlyn Hay  
FACULTY MENTOR(S): Sarah Grinder  
AFFILIATION: USM  
ABSTRACT: This evidence-based search of existing literature was completed to determine what the essential features of sensory based interventions for adolescents with autism spectrum disorder (ASD) in the educational setting are. After searching online databases of peer-reviewed journal articles, we appraised 12 articles relevant to our inclusion criteria of: sensory based interventions, children or adolescents with ASD, and classroom setting. After appraising the articles, three major themes related to our PIO question were discovered: the need for comprehensive assessment, the importance of clear and concise definitions of sensory intervention, and the need for an individualized approach to therapeutic interventions. Comprehensive assessment is important in order to provide effective and efficient interventions, especially with the ASD population because it is necessary to identify the child’s prior level of function. Clear and concise definitions of sensory interventions are important because there are an array of different types of sensory interventions. Therefore, the kind of sensory intervention being used in the study needs to be specified. Lastly, the need for an individualized approach to therapeutic intervention is crucial because every child with ASD presents differently. Clinicians should be sure to trial different interventions on these children to ensure they find the one that best fits the child’s unique needs.

TITLE: Iron Compassion  
AUTHOR(S): Cody Mower  
FACULTY MENTOR(S): Vaishali Mamgain  
AFFILIATION: USM  
ABSTRACT: My name is Cody Mower, I am a seven-year veteran of the United States Marine Corps. When I left the military, I left with a brain injury that had left me fundamentally broken in both my body and spirit. I walked on a cane and I drank myself to forget the person I had become. My wife had left me and I was on the verge of giving up entirely. This talk is a window on the journey I took to find my way back. At its core, these are lessons about forgiveness, about love, and it’s about how finding compassion for yourself and others can lead to a better state of being. Of course, these were not things that I was able to learn overnight and was not something I could have done on my own. After moving to Portland, I came back to the shared studio apartment that I shared with my brother with the worst hangover I had ever had. As I was cleaning myself up, I had a look in the mirror that completely broke me with the truth. I hated who I was. From my brain to my body, I couldn’t stand what was looking back at me in the mirror. It just so happened that I lived across the street from a place that would change my life, ‘Optimal Self’. This was a gym run by a war veteran named Eric Hilton. He introduced me to a community of people that I learned to humble myself before. They taught me the value of people in your everyday life, the impact of a kind word, and to recognize that we all are going through struggles, but they never have to be alone. This talk focuses on those lessons and about the value of being kind.
TITLE: Building Bonds on Teams: How Team Building Positively Impacts Young Athletes
AUTHOR(S): Jennifer Mull-Brooks
FACULTY MENTOR(S): Elizabeth Goryunova
AFFILIATION: USM
ABSTRACT: Creating positive team culture through team building in youth sports cultivates players who feel a part of a strong, close-knit organization which escalates their level of play. In addition to this, teams who have positive team culture develop on-field cohesion and trust that allows for sport strategy to be executed in a way that promotes success for the team as a whole. The methods used in coaching to promote this are focused on developing leadership, team building, positive reinforcement, and other non-punitive measures. The goal of this qualitative study is to determine the impact of positive coaching and team building strategies on young athletes and their desire to continue play through college. While scholarly articles in this research do support of this concept, in-depth interviews with a sample group of six collegiate student-athletes show this does not always make a connection between positive team culture and their own success or desire to play in college.

TITLE: Occupation and Early Childhood Power Mobility: An Exploratory Case Study of Family Perspectives Through Participation in Go Baby Go
AUTHOR(S): Erin Murphy
FACULTY MENTOR(S): Sarah Grinder
AFFILIATION: USM
ABSTRACT: Go Baby Go is a nationwide, interdisciplinary program that adapts toy ride-on cars for young children with limited mobility. The primary problem is that power mobility is not available for most young children who would benefit from it. Power mobility (PM) offers many benefits to developing children. Early utilization of power mobility for the appropriate child enhances independence, improves psychosocial development, and improved cognitive and perceptual skills. This exploratory case study will present the occupational participation of a child and family participating in this program. Current research has examined how Go Baby Go supports the child in play, mobility, and socialization. Yet no studies have investigated the family perspective. The goal of this study is to better understand occupations influenced by early power mobility and how this type of intervention supports occupation based practice.

TITLE: A Meta-Analysis Exploring Literacy Leadership Efforts in Schools and How Literacy Leaders Facilitate and Serve as a Catalyst for Successful Student Achievement
AUTHOR(S): Lai Nguyen
FACULTY MENTOR(S): Sharon Timberlake
AFFILIATION: USM
ABSTRACT: Learning to read is one of the most highly satisfying and crucially important accomplishments in one’s life. Offering the essential strategies for students at an early age can keep them from having low academic performance for the rest of their school careers. In addition, it encourages a love for literature within the student especially when comprehension and adequate resources are not an issue. There are five major components of reading: phonemic awareness, phonics, fluency, vocabulary and comprehension which are essential to the improvement of literacy learning. It is critical to the improvement of student academic performance that literacy leaders ensure those five components are incorporated in their classrooms. According to Darling-Hammond and Youngs, teachers have been recognized as the most important variable in student achievement (2002). “Although classroom teachers are largely held responsible for educating children, they cannot do the job alone. Good classroom instruction requires support from administration and from those in school leadership positions” (Sherman & Crum, 2001, p.391). Developing a collaborative team of literacy leadership within schools who implement student-focused interventions can lead to noticeable improvement in student academic achievement. Therefore, the purpose of this study is to explore how literacy leaders facilitate and serve as a catalyst for successful student academic achievement.

TITLE: Theory to Practice: Connecting Empirical Research and Professional Development
AUTHOR(S): Clover Nichols
FACULTY MENTOR(S): Robert Thompson
AFFILIATION: USM
ABSTRACT: This presentation will describe empirical observations tied to published literature as part of my experiences working as a behavioral health professional (BHP), serving the developmental needs of an autistic child. Relevant research has been analyzed and connected to specific behavioral supports within my field; and I have qualitatively evaluated how well this maps onto my client’s greater ability to complete goals. This presentation will detail specific facets of my personal and professional development as a result of integrating
knowledge gained from my undergraduate classes, from my review of literature specific to this topic and my practical experiences working in the field. Specifically I plan to describe my experiences integrating concepts of positive reinforcement and classical conditioning into my methods of supporting my client, as well as comparing and contrasting the behaviors of children with autism and Down Syndrome. I seek to address common misconceptions, especially regarding stereotypes of individuals with autism; and to acknowledge and highlight the significant within-group differences. A key aim is to present practical, career-relevant ways in which students can integrate research-based knowledge with key professional growth and development needs. Additionally I will discuss how students can use this type of integrative work to further their own understanding, professional growth and respect for the communities around them.

TITLE: Trauma-Informed Practices To Reduce Student Stress
AUTHOR(S): Stacy Nightingale
FACULTY MENTOR(S): Sharon Timberlake
AFFILIATION: USM
ABSTRACT: This paper examines specific processes and strategies educators and school leaders may incorporate into their learning environment to support and enhance learning in students who have experienced trauma. The Center for Disease Control and Prevention along with the American health organization Kaiser Permanente conducted research on the association of adverse childhood experiences with health and social problems across the lifespan of a student (Jones, 2018). Keiser’s Adverse Childhood Experiences (ACES) study is one of the largest investigations of child abuse and neglect and later-life health and well-being. The purpose of this research paper is to explore the processes and strategies that educators and school leaders can incorporate into their learning environment to address the needs of students who have experienced these adverse experiences as documented in the Keiser study.

TITLE: The significance of Cross-Generational Connection in the Queer Community
AUTHOR(S): Johnna Ossie
FACULTY MENTOR(S): Wendy Chapkis
AFFILIATION: USM
ABSTRACT: Young LGBTQ people often have little or no access to queer elders. Many LGBTQ elders report feeling unwelcome in spaces where LGBTQ youth are present. A disconnect between young and older LGBTQ people means a loss of history central to our collective story, and a divide in places the community could be strengthened. But elders’ stories, including those from Stonewall and Gay Liberation through the AIDS epidemic and ACT UP activism, are imperative to our collective story. The Querying the Past: LGBTQ Maine Oral History Project connects young people with older queer people in an effort to preserve vital Maine history. Oral history research with LGBTQ elders in Maine captures their stories. These stories are recorded, transcribed, and preserved in USM’s Sampson Center for Diversity in Maine’s LGBTQ+ Collection. What are the benefits of these cross-generational connections? My research aims to highlight the importance of intergenerational storytelling and relationship building that connects young LGBTQ people with the stories of our past, directly from those who experienced it.

TITLE: Lived Experiences of Veterans Family Members in Maine
AUTHOR(S): Sally Papciak
FACULTY MENTOR(S): Paula Gerstenblatt
AFFILIATION: USM
ABSTRACT: Over the past eighteen years, The United States has sent millions of troops to fight back-to-back campaigns. These on-going campaigns have brought attention to the plight of military, veterans and family members of all eras. Family members of troops have endured long separations, with countless issues along the way, and many have also endured continued struggles post-deployment. Some have been struggling since the Vietnam war and even prior. The purpose of this study is to learn and share the lived experiences of twelve family members of veterans currently living in Maine. This study uses qualitative methods to explore commonalities in the stories shared by family members of military troops that have deployed. Using story-telling narratives, these family members shared challenges they faced during and post-deployments as well as post-discharge from the military. Their stories share not only difficulties they have faced, but also support systems they utilized during times of need. These stories were analyzed for commonalities and themes coded for summarization. The narratives revealed difficulties participants experienced during and after the time their loved ones served in the military. These stories identified limited supports designed to assist family members post-service and services available generally only included the veterans and their immediate family members.
TITLE: Microbot™ Modification for Redundancy Resolution  
AUTHOR(S): Seth Percy  
FACULTY MENTOR(S): Carlos Lück  
AFFILIATION: USM  
ABSTRACT: The project aims to modify a Microbot Teachmover™ to become a planar redundant serial arm and implement algorithms for redundancy resolution, following Dr. Lück’s semi-singularity papers. The plan includes mechanical hardware modifications of the robotic manipulator, design (using Solidworks™ parametric modeling software) and construction of a calibration jig, adaptive base, and a modified Microbot™. The project strictly adheres to the “design rules and standards” practiced within the engineering curriculum at USM. Constraints associated with the design aspects of this project pertained to the 3-D printer used for all part fabrication. This imposed that all parts needed to be fabricated using a buildable workspace of 200mm x 200mm x 190mm. As a result, the designs for the jig, base, and Microbot™ parts needed to be broken up into pieces. Another constraint for this project pertained directly to the modification process for the Microbot™. Genuine parts for the desktop manipulator are challenging to acquire. Therefore, some hardware had to be substituted for something as similar as possible in order to reconstruct the manipulator. The project hopes to deliver an adaptive base for the desktop manipulator, comprehensive Solidworks™ generated models, and a mechanically modified and programmed Microbot™. We also hope to be able to use this project as a teaching instrument in future graduate-level robotics courses graciously offered at the University of Southern Maine.

AUTHOR(S): Seth Percy  
FACULTY MENTOR(S): Mustafa Guvench  
AFFILIATION: USM  
ABSTRACT: Micro-Electro-Mechanical Systems (MEMS) technologies allow for the creation of small electro-mechanical devices that can be integrated with Silicon microelectronic circuits to achieve a variety of functionalities. The purpose of this project was to design, fabricate and test MEMS Thermal Actuators and Sensors under the guidance of Dr. Mustafa Guvench. The concepts critical in the design of the device involve Joule heating and thermal expansion. An additional aspect associated with the outcome of this project was to test the validity of SolidWorks™ FEM software as a candidate for future MEMS course-based simulations at the University of Southern Maine. The design portion of this project required creating a thermal actuator model using L-Edit™ software for the layout and SolidWorks™ software for simulations. The simulations were used to verify and maximize displacement achievable before failure (breakage) within the operating temperature limit set at 400°C. We compared our simulated results with other models to determine if the results were feasible. The designs were fabricated, packaged, wire-bonded, and tested under a microscope to measure the thermal actuators’ tip-to-tip displacement as a function of electrical power and voltage applied. The Chevron design chosen for this project (2mm by 2mm area, 1.2 mm arm length) was simulated to yield 80um of displacement tip-to-tip and physically produced a substantial portion of this 80um of displacement tip-to-tip when powered by an 11VDC source.

TITLE: Multimeter Design Kit for Circuit Theory Education  
AUTHOR(S): Seth Percy, Josh Perry  
FACULTY MENTOR(S): Carlos Lück  
AFFILIATION: USM  
ABSTRACT: One of the most common tools for the practicing electrical engineer is the multimeter. This paper describes a kit that was fabricated for use in laboratory experiments to explore concepts of circuit design and implementation of a simple analog multimeter. The commercial multimeter is a combination of several individual instruments to measure voltage, current, resistance, and capacitance. Common multimeter designs incorporate digital displays. Before the digital age, the world relied on analog displays. Some argue that analog displays are outdated. However, this overlooks one of the most important characteristics of analog displays, which is an immediate visual and qualitative perception based on needle deflection. Analog displays are still used in many applications such as aviation and automotive, demonstrating their continued usefulness. The analog display is based on an electromechanical device called galvanometer. The galvanometer consists of an incrementally marked face and a needle indicator. The needle deflection indicates the intensity of the flow of a small direct current passing through the device. This kit consists of a galvanometer, a ribbon cable with a breadboard connector, three external lead connectors, a 12-position switch and a fuse, all packaged in a 3D-printed enclosure resembling a handheld commercial multimeter. Students use the kit to design a multi-scale DC voltmeter, DC ammeter and AC voltmeter on a breadboard in the circuits laboratory. A parts list and 3D model files are publicly available online for other institutions and individuals to utilize. This project was student-led with close faculty guidance throughout implementation.
ABSTRACTS

TITLE: Consultation for Lighting Replacement in USM's Bailey Hall
AUTHOR(S): Seth Percy, Earl Fall, John Gaudet, Nicholas Nelson, Mike Zagorianakos
FACULTY MENTOR(S): Ivan Most
AFFILIATION: USM
ABSTRACT: As part of our EGN 304 Engineering Economics course we were tasked with providing a pro bono consultation for the University of Southern Maine. The consultation entails a complete analysis and group-established recommendation for replacing all the current lighting arrangements in Bailey Hall located on the University of Southern Maine's Gorham Campus. Our recommendations were to accommodate for the most feasible course of action. In many respects, the job is naturally driven by its cost-effectiveness with regards to factors such as current Efficiency MaineTM discounts, power-usage, price-per-bulb, and the overall bulb count. Our financial analysis will look closely at many of these trade-offs such as power-usage over a fixed period vs. the cost of all light bulbs, where the break-even point would be evaluated for a range of prices for bulbs. However, this was not our only concern for our analysis. We also needed to accommodate for other factors such as potential health-related concerns, the buildings preexisting electrical wiring, luminosity intensity and how this subsequently impacted the overall perceivable coverage of the enclosed area, as well as the possibility of needing to replace some of the actual lighting fixtures within portions of the building. The consultation is to be submitted by April of 2019 with the collaborative efforts of Sarah Chang, Samantha Frisk, Chelsea Malacara, and Dr. Ivan Most. The expectation for the execution of the job is projected for sometime in the early Summer of 2019.

TITLE: Testing and Characterization of MEMS Narrow Band Biomimetic Directional Microphone Based on the Fly Ormia Ochracea
AUTHOR(S): Joshua Perry
FACULTY MENTOR(S): Mustafa Guvench
AFFILIATION: USM
ABSTRACT: The fly Ormia ochracea has the ability to sense the direction of the sound produced by its host cricket. A large separation of the eardrums allows larger animals’ brains to calculate the directionality of a sound based on time delay or pressure differences, but the eardrums of Ormia ochracea are only separated by 0.5mm. A microelectromechanical system, or MEMS microphone was designed and fabricated by a multidisciplinary team at the University of Southern Maine (USM) to mimic the eardrums of Ormia ochracea to study its direction-finding capabilities. This project continues with the research of tiny direction-finding systems for sonic and ultrasonic tracking of biological and mechanical systems. A sound directionality test apparatus was fabricated to test the prototype microphone. An electronic amplifier was designed and fabricated to condition the microphone signal for testing. The continuation of this project will focus on characterization of the sensor.

TITLE: Independence Among Students Newspapers at Public Universities in New England
AUTHOR(S): Julie Pike
FACULTY MENTOR(S): Daniel Panici
AFFILIATION: USM
ABSTRACT: In today’s climate, freedom of speech and freedom of the press on college campuses is being threatened. More and more college newspapers are facing censorship or prior restraint from university officials. This brings up the question of just how many student run newspapers have true independence from their university in terms of their editorial content. This research project focuses on the college newspapers in the New England area, looking at how many of those publications have editorial independence and how or if that is guaranteed to them. By interviewing the students who work for their newspaper, looking at their paper’s constitution and bylaws, and comparing those to what is outlined in their university’s governance documents, I was able to see how many of those student newspapers have full editorial independence for their publication and whether or not their university provides them with that freedom in their school’s rules and regulations. This research serves to provide future guidance to student newspapers across the country wishing to obtain more independence from their university, by compiling information from interviews with student editors, their governing documents, and professional advice from advisers at the Student Press Law Center. As Editor-in-Chief of the Free Press at USM, I also hope to use my findings to ensure future independence for my own newspaper.

TITLE: Analysis of the transition of chemistry students from high school to the university.
AUTHOR(S): Prashiddhi Pokhrel
FACULTY MENTOR(S): James Ford
AFFILIATION: USM
ABSTRACT: Chemistry is a subject that covers a broad area of studies and connects various other subjects. And yet, given its significance,
students do not perform as expected in the chemistry class in the university. Could it be that the high school students are not prepared enough for the course load in the university, or could it be the ‘belief’ that chemistry is a difficult subject that is clouding their judgement and preventing them to perform on their maximum potential? The major goal of this research is to understand the transition of students through the perspective of the professors. Moreover, to find out the solution, or at least have an idea on the successful transition of students from high school to the university, professors and high school teachers around Maine are randomly chosen and asked to fill out online survey forms. The survey consists of multiple-choice questions asking the possible reasons of students performing poorly in the chemistry class, and it consists few short-answer questions which asks the professors the possible solution for better transitioning of the chemistry students to the university. The data is still being collected over the online survey and we hope to have a conclusion, or at least have an idea to make education environment for chemistry students better in the university. The data will be presented over graphs and analyzed using different statistical approaches like central tendency and variation of the data.

TITLE: Myth, Metaphor, and Memorialization: A History of the Spanish Civil War through Pablo Picasso’s Guernica and Robert Capa’s photography
AUTHOR(S): Emma Quinn
FACULTY MENTOR(S): Elizabeth Bischof
AFFILIATION: USM
ABSTRACT: The Spanish Civil War (1936-1939) was a bloody and violent conflict, that resulted in the rise of the dictator Francisco Franco and the death of over 100,000 Spaniards. With the country divided in two—the Nationalists and the Republicans—Spain was ensnared in violent civil war for three bitter and bloody years. This conflict captured the attention of the world and became a harbinger for the devastation of the second World War. Many intellectuals and artists were inspired by the Spanish Civil War. For two artists, in particular, the painter Pablo Picasso and the photographer Robert Capa, the war became their muse. In fact, two of the most iconic images of the twentieth century—Picasso’s Guernica (1937), and Capa’s the Falling Soldier (1938), immortalized the brutality of the Spanish Civil War for audiences around the globe. Although these works exist in two different mediums, Picasso and Capa both created powerful anti-war icons. This project, “Myth, Metaphor, and Memorialization: A History of the Spanish Civil War,” analyzes Picasso’s Guernica and Robert Capa’s the Falling Soldier, to seek to understand how these iconic images influenced the Spanish Civil War and beyond. Exploring the powerful connection between art, war, and politics, “Myth, Metaphor, and Memorialization,” examines the importance of historical memory, and how we reckon with the past.

TITLE: Abortion in Maine: A Historical Inquiry into Abortion Access
AUTHOR(S): Mariah Reed
FACULTY MENTOR(S): Rosemary Cleary
AFFILIATION: USM
ABSTRACT: Through my internship with Maine Family Planning for my Women and Gender Studies major at the University of Southern Maine, I will be researching and collecting the history of abortion access in Maine. My purpose is to collect all of this history into one shareable and teachable tool, which can be used to inform the current defenders of reproductive rights about the context of this fight in Maine. Using peer reviewed articles, Maine legislation that limited or expanded access, newspaper articles with primary testimony, and other academic works, I want to paint the picture of what abortion access has looked like from the 19th century to the present. My research has shown that the culture around anti-abortion propaganda has morphed and changed through time depending on the actors who were using the limitation of women’s reproductive rights as a way to legitimize their own power. The results of this research will illuminate the various ways that the state and other institutions have attempted to or have successfully limited reproductive rights in Maine. This information will allow the current defenders of those rights to add historical context to their policy and advocacy work.

TITLE: The Effects of Online Harassment on Feminist Cyber Communities
AUTHOR(S): Heather Roberts
FACULTY MENTOR(S): Maureen Ebben
AFFILIATION: USM
ABSTRACT: This project explores the effects of online harassment on cyber feminist communities. It is a compilation of studies as well as the conclusion of an experiment. This project displays data both qualitative and quantitative that supports the idea that online harassment can have negative effects on cyber feminist communities such as making the community a hostile place, ruining its reputation, causing emotional and mental damage to the moderators and members, and creating chaos in the community. Qualitative data is from my personal experience with owning and maintaining a cyber feminist community through Discord Server. The quantitative data are dissuasive words sent by pending members in the pending members chat. No names or any identifiers are recorded.
TITLE: Automated Grading of Histology Slides for Breast Cancer Prognosis with Convolutional Neural Networks
AUTHOR(S): Zachary Rohman
FACULTY MENTOR(S): Hady Phoulady
AFFILIATION: USM

ABSTRACT: Breast cancer is the most common cancer among women. In 2018 there were an estimated 266,120 new cases of breast cancer in women in the U.S. After diagnosis, a biopsy is performed and the cancer will be graded based on the amount of gland formation, nuclear features, and mitotic activity. The mitotic activity is considered particularly prognostically valuable and is graded by assessing the rate of mitosis (cell division). Higher mitosis counts are associated with greater severity in the prognosis, and the pathologist will assign a score of 1 to 3 depending on the mitotic figures (1 being the lowest severity). However, mitosis counting is both time consuming and subject to poor reproducibility. Automated detection and grading offers to reduce time and labor. We propose an approach based on a deep learning model to automate the process of scoring patches of histology images from breast biopsies. We trained our model by extracting patches within predetermined regions of interest (ROIs) in a dataset containing 111 whole-slide-images, and training a Convolutional Neural Network (CNN). The H&E staining of patches were normalized and several different CNN architectures were designed, trained and tested on a validation dataset. The final trained model had an accuracy of 60%, 39% and 40% in classifying patches of grades 1, 2 and 3, respectively. These preliminary results suggest that further research and experimentation is required before CNNs can be considered a viable approach to mitosis counting and grading.

TITLE: Mindfulness Practices and Recovery
AUTHOR(S): Daniel Rosenheck, Sarah Dion, Benjamin Richards
FACULTY MENTOR(S): Rachel Casey
AFFILIATION: USM

ABSTRACT: Experimental trials have been done by other researchers addressing the effectiveness of mindfulness/meditation practices, but there has been little inquiry into how recovering individuals think, feel, and use mindfulness in their personal recovery. The purpose of this study is to investigate, qualitatively, the perceptions among those within the recovery community in Portland Maine of mindfulness practices and their relationship to recovery from Substance Use Disorder (SUD). By examining individual perceptions within this community, we identified themes across the experiences and perspectives of recovery community members, and built a theory of how mindfulness contributes to recovery. Researchers audio recorded 9 one-on-one interviews, transcribed, wrote memo, and coded these interviews using a grounded theory approach. Our preliminary findings show that there are strong connections between mindfulness practices and the process of developing healthy relationships in recovery. This research will be informative for those in the helping profession as they work with SUD by providing information about the benefits of mindfulness and its place in the recovery process.

TITLE: Using Genetic Barcoding to Identify Stomach Samples
AUTHOR(S): Mariah Ross
FACULTY MENTOR(S): Rachel Lasley Rasher
AFFILIATION: USM

ABSTRACT: Genetic barcoding is way quantitatively identifying species. Genetic barcoding involves taking a sample of an unknown species and coding the Cytochrome Oxidase I gene (COI). Genetic barcoding is a powerful tool in science because it allows for the quick, inexpensive, and accurate identification of an organism. The Gulf of Maine Research institute collected stomach samples from Blue-fin tuna to be sent out and barcoded. These samples were partially digested, and unrecognizable through physical characteristics. Barcoding allowed samples to be identified, and thus increased the knowledge and data on the Blue-fin Tuna’s diets and the abundance of certain species in areas where Blue-fins visit.

TITLE: Modeling an articulated Helicopter Blade hinge mechanism and the CFD analysis of the blades in hover
AUTHOR(S): Itay Savion
FACULTY MENTOR(S): Mehrdaad Ghorashi
AFFILIATION: USM

ABSTRACT: Helicopters have been around since late 1930’s when the first practical helicopter that was designed by Igor Sikorsky took off in Stratford, CT. In this project, an articulated hinge mechanism for a helicopter blade model is designed by SolidWorks. Three degrees of freedom, i.e. the pitch, flap, and lead-lag are considered in the model of the hinge. Furthermore, the blade is analyzed by the CFD capability of SolidWorks. Using these results, the lift and drag forces for various angles of attack are calculated. These results are used for analyzing force balance of the hover motion of a helicopter.
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TITLE: Testing the Accuracy of Inexpensive Air Quality Sensors and Forming an On Campus Network
AUTHOR(S): Emma Sawyer
FACULTY MENTOR(S): Daniel Martínez
AFFILIATION: USM
ABSTRACT: Clean air is undoubtedly crucial to human well-being. This is a growing problem as we see the atmosphere become increasingly polluted. The air pollutant most responsible for adversely affecting human health is particulate matter. Air quality sensors that can measure this have been very expensive until quite recently. Five inexpensive $200 sensors were placed in and surrounding Portland, including one colocated with the DEP’s $20,000 sensor which acts as our reference for accuracy. With measurements having a possible range of 0-500 microns, our sensor’s average variation from the DEP’s is only 0.9 microns. This shows good accuracy, but says little about precision due to the range of variations measured. To increase precision, another inexpensive sensor will be colocated with the DEP’s and the data from the two inexpensive sensors will be averaged to decrease outliers’ effects on the data. Grant money has recently allowed us to buy 40 more sensors which will be placed around USM’s Portland and Gorham campuses, plus a few in the surrounding area. Depending on the effectiveness of clustering our two sensors with the DEP’s sensor, these 40 new sensors may be arranged in clusters of two or three as well. Once these sensors are established and we begin recording data, it will be automatically uploaded to a public website in real time. Creating this sensor network will help identify on campus pollution sources and allow the community to be better aware of their air quality.

TITLE: Gender Based Harassment & Discrimination in the Workplace
AUTHOR(S): Anna Schindler
FACULTY MENTOR(S): Reuben Addo
AFFILIATION: USM
ABSTRACT: According to the U.S. Equal Employment Opportunity Commission (EEOC), harassment is defined as: unwelcome conduct that is based on race, color, religion, sex, national origin, age, disability or genetic information, (EEOC). There are hundreds of instances that can be considered harassment such as a work environment that becomes hostile, intimidating, or abusive. Harassment occurs in numerous ways; the victim’s supervisor, an agent of the employer, a co-worker or even a non-employee, (EEOC). The victim does not necessarily have to be the one harassed, but they can witness or observe the harassment, which is called a third party. There are various different types of discrimination in the workplace, including: age, disability, equal pay/compensation, genetic information, harassment, national origin, pregnancy, race/color, religion, retaliation, sex, and sexual harassment, (EEOC). Discrimination is defined as the prejudicial treatment of different varieties of people. Harassment and discrimination in the workplace is an underreported field for many different reasons. There is a stigma and stereotype that only women experience harassment in the workplace, and people of color are the most susceptible to discrimination. This research paper study seeks to determine how many people have experienced harassment or discrimination in the workplace, when they first experienced it, and if they have witnessed it against their coworkers. This is an exploratory study and used availability sampling.

TITLE: Post Millennial Generations in the Workforce
AUTHOR(S): Tarynne Scott
FACULTY MENTOR(S): Elizabeth Goryunova
AFFILIATION: USM
ABSTRACT: Post Millennials, defined as individuals born between the years of 1997 to present day and whom are currently between the ages of zero and twenty-one years old, are one of the largest generational cohorts to enter the workforce thus far (Ozkan, Soulmaz, 2015). Without understanding the characteristics of this generation, leaders could find themselves with followers they do not know how to motivate or communicate with (Seemiller, 2017, pg. 8). The purpose of this study is to explore and gain a deeper understanding of what Post Millennials need to be successful in the workforce, and how they differ in their follower and cultural beliefs. The researcher conducted a quantitative study by collecting data from participants currently between the ages of eighteen and twenty-one through an online anonymous survey. Results show a pattern on preferences relating to leadership styles, followership characteristics, and the type of work environment this generation prefers. Major themes include preferences in communicating digitally, wanting a leader who is hands-on and active in the professional development process, as well as an overwhelming majority identifying themselves as an idealistic follower. These findings support prior research in the field and expand upon the needs and wants of the Post Millennial generation as they leave their education and enter the workforce.
TITLE: Occupational Therapy in Post-Secondary Education Using Supported Education Interventions in Individuals with Mental Illness  
AUTHOR(S): Samantha Sheehan, Megan Hutcherson  
FACULTY MENTOR(S): Sarah Grinder  
AFFILIATION: USM  
ABSTRACT: Students who experience mental health illness have shown to have difficulties performing and engaging in a university setting. If these students do not receive support and interventions to address their academic needs, student’s will struggle succeeding in a post secondary education setting. A thorough examination was required to discover occupation-based support for students experiencing mental health illness to improve occupational performance in a post-secondary based setting. Eight research articles were examined to provide evidenced based interventions to address students educational needs. Literature showed that supported education programs provided necessary services to improve education based occupational performance while maintaining a desired level of confidentiality and a client centered approach. Further research is required to provide support for the implementation of an occupational therapist in a post secondary supported education program.

TITLE: Experiences of Veterans with PTSD and SUD in an outpatient setting  
AUTHOR(S): Hannah Shifflett-Kohler, Andrew Breault  
FACULTY MENTOR(S): Caroline Shanti  
AFFILIATION: UMS  
ABSTRACT: In 2014, there were approximately 7.9 million adults in the United States with co-occurring Post Traumatic Stress Disorder (PTSD) and Substance Use Disorders (SUD) (SAMHSA, 2014). Of the veterans who served in the conflicts in Iraq and Afghanistan alone, 30% of those in SUD treatment also meet the criteria for PTSD (Seal et al, 2008, pp. 476). Furthermore, statistics show that about 20 Veterans in the United States complete suicide daily (Spiva, 2019, p. 8). The Department of Veterans Affairs is urgently seeking successful approaches to addressing the high incidence of suicides among all veterans along with the low retention rates of veterans in co-occurring treatment programs. This qualitative project included 6 one on one interviews with combat veterans in Maine that experience co-occurring PTSD and SUD, utilizes thematic analysis to identify primary themes. We hope that these findings will be used to inform practitioners and improve services for Veterans.

TITLE: Design and Test of Micro-Electro-Mechanical Systems (MEMS) Piezoelectric Energy Harvester  
AUTHOR(S): Shindano Singi  
FACULTY MENTOR(S): Mustafa Guvench  
AFFILIATION: USM  
ABSTRACT: Micro-Electro-Mechanical Systems (MEMS) have an important design opportunity of interacting with the world on an unusual scale. The goal of this project is to test two devices (Piezoelectric Energy Harvesters): Alexander Wilson’s and mine. This project will demonstrate the design and calculation of my device. Energy harvesters are based on the principle of piezoelectricity in which vibration energy is converted into electrical energy. The harvested power could be combined to supply general-purpose electronics as a renewable energy source. When mixed with other circuitry, the harvester can power low-powered devices by avoiding bulky batteries. Usually, such low power devices are employed to follow and control numerous physical parameters, store data, and wirelessly transfer them. Combining the circuitry with its power enables sensor placement in hard to access environments. Simulations of the two devices revealed resonant frequencies of 880Hz and 208 Hz, respectively. The test revealed output voltages peak to peak ranging from 100 mV to 2 V into a 10 Mega Ohms probe. The power produced ranged from 1nW to 260nW. Previous work on this type of device shows potential for practical application in naval, aerospace, and general industrial applications.

TITLE: The Sexualization and Misrepresentation of Lesbian Characters in Contemporary Television  
AUTHOR(S): Eliza Skidgel  
FACULTY MENTOR(S): Sharon Timberlake  
AFFILIATION: USM  
ABSTRACT: A common theme throughout fictional lesbian television characters is that they are created to be sexual creatures. They are written in situations that cause them to be represented merely for sexual purposes. These characters are either being made fun of, leered at, or made to be this sexual being. In television shows such as Orange is the New Black and The L Word, lesbians are sexualized and shown in unhealthy relationships. This representation establishes stereotypes throughout society. Representation is used to help the
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population find themselves. Women, specifically young girls, who are coming to terms with their sexuality, may use television to help shape their own identity. The goal of this study was to analyze fictional lesbian characters and to find the reasons for this misrepresentation.

TITLE: Refugee Conceptualizations of Mental Health
AUTHOR(S): Emelda Ogweta, Teresa Sosa
FACULTY MENTOR(S): Rachel Casey
AFFILIATION: USM

ABSTRACT: As of 2016, 42 million refugees from around the world had been forced to flee their homes due to war, persecution, or natural disaster (George & Jettner, 2016). Due to these factors, as well as relocation and resettlement, refugees are at a significant risk for trauma and other mental health issues (George & Jettner, 2016). While the literature consistently validates this heightened risk for mental illness in refugees, more research is needed into refugee’s perspectives on mental health. Through analysis of semi-structured interviews with eight refugees from Africa, this phenomenological study investigated refugee’s perceptions of mental health and mental illness. Themes found from the interviews highlighted causes of mental illness from external factors such as war, poverty, stress, and familial relations. Aspects of spirituality could be seen as the cause of mental struggles (i.e. demonic possession), or strength (i.e. prayer, or seeking help from a spiritual leader). Stigma from refugee communities around seeking mental health treatment in the U.S. was also a common theme. Participants noted the need of education around mental health, mental illness, available treatments, and the breaking down of stigma against seeking treatment. This research shares crucial voices on the topic of mental illness, providing information to promote cultural sensitivity among practitioners working with African refugees.

TITLE: The Incidence and Impact of Workplace Incivility: A Quantitative Study Comparing Public University Staff Member Experiences in the Northeast
AUTHOR(S): Tracy St. Pierre
FACULTY MENTOR(S): Elizabeth Goryunova
AFFILIATION: USM

ABSTRACT: Workplace Incivility (WI) is a construct similar to sexual harassment or bullying - it is unwanted behavior and can cause negative emotions for those who experience it. However, it lacks a clear definition or legal repercussions that have been established for sexual harassment and bullying. Thus, incivility is able to thrive in the workplace with little intervention and can create adverse consequences for employees and the organization. Several studies demonstrate that up to 96% of employees have experienced WI (Porath & Pearson, 2010, p.64). Employees who experience WI reduce their work effort and decrease productivity by “venting” to co-workers (Cortina and Magley, 2009, p. 286). This results in more work for mangers and HR personnel who need to mediate the situation; the organization may experience an overall reduction in morale and productivity, leading to lost revenue. The goal of this study is to explore the incidences of WI in higher education (HE), which relies heavily on personnel for success. Data from this study indicate that WI does exist among FT staff in HE, with those working in a rural setting experiencing greater frequencies than those in an urban setting. Additionally, WI exists with greater frequency among those with union coverage vs. those without. These results, combined with data around types of incivility experienced, emotions felt by employees and hours spent dealing with the aftermath may enlighten managers and HR personnel to the value of proactively addressing Workplace Incivility.

TITLE: Design, Analysis, and Fabrication of a Wankel Rotary Engine
AUTHOR(S): Alexander St. Pierre
FACULTY MENTOR(S): Mehrdad Ghorashi
AFFILIATION: USM

ABSTRACT: The Wankel Rotary Engine unlike the traditional combustion engines that use the linear motion of pistons to generate rotational motion, use an eccentric rotary design to convert the pressure created by internal combustion directly into output torque. This design allows for a simpler, more compact engine that delivers a much higher power-to-weight ratio than the traditional reciprocating piston engines. In this project, the pressure generated by the internal combustion process, the resulting power output, and angular velocity of the rotor are calculated theoretically. Then a 3D model is constructed in SolidWorks to analyze the same motion. The input is the applied pressure on the rotor and the output is the rotor angular velocity. The results produced by the SolidWorks model are used to verify the theoretical ones. Using the SolidWorks model a prototype is 3D-printed. This model will not be capable of performing internal combustion but will demonstrate the operation of a Wankel Rotary Engine.
TITLE: Alternative Treatment for People in Recovery: The Impact of Yoga on Recovery
AUTHOR(S): Mary Stanton
FACULTY MENTOR(S): Caroline Shanti
AFFILIATION: USM
ABSTRACT: Substance use disorders are a public health crisis in the United States. There are established medical interventions to assist with recovery of Substance Use Disorders, as well as a growing interest in alternative approaches. Yoga is one of these alternative approaches and currently there is little research on the effects or impact of yoga on recovery. The study described here explored how adults in recovery view the effectiveness of yoga to strengthen their resiliency in recovery. This exploratory, cross-sectional quantitative research project measured the impact of yoga as an intervention in early recovery (a year or less). Voluntary surveys were distributed after various recovery yoga classes in the Portland, Maine community, at both non-profit (public) and for-profit (private) venues. The survey measured multiple factors including but not limited to: cravings of substances, trauma history, mental health diagnoses, other recovery interventions, and awareness of bodily and breath sensations). All participants unanimously stated that yoga has had a positive impact on each participant's maintenance of sobriety.

TITLE: Undergraduate Social Work Students Perceptions of Developmental Disability
AUTHOR(S): Chelsea Stephens
FACULTY MENTOR(S): Elizabeth Tracy
AFFILIATION: USM
ABSTRACT: This study explores undergraduate social work students’ perceptions, knowledge, and intent to work with people with intellectual and developmental disabilities (IDD). Based on surveys taken by 54 undergraduate social work students at the University of Southern Maine, the author found that 75.9% of respondents reported that few or no social work classes focused on IDD. While most students knew basic facts about IDD, 81.5% were unaware that voting rights for those with IDD in the United States varies by state, based on things like guardianship. Both the quantity and quality of personal experience with those with IDD had an effect on perception, consistent with Contact Theory. This study could aid The University of Southern Maine in closing a potential gap in their curriculum.

TITLE: Digitally Mediated Spaces as Sites for Counterpublic Discourse among LGBTQIA+ and Disabled Adults
AUTHOR(S): Bianca Sturchio
FACULTY MENTOR(S): Jessica Ouellette
AFFILIATION: USM
ABSTRACT: The digital world significantly transforms the way people communicate and learn about social issues. Digitally mediated spaces, like social media and microblogging platforms, make it possible to remotely connect with others through a screen despite locational barriers. Though popular narratives paint online social enclaves as damaging to socialization, such instances fail to acknowledge factors of accessibility and opportunity for marginalized groups. Online spaces are particularly vital to minority populations, like disabled LGBTQIA+ people whose participatory visibility within the public sphere is frequently prevented or substantially reduced by dominant ideologies, discriminatory political practices, and de-prioritization. My research seeks to explore how queer/LGBTQIA+ and disabled adults utilize online spaces to engage in the creation and consumption of identity-specific locales, otherwise described as counterpublics. I aim to identify social uses that take place in digital counterpublics as they relate to matters of identity construction, support seeking, and knowledge production. Using a mixed methods approach, I conduct a feminist rhetorical analysis of the personal narratives of adults who exist at non-normative intersections of identity and body. I argue that digitally mediated counterpublics afford queer/LGBTQIA+ adults productive spaces to explore issues related to identity and ability; build identity-specific coalitions; and facilitate social processes that typically develop offline.

TITLE: Updating the University of Southern Maine Arboretum
AUTHOR(S): Katherine-Helene Sullivan
FACULTY MENTOR(S): Robert Sanford
AFFILIATION: USM
ABSTRACT: USM Gorham campus's long history is marked with the presence of trees, including remnant old growth conifers, many fruit trees and various exotic species. In 2002, the Department of Environmental Science & Policy in conjunction with Facilities Management put together a booklet creating the USM Arboretum Walking Tour. My project is to update the inventory of trees, make recommendations for improvements, and make a new tour guidebook. An arboretum defines an area of trees and shrubs designed for scientific and educational purposes. The USM Arboretum was founded as an educational and informational tour guide of the USM Gorham campus. The walking tour...
is a detailed key of the tree life on campus, illustrating the diversity of the university’s large flora. Towering trees intricately web through the developed portion of the campus. However, the arboretum can easily be overlooked. An updated guide would make these trees more useful to students and visitors. Further, in the intervening years some trees have died or been damaged, new trees have been added, and sidewalks and buildings have been reconfigured or newly added. A new guidebook with tree identification and location information will address these changes. The arboretum can once again be a feature that draws people to campus and enhances appreciation of it.

**TITLE:** Exploring connections between Adverse Childhood Experiences and Homelessness  
**AUTHOR(S):** Sean Thomas, Henry Myer  
**FACULTY MENTOR(S):** Caroline Shanti  
**AFFILIATION:** USM  
**ABSTRACT:** Individuals who have been exposed to multiple adverse childhood experiences (ACEs) are at increased risk of entering homelessness as an adult. The correlation between ACEs and adult homelessness is well established in the current literature, but the potential causal pathways remain unclear. This qualitative, exploratory study aims to understand the potential pathways from ACEs to adult homelessness, in order to establish a foundation for future research on the subject. Using semi-structured interviews, the researchers spoke with homeless service providers to answer the question: What are the potential causal pathways between adverse childhood experiences and adult episodes of homelessness?

**TITLE:** Constant Force Spring Loaded Bicycle  
**AUTHOR(S):** Joseph Towns  
**FACULTY MENTOR(S):** Susannah Gordon-Messer  
**AFFILIATION:** USM  
**ABSTRACT:** Despite being invented over two hundred years ago the modern day bicycle has been prevalent in society since it’s conception. There have been several iterations of the original design, each meant to make the the bicycle a more enjoyable experience. The basic design has adapted with every generation. Now we’re left with the question of what’s next? In a world rightfully obsessed with the how many pollutants the human race creates. The way to bring the bicycle into the next generation is developing a modification that can make it become a mode of transportation that can compete with its carbon emitting competition. This experiment is to develop a working prototype of a completely original and new bike modification. The modification will store a set portion of the kinetic energy introduced to the system by the riders pedaling. This will be accomplished by mounting a Constant force spring to the frame of the bicycle. Using a lever the user can then use the energy stored to propel themselves forward or up an inclined terrain. The modification will be completely mechanical and will not make use of any batteries of motors. This will allow the user to have aided travel without the production of any pollutants, this will also make the modification more affordable, and an overall more enjoyable experience. This would allow most everyone to use a bike without strain, and could have a huge impact for places in the world that use bicycles as their primary form of transportation.

**TITLE:** A Refugee’s Journey  
**AUTHOR(S):** Trisha Trinidad  
**FACULTY MENTOR(S):** Reza Jalali  
**AFFILIATION:** USM  
**ABSTRACT:** Due to the current political climate of certain countries over the past few years, there has been an influx of refugees arriving in the United States. A refugee, defined by UNCHR is a person that is forced to flee their home, who “has a well-founded fear of persecution for reasons of race, religion, nationality, political opinion or membership in a particular social group”. This study will describe the journey that a displaced person (a refugee) takes after they are forced to flee from their home country. The first step that a refugee encounters is “Pre-Departure/Threat”; which is the conflict that causes a citizen to leave their country, making them a refugee. The second step is “Migration/Flight”; this is when a refugee leaves everything behind in their home country to flee to another country to seek safety. The next step is “Transition”; Arriving at a refugee camp. Typically refugees arrive at a country to stay at a refugee camp for a certain period of time. Then, they begin the “Asylum Process”; when they begin to gather information and attempt to seek asylum. The fifth step after that is, “Settlement/ Repatriation.” They are sent to a different country (ex: United States) to resettle. The second to last step is, “Adjustment/ Acculturation”; The refugee has arrived in their new country and now adjust to their new surroundings. Lastly, “Assimilation/Integration Process”. In this step, the refugee(s) now has gotten used to the new country and comprehended the culture.
TITLE: Diversity of Nitrogen Fixing Bacteria in a Sample Aquaponics Ecosystem  
AUTHOR(S): Joshua Trombley, Haley Depner  
FACULTY MENTOR(S): Rachel Larsen  
AFFILIATION: USM  
ABSTRACT: In natural ecosystems, nitrogen-fixing bacteria act as the primary source of useable nitrogen for many plants by converting atmospheric N2 into ammonia. In an aquaponics system, however, the primary source of ammonia is provided by fish waste. We are investigating the effect of this ammonia saturation on the diversity of nitrogen-fixing bacteria in a sample aquaponics system. We seek to answer two fundamental questions: First, what nitrogen fixing microbes are present in these systems? Second, does the character of these microbial communities have any effect on plant growth? In order to answer these questions, we first determine whether nitrogen-fixing bacteria are present in the system by culturing resident bacterial populations on nitrogen-free media, isolating, and identifying these species. We then investigate the diversity of both cultured and non-culturable nitrogen-fixing bacteria via metagenomic analysis. Finally, we will investigate possible links between the characteristics of these microbial communities and plant health.

TITLE: Age Differences in Illicit Drug Use in Maine  
AUTHOR(S): Andre Trzaskowski  
FACULTY MENTOR(S): Brenda Joly  
AFFILIATION: USM  
ABSTRACT: Illicit drug abuse is a large problem nationwide, causing substantial loss of productivity, resources, and even life. The opiate epidemic is widespread, with significant problems in both rural and urban areas. The purpose of this study is to compare rates of illicit drug abuse in Maine between age groups. The data were collected using the National Survey on Drug Use and Health sampling design. These stages included populations at the national, state, and municipal levels. Exclusion criteria included those with no fixed home address, those under age 12, military personnel, and residents of institutional group facilities. For this study, information for the state of Maine was used. Results of this survey showed that in response to the question “Past month use of illicit drugs other than marijuana”, 10.9% of responders in age group 18-25 responded “yes”, as opposed to 4.3% in 12-17, and 2.56% in over 26. In addition, in response to the question of “Past year nonmedical pain reliever use”, 13.81% ages 18-25 responded yes, as opposed to 6.01% in 12-17, and 3.03% in over 26. This research shows that there is a much higher incidence of illicit substance in the age group 18-25 than the other age groups. Primarily, these data suggest a “high risk” age group to target with education programs and interventions. Secondly, these findings open new areas of research, including exploration of potential age-specific risk factors or biologic factors that might be associated with increased substance use behavior.

TITLE: Tablet Use and Children’s Fine Motor Development  
AUTHOR(S): Kayla Tuttle, Sophie Schraeter  
FACULTY MENTOR(S): Mary Anderson  
AFFILIATION: USM  
ABSTRACT: Technology is changing the way children play, learn, and interact. Consequently, it has the potential to drastically impact a child’s development. A broad search of the available evidence was conducted to determine how technology, specifically touch-screen tablet use, affects children’s fine motor development. The search yielded seven articles that provided the best possible evidence to address the relationship between touch-screen technology and fine motor skill development. Four out of seven studies concluded that using touch-screen technology can have a negative effect on children’s fine-motor development and handwriting skill. These studies examined the general everyday usage of touch-screens as well as specific apps. The three remaining studies highlighted that there are specific applications which can support children’s development by improving their handwriting and fine-motor skills. However, these studies did not address the general home use of touch-screen technology. Thus, it is critical to differentiate between general everyday use of touch-screen technology and specific applications. Future research should focus on clarifying the effects of home technology use versus specific applications which can support handwriting.

TITLE: Improving Safety on the Road through Occupational Therapy Intervention  
AUTHOR(S): Katherine Uschmann, Zachary Childs  
FACULTY MENTOR(S): Susan Noyes  
AFFILIATION: USM  
ABSTRACT: As the U.S. population ages, increasing the likelihood of impaired fitness-to-drive, the topic of road safety holds strong interest among numerous professionals. The field of occupational therapy (OT) affirms the importance of community mobility in supporting overall
health and well-being. OT practitioners who encounter clients with questionable driving ability should refer them to driving specialists. However, the question remains what kind of interventions may help clients with cognitive decline who have the potential to return to safe driving. This project’s evidence search revealed a wide range of interventions that show promise including: classroom education (especially when augmented by on-road training), cognitive-perceptual trainings, simulator and virtual reality training, and physical exercise incorporating cognitive challenges. Because there is no definitive one-size-fits-all approach that works for everyone, approaches should be highly individualized. Throughout the process, OT practitioners should maintain an open dialogue and sensitivity with their clients.

**TITLE:** Veterans’ Experience of Other Than Honorable Discharge  
**AUTHOR(S):** Kasey Villeneuve, Erin Kelly  
**FACULTY MENTOR(S):** Rachel Casey  
**AFFILIATION:** USM  
**ABSTRACT:** Many people have heard the terms Honorable Discharge and Dishonorable Discharge. However, those are not the only types of discharge one can get from the military. Little literature is available examining the experiences of veterans who were discharged under other, less common categories. The existing literature does link these discharges to negative outcomes such as homelessness, but the nature of that link remains mysterious. The current study aims to describe the experiences of veterans who have received discharges labeled Other Than Honorable or General Under Honorable Conditions. In order to gain an understanding of what those rarer discharges are like from the service person’s perspective, the researchers conducted semi-structured qualitative interviews with seven veterans who have been through them. Using phenomenological content analysis, we identified several common themes among the interviews, including self-blame, regret, and a sense of unfinished business. Further research is needed to understand the mechanisms behind these experiences.

**TITLE:** Determining the Relationship of Proteins and Iso-α-acids to Foam Retention in Various Beers  
**AUTHOR(S):** Laura Walters  
**FACULTY MENTOR(S):** Lucille Benedict  
**AFFILIATION:** USM  
**ABSTRACT:** The goal of this research was to determine the correlation between beer foam retention and the amount of protein and iso-α-acids present. Most people view foam as being desirable, and expect at least some foam on almost any beer they drink. Quantity of foam is often an important brand trait, and therefore should be consistent from batch to batch, and across various styles of finished product. Beer foam is a balance between surface active materials, such as proteins and iso-α-acids, and foam destabilizing materials. It has been observed that foam varies between styles of beer and was hypothesized that there is a correlation between proteins, iso-α-acids and foam longevity. To determine if a correlation existed methods from the American Society of Brewing Chemists were utilized. The focus of this experiment was on the effects of proteins and iso-α-acids in beer foam. Research suggesting that proteins and bittering acids (iso-α-acids) play the largest role in foam stability. Proteins in beer have been found to have a good degree of hydrophobic or amphipathic tendencies and are postulated to be a strong force binding foam together. Evidence suggests bittering acids found in hops act as a hydrophobic binding agent in beer and could influence the foam retention greatly. The experiment was undertaken to help determine why some local beer brands have exceptional foam retention, while others within the same brewery have low or quickly collapsing foam.

**TITLE:** What is the Role of Occupational Therapy in Increasing Medication Adherence in Adults Receiving Home Health Services?  
**AUTHOR(S):** Emma Waterhouse, Rebecca Orcutt  
**FACULTY MENTOR(S):** Bernadette Kroon  
**AFFILIATION:** USM  
**ABSTRACT:** This poster illustrates the answer to the PIO question of what is the role of occupational therapy in increasing medication adherence in adults receiving home health services? The community partner for this project was Northern Light Homecare and Hospice. A review of the literature shows that the American Occupational Therapy Association (AOTA) is pushing to promote occupational therapy’s role in medication management. According to the World Health Organization (WHO), people who don’t take their medications as prescribed demonstrate increased morbidity and mortality compared to those who are adherent (as cited by AOTA, 2017, p. 1). As a result, medication management is a key instrumental activity of daily living (IADL) as non-adherence can lead to adverse health outcomes, increased health care costs, and even death (AOTA, 2017, p. 2). According to the literature, there is a lack of occupational therapy involvement with medication management. However, analysis has shown that occupational therapists’ skills best compliment the evidence-based intervention approaches needed to support clients’ medication adherence compared to other professions (Schwartz & Smith, 2017, p. 2). The evidence-based articles show that occupational therapy can play a role in medication management at each step of the occupational therapy process; occupational therapists can assess a client’s barriers to medication management and then create client-centered interventions to address those barriers and increase adherence.
TITLE: Biofilms Within an Aquaponic System  
AUTHOR(S): Micaela Watermolen  
FACULTY MENTOR(S): Katherine Gamage  
AFFILIATION: USM  
ABSTRACT: An aquaponics system combines raising aquatic animals, such as fish or shrimp, with cultivating plants in water. This creates a synergetic environment that is beneficial for both the fish and the plants. One of the most important aspects in an aquaponic system are the microbes present and the biofilms that they create. While there are many types of microbes in an aquaponic system the focus of this project is on the roles and relationships of microbes that help promote biofilm formation within the system. This is being done by first identifying the microbes present in the system using DNA sequencing techniques and then assessing the ability to form a biofilm. Then with these results we hope to determine how each identified microbe affects the aquaponic system.

TITLE: The Impact of Life Experiences on Future Hopes and Aspirations  
AUTHOR(S): Hannah Watson, Megan Kemna  
FACULTY MENTOR(S): Caroline Shanti  
AFFILIATION: USM  
ABSTRACT: Life experiences, such as having a positive role model and experiencing childhood trauma, are thought to influence future hopes and aspirations of high school students. An understanding of how life experiences affect the dreams of high school students could help professionals provide better support for students in developing positive hopes and dreams. The purpose of this project was to explore the experiences of high school students and to understand how these experiences impact student's perspectives on their future. Students from one high school in Portland, Maine participated in focus groups or in individual interviews where they discussed their life experiences along with their future hopes and dreams. A questionnaire was used to collect demographic data. Results were analyzed using thematic analysis. Themes in student experiences and how they may relate to an individual’s future hopes and dreams were identified.

TITLE: X-inactivation  
AUTHOR(S): Serena Weston  
FACULTY MENTOR(S): Daniel Moore  
AFFILIATION: SMCC  
ABSTRACT: To prevent abnormal development caused by expressing both X chromosomes, female mammals inactivate one of their X chromosomes using an epigenetic process called dosage compensation. This literature review examines how X chromosome inactivation (XCI) occurs during the formation and development of an embryo. This condensation of DNA is marked by histone tail modifications, DNA methylation, and the arrival of structural proteins resulting in extraordinarily stable heterochromatin. X-inactivation is regulated in cis by the X-inactivation center (Xic) that contains the Xist gene and its antisense gene, Tsix. On one X chromosome, Xist RNA is expressed and coats the center of the future inactive X chromosome. Xist RNA recruits epigenetic regulators, Polycomb Repressive Complexes PRC1 and PRC2 that catalyze H2AK119 ubiquitination and H3K27 trimethylation. These events lead to the X chromosome being condensed into a Barr body. The tightly packed DNA is silenced. X-inactivation is responsible for a calico cat’s beautiful color patches. The fur color gene is located on the X chromosome. Some cells inactivate the X carrying the black fur allele and others inactivate the X with the orange fur allele. The patches are formed from millions of cells expressing black fur and millions expressing orange fur, each patch growing from a single cell.

TITLE: Querying the Past: Maine LGBTQ Oral History Project  
AUTHOR(S): Caroline Wheeler  
FACULTY MENTOR(S): Wendy Chapkis  
AFFILIATION: USM  
ABSTRACT: As part of the Querying the Past: Maine LGBTQ Oral History Project, I conducted a life history interview with a local community member, Ellen McKenzie. The interview and transcription is available to researchers and the public on the USM digital commons: http://digitalcommons.usm.maine.edu/querying_ohproject/index.html. In this Thinking Matters presentation, I will discuss the process of, and insights obtained through, the oral history interview, and I will reflect on the challenges and benefits of interviewing someone who is part of the same community as I am, and at the same time a different community based on a different part of their identity, based on sexual orientation and race. As a queer white woman, I could relate to my narrator on the basis of sexual orientation and gender, but could not personally relate on the basis of race. Being able to identify with your narrator, as well as being part of a different community than your narrator offer pros and cons that shape an interview.
I will also discuss the importance of capturing oral interviews, especially from those whose voices are often oppressed, and the benefits of cross-generational conversations within the queer community.

**TITLE:** What Safe Gun Storage and Child Access Prevention Policies do People Think would be Effective in Reducing Accidental Gun Deaths in America?
**AUTHOR(S):** Stephen White, Bridget O'Keefe
**FACULTY MENTOR(S):** Rachel Casey
**AFFILIATION:** USM

**ABSTRACT:** Firearm-related incidents are often highly publicized tragedies that fuel unproductive political debates on gun policies at the local, state, and national levels. Current best practices in safe gun storage suggest that caregivers can protect their children from injury or death from an accidental gun discharge by keeping guns unloaded, locked up, and stored separately from their ammunition (Crifasi, Doucette, McGinty, Webster, & Barry, 2018). Child access prevention mechanisms including trigger locks, lock boxes, gun safes, and safe storage legislation are encouraged by the American Academy of Pediatrics (Dowd & Sege, 2012). This study gathers quantitative responses from 1,021 participants using an online survey to observe individuals’ perceptions of gun storage and gun safety policies. The data gathered may be used to further understand people’s views on five gun safety and gun storage policies that could reduce accidental firearm-related deaths among children and adults. Significant correlations that illuminate relationships between perceptions of storage policies and individual demographic data may help guide public messaging strategies that may be used to promoting safer gun storage practices in US homes, especially those with children.

**TITLE:** Development of transgenic mouse models to investigate RAB27a regulation of perivascular adipose tissue
**AUTHOR(S):** Samantha White, Joshua Boucher, Anne Harrington, Larisa Ryzhova
**FACULTY MENTOR(S):** Lucy Liaw
**AFFILIATION:** USM

**ABSTRACT:** Perivascular adipose tissue (PVAT) surrounds blood vessels and in metabolically healthy individuals, secretes vasoprotective cytokines. Conversely, obesity causes pathological conversion of PVAT. We sought to identify pathways in PVAT that regulate paracrine signaling to blood vessels. We hypothesized that RAB27A, a GTPase that regulates secretion, is a novel regulator of PVAT function. Suppression of RAB27A in human adipose progenitor cells retards exosome secretion, suggesting a novel function for RAB27A in regulating PVAT paracrine signaling. This project is developing novel mouse strains targeting Rab27a to enable mechanistic evaluation in vivo. Using CRISPR/Cas9 in C57BL/6 mice, we inserted LoxP sites flanking exon 4 of the Rab27a locus to produce a Cre recombinase-mediated conditional knockout (cKO) of exon 4, and a Rab27a global knockout (gKO) mouse via exon 4 deletion. Genomic DNA from pups was analyzed via PCR genotyping and Sanger sequencing, which identified two gKO mosaic founders containing three gKO alleles, and one cKO founder with proper LoxP integration. These founders were backcrossed to wildtype mice, and a rigorous genotyping strategy was implemented to analyze and strategically breed over 300 pups producing heterozygous N1, N2, and N3 generations. We recently produced our first homozygous Rab27a gKO mouse and will soon have our first F1 cKO generation. After validation, these models will be used to investigate RAB27A-mediated regulation of PVAT during obesity.

**TITLE:** The Power of Disclosure: How Students and Advisors Reduce Uncertainty
**AUTHOR(S):** Tessa Winship
**FACULTY MENTOR(S):** Daniel Panici
**AFFILIATION:** USM

**ABSTRACT:** Uncertainty reduction theory suggests that as time goes on, individuals will become more comfortable with one another by disclosing information about themselves. One relationship where uncertainty is seldom reduced is with professional advisors and college students. Without reducing uncertainty and forming a crucial relationship with an advisor, students may not be as successful in their college career. The aim of this research project is to find out what uncertainty means to advisors and what strategies both students and advisors use to reduce uncertainty. Thirteen professional advisors were interviewed about their perceptions of advising and what they define as uncertainty, either with themselves or with students. The participants confirmed that the uncertainties that come between them and the students are a hindrance to forming relationships with students, but, as students become more familiar with the college experience (i.e., becoming matriculated or navigating campus), the participants found that students become more at ease with them as well. The participants explained that they use active (gathering information about the student without meeting the student) and interactive (using the information they learned about the student to start a conversation with the student when meeting face to face) strategies to help with reducing uncertainty. These strategies allowed for students to disclose more information about themselves, which in turn helped the advisors form important relationships with the students.
TITLE: Toxic Masculinity and Programs of Intervention in Maine
AUTHOR(S): Devyn Winter
FACULTY MENTOR(S): Rosemary Cleary
AFFILIATION: USM
ABSTRACT: Toxic masculinity has many connotations attached to it. It is defined as the limitations and expectations put on men by society through interactions and culture. It is upheld by many systems of oppression but mostly falls on the basis of homophobia and misogyny/sexism. Violence against women is most commonly perpetrated by men and I believe toxic masculinity is the biggest reason for it. What can America do about it? This article will discuss two intervention programs implemented here in the state of Maine the Green Dot Program (beginning it’s implementation at USM) and Maine Boys to Men. This paper will explore what toxic masculinity is, why it is an issue and how the aforementioned programs plan to curb the issue. I will also be looking at a criminological theory that is used in Green Dot and give it a feminist critique.

TITLE: Cyberbullying and Suicide Among LGBTQ Youth: Is There a Connection?
AUTHOR(S): Holly Wright, Victoria Wilson Townley
FACULTY MENTOR(S): Caroline Shanti
AFFILIATION: USM
ABSTRACT: The suicide rate among children and teens has been rising over the last decade, and members of the LGBTQ youth population are at considerably greater risk for suicide than their heterosexual peers. LGBTQ youth are also at heightened risk of being bullied due to sexual orientation. Recent technological advancements have created a new platform for bullying, that of cyberbullying, which can contribute to feelings of depression and low self-esteem. The detrimental impact that cyberbullying can have on mental health suggests the possibility of a potential connection between cyberbullying and LGBTQ youth suicide. This qualitative study examines the possible link between cyberbullying and LGBTQ youth suicide by conducting a content analysis of newspaper articles about LGBTQ youth suicide over the last ten years. A random sample of 47 national newspaper articles that fit the inclusion criteria of LGBTQ youth, suicide, and cyberbullying was compiled utilizing academic databases available via the researchers’ university library system and via a public search engine. Articles were coded by both researchers and, as categories and subcategories were identified, broader themes emerged that support the researchers’ question of whether there is a connection between cyberbullying and suicide among the LGBTQ youth population. These findings highlight the need for further examination, prevention, and intervention for this vulnerable population at both the policy and practice levels.

TITLE: Video Game and the Future of Capitalism
AUTHOR(S): Yihui Yao
FACULTY MENTOR(S): Ann Spencer
AFFILIATION: USM
ABSTRACT: For the past year me and a few students have been developing an online video game. I am working on game design, animation and level programing specifically. The conception and development of this game have led me into thinking about macroeconomic issues which are related to subjects such as managing the economic activities in a massive multiplayer environment and innovating ways to do microtransaction and online services. The overall idea is that players are able to occupy resources through battling others in combat zone and extracting from randomly-generated environments. The game allows you to "loot" other players if you are able to defeat them in battle. The resources are used to craft player equipment which gives you special bonuses in skills. Through such system, players with more resources have slight advantages but higher risk while venturing forth. My particular economic inquiry in relation to designing this game came first from studying concept such as ‘economic liberty’ and the notion of "subjugating labour-power into capitalist mode of production” by Karl Marx. These ideas are still relevant in today’s economic and political debates, which should focus on not only political solutions but also innovative thinking that can break the box. A disposition in economic liberalism has induced me to ask curiously if activities in an online game environment would provide any insight into the vision of capitalism in the future.